

GUIDE SPECIFICATION

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SECTION 054400

COLD-FORMED METAL TRUSSES

This guide specification has been prepared by OEG Building Materials Inc., as an aid to specifiers in preparing written construction documents for cold formed metal trusses based on OEG's line of products. For axial load bearing wall framing and horizontal framing applications (floor, ceiling, and rafter joists), use guide specification 054020 – Cold Formed Metal Framing – Axial Load Bearing.

Edit entire master to suit project requirements. Modify or add items as necessary. Delete items which are not applicable. Words and sentences within brackets [_____] reflect a choice to be made regarding inclusion or exclusion of a particular item or statement. This section may include performance, proprietary, and descriptive type specifications. Edit to avoid conflicting requirements. Editor notes to guide the specifier are included between lines of asterisks to assist in choices to be made. Remove these notes before final printing of specification.

This guide specification is written around the Construction Specifications Institute (CSI), Section Format standards references to section names and numbers are based on MasterFormat 2020.

For specification assistance on specific product applications, please contact our offices above.

OEG Building Materials reserves the right to modify these guide specifications at any time. Updates to this guide specification will be posted to the manufacturer's web site. OEG Building Materials makes no expressed or implied warranties regarding content, errors, or omissions in the information presented.

PART 1 - GENERAL

1.1 SUMMARY

Select project specific applications below.

- A. Section Includes:
1. Cold-formed steel roof trusses.
 2. Cold-formed steel floor trusses.

Select related sections below as applicable to the project.

- B. Related Requirements:
1. [Section 054020 – Cold Formed Metal Framing – Structural, for interior and exterior load-bearing metal stud framing that supports floor or roof loads above.]

1.2 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.

- 1.3 ACTION SUBMITTALS
- A. Product Data: For each product specified in Part 2.
 - B. Shop Drawings:
 - 1. Include layout, spacings, sizes, thicknesses, and types of cold-formed steel trusses; fabrication; and fastening and anchorage details, including mechanical fasteners.
 - 2. Indicate reinforcing channels, opening framing, supplemental framing, strapping, bracing, bridging, splices, accessories, connection details, and attachment to adjoining work.
 - C. Delegated Design: Provide shop drawings signed and sealed by a structural engineer licensed to practice in the location of the project, indicating ability of system and attachment to supporting construction to resist indicated or code required loads.
- 1.4 INFORMATIONAL SUBMITTALS
- A. Qualification Data: For testing agency.
 - B. Welding certificates.
 - C. Product Test Reports: For each listed product, for tests performed by manufacturer and witnessed by a qualified testing agency.
 - 1. Steel sheet.
 - 2. Expansion anchors.
 - 3. Power-actuated anchors.
 - 4. Mechanical fasteners.
 - 5. Miscellaneous structural clips and accessories.
 - D. Field quality-control reports.
- 1.5 QUALITY ASSURANCE
- A. Testing Agency Qualifications: Qualified in accordance with ASTM E329 for testing indicated.
 - B. Product Tests: Mill certificates or data from a qualified independent testing agency, or in-house testing with calibrated test equipment, indicating steel sheet complies with requirements, including base-metal thickness, yield strength, tensile strength, total elongation, chemical requirements, and metallic-coating thickness.
 - C. Welding Qualifications: Qualify procedures and personnel in accordance with the following:
 - 1. AWS D1.1/D1.1M, "Structural Welding Code - Steel."
 - 2. AWS D1.3/D1.3M, "Structural Welding Code - Sheet Steel."

