



05 4000
Cold-Formed Metal Framing

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A. General:

1. Metal framing specified under this section includes load bearing cold-formed metal framing for exterior wall studs and anchors, bearing walls, and roof framing where permitted by the owner.
2. Non-load-bearing metal framing may be specified in this section or in Division 09.

B. Design Criteria:

1. Design cold-formed metal framing, anchors, supports, and reinforcement to resist erection loads and dead loads plus additional live loads without exceeding the working stresses permitted for the materials by applicable Codes and standards.
 - a. Comply with the load requirements of ASCE 7, member design requirements of ASCE 8, and requirements of Chapter 16 of the Indiana Building Code (IBC).
 - 1) Design shall include member dead loads, superimposed loads as indicated on the Drawings, seismic and lateral loads.
 - 2) Design wind pressure shall not be less than 10 pounds per square foot, acting normal to the exposed surface, either direction.
 - 3) Include loading changes due to height above ground and at wall discontinuities (corners, parapets, etc.), as defined in the IBC.
 - b. Indicate general load requirements and lateral load design criteria in the Construction Documents.
 - c. All loads shall be applied to each member and shall transfer through supporting elements to the structure of the building.
 - d. Structural designs shall be prepared by a qualified Professional Engineer registered in the State of Indiana.
 - 1) Review the design criteria with the Structural Engineer. Verify exterior stud depths and spacing based on wind load criteria during design, and indicate spacing changes on Drawings, if required to meet design load/span criteria.
 - e. Anchorage:
 - 1) Provide anchors that permit deflection of the primary structure without applying axial loads to the studs while maintaining lateral load resistance.
 - 2) Provide fasteners or anchors of sufficient size and spacing to resist shear loads imposed on the framing.
2. Deflection limit:
 - a. Exterior studs, masonry veneer: L/600



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- b. Exterior studs, non-masonry cladding: L/360
- c. Interior Studs, unless otherwise indicated: L/240 over the full height of studs, L/360 over the height of gypsum board and plaster surfaces.
- d. Interior studs scheduled to be finished with porcelain tile, 12 inch or greater dimension: L/360.

C. Submittals:

- 1. Shop Drawings, Exterior Metal Studs: Provide exterior metal stud erection drawings produced by the Professional Engineer responsible for design of exterior framing.
 - a. Provide elevations for each framing assembly, indicating anchorage locations, member sizes, sills and lintels.
 - b. Provide details including anchorages, splices, boxed members, bracing, and other framing and fabrication details necessary to fully describe construction.
- 2. Engineering Calculations: Provide signed and sealed design calculations or certification by a professional engineer indicating compliance of stud selection with design criteria specified.

D. Acceptable Products:

- 1. Metal framing members: Materials manufactured in the United States. Any manufacturer may be permitted as long as the following conditions are met:
 - a. SSMA member company.
 - b. Moment of inertia and section modulus meet or exceed the item specified.
 - c. Modulus of elasticity and yield point meet or exceed the item specified.
 - d. The submitted items functionally perform as well as the item specified.
 - e. No adjustment in section depth is required to meet design criteria.
- 2. Stud Gages:
 - a. Structural Studs: Minimum 0.0451 inch (18 gage, 43 mil)
 - b. Interior wall framing: Minimum 0.0329 inch (20 gage, 33 mil)
- 3. Deflection Track: Provide at all floor-to-deck walls and where otherwise required, to allow for deflection of the structural framing. Provide a system capable of accommodating 2 times the calculated deflection without imposing a vertical load on the studs.
 - a. Provide appropriate fire-rated systems at fire resistance-rated walls.



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4. Slide Clips: Provide for studs that extend past floor lines or structural frame to accommodate deflection without imposing vertical loads on the studs.
5. Lateral Bracing: Provide lateral bracing of type and at spacing required to develop full load bearing capacity, including lateral loads.

E. Installation:

1. Install metal framing in accordance with ASTM C1007 and approved engineering submittals.
2. At exterior walls, install sill seal between runner track and foundation or floor slabs.
3. Position studs in runners at 16" o.c. maximum. Secure each stud to runners with minimum of four screws in flange of stud: two at top and two at bottom.
4. Provide full-height structural studs at all corners
5. Provide full-height structural studs at jambs of all door frames and windows. Extend studs and anchor to the structure.
6. Provide deflection track or slide clips at all exterior walls and as required at slabs or beams to allow for vertical movement.
7. Install lateral bracing where required to achieve design loads.
 - a. Where walls are indicated to receive sheathing only on one side, or where otherwise required, install metal strapping horizontally across the unsheathed side of studs or select stud depth and gage for single-sided panel installation.
 - b. Fasten strapping to each stud with 2 screws, minimum.
8. Where field cuts reduce the length of the unpunched steel web to less than 10" from the end of the stud, the web must be stiffened with another stud for a minimum of 12" from the end.
9. At exterior walls and interior wet walls, field coat all cuts and abrasions of the studs and runners with a cold galvanizing compound.

END OF SECTION