**SECTION 05 4000**

**COLD-FORMED METAL FRAMING**

This section includes editing notes to assist the user in editing the section to suit project requirements. These notes are included as hidden text, and can be revealed or hidden by one of the following methods:

Microsoft Word 2010: Display the FILE tab on the ribbon, click OPTIONS, then on left menu click on DISPLAY. Under ALWAYS SHOW THESE select or deselect HIDDEN TEXT.

Microsoft Word 2007: Click the OFFICE button, select WORD OPTIONS, select DISPLAY, then select or deselect the HIDDEN TEXT option.

Corel WordPerfect: From the pull-down menus select VIEW, then select or deselect the HIDDEN TEXT option.

This master specification section is intended for use in the preparation of a project specification section covering cold-formed steel exterior wall studs, joists, and trusses, field installed or shop fabricated and field erected. Studs may be either axially-load bearing or non-axially load bearing. Studs for interior partition framing are specified in Section 09 2200.

This specification is sponsored by the Steel Stud Manufacturers Association (SSMA) who’s members are listed under Part 2 - Products.

Mission: SSMA's mission is to pro-actively represent member firms engaged in the manufacture, marketing and sale of cold-formed steel framing members, as a unified voice to the residential and light commercial construction industry serviced by its products, which includes contractors, distributors, design professionals, code officials and standards organizations.

Product Certification: SSMA offers the Code Compliance Certification Program as a means for member manufacturers to certify that structural and non-structural cold-formed steel framing they produce complies with IBC 2009 code requirements. Certification is independently evaluated.

Sustainability: SSMA has developed Technical Note 6 - LEED 2.2 Credits for Cold-Formed Steel Framing Manufacturers, for use on projects evaluated under LEED 2.2. Although the wording and examples in the Technical Note do not specifically apply to other versions of LEED or other rating systems, the principles, recycling rates, and other data are still accurate and applicable, and may be quoted/used for requirements beyond LEED 2.2.

Publications: SSMA’s technical library currently features SSMA's 2009/2012 International Building Code (IBC) version of their Product Technical Guide as well as ESR-3064P, which complies with the 2012, 2009 and 2006 IBC and 2010 California and Florida Building Codes for both structural and nonstructural products.

This specification is a part of the SpexPlus™ system, which comprises a full architectural master specification that can be used to specify all project requirements.

The following should be noted in using this specification:

Hypertext links to specific websites are included after manufacturer names and names of organizations whose standards are referenced within the text, to assist in product selection and further research. Hypertext links are contained in parenthesis and shown in purple, e.g.:

 ([www.spexplus.net](http://www.spexplus.net))

Optional text requiring a selection by the user is enclosed within brackets, e.g.: "Section [09 0000.] [\_\_\_\_\_.]"

Items requiring user input are enclosed within brackets, e.g.: "Section [\_\_\_\_\_ - \_\_\_\_\_\_\_\_]."

Optional paragraphs are separated by an "OR" statement, e.g.:

\*\*\*\* OR \*\*\*\*

Sustainable requirements are included for projects requiring LEED certification, and are included as green text. For additional information on LEED, visit the U.S. Green Building Council website at [www.usgbc.org.](http://www.usgbc.org)

For assistance with obtaining or using the SpexPlus™ Master Specification System contact SpexPlus, Inc. by calling 1-888-877-SPEX (1-888-877-7739), by email at chaney@spexplus.net, or visit our website at [www.spexplus.net](http://www.spexplus.net)**.**

1. **GENERAL**
	1. SUMMARY

Edit the following paragraphs to include only those items specified in this section.

* + 1. Section Includes:
			1. Load-bearing steel stud [exterior] wall framing.
			2. Non-load-bearing steel stud [exterior] wall framing.
			3. Steel soffit framing.
			4. Steel [floor] [and] [ceiling] joist framing..
			5. Steel stud truss framing.

Coordinate the following paragraphs with other sections in the project manual.