PART 2 - PRODUCTS

- 2.1 COLD-FORMED METAL TRUSS COMPONENT FABRICATORS
- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. OEG Building Materials, Sayreville, NJ.
 - B. Substitutions: Submit in accordance with Division 01 – Substitution Procedures.
- 2.2 PERFORMANCE REQUIREMENTS
- A. Delegated Design: Engage a qualified professional engineer, as defined in Section 014000 "Quality Requirements," to design cold-formed steel framing including fasteners and connections to building structure.
 - B. Structural Performance: Provide cold-formed steel trusses capable of withstanding design loads within limits and under conditions indicated.
 - 1. Design Loads: As indicated on Drawings.
 - 2. Deflection Limits: Design trusses to withstand design loads without deflections greater than the following:
 - a. Floor Trusses: Vertical deflection of L/480 for live loads and l/360 for total loads of the span.
 - b. Roof Trusses: Vertical deflection of L/240 of the span.
 - c. Scissor Roof Trusses: Horizontal deflection of 1-1/4 inches at reactions.
 - 3. Design trusses to provide for movement of truss 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 deg F.
 - C. Cold-Formed Steel Truss Standards: Unless more stringent requirements are indicated, trusses comply with the following:
 - 1. Floor and Roof Systems: AISI S210.
 - 2. Lateral Design: AISI S213.

3. Roof Trusses: AISI S214.
 - D. Fire-Resistance Ratings: Comply with ASTM E119; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
 1. Indicate design designations from UL or from the listings of another qualified testing agency acceptable to authorities having jurisdiction.
- 2.3 COLD-FORMED STEEL TRUSS MATERIALS
- A. Steel Sheet: ASTM A1003/A1003M, Structural Grade, Type H, metallic coated, of grade and coating designation as follows:
 1. Grade: As required by structural performance.
 2. Coating: G60.
- 2.4 COLD-FORMED STEEL ROOF TRUSSES
- A. Roof Truss Members: Manufacturer's standard C-shaped steel sections.
 1. Minimum Base-Metal Thickness: As required by structural performance.
 2. Connecting Flange Width: 1-5/8 inches, minimum at top and bottom chords connecting to sheathing or other directly fastened construction.
- 2.5 COLD-FORMED STEEL FLOOR TRUSSES
- A. Floor Truss Members: Manufacturer's standard C-shaped steel sections.
 1. Minimum Base-Metal Thickness: As required by structural performance.
 2. Connecting Flange Width: 1-5/8 inches, minimum at top and bottom chords connecting to sheathing or other directly fastened construction.
- 2.6 TRUSS ACCESSORIES
- A. Fabricate steel-truss accessories from steel sheet, ASTM A1003/A1003M, Structural Grade, Type H, metallic coated steel sheet, of same grade and coating designation used for truss members.
 - B. Provide accessories of manufacturer's standard thickness and configuration unless otherwise indicated.
- 2.7 ANCHORS, CLIPS, AND FASTENERS
- A. Steel Shapes and Clips: ASTM A36/A36M, zinc coated by hot-dip process in accordance with ASTM A123/A123M.
 - B. Anchor Bolts: ASTM F1554, Grade 55, threaded carbon-steel hex-headed bolts, carbon-steel nuts, and flat, hardened-steel washers; zinc coated by mechanical deposition in accordance with ASTM B695, Class 50.
 - C. 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 AC01 as appropriate for the substrate.
 1. Uses: Securing cold-formed steel trusses to structure.
 2. Type: Torque-controlled expansion anchor.
 - D. design load, according to an evaluation report acceptable to authorities having jurisdiction, based on ICC -ES AC70.
 - E. Mechanical Fasteners: ASTM C1513, corrosion-resistant-coated, self-drilling, self-tapping steel drill screws.
 1. Head Type: Low-profile head beneath sheathing; manufacturer's standard elsewhere.
 - F. Welding Electrodes: Comply with AWS standards.
- 2.8 MISCELLANEOUS MATERIALS
- A. Galvanizing Repair Paint: MIL-P-21035B or SSPC-Paint 20.
 - B. Shims: Load-bearing, high-density multimonomer, nonleaching plastic; or cold-formed steel of same grade and metallic coating as truss members supported by shims.
- 2.9 FABRICATION OF COLD-FORMED STEEL TRUSSES AND ACCESSORIES
- A. Fabricate cold-formed steel trusses and accessories plumb, square, and true to line, and with connections securely fastened, according to referenced AISI's specifications and standards, manufacturer's written instructions, and requirements in this Section.
 1. Fabricate trusses using jigs or templates.
 2. Cut truss members by sawing or shearing; do not torch cut.
 3. Fasten cold-formed steel truss members by welding, screw fastening, clinch fastening, pneumatic pin fastening, or riveting as standard with fabricator.

