JOINT BASE LEWIS McCHORD DESIGN STANDARDS

 DIVISION 05 - METALS SECTION 05 40 00

COLD-FORMED METAL FRAMING

# 07/18

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

AMERICAN IRON AND STEEL INSTITUTE (AISI)

AISI S100 (2007; Supp 1: 2009; Supp 2: 2010) North

American Specification for the Design of

Cold-Formed Steel Structural Members

AISI S200 (2007) North American Standard for

Cold-Formed Steel Framing - General

Provision

AISI S201 (2007) North American Standard for

Cold-Formed Steel Framing - Product Data

AISI S202 (2011) Code of Standard Practice for

Cold-formed Steel Structural Framing

AISI S211 (2007) North American Standard for

Cold-Formed Steel Framing - Wall Stud

Design

AISI S212 (2007) North American Standard for

Cold-Formed Steel Framing - Header Design

AISI SG02-KIT 2001; Supp 1 2004) North American

Specification for the Design of

Cold-Formed Steel Structural Members

AISI SG03-3 (2002; Suppl 2001-2004; R 2008)

Cold-Formed Steel Design Manual Set

ASTM INTERNATIONAL (ASTM)

ASTM A1003/A1003M (2012) Standard Specification for Steel

Sheet, Carbon, Metallic- and

Nonmetallic-Coated for Cold-Formed Framing

Members

ASTM A1008/A1008M (2012) Standard Specification for Steel,

Sheet, Cold-Rolled, Carbon, Structural,

High-Strength Low-Alloy and High-Strength

Low-Alloy with Improved Formability,

Solution Hardened, and Bake Hardened

ASTM A1011/A1011M (2012) Standard Specification for Steel,

Sheet, and Strip, Hot-Rolled, Carbon,

Structural, High-Strength Low-Alloy and

High-Strength Low-Alloy with Improved

Formability and Ultra-High Strength

ASTM A123/A123M (2012) Standard Specification for Zinc

(Hot-Dip Galvanized) Coatings on Iron and

Steel Products

ASTM A153/A153M (2009) Standard Specification for Zinc

Coating (Hot-Dip) on Iron and Steel

Hardware

ASTM A370 (2012) Standard Test Methods and

Definitions for Mechanical Testing of

Steel Products

ASTM A653/A653M (2011) Standard Specification for Steel

Sheet, Zinc-Coated (Galvanized) or

Zinc-Iron Alloy-Coated (Galvannealed) by

the Hot-Dip Process

ASTM C1007 (2011a) Standard Specification for

Installation of Load Bearing (Transverse

and Axial) Steel Studs and Related

Accessories

ASTM C1513 (2012) Standard Specification for Steel

Tapping Screws for Cold-Formed Steel

Framing Connections

ASTM C955 (2011c) Load-Bearing (Transverse and

Axial) Steel Studs, Runners (Tracks), and

Bracing or Bridging for Screw Application

of Gypsum Panel Products and Metal Plaster

Bases

ASTM E119 (2012a) Standard Test Methods for Fire

Tests of Building Construction and

Materials

ASTM E329 (2011c) Standard Specification for

Agencies Engaged in the Testing and/or

Inspection of Materials Used in

Construction

ASTM F1941 (2010) Standard Specification for

Electrodeposited Coatings on Threaded

Fasteners (Unified Inch Screw Threads

(UN/UNR))

ASTM F1941M (2007) Standard Specification for

Electrodeposited Coatings on Threaded

Fasteners (Metric)

1.2 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. The following shall be submitted in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-02 Shop Drawings

Framing Components; G;

a. Cross sections, plans, and/or elevations showing component types and locations for each framing application; including shop coatings and material thicknesses for each framing component.

b. Connection details showing fastener type, quantity, location, and other information to assure proper installation.

SD-03 Product Data

Steel studs, joists, tracks, bracing, bridging and accessories

SD-07 Certificates

Load-bearing cold-formed metal framing;

Mill certificates or test reports from independent test agency, qualified in accordance with ASTM E329, showing that the steel sheet used in the manufacture of each cold-formed component complies with the minimum yield strengths and uncoated steel thickness specified. Test reports shall be based on the results of three coupon tests in accordance with ASTM A370.

