

SECTION 05 40 00
COLD FORMED STEEL FRAMING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Loadbearing wall framing.
2. Exterior nonload bearing wall framing.
3. Interior nonload bearing wall framing exceeding height and thickness limitations of standard, nonstructural metal framing.
4. Interior Wall Framing Specific Conditions
 - a. Interior wall framing for larger openings and CFMF.
 - b. Larger Openings: Openings larger than 6 foot 0 inches wide by 7 foot- 0 inches in height, and items noted as "CFMF" on the Drawings.
 - c. Interior wall framing which exceed height limitations indicated in the Drywall Partition Framing chart on the Drawings.

B. Interior wall framing items where Delegated Design is required are covered by this Section. For more information for wall framing refer to Section 09 29 00 Gypsum Board Assemblies. Coordinate all Work and submittals for compliance with the Contract Documents. Interior wall framing included in this Section includes but is not limited to:

1. Interior wall framing for larger openings.
2. Interior wall framing for items noted as "CFMF".
3. Interior wall framing which exceed height limitations indicated in the drywall partition framing chart on the Drawings.

1.2 ACTION SUBMITTALS

A. Product Data: Technical data for cold formed steel framing components, including framing, clips, track, anchors, and gaskets, and to verify section properties of studs shown on the drawings and instructions for securing studs to tracks and other framing connections and for accessories including factory applied primers.

B. Shop Drawings: Submit detailed stud layout, spacing, size, thickness, and types of cold formed steel framing; fabrication; and fastening and anchorage details, including mechanical fasteners, bracing and welds and related accessories.

1. Indicate reinforcing channels, opening framing, supplemental framing, strapping, bracing, bridging, splices, accessories, connection details, and attachment to adjoining work.

- C. Delegated Design Submittal: Submit For cold formed steel framing to verify compliance with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.
 - 1. Provide Delegated Design for all wall framing governed by this Section.

1.3 INFORMATIONAL SUBMITTALS

- A. Qualification Data: Submit data for testing agency.
- B. Product Certificates: Submit for each type of code compliance certification for studs and tracks.
- C. Product Tests: Submit mill certificates or data from a qualified independent testing agency indicating steel sheet complies with requirements, including base metal thickness, yield strength, tensile strength, total elongation, chemical requirements, and metallic coating thickness.
- D. Product Tests: Mill certificates or data from a qualified independent testing agency indicating steel sheet complies with requirements, including base metal thickness, yield strength, tensile strength, total elongation, chemical requirements, and metallic coating thickness. Submit reports for:
 - 1. Steel sheet.
 - 2. Expansion anchors.
 - 3. Power actuated anchors.
 - 4. Mechanical fasteners.
 - 5. Vertical deflection clips.
 - 6. Horizontal drift deflection clips
 - 7. Miscellaneous structural clips and accessories.
- E. Research Reports: Submit ICC-ES evaluation report for:
 - 1. Nonstandard cold formed steel framing post installed anchors and power actuated fasteners, from ICC-ES or qualified testing agency acceptable to authorities having jurisdiction.
 - 2. Sill sealer gasket/termite barrier showing compliance with ICC-ES AC380.

1.4 QUALITY ASSURANCE

- A. Regulatory Requirements:
 - 1. Comply with the IBC as adopted and amended by the AHJ including special inspections.
 - a. Code Compliance Certification of Studs and Tracks: Provide documentation that framing members are certified in accordance with the product certification program of the Certified Steel Stud Association, the Steel Framing Industry Association, or the Steel Stud Manufacturers Association.
- B. Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in the State in which the Project is located and who is experienced in providing

engineering services of the kind indicated. Engineering services are defined as those performed for installations of cold formed metal framing similar to those indicated in material, design, and extent.

1. Engineering Responsibility: Preparation of Shop Drawings, design calculations, and structural data.
- C. Testing Agency Qualifications: Qualified in accordance with ASTM E 329 for testing indicated.
- D. Welding Qualifications: Qualify procedures and personnel in accordance with:
 1. AWS D1.1/D1.1M Structural Welding Code - Steel.
 2. AWS D1.3/D1.3M Structural Welding Code - Sheet Steel.
- E. Preinstallation Conference: Conduct conference at the site.