* + 1. Related Sections:
			1. Division 01: Administrative, procedural, and temporary work requirements.
	1. REFERENCES

In the following paragraphs, retain only those reference standards that are used elsewhere in this section.

* + 1. American Iron and Steel Institute (AISI) ([www.steel.org](http://www.steel.org)) - Specification for the Design of Cold-Formed Steel Structural Members.
		2. American Society of Civil Engineers (ASCE) ([www.asce.org](http://www.asce.org)) 7 - Minimum Design Loads for Buildings and Other Structures.
		3. American Welding Society (AWS) ([www.aws.org](http://www.aws.org)) D1.3/D1.3M - Structural Welding Code - Sheet Steel.
		4. ASTM International (ASTM) ([www.astm.org](http://www.astm.org)):
			1. A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy Coated (Galvannealed) by the Hot-Dip Process..
			2. A780 - Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings.
			3. A1003/A1003M - Standard Specification for Steel Sheet, Carbon, Metallic- and Nonmetallic-Coated for Cold-Formed Framing Members.
			4. C955 - Standard Specification for Load-Bearing (Transverse and Axial) Steel Studs, Runners (Tracks), and Bracing or Bridging for Screw Application of Gypsum Board and Metal Plaster Bases.
			5. C1007 - Standard Specification for Installation of Load Bearing (Transverse and Axial) Steel Studs and Related Accessories.
			6. C1513 - Standard Specification for Steel Tapping Screws for Cold-Formed Steel Framing Connections.
		5. Steel Stud Manufacturer’s Association (SSMA) [(www.ssma.com](http://www.ssma.com)) - Member Directory.
		6. Society for Protective Coatings (SSPC) ([www.sspc.org](http://www.sspc.org)) - Painting Manual.
	1. SUBMITTALS

Limiting submittals to only those actually required helps to minimize liability arising from the review of submittals. Minimize submittals on smaller, less complex projects.

Include the following for submission of shop drawings, product data, and samples for the Architect's review.

* + 1. Submittals for Review:
			1. Shop Drawings: Indicate framing layout, components, connections, fastenings, and pertinent details.
			2. Product Data: Indicate framing components, sizes, materials, finishes, and accessories.

Include the following for submission of quality control submittals. These submittals are intended for the Owner's record purposes and are not intended to be reviewed by the Architect.

* + 1. Quality Control Submittals:
			1. Certificates of Compliance: Certificate from Professional Structural Engineer responsible for system design that system was designed in accordance with Contract Document requirements, applicable Building Code, and generally accepted engineering practices.
			2. Welder Certifications: As required by AWS D1.3/D1.3M.

Include the following for submission of sustainable design submittals.

* + 1. Sustainable Design Submittals:
			1. Recycled Content.
			2. Regional Materials.
	1. QUALITY ASSURANCE
		1. Manufacturer: Current member of SSMA.

The following paragraph specifies a minimum level of experience required of the parties performing the work of this section. Retain if required, and edit to suit project requirements.

* + 1. Installer Qualifications: Minimum [\_\_] years [documented] experience in work of this Section.
		2. Calculate structural properties of framing members in accordance with AISI Specifications.
		3. Design framing under the direct supervision of a Professional Structural Engineer with minimum [2] [\_\_] years [documented] experience in the work of this Section and licensed in the State in which the Project is located.
		4. Design [exterior wall stud system] [roof trusses] to withstand:
			1. Live and dead loads in accordance with Building Code.
			2. Wind pressure loads in accordance with [ASCE 7.] [Building Code.] [\_\_\_\_.]
			3. Movement caused by an ambient temperature range of [120] [\_\_] degrees F and a surface temperature range of [160] [\_\_] degrees F.
			4. Maximum deflection under loading: [L/240] [L/360] [L/600] [L/720] [\_\_\_\_] without sheathing materials.
			5. Minimum [1/2] [\_\_] inch vertical deflection of structure.
		5. Design joist system to withstand:
			1. Live and dead loads in accordance with Building Code.
			2. Maximum deflection under loading: [L/240] [L/360] [\_\_\_\_] without decking materials.
		6. Design system to accommodate construction tolerances, deflection of building structural members, and clearances at openings.
		7. Welder Qualifications: AWS D1.3/D1.3M.
	1. DELIVERY, STORAGE AND HANDLING
		1. In accordance with ASTM C1007.
1. **PRODUCTS**
	1. MANUFACTURERS

