

SECTION 05 45 00

SLOTTED STEEL CHANNEL FRAMING SYSTEM

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes:
 - 1. Channel framing system.
 - 2. Accessories necessary for a complete installation.
 - 3. Coordination of all loads intended to be supported by the slotted channel framing system.

1.2 SUBMITTALS

- A. Product Data: Technical data for steel channel framing products and accessories.
- B. Shop Drawings: Submit shop drawings detailing assembly layout, channel sizes and thickness, and type of steel channel. Include plans, elevations, sections, and details of steel components and connections. Show anchorage and accessory items.
 - 1. For installed products indicated to comply with design loads, include structural analysis data, for information only, signed and sealed by the qualified professional engineer responsible for their preparation.
- C. Delegated Design Submittal: Submit for channel framing system indicated to comply with performance requirements, seismic restraints, and design criteria, including analysis data, supporting calculations including stress and deflection analysis and framing members, fitting, and accessories signed and sealed by the qualified professional engineer responsible for the preparation.
 - 1. Slotted Channel Support Grid: Support grid capable of withstanding imposed gravity loads and resisting seismic loads.
 - 2. Coordinate all loads intended to be supported from the slotted channel framing system.

1.3 INFORMATIONAL SUBMITTALS

- A. Coordination Drawings: Reflected ceiling plans, drawn to scale, on which the following items are shown and coordinated with each other, using input from installers of the items involved:
 - 1. Suspended ceiling components.
 - 2. Structural members to which channel framing system will be attached.
 - 3. Structural Ceiling Grids to be suspended from Slotted Channel Framing Systems.
 - 4. Sprinkler system.

5. Items penetrating finished ceiling including the following:
 - a. Lighting fixtures.
 - b. Air outlets and inlets.
 - c. Speakers.
 - d. Sprinklers.
 - e. Cable trays and utility racks
 - f. Fire/smoke detector.
 - g. Access panels.

- B. Evaluation Reports: ICC-ES report for channel framing system, anchor, and fastener type.

1.4 QUALITY ASSURANCE

- A. Manufacturer Qualification: Manufacturer having minimum 10 years documented experience in the manufacturer and design of channel framing systems.
- B. Installer Qualifications: Installer having minimum 10 years documented experience, trained by the manufacturer, and is an authorized representative/installer.
- C. Sole Source Responsibility: Provide framing system component from a single manufacturer.
- D. Testing Agency Qualifications: An independent testing agency, acceptable to authorities having jurisdiction, qualified according to ASTM E 329 to conduct the testing indicated.
- E. Reports and Test Data: Submit mill certificates or testing data from a qualified independent testing agency or in house testing for calibrated test equipment indicating steel sheet complies with requirements, including base metal thickness, yield strength, tensile strength, total elongation, chemical requirements, ductility, and metallic coating thickness.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Store framing members in a dry, well ventilated, weathertight place. Deliver and handle to prevent type of damage to the components. Protect steel framing from corrosion, deformation, and damage.

1.6 COORDINATION

- A. Coordinate installation of steel channel framing members that are anchored to or that receive other work. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are embedded in concrete or masonry. Deliver to site in time for installation.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Delegated Design: Design framing system, including comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated.
- B. Channel Framing System: Framing system capable of withstanding structural loads complying with design criteria without exceeding the allowable design working stress of the materials involved, including anchors and connections, or of exhibiting excessive deflections in any of the components making up the framing system.
 - 1. Uniform Loads: Confirm channel framing system loading requirements with Architect and Engineer of record before proceeding with delegated design; comply with all loading requirements as indicated on the Drawings but no less than 40lbs / sq. ft..
 - 2. Maximum Static Point Load: 800 lbs in bottom slot of strut unless exceeded in the Drawings.
 - 3. Maximum Deflection: L/360 unless exceeded in the Drawings.
 - 4. Provide channel system for layout indicated on the drawings and as necessary to provide support for the structural ceiling grid system specified in Section 09 54 39.
 - 5. All loads from items intended to be supported by the slotted channel framing system shall be considered. The Contractor shall coordinate the Work of all trades.

2.2 MATERIALS

- A. Basis of Design: Unistrut Slotted Channel Framing System by Unistrut Corporation.
 - 1. Subject to compliance with requirements, and equivalence as determined by the Architect, products by one of the following may also be acceptable:
 - a. Eaton.
 - b. Gregory Strut.
- B. Steel Sheet: ASTM A 653/A653M structural steel, Grade 33 (Grade 230), with G90 (Z275) coating; 0.108 inch (2.8 mm) nominal thickness; hot dipped galvanized after fabrication complying with ASTM A 123 or ASTM A 153.
 - 1. All members shall be coated with rust-inhibitive, baked-on, acrylic enamel or hot-dip galvanized after fabrication at the Architect's discretion to avoid Zinc whisker development.
 - a. Color of baked on enamel selected by Architect from manufacturer's full range.
 - b. Electroplate galvanized steel members, fittings and other components shall not be permitted to avoid zinc whisker phenomenon and damage to electronic equipment.
 - 2. Fittings: Fabricated from steel sheet complying with requirements of ASTM A907 structural steel, Grade 33 (grade 230), and hot dip galvanized after fabrication in accordance with ASTM A123.