1.5 DELIVERY, STORAGE AND HANDLING

- A. Protect cold formed steel framing members from weather exposure and damage. Deliver to site in bundles, fully identified with name, type and grade. Store off ground in dry, ventilated space or protect with suitable, venting waterproof coverings.
- B. Inspect cold formed steel framing upon delivery for corrosion and damage to temporary primer. Remove corrosion and repair temporary primer.
- C. Protect cold formed steel framing from corrosion, moisture staining, deformation, and other damage during delivery, storage, and handling.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Delegated Design: Engage a qualified professional engineer to design cold formed steel framing complying with requirements.
- B. Structural Performance: Provide cold formed steel framing capable of withstanding design loads within limits and under conditions indicated.
 1. Design Loads: Indicated on Drawings.
 2. Seismic Loads: Indicated on Drawings.
 3. Deflection Limits: Design framing systems to withstand design loads without deflections greater than the following:
 - a. Exterior Load Bearing Wall Framing: Horizontal deflection of 1/360 of the wall height.
 - b. Interior Load Bearing Wall Framing: Horizontal deflection of 1/240 of the wall height under a horizontal load of 10 lbf/sq. ft. (478 Pa).
 - c. Exterior Nonload Bearing Framing: Horizontal deflection of 1/240 of the wall height.

- 1) For stud behind brick/masonry veneer: L/600 for stud by itself and L400 for the complete wall system.
 - 2) For stud behind plaster and EIFS: L/480 for stud by itself.
 - 3) For stud behind metal panel: L/240 for stud by itself.
 - d. Interior Nonload Bearing Framing: Horizontal deflection of 1/240 of the wall height under a horizontal load of 5 lbf/sq. ft. (239 Pa). Refer to Section 09 29 00 for more information where wall framing does not require delegated design.
 - e. Interior Framing for larger openings and CFMF: Horizontal deflection of 1/240 of the wall height under a horizontal load of 10 lbf/sq. ft. (478 Pa).
4. Design framing systems to provide for movement of framing members located outside the insulated building envelope without damage or overstressing, sheathing failure, connection failure, undue strain on fasteners and anchors, or other detrimental effects when subject to a maximum ambient temperature change of 120 degrees F (67 degrees C).
 5. Design framing system to maintain clearances at openings, to allow for construction tolerances, and to accommodate live load deflection of primary building structure as follows:
 - a. Upward and downward movement of 3/4 inch (19 mm).
- C. Cold Formed Steel Framing Standards: Unless more stringent requirements are indicated, framing shall comply with AISI S100, AISI S200:
1. Floor and Roof Systems: AISI S210.
 2. Wall Studs: AISI S211.
 3. Headers: AISI S212.
 4. Lateral Design: AISI S213.
- D. Fire Resistance Ratings: Comply with ASTM E 119; testing by UL. Identify products with appropriate markings.
1. Indicate design designations from the UL Fire Resistance Directory.
- E. AISI Specifications and Standards: Comply with AISI North American Specification for the Design of Cold Formed Steel Structural Members and Standard for Cold Formed Steel Framing - General Provisions.
1. Comply with AISI S100 and AISI S200 unless more stringent requirements are indicated.

2.2 COLD FORMED STEEL FRAMING MATERIALS

- A. Interior wall framing items where Delegated Design is required are covered by this Section. For more information for wall framing refer to Section 09 29 00 Gypsum Board Assemblies. Coordinate all Work and submittals for compliance with the Contract Documents. Interior wall framing included in this Section includes but is not limited to:
1. Interior wall framing for larger openings.
 2. Interior wall framing for items noted as "CFMF".

3. Interior wall framing which exceed height limitations indicated in the drywall partition framing chare on the Drawings.
- B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Allied Studco.
 2. AllSteel & Gypsum Products, Inc.
 3. CEMCO; California Expanded Metal Products Co.
 4. ClarkDietrich Building Systems.
 5. Formetal Co. Inc. (The).
 6. MarinoWARE.
 7. Quail Run Building Materials, Inc.
 8. SCAFCO Corporation.
 9. Southeastern Stud & Components, Inc.
 10. Steel Network, Inc. (The).
 11. United Steel Manufacturing.
- C. Steel Sheet: ASTM A 1003/A 1003M, Structural Grade, Type H, metallic coated, of grade and coating designation:
1. Grade: ST33H (ST230H) or as required by structural performance whichever is greater.
 2. Coating: G90 (Z275).
- D. Steel Sheet for Drift Clips: ASTM A 653/A 653M, structural steel, zinc coated, of grade and coating:
1. Grade: 50 (340), Class 1 or as required by structural performance whichever is greater.
 2. Coating: G90 (Z275).
- E. Framing Materials: Fabricate steel framing accessories from ASTM A 1003/A 1003M, Structural Grade, Type H, metallic coated steel sheet, of same grade and coating designation used for framing members.
1. Provide accessories in standard thickness and configuration, unless otherwise indicated:
 - a. Supplementary framing.
 - b. Bracing, bridging, and solid blocking.
 - c. Web stiffeners.
 - d. Anchor clips.
 - e. End clips.
 - f. Foundation clips.
 - g. Gusset plates.
 - h. Stud kickers and knee braces.
 - i. Joist hangers and end closures.
 - j. Hole reinforcing plates.

