CONSTRUCTION STANDARD SPECIFICATION

SECTION 05400

COLD-FORMED METAL FRAMING

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PART 1 - GENERAL

1.01 SUMMARY

A. Types of cold-formed metal framing units include the following:

1. Load-bearing punched channel studs.

2. C-shaped load-bearing steel studs.

3. C-shaped steel joists

B. Non-load bearing studs are specified in Section 09250, "Gypsum Drywall."

1.02 SUBMITTALS

A. Product Data: Submit product information and installation instructions from manufacturers for each item of cold-formed metal framing and accessories.

B. Shop Drawings: Shop drawings shall include placing drawings for framing members showing size and gauge designations, number, type, location, and spacing.

1. Indicate supplemental strapping, bracing, splices, bridging, accessories, and details required for proper installation.

C. Welding Certificates: Provide certificate signed by Contractor certifying that welders comply with requirements specified under “Quality Assurance” Article, prior to performing work.

D. Welding Procedures: Provide written welding procedure specification (WPS) document per AWS Code requirements.

1.03 QUALITY ASSURANCE

A. Component Design: Calculate structural properties of studs and joists in accordance with the American Iron and Steel Institute (AISI), "Specification for Design of Cold-Formed Steel Structural Members."

B. Welding Standards: Comply with applicable provisions of ANSI/AWS D1.1 “Structural Welding Code-Steel”, and ANSI/AWS D1.3 “Structural Welding Code-Sheet Steel.”

Certify that each welder has satisfactorily passed AWS qualification tests for welding processes involved, and if pertinent, has undergone recertification.

1.04 DELIVERY, STORAGE, AND HANDLING

Deliver to project site in manufacturer's unopened containers or bundles, fully identified with name, brand, type, and grade. Store off the ground in a dry ventilated space or protect with impervious covering. Protect metal framing units from rusting and damage.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated in the work include but are not limited to the following:

Dale Industries, Inc.
Dietrich Industries, Inc.
USG Industries
Unimast, Inc.
Wheeling Corrugating Co.

2.02 METAL FRAMING

A. System Components: Manufacturers' standard load-bearing steel studs and joists of type, size, shape, and gauge as indicated. With each type of metal framing required, provide manufacturer's standard steel runners (tracks), blocking, lintels, reinforcements, shoes, clip angles, fasteners, and accessories for applications indicated, as needed to provide a complete metal framing system.

B. Materials and Finishes:

1. For 16 gauge and heavier units, fabricate metal framing components of structural quality steel sheet with a minimum yield point of 40,000 psi, ASTM A 446 Grade C.

2. For 18 and 20 gauge units, fabricate metal framing components of commercial quality steel sheet with a minimum yield point of 33,000 psi, ASTM A 446 Grade A.

3. Provide galvanized finish to metal framing components complying with ASTM A 525 for minimum G 60 coating.

4. Finish of installation accessories to match that of main framing components, unless otherwise indicated.

C. Fasteners: Provide nuts, bolts, washers, screws, and other fasteners with corrosion-resistant plated finish.

D. Electrodes for Welding: Comply with AWS Code and as recommended by stud manufacturer.

E. Galvanizing Repair: Where galvanized surfaces are damaged, prepare surfaces and repair in accordance with procedures specified in ASTM A 780.

2.03 FABRICATION

A. General: Framing components may be prefabricated into assemblies before erection. Fabricate panels plumb, square, true-to-line, and braced against racking with joints welded. Perform lifting of prefabricated units to prevent damage or distortion.

1. Fabricate units in jig templates to hold members in proper alignment and position and to assure consistent component placement.

B. Fasten cold-formed metal framing members by welding or screw fastening, as standard with fabricator. Do not field weld units of 20 gauge or lighter. Wire tying of framing members is not permitted.

1. Comply with AWS requirements and procedures for welding, appearance and quality of welds, and methods used in correcting weld work.

