

**SECTION 5400
COLD-FORMED STEEL TRUSSES
(Proposed New Section 5425)**

PART 1 GENERAL**1.1 SECTION INCLUDES:**

- A. Cold-formed steel roof and floor trusses.
- B. Anchorage, connections, bracing and decking.

1.2 RELATED SECTIONS:

- A. Section 5300 - Metal Decking
- B. Section 5400 - Cold-Formed Metal Framing
- C. Section 6150 - Wood Decking

1.3 REFERENCES:

- A. AISI Standard for Cold-Formed Steel Framing - Truss Design. American Iron and Steel Institute (AISI). Washington, DC. 2000.
- B. ASTM A-780. Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings, American Society for Testing and Materials (ASTM). West Conshohocken, PA 2000.
- C. ASTM A-1003/A1003M. Standard Specification for Sheet Steel, Carbon, Metallic and Non-Metallic Coated for Cold-Formed Framing Members.
- D. LGSEA Field Installation Guide for Cold-Formed Steel Trusses. Light Gauge Steel Engineers Association, Nashville, TN. 1999.
- E. LGSEA Tech Note 551e. Design Guide for Permanent Bracing of Cold-Formed Steel Trusses. LGSEA, Nashville, TN 1998.
- F. LGSEA Tech Note 551d. Design Guide for Construction Bracing of Cold-Formed Steel Trusses. LGSEA, Nashville, TN 1997.

1.4 SUBMITTALS

- A. Submit under provisions of Section 01300.
- B. Product Data : Truss manufacturer's product data for the cold-formed steel trusses specified in this section.
- C. Truss Drawings: Detailed truss drawings for each truss, prepared by the truss designer, signed and sealed by a registered Professional Engineer, and indicating the following:
 - 1. slope, depth, span, and spacing of the truss.
 - 2. bearing location and minimum bearing lengths.
 - 3. design loading(s)
 - 4. reaction forces and direction.
 - 5. location of all truss connections.
 - 6. gusset plate locations, sizes, and material specifications.
 - 7. fastener type, size, quantities, and locations.
 - 8. shape and material specification for each component.
 - 9. maximum compressive force in all truss members.
 - 10. locations of required permanent truss member bracing.
 - 11. connection requirements for:
 - a. truss-to-truss girder
 - b. truss ply-to-ply
 - c. field assembly of trusses
 - 12. calculated deflection ratio and/or maximum deflection for live and total load.

- D. Truss Placement Diagram: Drawing, prepared by the truss designer, showing the location of each truss in the project.
- E. Installation Recommendations: Furnished by the manufacturer, for the delivery, storage, handling, and installation of the cold-formed steel trusses specified in this section.

1.5 QUALITY ASSURANCE

- A. Truss Designer: Trusses shall be designed in accordance with the AISI Standard for Cold-Formed Steel Framing - Truss Design, and shall be signed and sealed by a Professional Engineer registered in the State in which the project is located.
- B. Truss Manufacturer: Trusses shall be manufactured by a firm with a documented in-plant quality assurance procedure and inspection process, and with a minimum of three (3) years documented experience in the manufacturing of cold-formed steel trusses similar to those required for this project.
- C. Truss Installer: Trusses shall be installed by a firm approved by the truss manufacturer with documented experience installing cold-formed steel trusses similar to those required for this project.
- D. Field Measurements: Where possible, verify bearing locations prior to fabrication and installation of trusses. Provide truss designer actual field measurements where they differ from dimensions shown on the project design drawings.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials in manufacturer's unopened bundles, fully identified by the manufacturer's name and job number. Exercise care to avoid damage during unloading, storage, and installation, in accordance with manufacturer's instructions and the LGSEA Field Installation Guide for Cold-Formed Steel Trusses.
- B. Inspect trusses upon arrival at site and prior to installation. Notify truss manufacturer of any damaged trusses. Do not install damaged trusses without the approval of the truss manufacturer.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable Truss Manufacturer: Trusses shall be manufactured by Steel Construction Systems, 11250 Astronaut Blvd., Orlando, FL 32837 (Tel: 407-438-1664).

