SECTION 05400

COLD FORMED METAL FRAMING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Formed steel stud exterior wall and interior wall framing.

B. Exterior wall sheathing.

C. Formed steel joist, purlin, and slotted channel framing and bridging.

1.02 RELATED REQUIREMENTS

A. Section 04852 - Stone Masonry Veneer: Stone veneer supported by wall stud metal framing.

B. Section 05310 - Steel Deck.

C. Section 07212 - Board and Batt Insulation: Insulation within framing members.

D. Section 07900 - Joint Sealers.

E. Section 09111 - Non-Loadbearing Metal Framing.

F. Section 09260 - Gypsum Board Assemblies: Lightweight, non-load bearing metal stud framing.

1.03 REFERENCE STANDARDS

A. AISI SG02-1 - North American Specification for the Design of Cold-Formed Steel Structural Members; American Iron and Steel Institute. (replaced SG-971)

B. ASTM A 653/A 653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.

C. ASTM C 955 - Standard Specification for Load-Bearing (Transverse and Axial) Steel Studs, Runners (Tracks), and Bracing or Bridging for Screw Application of Gypsum Panel Products and Metal Plaster Bases.

D. AWS D1.1/D1.1M - Structural Welding Code - Steel; American Welding Society.

E. AWS D1.3 - Structural Welding Code - Sheet Steel; American Welding Society.

F. ICC-ES AC38 - Acceptance Criteria for Water-Resistive Barriers; ICC Evaluation Service, Inc..

G. SSPC-Paint 15 - Steel Joist Shop Primer; Society for Protective Coatings.

H. SSPC-Paint 20 - Zinc-Rich Primers (Type I, "Inorganic," and Type II, "Organic"); Society for Protective Coatings.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Coordinate with work of other sections that is to be installed in or adjacent to the metal framing system, including but not limited to structural anchors, cladding anchors, utilities, insulation, and firestopping.

1.05 SUBMITTALS

A. See Section 01350 - Submittals, for submittal procedures.

B. Product Data: Provide data on standard framing members; describe materials and finish, product criteria, limitations.

C. Product Data: Provide manufacturer's data on factory-made framing connectors, showing compliance with requirements.

D. Shop Drawings: Indicate component details, framed openings, bearing, anchorage, loading, welds, and type and location of fasteners, and accessories or items required of related work.
   1. Indicate stud, floor joist, and ceiling joist layout.
   2. Describe method for securing studs to tracks and for bolted or welded framing connections.
   3. Provide design engineer's stamp on shop drawings.
   4. Provide calculations for loadings and stresses of specially fabricated framing, stamped by a Professional Structural Engineer.
   5. Provide details and calculations for factory-made framing connectors, stamped by a Professional Structural Engineer.

E. Manufacturer's Installation Instructions: Indicate special procedures, conditions requiring special attention.

1.06 QUALITY ASSURANCE

A. Designer Qualifications: Design framing system under direct supervision of a Professional Structural Engineer experienced in design of this Work and licensed in California.

B. Manufacturer Qualifications: Company specializing in manufacturing the types of products specified in this section, and with minimum 10 years of documented experience.

C. Installer Qualifications: Company specializing in performing the work of this section with minimum 10 years of documented experience.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Metal Framing, Connectors, and Accessories:
   1. Dietrich Metal Framing: www.dietrichindustries.com.
   2. Marino\Ware: www.marinoware.com.
   3. The Steel Network, Inc: www.SteelNetwork.com.
   4. Cemco. www.cemcosteel.com.
   5. Substitutions: See Section 01640 - Substitutions and Product Options.

2.02 FRAMING SYSTEM

A. Provide primary and secondary framing members, bridging, bracing, plates, gussets, clips, fittings, reinforcement, and fastenings as required to provide a complete framing system.

B. Design Criteria: Provide completed framing system having the following characteristics:
   1. Design: Calculate structural characteristics of cold-formed steel framing members according to AISI North American Specification for the Design of Cold-Formed Steel Structural Members.
   2. Structural Performance: Design, engineer, fabricate, and erect to withstand specified design loads for project conditions within required limits.
   3. Design Loads: In accordance with applicable codes.
   4. Deflections: Live load deflection in accordance with applicable codes:
   5. Able to tolerate movement of components without damage, failure of joint seals, undue stress on fasteners, or other detrimental effects when subject to seasonal or cyclic day/night temperature ranges.
   6. Able to accommodate construction tolerances, deflection of building structural members, and clearances of intended openings.

