

SECTION 05 44 00

COLD-FORMED STEEL TRUSSES

PART 1 GENERAL

1.1 GENERAL CONDITIONS

- A. All work under this section is subject to the General Conditions and Supplementary General Conditions and shall be governed by the requirements therein.

1.2 SUMMARY – Pre-engineered cold framed steel roof trusses and cold-formed steel framing trusses, complete.

- A. Design, engineering, fabrication by manufacturer in accordance with ANSL, and conforming to code requirements and design loads indicated.
- B. Erection by installer approved by truss manufacturer.

1.3 RELATED WORK SPECIFIED ELSEWHERE:

- A. Quality Control - Section 01 40 00: Required Special Inspections
- B. Steel Decking: Section 05 31 23
- C. Cold-Formed Metal Framing: Section 05 40 00

1.4 SYSTEM DESCRIPTION

- A. Design Requirements
 - 1. Design system components in accordance with the following:
 - a. AISI S100 Current edition “North American Specification for the Design of Cold-Formed Steel Structural Members”.
 - b. AISI S240 Current edition “North American Standard for Cold-Formed Steel Structural Framing”
 - c. AISI S202 Current edition “Code of Standard Practice for Cold-Formed Steel Structural Framing”
 - d. ASTM A500-18 “Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes
 - e. ASTM A653 “Standard Specification for Steel Sheet, Zinc-coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process
 - f. ASTM A780 “Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dipped Galvanized Coatings”.
 - 2. Conform to requirements of **2021** International Building code.
 - 3. Comply with deflection requirements for total design loads and live design loads according to International Building Code Requirements.

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- B. Performance Requirements: Truss system, with framing components and accessories, shall provide a complete horizontal framing system, ready for deck installation, meeting design requirements.
- C. Component Requirements: Truss chord and web components shall have rolled or closed edges to minimize the danger of cutting during handling.
- D. System Definitions
 - 1. Truss Component Manufacturer: Approved maker of components that will be assembled into truss fabricator.
 - 2. Truss Fabricator: Approved truss manufacturer who assembles truss manufacturer's components into completed trusses.
 - 3. Truss Designer: Design professional, individual or organization having responsibility for design of light gage steel trusses.

1.5 SUBMITTALS: Comply with Section 01 33 00.

- A. Product Data: Submit component manufacturer's descriptive literature for each item of cold-form metal framing and each accessory specified.
- B. Shop Drawings: Truss fabricator's drawings that:
 - 1. Indicate special components and installations not fully described in product data.
 - 2. Indicate in layout placement drawings the number, types, location, and spacing of trusses and other framing members.
 - 3. Indicate details of truss loading, reactions, uplifts, support locations, material sizes and gages, permanent truss web bracing, and splices as required for complete installation.
- C. Quality Assurance Submittals:
 - 1. Truss Component Manufacturer's Instructions: Printed installation instructions for each item of cold-formed metal framing and each accessory specified.
 - 2. Design Data: Results of design analysis, bearing the seal and signature of a professional engineer registered in Arkansas.
- D. Truss Component Manufacturer's recommendations for Handling and Storage: Observe written recommendations.

1.6 QUALITY ASSURANCE

- A. Fabricator Qualifications; Fabrication shall be by experienced cold-formed metal framing truss fabricator with not less than three years experience designing and fabricating cold-framed metal trusses equal in material, design and extent to systems required for this project. Primary fabrication shall be conducted in permanent facility dedicated to manufacturing of cold-formed metal trusses. Job site fabrication is strictly prohibited.

- B. Erectors Qualifications: Truss erection shall be performed by qualified installer experienced in structural light gage steel framing and recommended truss installation practices.

1.7 DELIVERY, STORAGE AND HANDLING

- A. Deliver trusses to job site individually labeled to match information in layout drawings. Exercise extreme care to avoid damage during unloading, storing and erection.
- B. Store trusses on blocking off of ground and in an upright position when possible to avoid damage from bending and over stressing. Protect metal from corrosion, deformation, damage, and deterioration when stored on job site. Keep trusses free of dirt and other foreign matter.

PART 2 PRODUCTS

2.1 TRUSS COMPONENT MANUFACTURERS: Manufacturers meeting quality assurance requirements specified.

2.2 TRUSS FABRICATORS: Fabricators meeting quality assurance requirements specified.

2.3 MATERIALS

- A. Truss Chord and Web Components: Shapes, sizes, and thicknesses as required by design requirements and as indicated on final shop drawings.
 - 1. Chords: Commercial quality cold formed steel complying with ASTM A 653, minimum G60 coating, minimum yield strength of 55,000 psi.
 - 2. Webs: Cold formed structural steel tubing complying with ASTM A500, minimum strength of 45,000 psi.
- B. Fabricating Fasteners: Screw fasteners recommended by truss component manufacturer and bearing manufacturer's stamp.
- C. Galvanizing Repair: Where galvanized surfaces are damaged, prepare surfaces and repair in accordance with procedures specified in ASTM A 780.