The following list includes manufacturers that are known to produce one or more of the products specified in this section, and that have websites available to assist in product research. Careful consideration of product attributes in relationship to project requirements is required before including products in the paragraphs that follow. This list is not intended to include every available manufacturer.

* + 1. Acceptable Manufacturers:
			1. Allsteel and Gypsum Products, Inc. [(www.allsteelproducts.com](http://www.allsteelproducts.com))
			2. Consolidated Fabricators Corp. [(www.confabbpd.com](http://www.confabbpd.com))
			3. Craco Manufacturing., Inc. [(www.cracometals.com](http://www.cracometals.com))
			4. Custom Stud, Inc. [(www.customstud.com](http://www.customstud.com))
			5. Design Shapes in Steel.
			6. Frametek Steel Products. [(www.frameteksteel.com](http://www.frameteksteel.com))
			7. Olmar Supply Inc. [(www.olmarsupply.com](http://www.olmarsupply.com))
			8. Quail Run Building Materials, Inc. [(www.qrbm.com](http://www.qrbm.com))
			9. SCAFCO Corporation. [(www.scafco.com](http://www.scafco.com))
			10. Steel Construction Systems. [(www.steelconsystems.com](http://www.steelconsystems.com))
			11. United Metal Products, Inc. [(www.unitedmetalproducts.info](http://www.unitedmetalproducts.info))
			12. [\_\_\_\_].
			13. [\_\_\_\_].
			14. [\_\_\_\_].

Edit the following to indicate whether or not substitutions will be permitted for the products in this section.

* + 1. Substitutions: [Under provisions of Division 01.] [Not permitted.]
	1. MATERIALS
		1. Framing Materials:
			1. ASTM A653/A653M or A1003/A1003M, galvanized sheet steel, [G60] [G90] [\_\_\_] coating class.
			2. Recycled content: Minimum [\_\_] percent, with minimum [\_\_] percent classified as post consumer.
			3. Fabricate components to ASTM C955.
			4. [Studs] [and] [joists]: SSMA stud profile, C-shaped, punched for utility access.
			5. Tracks:
				1. SSMA stud track profile, C-shaped, same gage and depth as studs, unpunched.

Include the following where deflection of overhead structure is anticipated.

* + - * 1. Top track: Deflection type, deep leg track with slotted screw holes; permit plus or minus [1/2] [\_\_] inch movement of overhead structure without damage to framing.
				2. [Top and] bottom track: [1-1/4] [\_\_] inch high legs.
				3. Rim track: Provide closure for ends of joists.
	1. ACCESSORIES
		1. Bracing, Furring, Bridging and Web Stiffeners: Formed sheet steel, thickness determined by performance requirements specified.
		2. Plates, Gussets, Clips: Formed sheet steel, thickness determined by performance requirements specified.
		3. Fasteners: ASTM C1513; self-drilling, self-tapping screws.
		4. Touch Up Paint: SSPC Paint 20, Type I or II.
		5. Welding Electrodes: AWS D1.3/D1.3M; type required for materials being welded.
	2. FABRICATION
		1. Framing components may be prefabricated using templates.

