

**Section 05410**  
**Long Form Specification**  
**LOAD BEARING METAL STUD FRAMING**

*This section includes axially loaded steel studs, with unique slotted top channels, usually of 0.91, 1.2 and 1.5 mm (16, 18, or 20 ga) metal thickness; including bracing, fasteners and accessories. Light weight interior non-load bearing studs and associated framing are included in Section 09110. This section includes performance, proprietary, and descriptive type specifications. Edit to avoid conflicting requirements.*

**PART 1 GENERAL**

**1.1 SECTION INCLUDES**

- A. Load bearing formed steel stud exterior wall [and] [\_\_\_\_\_] framing.
- B. Slotted metal top track to permit vertical deflection of structural framing.
- C. Framing accessories.

**1.2 RELATED SECTIONS**

- A. Section [\_\_\_\_\_ - \_\_\_\_\_]: Structural building framing.
- B. Section 04812 - Veneer Masonry System: Veneer masonry supported by wall stud metal framing.
- C. Section 04860 - Cut Stone Veneer: Stone veneer supported by wall stud metal framing.
- D. Section 05311 - Steel Floor Deck: Metal floor decking supported by wall stud metal framing.
- E. Section 05313 - Steel Roof Deck: Metal roof decking supported by wall stud metal framing.
- F. Section [\_\_\_\_\_ - \_\_\_\_\_]: Wall sheathing.
- G. Section [\_\_\_\_\_ - \_\_\_\_\_]: Head and sill flashings.
- H. Section 07260 - Vapour Retarders.
- I. Section 07270 - Air Barriers.
- J. Section 07213 - Batt Insulation: Thermal insulation within framing members.
- K. Section 07810 - Applied Fireproofing.
- L. Section 09110 - Interior Metal Stud Framing.
- M. Section 09260 - Gypsum Board Assemblies.

**1.3 REFERENCES**

*List reference standards that are included within the text of this section. Edit the following as required for project conditions.*

- A. CISC - Cold-Formed Steel Design Manual.
- B. ASTM A570/A570M - Standard Specification for Steel, Sheet and Strip, Carbon, Hot-Rolled, Structural Quality.

- C. ASTM A611 - Standard Specification for Steel, Sheet, Carbon, Cold-Rolled, Structural Quality.
- D. ASTM A653/A653M - Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
- E. ASTM A924 / A924M - Standard Specification for General Requirements for Steel Sheet, Metallic-Coated by the Hot-Dip Process.
- F. ASTM C955 - Standard Specification for Load-Bearing (Transverse and Axial) Steel Studs, Runners (Tracks), and Bracing or Bridging, for Screw Application of Gypsum Board and Metal Plaster Bases.
- G. ASTM E119 - Standard Test Methods for Fire Tests of Building Construction and Materials.
- H. ASTM E814 - Standard Test Method for Fire Tests of Through-Penetration Fire Stops.
- I. CSA W47.1 - Certification of Companies for Fusion Welding of Steel Structures.
- J. CSA W55.3 - Resistance Welding Qualification Code for Fabricators of Structural Members Used in Buildings.
- K. CSA W59 - Welded Steel Construction (Metal Arc Welding).
- L. MFMA (Metal Framing Manufacturers Association) - Guidelines for the Use of Metal Framing.
- M. ML/SFA 540 - (Metal Lath/Steel Framing Association, Division of National Association of Architectural Metal Manufacturers; NAAMM) - Lightweight Steel Framing Systems Manual.
- N. SPCC - Society for Protective Coatings (formerly Steel Structures Painting Council):
  - 1. Paint 15, Steel Joist Shop Paint.
  - 2. Paint 20, Zinc Rich Primers.
- O. UL 2079 - Test for Fire Resistance of Building Joint Systems.

#### 1.4 **SYSTEM DESCRIPTION**

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*Use this article carefully; restrict statements to describe the combined result of the components used to assemble the system. Do not repeat statements made in the Section Includes article. If using this article, do not specify metal thickness in Part 2 - Products.*

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- A. Size components to withstand design loads as follows:
  - 1. Vertical Assembly: [\_\_\_\_] kPa ([\_\_\_\_] psf) positive and [\_\_\_\_] kPa ([\_\_\_\_] psf) negative.
  - 2. Horizontal Assembly: [\_\_\_\_] kPa ([\_\_\_\_] psf) live [and dead] loads.