2. Locate mechanical fasteners and install according to cold-formed metal framing manufacturer’s instructions.

C. Fabrication Tolerances: Fabricate units to a maximum allowable tolerance variation from plumb, level, and true-to-line of 1/8 inch in 10 feet.

PART 3 - EXECUTION

3.01 INSTALLATION

A. General: Install cold-formed metal framing and accessories plumb, square, true to line, and with connections securely fastened, in accordance with manufacturer's recommendations and the requirements of this Section.

1. Fasten cold-formed metal framing members by welding or screw fastening, as standard with fabricator. Wire tying of framing members is not permitted.

2. Comply with AWS requirements and procedures for welding, appearance and quality of welds, and methods used in correcting weld work.

a. Where weld throat is not shown on the Contract documents, the weld throat shall be at least as large as the thickness of the thinnest sheet joined. All welds shall provide complete fusion of the sheets without “blow-out.”

3. Locate mechanical fasteners and install according to cold-formed metal framing manufacturer's instructions.

B. Runner Tracks: Install continuous tracks sized to match studs. Align tracks accurately to layout at base and tops of studs.

1. Secure tracks as recommended by stud manufacturer for type of construction involved, spacing not to exceed 24 inches o.c. for nail or power-driven fasteners, or 16 inches o.c. for other types of attachment. Provide fasteners at corners and ends of tracks.

2. All track butt joints, abutting pieces of track shall be securely anchored to a common structural element or they shall be spliced together.

C. Wall Studs: Secure studs to top and bottom runner tracks, except where provisions for structure vertical movement is provided on drawings, by either welding or screw fastening at both inside and outside flanges.

1. Set studs plumb, except as needed for diagonal bracing or required for non-plumb walls or warped surfaces and similar requirements.

2. Where stud system abuts structural columns or walls, including masonry walls, anchor ends of stiffeners to supporting structure.

3. Axially loaded studs shall have full bearing against the inside web of top and bottom tracks. Splices in axially loaded studs are not permitted.

D. Install supplementary framing, blocking, and bracing in metal framing system wherever walls or partitions are indicated to support fixtures, equipment, services, casework, heavy trim and furnishings, and similar work requiring attachment to the wall or partition. Where type of supplementary support is not otherwise indicated, comply with stud manufacturer's recommendations.

E. Frame wall openings larger than 2'-0" square with double stud at each jamb of frame, except where more than two studs are either shown or indicated in manufacturer's instructions.

1. Install runner tracks and jack studs above door openings, and above and below wall openings.

2. Anchor tracks to jamb studs with stud shoes or by welding, and space jack studs same as full-height studs of wall.

3. Secure stud system wall opening frame in manner indicated.

F. Frame both sides of expansion and control joints with separate studs; do not bridge the joint with components of stud system.

G. Install horizontal bridging in all load-bearing and exterior stud wall systems, with two (2) equally spaced rows for walls less than 10 feet high and rows spaced not more than 48 inches o.c. at walls higher than 10 feet.

H. Horizontal Bridging is not required for non-loadbearing interior stud walls unless noted on the drawings.

I. Provisions for structure vertical movement shall be provided where indicated on the drawings.

J. All welds shall be touched up using zinc-rich paint.

K Erection Tolerances: Bolt or weld wall panels (at both horizontal and vertical junctures) to produce flush, even, true-to-line joints.

1. Maximum variation in plane and true position between prefabricated assemblies should not exceed 1/16 inch.

L. Installation of Joists: Install level, straight, and plumb, complete with bracing and reinforcing as indicated on drawings. Provide not less than 1-1/2 inch end bearing.

1. Reinforce ends with end clips, steel hangers, steel angle clips, steel stud section, or as otherwise recommended by joist manufacturer.

2. When required, reinforce joists at interior supports with single short length of joist section located directly over interior support, snap-on shoe, 30 percent side-piece lapped reinforcement, or other method recommended by joist manufacturer.

3. Secure joists to interior support systems to prevent lateral movement of bottom flange.

END OF SECTION