k. Backer plates.

F. Anchors, Clips, and Fasteners:

1. Steel Shapes and Clips: ASTM A 36/A 36M, zinc coated by hot dip process in accordance with ASTM A 123/A 123M.
2. Anchor Bolts: ASTM F 1554, Grade 55, threaded carbon steel hex headed bolts, carbon steel nuts, and flat, hardened steel washers; zinc coated by hot dip process in accordance with ASTM A 153/A 153M, Class C.
3. Post Installed Anchors: Fastener systems with bolts of same basic metal as fastened metal, if visible, unless otherwise indicated; with working capacity greater than or equal to the design load, according to an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC58 or ICC-ES AC308 as appropriate for the substrate.
 - a. Uses: Securing cold formed steel framing to structure.
 - b. Type: adhesive anchors.
 - c. Material for Interior Locations: Carbon steel components zinc plated to comply with ASTM B 633 or ASTM F 1941 (ASTM F 1941M), Class Fe/Zn 5, unless otherwise indicated.
 - d. Material for Locations Where Stainless Steel Is Indicated: Alloy Group 1 (A1) stainless steel bolts, ASTM F 593 (ASTM F 738M), and nuts, ASTM F 594 (ASTM F 836M).
4. Power Actuated Anchors: Fastener systems with working capacity greater than or equal to the design load, in accordance with an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC70.
5. Mechanical Fasteners: ASTM C 1513, corrosion resistant coated, self drilling, self tapping, steel drill screws.
 - a. Head Type: Low profile head beneath sheathing.
6. Welding Electrodes: Comply with AWS standards.

G. Miscellaneous Materials:

1. Galvanizing Repair Paint: High zinc dust content galvanizing repair paint ASTM A 780/A 780M or SSPC-Paint 20.
2. Nonmetallic, Nonshrink Grout: Factory packaged, nonmetallic, noncorrosive, nonstaining grout, complying with ASTM C 1107/C 1107M, and with a fluid consistency and 30 minute working time.
3. Shims: Load bearing, high density, multimonomer, nonleaching plastic; or cold formed steel of same grade and metallic coating as framing members supported by shims.
4. Sealer Gaskets: Closed cell neoprene foam, 1/4 inch (6 mm) thick, selected from widths to match width of bottom track or rim track members as necessary.

2.3 LOAD BEARING WALL FRAMING

- A. Steel Studs: C shaped steel studs, of web depths indicated, punched, with stiffened flanges:
1. Minimum Base Metal Thickness 0.0428 inch (1.09 mm) or 18 Gauge.

2. Flange Width: 1-5/8 inches (41 mm).
 3. Section Properties: As determined by Delegated Design minimum properties from dimensions and minimum base metal thickness indicated.
- B. Steel Track: U shaped steel track, of web depths indicated, unpunched, with straight flanges:
1. Minimum Base Metal Thickness: 0.0428 inch (1.09 mm) or 18 Gauge.
 2. Flange Width: 1-5/8 inches (41 mm).
- C. Steel Box or Back to Back Headers: C shapes used to form header beams, of web depths indicated, unpunched, with stiffened flanges:
1. Minimum Base Metal Thickness: 0.0428 inch (1.09 mm) or 18 Gauge.
 2. Flange Width: 1-5/8 inches (41 mm).
 1. Section Properties: As determined by Delegated Design minimum properties from dimensions and minimum base metal thickness indicated.