1.3 DELIVERY, STORAGE, AND HANDLING

Deliver materials to job site and store in adequately ventilated, dry locations. Storage area shall permit easy access for inspection and handling. If necessary to store materials outside, stack off the ground, support on a level platform, and protect from the weather as approved. Handle materials to prevent damage. Finish of the framing members shall maintained at all times, using an approved high zinc dust content, galvanizing repair paint whenever necessary to prevent the formation of rust. Replace damaged items with new, as directed by the Contracting Officer. Steel framing and related accessories shall be stored and handled in accordance with the AISI S202, "Code of Standard Practice for Cold-Formed Steel Structural Framing".

1.4 LOAD-BEARING COLD-FORMED METAL FRAMING

Include top and bottom tracks, connections top and bottom, bracing, fastenings, and other accessories necessary for complete installation.

Framing members shall have the structural properties indicated. Where physical structural properties are not indicated, they shall be as necessary to withstand all imposed loads. Design framing in accordance with AISI SG03-3. Non-load-bearing metal framing, furring, and ceiling suspension systems are specified in Section 09 22 00 SUPPORTS FOR PLASTER

AND GYPSUM BOARD.

1.5 QUALITY ASSURANCE

a. Testing Agency Qualifications: An independent testing agency, acceptable to authorities having jurisdiction, qualified according to ASTM E329 for testing indicated.

b. Product Tests: Mill certificates or data from a qualified independent testing agency indicating steel sheet complies with requirements, including base-metal thickness, yield strength, tensile strength, total elongation, chemical requirements, and metallic-coating thickness.

c. Fire-Test-Response Characteristics: Where indicated, provide cold-formed metal framing identical to that of assemblies tested for fire resistance per ASTM E119 by, and displaying a classification label from, a testing and inspecting agency acceptable to authorities having jurisdiction.

d. AISI Specifications and Standards: Comply with:

1. AISI S100, "North American Specification for the Design of

Cold-Formed Steel Structural Members".

2. AISI S200, "North American Standard for Cold-Formed Steel Framing

General Provision".

3. AISI S201, "North American Standard for Cold-Formed Steel Framing

Product Data".

4. AISI S202, "Code of Standard Practice for Cold-Formed Steel

Structural Framing".

5. AISI S211, "North American Standard for Cold-Formed Steel Framing

Wall Stud Design".

6. AISI S212, "North American Standard for Cold-Formed Steel Framing

Header Design".

PART 2 PRODUCTS

2.1 STEEL STUDS, JOISTS, TRACKS, BRACING, BRIDGING AND ACCESSORIES

Framing components shall comply with ASTM C955 and the following.

a. Recycled Content of Steel Products: Provide products with an average recycled content of steel products so postconsumer recycled content plus one-half of pre-consumer recycled content not less than 25 percent.

b. Steel Sheet: ASTM A1003/A1003M, Structural Grade, Type H, metallic coated, of grade and coating weight as follows:

1. Grade: ST50H or as required by structural performance or drawings.

c. Steel Sheet for Vertical Deflection Clips: ASTM A1003/A1003M,

ASTM A653/A653M, structural steel, zinc coated, of grade and coating as follows:

1. Grade: 50 as required by structural performance or drawings.

2. Coating: G60.

d. Steel Studs: Manufacturer's standard C-shaped steel studs, of web depths indicated, punched, with stiffened flanges, as required for sections shown on the drawings.

e. Steel Track: Manufacturer's standard U-shaped steel track, of web depths indicated, unpunched, with straight flanges, as required for sections shown on the drawings.

2.1.1 Studs and Joists of 16 Gage (0.0538 Inch) and Heavier Galvanized steel, ASTM A653/A653M and ASTM A1003/A1003M, SS Grade 50, or carbon steel, ASTM A1011/A1011M, Grade 50, painted.

2.1.2 Studs and Joists of 18 Gage (0.0478 Inch) and Lighter Studs and Joists of 18 Gage (0.0428 Inch) and Lighter, Track, and Accessories (All Gages): Galvanized steel, ASTM A653/A653M and ASTM A1003/A1003M, SS, Grade 50 33,000 psi G60; or carbon steel, ASTM A1008/A1008M, Grade C, painted.

2.1.3 Sizes, Gages, Section Modulus, and Other Structural Properties Size and gage as indicated.

2.2 MARKINGS

Studs and track shall have product markings stamped on the web of the section. The markings shall be repeated throughout the length of the member at a maximum spacing of 4 feet on center and shall be legible and easily read. The product marking shall include the following:

a. An ICC number.

b. Manufacturer's identification.

c. Minimum delivered uncoated steel thickness.

d. Protective coating designator.

e. Minimum yield strength.