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*The deflection limits in the following paragraph relate directly to the nature, type, and exposure of the finish to be installed over the metal framing work. Smooth finish plasters usually require a deflection limit of 1/480, 1/600, or less. Certain masonry*

*vener cladding, when attached to components specified in this section, may require even more stringent deflection limits such as 1:600 or 1:720; also consider the type and frequency of masonry wall ties and load distribution to the metal stud framing.*

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- B. Maximum Allowable Deflection: [1:180] [1:240] [1:360] [1:600] [1:720] [\_\_\_\_\_] of span.
  - C. [Wall] [\_\_\_\_\_] System:
    - 1. Design to AISI - Cold-Formed Steel Design Manual.
    - 2. Design to provide for 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.
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*The following subparagraph identifies anticipated deflections of building structural framing elements and the effect the deflecting member will have on the metal framing work of this section.*

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- 3. Design system to accommodate construction tolerances, deflection of building structural members, and clearances of intended openings.

*Include the following subparagraph when seismic requirements must be addressed.*

- 4. Seismic Loads: Design and size components to withstand seismic loads and sway displacement as calculated in accordance with [\_\_\_\_\_] code.
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*The following Article identifies performance requirements for metal stud systems in conjunction with fireproofing assemblies specified under Section 07810. Edit the Paragraphs to suit Project conditions and requirements.*

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## **1.5 PERFORMANCE REQUIREMENTS**

- A. Static System: When tested in accordance with the time temperature curve of ASTM E119 and ASTM E814, conform to requirements of 1 and 2 hour fire resistive construction and to requirements of hose stream resistance.
- B. Cyclic System: When tested in accordance with UL 2079 [and UBC-1997, Section 706.2] for cyclical movement and when subsequently tested in accordance with the time temperature curve of ASTM E119 and ASTM E814, conform to requirements of 1 and 2 hour fire resistive rated construction and to requirements of hose stream resistance.

## **1.6 SUBMITTALS FOR REVIEW**

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*Do not request submittals if drawings sufficiently describe the products of this section or if proprietary specifying techniques are used. The review of submittals increases the possibility of unintended variations to drawings, thereby increasing the Specifier's liability. Request shop drawings for shop pre-fabricated framing or assembly of special load bearing partition details. Metal framing component manufacturers'*

*product data is usually acceptable to illustrate standard framing details. The following submittals are intended for review and approval or other action by the Consultant.*

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- A. Section 01300: Submission procedures.
- B. Shop Drawings:
  - 1. Indicate component details, [framed openings,] [bearing,] [anchorage,] [loading,] [welds,] [type and location of fasteners,] and accessories or items required of related work.
  - 2. Indicate stud, slotted top track, bottom track, and framing layout.
  - 3. Describe method for securing [studs] [\_\_\_\_\_] to tracks and for [bolted] [welded] [\_\_\_\_\_] framing connections.
  - 4. Provide calculations for loadings and stresses of [specially fabricated framing,] [roof trusses,] [and] [\_\_\_\_\_] under the Professional Structural Engineer's seal.
- C. Product Data: Provide data on standard framing members; describe materials and finish, product criteria, limitations and [\_\_\_\_\_].

## **1.7 SUBMITTALS FOR INFORMATION**

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*The following submittals are informational; responsive action by the Consultant is not required.*

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- A. Section 01300: Submission procedures.
- B. Manufacturer's Installation Instructions: Indicate special procedures, perimeter conditions requiring special attention, and [\_\_\_\_\_].