2.4 EXTERIOR NONLOAD BEARING WALL FRAMING

- A. Steel Studs: C-shaped steel studs, of web depths indicated, punched, with stiffened flanges:
1. Minimum Base Metal Thickness: . 0.0428 inch (1.09 mm) or 18 Gauge.
 2. Flange Width: 1-5/8 inches (41 mm).
 3. Section Properties: As required to meet minimum thickness, dimensions and Performance Requirements. Minimums apply to minimum thickness and dimensions indicated.
- B. Steel Track: U shaped steel track, of web depths indicated, unpunched, with unstiffened flanges, and as follows:
1. Minimum Base Metal Thickness Matching steel studs.
 2. Flange Width: 1-5/8 inches (41 mm).
- C. Vertical Deflection Clips: Head clips, capable of accommodating upward and downward vertical displacement of primary structure through positive mechanical attachment to stud web. Provide deflection tracks as required in Section 09 29 00 Gypsum Board Assemblies with minimum thicknesses defined herein.
1. Manufacturers: Subject to compliance with requirements, provide products for framing manufacturer or compatible products by one of the following:
 - a. AllSteel & Gypsum Products, Inc.
 - b. ClarkDietrich Building Systems.
 - c. Marino\WARE.
 - d. SCAFCO Corporation.
 - e. Simpson Strong-Tie Co., Inc.
 - f. Steel Network, Inc. (The).
 - g. Steeler, Inc.

- D. Single Deflection Track: Single, deep leg, U shaped steel track; unpunched, with unstiffened flanges, of web depth to contain studs while allowing free vertical movement, with flanges designed to support horizontal loads and transfer them to the primary structure:
 - 1. Minimum Base Metal Thickness: 0.0428 inch (1.09 mm) or 18 Gauge.
 - 2. Flange Width: 1 inch (25 mm) plus twice the design gap for other applications.

- E. Double Deflection Tracks: Double, deep leg, U-shaped steel tracks, consisting of nested inner and outer tracks; unpunched, with unstiffened flanges.
 - 1. Outer Track: Of web depth to allow free vertical movement of inner track, with flanges designed to support horizontal loads and transfer them to the primary structure:
 - a. Minimum Base Metal Thickness: 0.0428 inch (1.09 mm) or 18 Gauge.
 - b. Flange Width: 1 inch (25 mm) plus twice the design gap for other applications.
 - 2. Inner Track: Of web depth indicated:
 - a. Minimum Base Metal Thickness: 0.0428 inch (1.09 mm) or 18 Gauge.
 - b. Flange Width: dimension equal to sum of outer deflection track flange width plus 1 inch (25 mm).

- F. Drift Clips: Bypass or head clips, capable of isolating wall stud from upward and downward vertical displacement and lateral drift of primary structure through positive mechanical attachment to stud web and structure.

2.5 INTERIOR WALL FRAMING SPECIFIC CONDITIONS

- A. Materials of this Article apply to the following:
 - 1. Larger openings defined as openings larger than 6 foot 0 inches wide by 7 foot- 0 inches in height
 - 2. Items noted as "CFMF" on the Drawings.
 - 3. Interior wall framing which exceed height limitations indicated in the Drywall Partition Framing chart on the Drawings.

- B. Steel Studs: C-shaped steel studs, of web depths indicated, punched, with stiffened flanges:
 - 1. Minimum Base Metal Thickness: 0.0428 inch (1.09 mm) or 18 Gauge.
 - 2. Flange Width: 1-5/8 inches (41 mm).
 - 3. Section Properties: As required to meet minimum thickness, dimensions and Performance Requirements. Minimums apply to minimum thickness and dimensions indicated.

- C. Steel Track: U shaped steel track, of web depths indicated, unpunched, with unstiffened flanges, and as follows:
 - 1. Minimum Base Metal Thickness: 0.0428 inch (1.09 mm) or 18 Gauge.
 - 2. Flange Width: 1-5/8 inches (41 mm).