\*\*\*\* OR \*\*\*\*

* + 1. Prefabricate framing components using templates. Field fabrication prohibited except for minor alterations to accommodate site conditions.
		2. Cut members square and with tight fit to adjacent framing.
		3. Assemble components using screw connection, welding, or clinching methods. Welding to conform to AWS D1.3/D1.3M.
		4. Fabricate straight, level, and true, without warp or rack.
		5. Fabrication Tolerances: In accordance with ASTM C955.
1. **EXECUTION**
	1. INSTALLATION - GENERAL
		1. Install framing components in accordance with ASTM C1007, manufacturer's instructions, and approved Shop Drawings.
		2. Welding: In accordance with AWS D1.3/D1.3M.
		3. Make provisions for erection stresses. Provide temporary alignment and bracing.

Include the following for axial load-bearing wall construction.

* 1. INSTALLATION - AXIALLY LOADED STUD FRAMING
		1. Place top and bottom tracks in straight lines with ends butted. Fasten tracks [at maximum [12] [\_\_] inches on center.] [as indicated.]
		2. Place studs at spacing indicated and not more than [2] [\_\_] inches from abutting walls and at each side of openings.
		3. Connect studs to top and bottom tracks.
		4. Construct corners using minimum of three studs.
		5. Do not splice studs.
		6. Erect, brace, and reinforce stud framing to develop strength to achieve design requirements.
		7. Install headers above openings and intermediate studs above and below openings to align with wall stud spacing.
		8. Install framing between studs for attachment of mechanical and electrical items, and to prevent stud rotation.
		9. Diagonally brace walls at location indicated for shear construction.

\*\*\*\* OR \*\*\*\*

Include the following for non-axial load bearing wall construction where allowance for top track deflection is required.

* 1. INSTALLATION - NON-AXIALLY LOADED STUD FRAMING
		1. Place top and bottom tracks in straight lines with ends butted. Fasten tracks [at maximum [12] [\_\_] inches on center.] [as indicated.]
		2. Place studs at spacing indicated and not more than [2] [\_\_] inches from abutting walls and at each side of openings.
		3. Install deflection compensating top track at framing extending to underside of structure.
		4. Connect studs to top and bottom tracks.
		5. Construct corners using minimum of three studs.
		6. Do not splice studs.
		7. Erect, brace, and reinforce stud framing to develop strength to achieve design requirements.
		8. Install headers above openings and intermediate studs above and below openings to align with wall stud spacing.
		9. Install framing between studs for attachment of mechanical and electrical items, and to prevent stud rotation.
		10. Laterally brace walls at locations indicated.
	2. INSTALLATION - JOISTS
		1. Place joists at spacings indicated and not more than [2] [\_\_] inches from abutting walls. Connect members to supports using fastener method.
		2. Set members parallel and level; install lateral bracing and bridging where indicated.
		3. Locate joists directly over bearing studs or provide load distribution member.
		4. Provide additional joists under parallel partitions when partition length exceeds one-half of joist span and around openings that interrupt one or more joists.
		5. Do not splice joists.
		6. Provide web stiffeners at reaction points and points of concentrated loads.
		7. Provide end blocking where joist ends are not otherwise restrained from rotation.
	3. INSTALLATION - TRUSSES
		1. Place trusses at spacings indicated.
		2. Make provisions for erection stresses. Provide temporary alignment and bracing.
		3. Set trusses parallel and level; install lateral bracing and bridging as required.
	4. INSTALLATION TOLERANCES
		1. In accordance with ASTM C1007.
	5. FIELD QUALITY CONTROL
		1. Testing and Inspection Services: Inspect and test shop and field welds in accordance with AWS D1.3/D1.3M.
	6. ADJUSTING

In the following paragraph, A2 - Repair Using Paints Containing Zinc Dust, is the most common method. A1 - Repair Using Zinc-Based Alloys requires heating the surface to 600 degrees F and using repair sticks that melt on contact; A3 - Repair Using Sprayed Zinc (Metallizing) requires blast cleaning of affected areas and special application equipment.

* + 1. Clean and touch up galvanized coatings at welded and abraded surfaces in accordance with ASTM A780, Annex [A1.] [A2.] [A3.]

END OF SECTION