2.4 FABRICATION

- A. Trusses:
 - 1. Shop fabricate steel components in compliance with final shop drawings, using jiggling systems to ensure consistent component placement and alignment of components, and to maintain specified tolerances.
- B. Field fabrication of cold formed steel framing components, other than trusses, is permitted; fabricate in compliance with final shop drawings.

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- C. Fasten connections within truss assembly with truss component manufacturer's screws as indicated on final shop drawings.
- D. Fabricate straight, level, and true, without rack, and to specified tolerances.
- E. Reinforce, stiffen, and brace trusses to withstand handling, delivery, and erection stresses.

2.5 FABRICATION TOLERANCES

A. Material Tolerances:

- 1. Cold Formed Steel Chords:
 - a. Nominal 22 gage members:
 - 1) Minimum bare metal thickness: 0.0284"
 - 2) Maximum design thickness: 0.0299"
 - b. Nominal 20 gage members:
 - 1) Minimum bare metal thickness: 0.0329"
 - 2) Maximum design thickness: 0.0346"
 - c. Nominal 18 gage members:
 - 1) Minimum bare metal thickness: 0.0428"
 - 2) Maximum design thickness: 0.0451"
 - d. Nominal 16 gage members:
 - 1) Minimum bare thickness: 0.0538"
 - 2) Maximum design thickness: 0.0566"
- 2. Webs: Cold formed steel web components
 - a. Nominal 20 gage members:
 - 1) Minimum bare thickness: 0.033"
 - 2) Maximum design thickness: 0.035"
 - b. Nominal 18 gage members:
 - 1) Minimum bare thickness: 0.047"
 - 2) Maximum design thickness: 0.049"
 - c. Nominal 16 gage members:
 - 1) Minimum bare thickness: 0.063"
 - 2) Maximum design thickness: 0.065"
- 3. Truss Assemblies:
 - a. Trusses up to 30' long: Maximum ½" from design length.
 - b. Trusses over 30' long: Maximum ¾" from design length.
 - c. Trusses up to 5' high: Maximum ¼" variation from design height.
 - d. Trusses over 5' high: maximum ½" variation from design height.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that bearing surfaces and substrates are ready to receive steel trusses.
- B. Verify that truss bearing surfaces are within the following tolerances;
 - 1. Variation from level or specified plane: Maximum 1/8" in 10'.

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2. Variation from specified position: Maximum ¼”.
 - C. Verify that rough-in utilities and chases that will penetrate plane of trusses are in locations and do not interfere with truss, bracing or bridging placement.
 - D. Inspect conditions under which installation is to be performed and submit written notification if such conditions are unacceptable.
 1. Notify Architect within 24 hours of inspection.
 2. Beginning construction activities of this section before unacceptable conditions have been corrected is prohibited.
 3. Beginning construction activities of this section indicates installer’s acceptance of conditions.
- 3.2 INSTALLATION: Install in accordance with truss components manufacturer’s instructions and final shop drawings.
- A. erect trusses with plane of truss webs vertical and parallel to each other accurately located at design spacing indicated.
 - B. Provide proper lifting equipment suited to sizes and types of trusses, applied at lift points recommended by truss manufacturer.
 - C. Exercise care to avoid damage to truss members during erection and to keep horizontal bending of trusses to a minimum.
 - D. Provide framing anchors as indicated; anchor securely at bearing points.
 - E. Install truss framing and accessories plumb, square, true to line, and with connections safely fastened.
 - F. Provide temporary bracing and leave in place until permanent bracing, framing and sheathing is in place and securely fastened.
 - G. Install to maximum allowable tolerance variation from plumb, level and true to line of 1/8” from plan location. Cumulative error shall not exceed minimum fastening requirements of sheathing or other finishing material.
 - H. Do not alter, cut or remove framing members or connections of trusses.
 - I. Align webs of bottom chords and load-bearing studs or continuously reinforce track to transfer loads to structure. Anchor trusses securely at all bearing points as indicated.
- 3.3 FIELD PAINTING: Touch-up shop applied coatings damaged during handling and installation. Use galvanizing repair paint for galvanized surfaces.

3.4 SPECIAL INSPECTIONS

- A. Inspection of cold formed steel trusses for conformance to the construction documents and the IBC shall be completed by the designated third-party Special Inspector.

END OF SECTION

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