- D. Vertical Deflection Clips: Head clips, capable of accommodating upward and downward vertical displacement of primary structure through positive mechanical attachment to stud web. Provide deflection tracks as required in Section 09 29 00 Gypsum Board Assemblies with minimum thicknesses defined herein.
1. Manufacturers: Subject to compliance with requirements, provide products for framing manufacturer or compatible products by one of the following:
 - a. AllSteel & Gypsum Products, Inc.
 - b. ClarkDietrich Building Systems.
 - c. Marino\WARE.
 - d. SCAFCO Corporation.
 - e. Simpson Strong-Tie Co., Inc.
 - f. Steel Network, Inc. (The).
 - g. Steeler, Inc.
- E. Single Deflection Track: Single, deep leg, U shaped steel track; unpunched, with unstiffened flanges, of web depth to contain studs while allowing free vertical movement, with flanges designed to support horizontal loads and transfer them to the primary structure:
1. Minimum Base Metal Thickness: 0.0428 inch (1.09 mm) or 18 Gauge.
 2. Flange Width: 1 inch (25 mm) plus twice the design gap for other applications.
- F. Double Deflection Tracks: Double, deep leg, U-shaped steel tracks, consisting of nested inner and outer tracks; unpunched, with unstiffened flanges.
1. Outer Track: Of web depth to allow free vertical movement of inner track, with flanges designed to support horizontal loads and transfer them to the primary structure:
 - a. Minimum Base Metal Thickness: 0.0428 inch (1.09 mm) or 18 Gauge.
 - b. Flange Width: 1 inch (25 mm) plus twice the design gap for other applications.
 2. Inner Track: Of web depth indicated:
 - a. Minimum Base Metal Thickness: 0.0428 inch (1.09 mm) or 18 Gauge.
 - b. Flange Width: dimension equal to sum of outer deflection track flange width plus 1 inch (25 mm).
- G. Drift Clips: Bypass or head clips, capable of isolating wall stud from upward and downward vertical displacement and lateral drift of primary structure through positive mechanical attachment to stud web and structure.

2.6 SOFFIT FRAMING

- A. Exterior Soffit Frame: C shaped steel sections, of web depths indicated, with stiffened flanges:
1. Minimum Base Metal Thickness: 0.0428 inch (1.09 mm).
 2. Flange Width: 1-5/8 inches (41 mm), minimum.
 3. Section Properties: As required to meet the Performance Requirements.

2.7 FABRICATION

- A. Fabricate cold formed steel framing and accessories plumb, square, and true to line, and with connections securely fastened, in accordance with referenced AISI specifications and standards, manufacturer's written instructions, and requirements in this Section.
 - 1. Fabricate framing assemblies using jigs or templates.
 - 2. Cut framing members by sawing or shearing; do not torch cut.
 - 3. Fasten cold formed steel framing members by welding, screw fastening, clinch fastening, pneumatic pin fastening, or riveting as standard with fabricator. Wire tying of framing members is not permitted.
 - a. Comply with AWS D1.3/D1.3M requirements and procedures for welding, appearance and quality of welds, and methods used in correcting welding work.
 - b. Locate mechanical fasteners and install in accordance with Shop Drawings, with screws penetrating joined members by no fewer than three exposed screw threads.
 - 4. Fasten other materials to cold formed steel framing by welding, bolting, pneumatic pin fastening, or screw fastening, in accordance with approved Shop Drawings.
- B. Reinforce, stiffen, and brace framing assemblies to withstand handling, delivery, and erection stresses. Lift fabricated assemblies by means that prevent damage or permanent distortion.
- C. Tolerances: Fabricate assemblies level, plumb, and true to line to a maximum allowable variation of 1/8 inch in 10 feet (1:960):
 - 1. Spacing: Space individual framing members no more than plus or minus 1/8 inch (3 mm) from plan location. Cumulative error shall not exceed minimum fastening requirements of sheathing or other finishing materials.
 - 2. Squareness: Fabricate each cold formed steel framing assembly to a maximum out-of-square tolerance of 1/8 inch (3 mm).

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, conditions, and abutting structural framing for compliance with requirements for installation tolerances and conditions affecting performance of the work. Proceed with installation after correcting unsatisfactory conditions.

3.2 PREPARATION

- A. Before sprayed fire resistive materials are applied, attach continuous angles, supplementary framing, or tracks to structural members indicated to receive sprayed fire resistive materials.
- B. After applying sprayed fire resistive materials, remove only as much of the material as necessary to complete installation of cold formed framing without reducing thickness of

fire resistive materials below that required to obtain fire resistance ratings indicated. Protect remaining fire resistive materials from damage.

- C. Install load bearing shims or grout between the underside of load bearing wall bottom track and the top of foundation wall or slab at locations with a gap larger than 1/4 inch (6 mm) to ensure a uniform bearing surface on supporting concrete or masonry construction.
- D. Install sealer gaskets at underside of wall bottom track or rim track and at top of foundation wall or slab at stud or joist locations.
- E. Install sill sealer gasket/termite barrier in accordance with manufacturer's written instructions at the underside of wall bottom track or rim track and at the top of foundation wall or slab at stud or joist locations.