## **1.8 QUALITY ASSURANCE**

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*Include the last sentence of the following paragraph only when the costs of acquiring the specified standards are justified.*

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- A. Calculate structural properties of framing members in accordance with [MFMA - Guidelines for the Use of Metal Framing] [and] AWI welding requirements. [Maintain [one copy] [[\_\_\_\_\_] copies] on site.]
- B. Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum [three] [\_\_\_\_\_] years [documented] experience.
- C. Installer Qualifications: Company specializing in performing the work of this section [with minimum [\_\_\_\_\_] years [documented] experience.] [approved by manufacturer.]
- D. Design structural elements under direct supervision of a Professional Structural Engineer experienced in design of this Work and licensed [at the place where the Project is located.] [in the Province of [\_\_\_\_\_].]

*Consider including the following paragraph to complement requirements of this section.*

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- E. Form, fabricate, install, and connect components in accordance with ML/SFA 540 - Lightweight Steel Framing Systems Manual.

## **1.9 MOCK-UP**

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*Use this article for assessing full sized erected assemblies for review of construction, coordination of work of several sections, testing, or observation of operation.*

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- A. Section 01400: Requirements for mock-up.
- B. Provide mock-up of exterior framed wall including [insulation,] [sheathing,] [window frame,] [door frame,] [\_\_\_\_\_,] and interior and exterior finish specified in other sections. Coordinate with installation of associated work of Sections [07260,] [07270,] [09110,] [and] [\_\_\_\_\_].
- C. Mock-up Size: [\_\_\_\_x\_\_\_\_x\_\_\_\_] m ([\_\_\_\_x\_\_\_\_x\_\_\_\_] feet), including corner condition.
- D. Mock-up may [not] remain as part of the Work.

## **1.10 DELIVERY STORAGE AND HANDLING**

- A. Store materials off ground in a dry, well-ventilated area, covered or otherwise protected from physical damage.
- B. Support Products in a manner to prevent a deflection set.

## **1.11 PROJECT CONDITIONS**

- A. Section 01300: Coordination.
- B. Coordinate the placement of components within the stud framing system specified in Section [\_\_\_\_\_].

## **PART 2 PRODUCTS**

### **2.1 MANUFACTURERS**

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*In this article and subsequent articles, list the manufacturers acceptable for this project. Edit the subsequent descriptive specifications to identify project requirements and to eliminate any conflict with specified products.*

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- A. Slotted Top Track: Sliptrack Systems, SLP-TRK®, Phone: 888-475-7875, Fax: 530-662-2865, e-mail: mail@bradyinnovations.com, web site: www.bradyinnovations.com.
- B. [\_\_\_\_\_].
- C. Substitutions: [Refer to Section 01600.] [Not permitted.]

### **2.2 FRAMING MATERIALS**

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*Thickness and component dimension may be governed by load design and may vary by location. Consider performance specifying by load under the System Description*

*article or by scheduling loading variables in a schedule at end of this section. The first paragraph below references ASTM C955 (which utilizes A653/A653M steel); the second and subsequent paragraphs descriptively specify studs by referencing a variety of ASTM material standards. Note that the steel materials referenced in the paragraphs that follow are not all capable of factory galvanizing. Studs used in the exterior environment and in potentially corrosive environments should be galvanized. If thickness and material is consistent throughout, edit the following paragraphs. Where thicknesses or materials vary, edit the following paragraphs accordingly and identify the variables in a schedule at the end of this section.*