- 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.
- 4. Fasten other materials to cold-formed steel trusses by welding, bolting, pneumatic pin fastening, or screw fastening, according to Shop Drawings.
- B. Reinforce, stiffen, and brace trusses to withstand handling, delivery, and erection stresses. Lift fabricated trusses 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 and as follows:
 - 1. Spacing: Space individual truss members no more than plus or minus 1/8 inch from plan location. Cumulative error are not to exceed minimum fastening requirements of sheathing or other finishing materials.
 - 2. Squareness: Fabricate each cold-formed steel truss to a maximum out-of-square tolerance of 1/8 inch.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, conditions, and abutting trusses and framing for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

 Retain paragraphs below if spray applied fire resistive materials are to be applied.

- 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 these materials as needed to complete installation of cold-formed steel trusses without reducing thickness of fire-resistive materials below that required to obtain fire-resistance ratings indicated. Protect remaining fire-resistive materials from damage.

3.3 INSTALLATION OF COLD-FORMED STEEL TRUSSES

- A. Install bridge, and brace cold-formed steel trusses in accordance with AISI S200, AISI S202, AISI S214, and manufacturer's written instructions unless more stringent requirements are indicated.
 - 1. Coordinate with wall framing to align webs of bottom chords and load-bearing studs or continuously reinforce track to transfer loads to structure.
 - 2. Anchor trusses securely at all bearing points.
 - 3. Install continuous bridging and permanently brace trusses as indicated on Shop Drawings and designed according to CFSEI's Technical Note 551e, "Design Guide: Permanent Bracing of Cold-Formed Steel Trusses."
- B. Install cold-formed steel trusses and accessories true to line and location, and with connections securely fastened.
 - 1. Erect trusses with plane of truss webs plumb and parallel to each other. Align and accurately position trusses at required spacings.
 - 2. Erect trusses without damaging truss members or connections.
 - 3. Fasten cold-formed steel trusses by welding or mechanical fasteners.
 - 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 according to Shop Drawings, and comply with requirements for spacing, edge distances, and screw penetration.
- C. Install temporary bracing and supports to secure trusses 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 trusses are secured.
- D. Truss Spacing: As indicated on Drawings.
- E. Do not alter, cut, or remove truss members or connections of trusses.

3.4 ERECTION TOLERANCES

- A. Install cold-formed steel trusses level, plumb, and true to line to a maximum allowable tolerance variation of 1/8 inch in 10 feet and as follows:

1. Space individual trusses no more than plus or minus 1/8 inch from plan location. Cumulative error are not to exceed minimum fastening requirements of sheathing or other finishing materials.

3.5 REPAIR

- A. Galvanizing Repairs: Prepare and repair damaged galvanized coatings on fabricated and installed cold-formed steel trusses with galvanized repair paint in accordance with ASTM A780/A780M and manufacturer's written instructions.

3.6 FIELD QUALITY CONTROL

- A. Testing: Contractor will engage a qualified independent testing and inspecting agency to perform field tests and inspections and prepare test reports.
- B. Submit written report that work has been reviewed for compliance by Contractor, Installer, and Metal Framing Engineer, and is ready for inspection by Testing Agency.
- C. The following items will be subject to testing and inspecting:
 1. Field and shop welds.
 2. Attachment of tracks to structure, including the following:
 - a. Spacing of fasteners.
 - b. Edge clearance.
 - c. Embedment / penetration of fasteners.
- D. Testing agency will report test results promptly and in writing to Contractor and Architect.
- E. Cold-formed steel framing will be considered defective if it does not pass tests and inspections.
- F. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.
- G. Special Inspections: Engage a qualified special inspector to perform the following special inspections:
 1. Cold-Formed Steel Trusses Spanning 60 Feet (18 288 mm) or Longer: Verify temporary installation restraint/bracing and the permanent individual truss member restraint/bracing are installed according to the approved truss submittal package.

3.7 PROTECTION

- A. Provide final protection and maintain conditions, in a manner acceptable to manufacturer and Installer, that ensure that cold-formed steel trusses are without damage or deterioration at time of Substantial Completion.

END OF SECTION