3.3 INSTALLATION

- A. For interior wall framing and openings coordinate with Section 05 40 00. Refer to Cold Formed Steel Framing and the Drawings for additional information.
- B. Cold formed steel framing may be shop or field fabricated for installation, or it may be field assembled.
- C. Install cold formed steel framing according to AISI S200, AISI S202, and manufacturer's written instructions unless more stringent requirements are indicated.
- D. Install shop or field fabricated, cold formed framing and securely anchor to supporting structure.
 - 1. Screw, bolt, or weld wall panels at horizontal and vertical junctures to produce flush, even, true to line joints with maximum variation in plane and true position between fabricated panels not exceeding 1/16 inch (1.6 mm).
- E. Install cold formed steel framing and accessories plumb, square, and true to line, and with connections securely fastened.
 - 1. Cut framing members by sawing or shearing; do not torch cut.
 - 2. Fasten cold formed steel framing members by welding, screw fastening, clinch fastening, or riveting. Wire tying of framing members is not permitted.
 - a. Comply with AWS D1.3/D1.3M requirements and procedures for welding, appearance and quality of welds, and methods used in correcting welding work.
 - b. Locate mechanical fasteners, install in accordance with approved Shop Drawings, and comply with requirements for spacing, edge distances, and screw penetration.
 - 1) Make connection to concrete with self tapping screws designed specifically for concrete connections.
- F. Install framing members in one piece lengths unless splice connections are indicated for track or tension members.

- G. Install temporary bracing and supports to secure framing and support loads equal to those for which structure was designed. Maintain braces and supports in place, undisturbed, until entire integrated supporting structure has been completed and permanent connections to framing are secured.
- H. Do not bridge building expansion joints with cold-formed steel framing. Independently frame both sides of joints.
- I. Install insulation, specified in Section 07 21 00, in framing assembly members, such as headers, sills, boxed joists, and multiple studs at openings, that are inaccessible on completion of framing work.
- J. Fasten hole reinforcing plate over web penetrations that exceed size of manufacturer's approved or standard punched openings.
- K. Welding:
 - 1. Where welding is required, use low amperage welding equipment and small diameter rods to prevent blow holes in material.
 - 2. Welds: 1/8 inch (3mm) fillet continuous across contact joint.
 - 3. Puddle Welds: 3/4 inch (19 mm) diameter full fusion. Use weld washers where welds are made to material 3/16 inch (4.5 mm) or more in thickness.
 - a. Use splices or butt welds at all butt joints in runner track. No splices shall be permitted in track over lintels, diaphragm sheathing, or diagonal bracing.

3.4 LOAD BEARING WALL INSTALLATION

- A. Install continuous top and bottom tracks sized to match studs. Align tracks accurately and securely anchor at corners and ends, and at spacings:
 - 1. Anchor Spacing: 32 inches (813 mm).
- B. Squarely seat studs against top and bottom tracks, with gap not exceeding 1/8 inch (3 mm) between the end of wall framing member and the web of track. Fasten both flanges of studs to top and bottom tracks. Space studs as follows:
 - 1. Stud Spacing: 16 inches (406 mm).
- C. Set studs plumb, except as needed for diagonal bracing or required for nonplumb walls or warped surfaces and similar configurations.
- D. Align studs vertically where floor framing interrupts wall framing continuity. Where studs cannot be aligned, continuously reinforce track to transfer loads.
- E. Align floor and roof framing over studs in accordance with AISI S200, Section C1. Where framing cannot be aligned, continuously reinforce track to transfer loads.
- F. Anchor studs abutting structural columns or walls, including masonry walls, to supporting structure.