2.3 CONNECTIONS

2.3.1 Studs and Joists of 16-gage and Heavier Screws for steel-to-steel connections shall be self-tapping screws in compliance with ASTM C1513 of the type, size and location as shown on the drawings. Screws shall be hot-dipped galvanized in accordance with ASTM A123/A123M or ASTM A153/A153M as appropriate.

2.3.2 Studs and Joists 18-gage and Lighter screws for steel-to-steel connections shall be self-drilling screws in compliance with ASTM C1513 of the type, size, and locations shown on the drawings. Electroplated screws shall have a minimum 5 micron zinc coating in accordance with ASTM F1941M, ASTM F1941. Screws shall be hot-dipped galvanized in accordance with ASTM A123/A123M or ASTM A153/A153M as appropriate.

2.4 PLASTIC GROMMETS

Supply plastic grommets, recommended by stud manufacturer, to protect electrical wires. Prevent metal to metal contact for plumbing pipes.

PART 3 EXECUTION

3.1 FASTENING

Fasten framing members together by using self-drilling or self-tapping screws. Screw connections shall be as required and indicated in the design calculations.

3.1.1 Screws

Screws shall be of the self-drilling self-tapping type, with size and location shown on the drawings. Screw penetration through joined materials shall not be less than three exposed threads. Minimum spacing and edge distances for screws shall be as specified in AISI SG02-KIT. Screws covered by sheathing materials shall have low profile heads.

3.1.2 Anchors

Anchors shall be of the type, size, and location shown on the drawings.

3.1.3 Powder-Actuated Fasteners

Powder-actuated fasteners shall be of the type, size, and location shown on the drawings.

3.2 INSTALLATION

Install cold-formed framing in accordance with ASTM C1007 and AISI S200 AISI S202 and to manufacturer's written instructions unless more stringent requirements are indicated.

3.2.1 Tracks

Provide accurately aligned runners at top and bottom of partitions as required. Anchor tracks as indicated. Splice track with stud inserts. Fasteners shall be at least 3 inches from the edge of concrete slabs.

3.2.2 Studs

Cut studs square and set with firm bearing against webs of top and bottom tracks. Position studs vertically in tracks and space as indicated in design. Do not splice studs. Provide at least two studs at jambs of doors and other openings 2 feet wide or larger. Provide jack studs over openings, as necessary, to maintain indicated stud spacing. Provide tripled studs at corners, positioned to receive interior and exterior finishes. Fasten studs to top and bottom tracks by welding or screwing both flanges to the tracks. Framed wall openings shall include headers and supporting components as shown on the drawings. Headers shall be installed in all openings that are larger than the stud spacing in a wall. In curtain wall construction, provide for vertical movement where studs connect to the structural frame. Provide horizontal bracing in accordance with the design calculations and AISI SG03-3, consisting of, as a minimum, runner channel cut to fit between and welded to the studs or hot- or cold-rolled steel channels inserted through cutouts in web of each stud and secured to studs with welded clip angles. Bracing shall be not less than the following:

LOAD HEIGHT BRACING

Wind load only Up to 10 feet one row at mid-height

Over 10 feet Rows 5'-0" o.c. maximum

3.2.3 Erection Tolerances

a. Framing members which will be covered by finishes such as wallboard, plaster, or ceramic tile set in a mortar setting bed, shall be within the following limits:

(1) Layout of walls and partitions: 1/4 inch from intended position;

(2) Plates and runners: 1/4 inch in 8 feet from a straight line;

(3) Studs: 1/4 inch in 8 feet out of plumb, not cumulative; and

(4) Face of framing members: 1/4 inch in 8 feet from a true plane.

b. Framing members which will be covered by ceramic tile set in dry-set mortar, latex-portland cement mortar, or organic adhesive shall be within the following limits:

(1) Layout of walls and partitions: 1/4 inch from intended position;

(2) Plates and runners: 1/8 inch in 8 feet from a straight line;

(3) Studs: 1/8 inch in 8 feet out of plumb, not cumulative; and

(4) Face of framing members: 1/8 inch in 8 feet from a true plane.

-- End of Section --