

## SECTION 05400 –COLD FORMED METAL FRAMING

### PART 1 GENERAL

#### 1.01 RELATED DOCUMENTS

- A. The drawings and general conditions of the contract including General and Supplementary Conditions and other Division 1 Specification sections apply to work of this section.
- B. Examine all other sections of the Specifications for requirements which affect work of this Section whether or not such work is specifically mentioned in this Section.
- C. Coordinate work with that of all trades affecting or affected by work of this Section. Cooperate with such trades to assure the steady progress of all work under the Contract.

#### 1.02 DESCRIPTION OF THE WORK

- A. Work specified within this Section includes, but is not necessarily limited to, the following:
  - 1. Provide and install steel stud structural framing system at walls as noted on the Drawings.
  - 2. Providing and installing miscellaneous fasteners, hat channels, stiffeners, bridging, expansion joints, and accessories necessary to complete the work.
- B. Related work specified elsewhere:
  - 1. Partition Walls: Section 09 21 16 - Gypsum Board Assemblies

#### 1.03 QUALITY ASSURANCE

- A. Materials and installation shall conform to recommendations of the following publications:
  - 1. American Iron and Steel Institute Cold-Formed Steel Design Manual, “*Specification for the Design of Cold-Formed Steel Structural Members*”.
  - 2. AWS D1.1 "Structural Welding Code" - Steel.
  - 3. AWS D1.3 "Structural Welding Code" - Sheet Steel.
  - 4. ASTM C 954, Standard specification for steel drill screws for the application of gypsum board or metal plaster bases to steel studs from 0.033 in. to 0.112 in. thickness.
  - 5. ASTM C 955, Standard Specification for Load-Bearing Steel Studs, Runners, and Bracing or Bridging, for Screw Application of Gypsum Board and Metal Plaster Bases.
  - 6. ASTM C 1007 Standard Specification for installation of load bearing steel studs and related accessories.

7. Standard Specification for installation of load bearing steel studs and related accessories.
  8. ASCE 7-02 "Minimum Design Loads for Building and Other Structures."
  9. 2003 International Building Code
  10. "Code of Federal Regulations, Part 1926" per the Occupational Safety and Health Administration (OSHA), Department of Labor (Latest Revision).
- B. Maximum Allowable Deflections: Deflection limitations, (either horizontal or vertical), include the effect of studs only, not sheathing or facing material. Spans are measured in inches between the attachments to structural steel or concrete.
1. Supporting Masonry or Brick Veneer:  $1/600$  of span or 0.3 inches
  2. Supporting Siding:  $1/360$  of span
- C. Design wind pressures: Design wind pressures calculated in accordance with ASCE 7-02 for Components and Cladding, shall be used in the design of the exterior cold formed steel framing system. Utilize wind speed, importance factor and exposure indicated on the project General Notes.
- D. Slip Track Tolerances: Where non-bearing light gage framing abuts the structure, provide a slip joint capable of accommodating the vertical movement of the structure. Slip joint gaps shall allow for 1" Live Load deflection of the supporting member. Minimum depth of slip track shall be  $2 \frac{1}{2}$ ". Minimum thickness shall be 14 gage. Slide clips are also acceptable where applicable.

#### 1.04 SUBMITTALS

- A. Unless otherwise specified, submittals required in this section shall be submitted for review. Submittals shall be prepared and submitted in accordance with this section and Division 1.
- B. General Contractor shall submit a Submittal Schedule to the engineer within 30 days after they have received the Owner's Notice to Proceed.
- C. All submittals shall be reviewed and returned to the Architect within 10 working days.
- D. Incomplete submittals will not be reviewed.
- E. Submittals not reviewed by the General Contractor prior to submission to the Engineer will not be reviewed. Include on the submittal statement or stamp of approval by Contractor, representing that the Contractor has seen and examined the submittal and that all requirements listed in Division 1 have been complied with.
- F. Engineer will review submittals a maximum of two review cycles as part of their normal services. If submittals are incomplete or otherwise unacceptable and re-submitted, General Contractor shall compensate Engineer for additional review cycles.

- G. Product Data: Submit Manufacturer's specifications and installation instructions for the following products. Include laboratory test reports and other data to show compliance with specifications.
1. Steel Studs
  2. Anchors and anchor bolts
  3. Self drilling screws
- H. Shop Drawings:
1. Shop Drawing Review: Electronic files of structural drawings **will not** be provided to the contractor for preparation of shop drawings. Reproduction of any portion of the Construction Documents for use as Shop drawings and/or Erection Drawings is prohibited. Shop drawings and/or Erection drawings created from reproduced Construction Documents will be returned without review.
  2. General: Submit shop drawings showing the following:
    - a. Stud gages and spacings.
    - b. Sizes, gages and fastenings for all built-up members including but not limited to headers and jambs.
    - c. Shop Coatings
    - d. Type, size, quantity, locations and spacings of all anchorages and self drilling screws.
    - e. Details of attachment to structure and adjacent work
    - f. Supplemental strapping, bracing, splices, bridging, hat channels and other accessories required for proper installation.
    - g. Critical installation procedures.
  3. Conformance of the Shop Drawings to the Contract Drawings remains the responsibility of the General Contractor. Engineer's review in no way relieves the General Contractor of this responsibility. **Submit three prints. Prints will be reviewed by the Engineer, and then the Architect. One marked print will be returned to Contractor for printing and distribution. Multiple copies will not be marked by the Engineer.**
  4. Shop drawings will not be reviewed as partial submittals. A complete submittal shall be provided and shall include; erection and piece drawings. **Incomplete submittals will not be reviewed.**

- I. Design calculations shall be prepared by a Professional Engineer (Specialty Engineer) registered in the State of Maine, illustrating the design of exterior steel stud wall systems including all all necessary stiffeners and bracing connections and anchorage required for a complete structural system.
- J. Professional Engineer responsible for design of cold formed framing shall review the installation and submit a coorespondence indicating compliance with the design. Review shall include all work Any descrepancies noted shall be corrected and reviewed by the Engineer prior to the submittal of the coorespondence.