- G. Install headers over wall openings wider than stud spacing. Locate headers above openings. Fabricate headers of compound shapes indicated or required to transfer load to supporting studs, complete with clip angle connectors, web stiffeners, or gusset plates.
 - 1. Frame wall openings with not less than a double stud at each jamb of frame. Fasten jamb members together to uniformly distribute loads.
 - 2. Install tracks and jack studs above and below wall openings. Anchor tracks to jamb studs with clip angles or by welding, and space jack studs same as full height wall studs.
 - H. Install supplementary framing, blocking, and bracing in stud framing indicated to support fixtures, equipment, services, casework, heavy trim, furnishings, and similar work requiring attachment to framing.
 - 1. If type of supplementary support is not indicated, comply with stud manufacturer's written recommendations and industry standards in each case, considering weight or load resulting from item supported.
 - I. Install horizontal bridging in stud system, spaced vertically 48 inches (1220 mm). Fasten at each stud intersection.
 - 1. Channel Bridging: Cold rolled steel channel, welded or mechanically fastened to webs of punched studs with a minimum of two screws into each flange of the clip angle for framing members up to 6 inches (150 mm) deep.
 - 2. Strap Bridging: Combination of flat, taut, steel sheet straps of width and thickness indicated and stud track solid blocking of width and thickness to match studs. Fasten flat straps to stud flanges, and secure solid blocking to stud webs or flanges.
 - 3. Bar Bridging: Proprietary bridging bars installed in accordance with manufacturer's written instructions.
 - J. Install steel sheet diagonal bracing straps to both stud flanges; terminate at and fasten to reinforced top and bottom tracks. Fasten clip angle connectors to multiple studs at ends of bracing and anchor to structure.
 - K. Install miscellaneous framing and connections, including supplementary framing, web stiffeners, clip angles, continuous angles, anchors, and fasteners, to provide a complete and stable wall framing system.
 - L. Install framing between studs for attachment of electrical boxes and mechanical and electrical items.
- 3.5 EXTERIOR NONLOAD BEARING WALL INSTALLATION
- A. Install continuous tracks sized to match studs. Align tracks accurately and securely anchor to supporting structure.
 - B. Fasten both flanges of studs to top and bottom track unless otherwise indicated.
 - 1. Stud Spacing: 16 inches (406 mm).
 - C. Set studs plumb, except as needed for diagonal bracing or required for nonplumb walls or warped surfaces and similar requirements.

- D. Isolate nonload bearing steel framing from building structure to prevent transfer of vertical loads while providing lateral support.
 - 1. Install single deep leg deflection tracks and anchor to building structure.
 - 2. Install double deep leg deflection tracks and anchor outer track to building structure.
 - 3. Connect vertical deflection clips to bypassing studs and anchor to building structure.
 - 4. Connect drift clips to cold-formed steel framing and anchor to building structure.
- E. Install horizontal bridging in wall studs, spaced vertically in rows indicated on approved Shop Drawings but not more than 48 inches (1220 mm) apart. Fasten at each stud intersection.
 - 1. Channel Bridging: Cold rolled steel channel, welded or mechanically fastened to webs of punched studs.
 - 2. Strap Bridging: Combination of flat, taut, steel sheet straps of width and thickness indicated and stud track solid blocking of width and thickness to match studs. Fasten flat straps to stud flanges and secure solid blocking to stud webs or flanges.
 - 3. Bar Bridging: Proprietary bridging bars installed in accordance with manufacturer's written instructions.
- F. Top Bridging for Single Deflection Track: Install row of horizontal bridging within 12 inches (305 mm) of single deflection track. Install a combination of bridging and stud or stud track solid blocking of width and thickness matching studs, secured to stud webs or flanges.
 - 1. Install solid blocking at 96 inch (2440 mm) centers.
- G. Install miscellaneous framing and connections, including stud kickers, web stiffeners, clip angles, continuous angles, anchors, and fasteners, to provide a complete and stable wall framing system.

3.6 INTERIOR NONLOAD BEARING WALL INSTALLATION

- A. Install continuous tracks sized to match studs. Align tracks accurately and securely anchor to supporting structure.
- B. Fasten both flanges of studs to top and bottom track unless otherwise indicated.
 - 1. Stud Spacing: 16 inches (406 mm).
- C. Set studs plumb, except as needed for diagonal bracing or required for nonplumb walls or warped surfaces and similar requirements.
- D. Isolate nonload bearing steel framing from building structure to prevent transfer of vertical loads while providing lateral support.
 - 1. Install single deep leg deflection tracks and anchor to building structure.
 - 2. Install double deep leg deflection tracks and anchor outer track to building structure.
 - 3. Connect vertical deflection clips to studs and anchor to building structure.

4. Connect drift clips to cold formed steel metal framing and anchor to building structure.
- E. Install horizontal bridging in wall studs, spaced vertically in rows indicated but not more than 48 inches (1220 mm) apart. Fasten at each stud intersection.
 1. Channel Bridging: Cold rolled steel channel, welded or mechanically fastened to webs of punched studs.
 2. Strap Bridging: Combination of flat, taut, steel sheet straps of width and thickness indicated and stud track solid blocking of width and thickness to match studs. Fasten flat straps to stud flanges and secure solid blocking to stud webs or flanges.
 3. Bar Bridging: Proprietary bridging bars installed in accordance with manufacturer's written instructions.
- F. Top Bridging for Single Deflection Track: Install row of horizontal bridging within 12 inches (305 mm) of single deflection track. Install a combination of bridging and stud or stud track solid blocking of width and thickness matching studs, secured to stud webs or flanges.
 1. Install solid blocking at 96 inch (2440 mm) centers.
- G. Install miscellaneous framing and connections, including stud kickers, web stiffeners, clip angles, continuous angles, anchors, and fasteners, to provide a complete and stable wall framing system.

