SECTION 05 40 00

COLD-FORMED METAL FRAMING

PART 1 – GENERAL

1.1 PURPOSE

A. This guideline is intended to provide useful information to the Professional Service Provider (PSP) to establish a basis of design. PSP is to apply the principles of this section such that the University of Texas at Arlington (UTA) may achieve a level of quality and consistency in the design and construction of their facilities. Deviations from these guidelines must be approved by UTA and may require justification through Life Cycle Cost (LCC) analysis and submitted to UTA for approval.

1.2 LESSONS LEARNED AND DESIGN CONSIDERATIONS

A. The need for a delegated design should be identified early during project development and thoroughly coordinated with the rest of the project to avoid gaps and holes in the documentation. Relying on the Contractor to come up with a way to build something that was not properly detailed is not acceptable to UTA.

1.3 WORK INCLUDED

A. Formed steel stud exterior wall framing.

1.4 RELATED WORK

A. Section 06 10 00 – Rough Carpentry, wood blocking and miscellaneous framing.
B. Section 09 21 16 – Gypsum Board Assemblies, gypsum-based sheathing.

1.5 REFERENCE STANDARDS

A. AISI SG02-1 - North American Specification for the Design of Cold-Formed Steel Structural Members; American Iron and Steel Institute; current edition.
B. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; current edition.
C. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; current edition.
D. ASTM C955 - 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; current edition.
E. AWS D1.1/D1.1M - Structural Welding Code - Steel; American Welding Society; current edition.
F. SSPC-Paint 20 - Zinc-Rich Primers (Type I, "Inorganic," and Type II, "Organic"); Society for Protective Coatings; current edition.

1.6 SUBMITTALS

A. General: Submit the following in accordance with Conditions of Contract and Division 01.
B. Product Data: Submit product data on standard framing members; describe materials and finish, product criteria, limitations; and manufacturer’s data on factory-made framing connectors, showing compliance with requirements.
C. 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 lay-out.
    2. Describe method for securing studs to tracks and for welded framing connections.
    3. Provide design engineer’s stamp on shop drawings.
D. Manufacturer’s Installation Instructions: Indicate special procedures, conditions requiring special attention.

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

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

PART 2 – PRODUCTS

2.1 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 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: Refer to structural drawings for design loads
   4. Live load deflection meeting the following, unless otherwise indicated:
      a. Exterior Walls: Maximum horizontal deflection under wind load of L/700 of span.
   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.

2.2 FRAMING MATERIALS

A. Studs and Track: ASTM C955; 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. Minimum 16 gauge at composite metal panel system.
   2. Galvanized in accordance with ASTM A653/A653M G90/Z275 coating.

B. Framing Connectors: Factory-made, formed steel sheet.
   1. Material: ASTM A653/A653M SS Grade 33 and 40 (minimum), with G90/Z275 hot dipped galvanized coating for thicknesses less than 10 gage (0.118 inch), and factory punched holes and slots.
   2. 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.
   3. Movement Connections: Provide mechanical anchorage devices that accommodate movement using slotted holes, shouldered screws or screws and anti-friction or stepped bushings, while maintaining structural performance of framing. Provide movement connections where indicated on drawings.
      a. Where top of stud wall terminates below structural floor or roof, connect studs to structure in manner allowing vertical and horizontal movement of slab without affecting studs; allow for minimum movement of 1/2 inch.
      b. Provide top track preassembled with connection devices spaced to fit stud spacing indicated on drawings; minimum track length of 12 feet.
      c. Acceptable Products: VertiClip(r) or DriftClip(tm) manufactured by The Steel Network Inc.
   4. Fixed Connections: 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.

2.3 ACCESSORIES

A. Bracing, Furring, Bridging: Formed sheet steel, thickness determined for conditions encountered; finish to match framing components.

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

2.4 FASTENERS

A. Self-Drilling, Self-Tapping Screws, Bolts, Nuts and Washers: Hot dip galvanized per ASTM A153/A153M.

B. Anchorage Devices: Powder actuated.

C. Anchorage Devices: Power actuated.

D. Welding: In conformance with AWS D1.1.

PART 3 – EXECUTION

3.1 INSTALLATION OF STUDS

A. Install components in accordance with manufacturers' instructions and ASTM C 1007 requirements.
B. Align floor and ceiling tracks; locate to wall layout. Secure in place with fasteners at maximum 24 inches on center. Coordinate installation of sealant with floor and ceiling tracks.
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 clip and tie 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. Attach cross studs to studs for attachment of fixtures anchored to walls.
H. Install framing between studs for attachment of mechanical and electrical items, and to prevent stud rotation.
I. Touch-up field welds and damaged galvanized surfaces with primer.

3.2 FIELD QUALITY CONTROL

A. Testing: Owner reserves the right to engage a qualified independent testing and inspecting agency to perform field tests and inspections and prepare test reports.
B. Submit written report that work has been reviewed for compliance by Contractor, Installer, and Metal Framing Engineer, and is ready for inspection by Testing Agency.
C. The following items will be subject to testing and inspecting:
    1. Field and shop welds.
    2. Attachment of bottom track to floor structure, including the following:
        a. Spacing of fasteners.
        b. Edge clearance.
        c. Embedment / penetration of fasteners.
    3. Attachment of top track to overhead structure, including the following:
        a. Spacing of fasteners.
        b. Edge clearance.
        c. Embedment / penetration of fasteners.
    4. Attachment of studs to bottom track and top track/clips.
    5. Attachment of vertical deflection clips to overhead structure, including the following:
        a. Edge clearance.
        b. Embedment / penetration of fasteners.
    6. Attachment of studs to vertical deflection clips.
    7. Installation of bridging and bracing.
D. Testing agency will report test results promptly and in writing to Contractor, Architect, and Metal Framing Engineer.
E. Inspection Frequency:
    1. Owner and Architect will select approximately 20 random locations, roughly 12 to 15 feet wide by one story high, to be inspected by testing Agency. Testing Agency will inspect the following at each location:
        a. Top and Bottom Track:
            1) Each lineal foot of bottom track to structure.
            2) Each lineal foot of outer track (of double deflection track) to structure.
        b. Studs:
            1) Attachment of each stud to bottom track.
            2) Attachment of each stud to inner track of double deflection track.
            3) Attachment of each vertical deflection clip to structure.
    2. If inspections reveal repeat deficiencies or a pattern of noncompliance with requirements, as determined by the Owner, Architect, and Testing Agency, work of this Section for the entire balance of the project will be inspected by the Testing Agency at the Contractor’s expense.
F. Remove and replace work where inspections indicate that it does not comply with specified requirements. Do not cover or conceal corrected work until it has been re-inspected for compliance with requirements.
G. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

3.3 TOLERANCES

A. Maximum Variation from True Position: 1/8 inch.
B. Maximum Variation of any Member from Plane: 1/8 inch.

END OF SECTION