3. Hardware: Type 302 stainless steel or chromium zinc ASTM F1136 Grade 3, hot dip galvanized after fabrication products. Return fittings to point of manufacture after coating for inspection and removal of sharp burrs.
- C. Strut Channel Framing Components: 1-5/8 inches (41 mm) wide in varying heights and welded combinations necessary to comply with load capacities and designs indicated on the Drawings. Channels shall be coated with rust-inhibitive, baked-on, acrylic enamel or hot-dip galvanized after fabrication at the Architect's discretion to avoid Zinc whisker development.
1. Seismic Struts: Designed to accommodate seismic forces.
- D. Framing Accessories: Required by components for a structural sound channel framing system.
- E. Anchors, Clips, and Fasteners:
1. Steel Shapes and Clips: ASTM A 36/A 36M, zinc coated by hot dip process according to ASTM A 123/A 123M.
 2. Anchor Bolts: ASTM F 1554, Grade 36, threaded carbon steel hex headed bolts and carbon steel nuts; and flat, hardened steel washers; zinc coated by hot dip process according to ASTM A 153/A 153M, Class C.
 3. Expansion Anchors: Fabricated from corrosion resistant materials, with capability to sustain, without failure, a load equal to 5 times design load, determined by testing in accordance with ASTM E 488 conducted by a qualified independent testing agency.
 4. Mechanical Fasteners: ASTM C 1513, corrosion resistant coated, self drilling, self tapping steel drill screws.
 5. Head Type: Low profile head beneath sheathing, manufacturer's standard elsewhere.
- F. Seismic Stabilizer Bars: Perimeter stabilizers designed to accommodate seismic forces.
- G. Seismic Struts: compression struts designed to accommodate seismic forces.
- H. Miscellaneous Materials:
1. Galvanizing Repair Paint: High zinc dust content paint for regalvanizing welds in steel, complying with SSPC-Paint 20.
 2. Nonshrink, Nonmetallic Grout: Factory packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C 1107/C 1107M. Provide grout specifically recommended by manufacturer for interior and exterior applications with fluid consistency and 30 minute working time.
 3. Gaskets: Closed cell neoprene foam, 1/4 inch (6 mm) thick, selected from widths to match width of bottom track or rim track members.

2.3 FABRICATION

- A. Fabricate steel framing and accessories plumb, square, and true to line, and with connections securely fastened, according with AISI specifications and standards, manufacturer's written instructions, and specified requirements.

1. Fabricate framing assemblies using jigs or templates.
 2. Cut framing members by sawing or shearing; do not torch cut.
 3. Fasten steel framing members by welding, screw fastening, clinch fastening, or riveting as standard with fabricator. Wire tying of framing members is not permitted. Locate mechanical fasteners and install according to Shop Drawings, with screw penetrating joined members by minimum 3 exposed screw threads.
 4. Fasten materials to steel framing by welding, bolting, or screw fastening, according to Shop Drawings.
- B. Reinforce, stiffen, and brace framing assemblies to withstand handling, delivery, and erection stresses. Lift fabricated assemblies to prevent damage or permanent distortion.
- C. Fabrication Tolerances: Fabricate assemblies level, plumb, and true to line to maximum allowable tolerance variation of 1/8 inch in 10 feet (3mm in 3 m):
1. Spacing: Space individual framing members no more than plus or minus 1/8 inch from plan location. Cumulative error shall not exceed minimum fastening requirements of sheathing or other finishing materials.
 2. Squareness: Fabricate steel framing assembly to a maximum out of square tolerance of 1/8 inch.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine supporting substrates and abutting structural framing for compliance with requirements for installation tolerances and other conditions affecting performance. Proceed with installation after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Install steel framing in accordance with manufacturer written instructions, design calculations and criteria, seismic requirements and MFMA 102.
- B. Install shop fabricated framing and securely anchor to supporting structure. Screw, bolt, or weld framing to produce flush, even, true to line joints with maximum variation in plane and true position between fabricated panels not exceeding 1/16 inch (1.5 mm).
- C. Install 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 steel framing members by welding, screw fastening, clinch fastening, or riveting. Wire tying of framing members is not permitted. Locate mechanical fasteners and install according to Shop Drawings, and complying with requirements for spacing, edge distances, and screw penetration.
- D. Install framing members in one piece lengths unless splice connections are indicated for track or tension members.

- E. Do not bridge building expansion and control joints with cold formed steel framing. Independently frame both sides of joints.
- F. Erection Tolerances: Install steel framing level, plumb, and true to line to a maximum allowable tolerance variation of 1/8 inch in 10 feet (3 mm in 3 m) and space individual framing members no more than plus or minus 1/8 inch (3mm) from plan location. Cumulative error shall not exceed minimum fastening requirements of sheathing or finishing materials.

3.3 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. Remove and replace work where test results indicate that it does not comply with specified requirements.
- E. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

3.4 CLEANING

- A. Clean exposed surfaces, including trim and edge moldings. Comply with manufacturer's written instructions for cleaning and touchup of minor finish damage.
- B. Remove and replace ceiling grid components that cannot be successfully cleaned and repaired to permanently eliminate evidence of damage

3.5 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 and manufacturer's written instructions.
- B. Provide final protection and maintain conditions acceptable to manufacturer ensuring steel channel framing is without damage or deterioration at time of Substantial Completion.

END OF SECTION