3.7 INTERIOR WALL INSTALLATION FOR SPECIFIC CONDITIONS

- A. Definitions:
 1. Larger Openings: Openings larger than 6 foot 0 inches wide by 7 foot- 0 inches in height.
 2. CFMF: items noted as "CFMF" on the Drawings and therefore requiring delegated design requirements.
- B. Larger opening framing:
 1. Provide double king studs securely anchored to base track and structure above; members shall have a minimum thickness of 0.0478inch (18 Gauge) and meet all Performance Requirements of this Section.
 2. Provide double jack studs at both sides of opening; members shall have a minimum thickness of 0.0478inch (18 Gauge) and meet all Performance Requirements of this Section. Provide continuous wood blocking nested into inner jack stud for opening perimeter frame anchorages.
 3. Provide built up headers at all openings consisting of open face to open face stud members no less than 1-5/8 inch deep by 7-5/8 inch wide; members shall have a minimum thickness of 0.0478inch (18 Gauge) with no pre-punched openings. Secure members together with continuous track at the top of the header assembly, width to match partition assembly, thickness to match header.
- C. CFMF Wall Framing:

1. Install continuous tracks sized to match studs. Align tracks accurately and securely anchor to supporting structure.
2. Fasten both flanges of studs to top and bottom track unless otherwise indicated.
 - a. Stud Spacing: 16 inches (406 mm).
3. Set studs plumb, except as needed for diagonal bracing or required for nonplumb walls or warped surfaces and similar requirements.
4. Isolate nonload bearing steel framing from building structure to prevent transfer of vertical loads while providing lateral support.
 - a. Install single deep leg deflection tracks and anchor to building structure.
 - b. Install double deep leg deflection tracks and anchor outer track to building structure.
 - c. Connect vertical deflection clips to studs and anchor to building structure.
 - d. Connect drift clips to cold formed steel metal framing and anchor to building structure.
5. Install horizontal bridging in wall studs, spaced vertically in rows indicated but not more than 48 inches (1220 mm) apart. Fasten at each stud intersection.
 - a. Channel Bridging: Cold rolled steel channel, welded or mechanically fastened to webs of punched studs.
 - b. Strap Bridging: Combination of flat, taut, steel sheet straps of width and thickness indicated and stud track solid blocking of width and thickness to match studs. Fasten flat straps to stud flanges and secure solid blocking to stud webs or flanges.
 - c. Bar Bridging: Proprietary bridging bars installed in accordance with manufacturer's written instructions.
6. Top Bridging for Single Deflection Track: Install row of horizontal bridging within 12 inches (305 mm) of single deflection track. Install a combination of bridging and stud or stud track solid blocking of width and thickness matching studs, secured to stud webs or flanges.
 - a. Install solid blocking at 96 inch (2440 mm) centers.

3.8 ERECTION TOLERANCES

- A. Install cold formed steel framing level, plumb, and true to line to a maximum allowable tolerance variation of 1/8 inch in 10 feet (1:960):
 1. Space individual framing members no more than plus or minus 1/8 inch (3 mm) from plan location. Cumulative error shall not exceed minimum fastening requirements of sheathing or other finishing materials.

3.9 FIELD QUALITY CONTROL

- A. Testing: Owner will engage a qualified independent testing and inspecting agency to perform field tests and inspections and prepare test reports.
- B. Field and shop welds will be subject to testing and inspecting.
- C. Testing agency will report test results promptly and in writing to Contractor and Architect.

- D. Cold formed steel framing will be considered defective if it does not pass tests and inspections.
- E. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

3.10 REPAIRS AND PROTECTION

- A. Galvanizing Repairs: Prepare and repair damaged galvanized coatings on fabricated and installed cold formed steel framing with galvanized repair paint according to ASTM A 780/A 780M and manufacturer's written instructions.
- B. Provide final protection and maintain conditions ensuring cold formed steel framing is without damage or deterioration at time of Substantial Completion.

END OF SECTION

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