C. Shop fabricate framing system to the greatest extent possible.

D. Deliver to site in largest practical sections.

2.03 FRAMING MATERIALS

A. Studs and Track: ASTM C 955; studs formed to channel, "C", or "Sigma" shape with punched web; U-shaped track in matching nominal width and compatible height.

1. Gage and depth: As required to meet specified performance levels and minimums as indicated on the drawings.
2. Galvanized in accordance with ASTM A 653/A 653M G60/Z180 coating.

B. Joists and Purlins: Fabricated from ASTM A 653/A 653M steel sheet, with G60/Z180 hot dipped galvanized coating.
1. Base Metal: As required to meet specified performance levels.
2. Gage and depth: As required to meet specified performance levels and minimums as indicated on the drawings

C. Framing Connectors: Factory-made formed steel sheet, ASTM A 653/A 653M SS Grade 50, with G60/Z180 hot dipped galvanized coating and factory punched holes.
1. Structural Performance: Maintain load and movement capacity required by applicable code, when evaluated in accordance with AISI North American Specification for the Design of Cold Formed Steel Structural Members; minimum 16 gage, 0.06 inch thickness.
2. Movement Connections: Provide mechanical anchorage devices that accommodate movement using slotted holes, screws and anti-friction bushings, while maintaining structural performance of framing. Provide movement connections where indicated on drawings.
   a. Acceptable Products: VertiClip(r) or DriftClip(tm) manufactured by The Steel Network Inc.
3. Provide non-movement connections for tie-down to foundation, floor-to-floor tie-down, roof-to-wall tie-down, joist hangers, gusset plates, and stiffeners.

2.04 WALL SHEATHING

2.05 ACCESSORIES

A. Bracing, Furring, Bridging: Formed sheet steel, 16 gauge thickness; finish to match framing components.

B. Plates, Gussets, Clips: Formed Sheet Steel, 16 gauge thickness; finish to match framing components.

C. Touch-Up Primer for Galvanized Surfaces: SSPC-Paint 20, Type I - Inorganic, complying with VOC limitations of authorities having jurisdiction.

2.06 FASTENERS

A. Self-Drilling, Self-Tapping Screws, Bolts, Nuts and Washers: Hot dip galvanized per ASTM A 153/A 153M.

B. Welding: In conformance with AWS D1.1 and AWS D1.3.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that substrate surfaces or building framing components are ready to receive work.

B. Verify field measurements and adjust installation as required.

3.02 INSTALLATION OF STUDS

A. Install components in accordance with manufacturers' instructions.

B. Align floor and ceiling tracks; locate to wall or partition layout. Secure in place by welding at maximum 24 inches on center.

C. Place studs at 16 inches on center; not more than 2 inches from abutting walls and at each side of openings. Connect studs to tracks using welding method.

D. Construct corners using minimum of three studs. Install double studs at wall openings, door

and window jambs.

E. Install load bearing studs full length in one piece. Splicing of studs is not permitted.

F. Install load bearing studs, brace, and reinforce to develop full strength and achieve design requirements.

G. Coordinate placement of insulation in multiple stud spaces made inaccessible after erection.

H. Install intermediate studs above and below openings to align with wall stud spacing.

I. Provide deflection allowance in stud track, directly below horizontal building framing at non-load bearing framing.

J. Attach cross studs or furring channels to studs for attachment of fixtures anchored to walls.

K. Install framing between studs for attachment of mechanical and electrical items, and to prevent stud rotation.

L. Touch-up field welds and damaged galvanized surfaces with primer.

3.03 INSTALLATION OF JOISTS AND PURLINS

A. Install framing components in accordance with manufacturer's instructions.

B. Make provisions for erection stresses. Provide temporary alignment and bracing.

C. Place joists or purlins at 16 inches o.c.; not more than 2 inches from abutting walls. Connect joists to supports using welding method.

D. Set floor and ceiling joists parallel and level, with lateral bracing and bridging.

E. Locate joist end bearing directly over load bearing studs or provide load distributing member to top of stud track.

F. Provide web stiffeners at reaction points.

G. Touch-up field welds and damaged galvanized surfaces with primer.

3.04 WALL SHEATHING

A. Wall Sheathing: Secure with long dimension perpendicular to wall studs, with ends over firm bearing and staggered, using self-tapping screws.

3.05 TOLERANCES

A. Maximum Variation from True Position: 1/4 inch.

B. Maximum Variation of any Member from Plane: 1/4 inch.

END OF SECTION