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- A. Studs: ASTM C955, formed to [channel] [\_\_\_\_\_] shape, [solid] [punched] [\_\_\_\_\_] web, [knurled faces]; [1.2] [\_\_\_\_\_] mm ([0.048] [\_\_\_\_\_] inch) thick, [\_\_\_\_\_] mm ([\_\_\_\_\_] inch) face and [\_\_\_\_\_] mm ([\_\_\_\_\_] inch) depth.
- B. [OR]
- C. Studs: ASTM [A653/A653M] [A570/A570M] [A611] [A645/A645M] [\_\_\_\_\_] Grade [\_\_\_\_\_] sheet steel, formed to [channel] [\_\_\_\_\_] shape, [solid] [punched] [\_\_\_\_\_] web, [knurled faces]; [1.2] [\_\_\_\_\_] mm ([0.048] [\_\_\_\_\_] inch) thick, [\_\_\_\_\_] mm ([\_\_\_\_\_] inch) face and [\_\_\_\_\_] mm ([\_\_\_\_\_] inch) depth.
- D. Bottom Track: Formed [\_\_\_\_\_] steel; channel shaped; same width as studs, tight fit; [\_\_\_\_\_] mm ([\_\_\_\_\_] inch) thick, solid web.
- E. Slotted Top Tracks:
  - 1. 1.5 mm (16 ga.) thick, to ASTM A653/A653M, Grade 50 with a minimum yield point of 345 MPa (50,000 psi)
  - 2. [1.2] [0.91] [0.53] mm ([18 ga] [20 ga] [25 ga]) thick, to ASTM A653/A653M, Grade 33 with a minimum yield point of 228 MPa (33,000 psi),
  - 3. [63] [92] [102] [152] [203] mm ([2-1/2] [3-5/8] [4] [6] [8] inches) wide,
  - 4. 3050 mm (10'-0") long,
  - 5. 63 mm (2-1/2 inch) down-standing legs with 6 mm (1/4 inch) wide by 38 mm (1-1/2 inch) high slots spaced at 25 mm (1 inch) on center.
- F. Framing Materials: Roll from new sheet steel; re-rolled steel not acceptable.

## **2.3 ACCESSORIES**

*If performance specifying, select the first paragraph below; if prescriptive specifying, select and edit the second paragraph.*

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- A. Bracing, Furring, Bridging: Formed sheet steel, thickness determined by performance requirements specified.
- B. [OR]
- C. Bracing, Furring, Bridging: Formed sheet steel, [\_\_\_\_\_] mm ([\_\_\_\_\_] inch) thick.

*If performance specifying, select the first paragraph below; if prescriptive specifying, select and edit the second paragraph.*

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D. Plates, Gussets, Clips: [Formed] sheet steel, thickness determined by performance requirements specified.

E. [OR]

F. Plates, Gussets, Clips: [Formed] sheet steel, [\_\_\_\_\_] mm ([\_\_\_\_\_] inch) thick.

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*Select one or both of the following paragraphs for the primer type required. Select a primer compatible with finishing material.*

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G. Shop and Touch-Up Primer: [SPCC Paint 15, Type I, red oxide.] [\_\_\_\_\_].

H. [OR]

I. Touch-Up Primer for Galvanized Surfaces: [SPCC Paint 20 [Type I Inorganic] [Type II Organic] zinc rich.] [\_\_\_\_\_].

## 2.4 FASTENERS

A. Self-drilling, Self-tapping Screws, Bolts, Nuts, and Washers: Steel, hot dip galvanized to ASTM A123 [380] [\_\_\_\_\_] g/sq m ([1.25] [\_\_\_\_\_] oz/sq ft).

B. Anchorage Devices: [Power actuated,] [drilled expansion bolts,] [screws with sleeves,] [and] [\_\_\_\_\_].

C. Welding: In conformance with AWI requirements.

## 2.5 FABRICATION

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*Edit the following paragraphs for use only when shop fabricated assemblies are required.*

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A. Fabricate assemblies of [formed sections] [\_\_\_\_\_] of sizes and profiles required.

B. Fit, reinforce, and brace framing members to suit design requirements.

C. Fit and assemble in largest practical sections for delivery to site, ready for installation.

## 2.6 FINISHES

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*Metal finishes may be constant throughout as either galvanized, primed, or unfinished. Where finishes vary by component or location, identify the variables in a schedule at end of this section. Note that options listed for stud and joist materials in the paragraphs above (ASTM A570/A570M, A611, and A645/A645M sheet steel) are not galvanized.*

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A. Studs and Slotted Top Track: [Galvanize to ASTM A924 / A924M [Z275] [Z180] [\_\_\_\_\_] ([G90] [G60] [\_\_\_\_\_] ) coating class.] [Prime paint.]

B. Bottom Tracks and Headers: [Galvanize to ASTM A924 / A924M [Z275] [Z180] [\_\_\_\_\_] ([G90] [G60] [\_\_\_\_\_] ) coating class.] [Prime paint.]