1.05 DELIVERY, STORAGE AND HANDLING:

- A. Deliver materials to site at such intervals to insure uninterrupted progress of work.
- B. Deliver anchorage devices, which are to be embedded in cast-in-place, in ample time to not delay work.
- C. Store materials to permit easy access for inspection and identification. Keep cold formed members off ground, using pallets, platforms, or other supports. Protect cold formed members and packaged materials from corrosion and deterioration.
- D. Do not store materials on structure in a manner that might cause distortion or damage to members or supporting structures. Materials shall be stored in a manner to avoid ponding of precipitation on members. Repair or replace damaged materials or structures as directed.

PART 2 PRODUCTS

2.01 FRAMING MEMBERS

- A. Steel Studs:
  - 1. Acceptable manufacturers: Manufacturer shall be a member of the Steel Stud Manufacturers Association.
  - 2. Minimum stud shall be 6", 18 gage with 1.625" flange at siding.
  - 3. Minimum stud shall be 6", 16 gage with 2.0" flange at masonry veneer.
  - 4. Maximum Spacing: 16 inches, on-center.
  - 5. Minimum studs indicated have not been engineered, but are provided as a general guideline. Engineering of studs is the responsibility of the Specialty Design Engineer referenced in the Submittals Section, and not the Engineer of Record nor the Architect of Record. Any exterior stud size, gage, spacing, bracing and connection information shown on the Contract Documents is schematic only. The Contractor shall provide the studs and built-up sections, engineered by the Specialty Engineer. If studs of a thicker gage or lesser spacing are required by the Specialty Engineer's design, the studs shall be provided at no additional cost to the Owner.

6. Provide channel-shaped load-bearing studs, channel-shaped joists, runners (tracks), blocking, lintels, clip angles, shoes, reinforcements, stiffeners, fasteners, and other accessories recommended by manufacturer for complete framing system
  7. Steel framing materials shall comply with ASTM A 446, A 570, or A 611, as applicable. Fabricate all components from structural quality sheet steel with the following minimum yield points:
    - a. 16 ga. and heavier 50,000 psi
    - b. 18 ga., 33,000 psi
    - c. 20 ga., 33,000 psi (permitted for bottom track only).
  8. Manufacture of studs, runners (track), and other framing members shall comply with ASTM C 955.
  9. Framing components shall be galvanized per ASTM A 525, minimum G-90 coating.
- B. Screws and other attachment devices:
1. Provide a protective cadmium or zinc plated coating and comply with ASTM A 165 type NS.
  2. Self-drilling screws shall comply with the Industrial Fastener Institute Standard for steel self-drilling and tapping screws (IFI-113).
  3. Penetration through jointed materials shall not be less than three (3) exposed threads.
- C. Standard Steel Shapes: Standard steel shapes, plates, etc. shall conform to material and finish specifications in Division 5 -Miscellaneous Metals.

## PART 3 EXECUTION

### 3.01 INSTALLATION

- A. Product Storage: Store studs, joists, track etc. on a flat plane. Material damaged (i.e. rusted, dented, bent or twisted) shall be discarded. Protect adhesives and sealants from freezing.
- B. Construction Methods: Construction may be either piece-by-piece (stick-built), or by fabrication into panels either on or off site.
- C. Material Fit up: All framing components shall be cut squarely or at an angle to fit squarely against abutting members. Members shall be held firmly in position until properly fastened. Prefabricated panels, if used, shall be square and braced against racking. Provide blocking and strapping within 12" of slip joint and at 8'-0" o.c., or as required for member bracing.

- D. Attachment: Components shall be joined by self-drilling screws, so that connection meets or exceeds required design loads. Wire tying of framing components will not be permitted. Field welding will be permitted only where shown on the drawings.
- E. Anchorage to Structure: Securely anchor studs and track to floor construction and overhead structure. Provide fasteners at a maximum of 16" on center. Provide slip joints where non-bearing vertical studs meet floor or roof structural steel, or as indicated on the drawings. Provide sill sealer beneath all floor tracks.
- F. Welding: Shop and field welds shall conform to applicable AWS and AISI standards, and may be fillet, plug, butt or seam type. Touch-up damage to galvanizing caused by welding with zinc-rich paint.
- G. Openings: Frame openings larger than 2 ft. square with double studs. Provide suitable reinforcements (double studs, headers, jack studs, cripples, bracing, etc.) at control joint intersections, corners, and other special conditions.
- H. Lintels: Lintels supporting masonry veneer shall be secured to studs by screws or power-driven anchors. Method of anchorage shall be sufficient to support veneer with a factor of safety of 3.0.
- I. Bridging/Bracing: Provide horizontal strap bracing for all walls. Minimum requirements are as follows: Horizontal bracing shall be continuous 20 gage x 1 1/2" wide steel straps on each face of the stud, located at 4'-0" maximum for the full height of the wall. Provide CR runner solid bridging at 8'-0" for the full height of the wall at each line of bracing. An additional row of bracing shall be provide within 12 inches of the slip joint.
- J. Tolerances: Finished installation shall be level and plumb within a tolerance of 1/8 inch in 10 feet horizontally and vertically. Maximum deviation from plan or section dimension shall not exceed 1/8 inch. Spacing of studs shall not be more than 1/8 inch from design spacing, providing that cumulative error does not exceed requirements of finishing materials.

**END OF SECTION**