C. Bracing, Furring, and Bridging: [Same finish as framing members.] [Galvanize to ASTM A924 / A924M [Z275] [Z180] [\_\_\_\_\_] ([G90] [G60] [\_\_\_\_\_] ) coating class.] [Prime paint.]

D. Plates, Gussets, and Clips: [Same finish as framing members.] [Galvanize to ASTM

A924 / A924M [Z275] [Z180] [\_\_\_\_] ([G90] [G60] [\_\_\_\_]) coating class.]  
[Prime paint.]

### **PART 3 EXECUTION**

#### **3.1 EXAMINATION**

- A. Section 01300: Verification of existing conditions before starting work.
- B. Verify that [substrate surfaces] [building framing components] are ready to receive work.
- C. Verify that rough-in utilities are in proper location.

#### **3.2 INSTALLATION**

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

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*The following paragraph identifies acoustic sealant; make a similar statement in the appropriate sealant section for coordination purposes.*

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- B. Align top and bottom tracks; locate to [wall] [partition] layout. Secure in place [with fasteners] [by welding] at maximum [600] [\_\_\_\_] mm ([24] [\_\_\_\_] inches) oc. [Coordinate installation of acoustic sealant with bottom [and [slotted] top tracks.]
- C. Install slotted tracks in strict accordance with manufacturer's instructions and referenced regulation requirements, to give proper support [and to achieve the required fire rating].

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*Note in the following paragraph that stud spacing can also be described on drawings, in a schedule, and required in multiple spacings at various locations; develop a schedule at the end of the section when appropriate.*

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- D. Place studs at [300] [400] [600] [\_\_\_\_] mm ([12] [16] [24] [\_\_\_\_] inches) on centre; not more than [50] [\_\_\_\_] mm ([2] [\_\_\_\_] inches) from abutting walls and at each side of openings. Connect axial loadbearing studs to top and bottom tracks using [clip and tie] [fastener] [welding] method.
- E. Provide deflection allowance in stud track, directly below horizontal building framing at non-load bearing framing.
- F. Secure non-load bearing studs to slotted top track with #8 waferhead screws. Maintain minimum deflection gap of 16.5 mm (0.65 inch) between top of stud and top of slotted track. Limit vertical movement to 25 mm (1 inch), plus or minus 13 mm (1/2 inch).
- G. Construct corners using minimum three studs. Double stud wall openings, door jambs, and window jambs.
- H. Erect load bearing studs one piece full length. Splicing of studs is not permitted.
- I. Erect load bearing studs, brace, and reinforce to develop full strength, to achieve design requirements.

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*The following paragraph identifies integral insulation; make a similar statement in the appropriate insulation section for coordination purposes.*

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- J. Coordinate placement of insulation in multiple stud spaces after erection.
- K. Install intermediate studs above and below openings to align with wall stud spacing.
- L. Attach [cross studs] [furring channels] to studs for attachment of fixtures anchored to walls.
- M. Install framing between studs for attachment of mechanical and electrical items, and to prevent stud rotation.
- N. Touch-up field welds and damaged [galvanized] [primed] surfaces with primer.

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*Describe the subsequent construction or assemblies of materials that will be affixed to the metal framing.*

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- O. Complete framing ready to receive [\_\_\_\_\_].

### **3.3 ERECTION TOLERANCES**

- A. Section 01400: Tolerances.

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*Include this article when tolerances are important to the nature of the project. Tolerances required will vary depending on the nature of subsequent construction of finish. Flat, smooth surface finishes will require rigid erection tolerances.*

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- B. Maximum Variation from True Position: [\_\_\_\_\_] mm ([\_\_\_\_\_] inch).
- C. Maximum Variation of any Member from Plane: [\_\_\_\_\_] mm ([\_\_\_\_\_] inch).

### **3.4 SCHEDULES**

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*Provide a schedule when framing members may result in differing design conditions or material thicknesses.*

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- A. Exterior Wall Studs: To resist positive and negative wind loading to a maximum deflection of 1:600 of span, galvanized to Z180 ( G60) coating class.

**END OF SECTION**