2.2 MATERIALS

- A. Cold-Formed Steel Trusses: Trusses meeting the following specified requirements:
 - 1. Roof Geometry and Bearing Conditions: As specified by the architect/engineer-of-record in project design drawings and notes.
 - 2. Local Building Code and Design Loads: As specified by the architect/engineer-of-record in project design drawings and notes.
 - 3. Deflection Limits (unless otherwise specified by the architect/engineer-of-record in project design drawings and notes):
 - a. Roof Trusses:
 - 1. Total Load: 1/180 of span (maximum)
 - 2. Live Load: 1/240 of span (maximum)
 - b. Floor Trusses:
 - 1. Total Load: 1/360 of span (maximum)
 - 2. Live Load: 1/480 of span (maximum)
- B. Chord Members, Web Members, and Gusset Plates:

1. Shape, Size, and Thickness: In accordance with the truss drawings and product data.
 2. Material Grade:
 - a. Chord Members: ASTM A-1003 SS Grade 50 (Grade 340)
 - b. Web Members: ASTM A-1003 SS Grade 40 (Grade 275)
 - c. Gusset Plates: ASTM A-1003 SS Grade 50 (Grade 340)
 3. Minimum Base Metal Thickness:
 - a. Nominal 22 gauge: 0.027 inch (0.68 mm)
 - b. Nominal 20 gauge: 0.033 inch (0.84 mm)
 - c. Nominal 18 gauge: 0.043 inch (1.09 mm)
 - d. Nominal 16 gauge: 0.054 inch (1.37 mm)
 - e. Nominal 14 gauge: 0.068 inch (1.72 mm)
 4. Coating: Galvanized sheet steel with a minimum G60 (Z 180) coating.
- C. Screw Fasteners: Type, size, and quantity specified in the truss drawings.

2.2 FABRICATION

- A. Shop fabricate cold-formed steel trusses in accordance with the truss drawings and manufacturer's documented in-plant quality assurance procedure and inspection process.
- B. Shop fabricate cold-formed steel trusses using a fabrication (jig) table to assure consistency and maintain specified tolerances, as follows:
 1. Variation from design length:
 - a. Trusses up to 30 feet in length: Maximum ½ inch.
 - b. Trusses over 30 feet in length: Maximum ¾ inch.
 2. Variation from design height:
 - a. Trusses up to 5 feet in height: Maximum ¼ inch.
 - b. Trusses over 5 feet in height: Maximum ½ inch.
- C. Field fabrication of cold-formed steel trusses is strictly prohibited unless performed by a fabricator authorized by and under the supervision of the truss manufacturer.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that substrates and adjacent work are ready to receive the work of this section. Do not proceed until unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Install trusses in accordance with drawings and/or notes prepared by the truss designer and the truss manufacturer's instructions.
- B. Erection Tolerances:
 1. Straightness: Trusses shall not be installed with an overall bow or bow in any chord or panel which exceeds the lesser of L/200 or 2 inches, where L is the length of the truss chord or panel.
 2. Plumbness: Trusses shall not be installed with a variation from plumb (vertical tolerance) at any point along the length of the truss from top to bottom which exceeds 1/50 of the depth of the truss at that point or 2 inches, whichever is less, unless trusses are specifically designed to be installed out of plumb.
 3. Location: Location of trusses along the bearing support shall be with ¼ inch of plan dimensions. Special hangers or supports shall be located to support trusses with ¼ inch of plan dimensions. Trusses shall be located at the on-center spacing specified by the truss placement diagram.
- C. Furnish and install framing anchors at all bearing points in accordance with the drawings and/or notes prepared by the engineer-or-record, and the instructions of the framing anchor manufacturer.

- D. Furnish and install materials for truss-to-truss connections and complete any truss field assembly in accordance with the drawings prepared by the truss designer.
- E. Furnish and install erection (temporary) bracing to hold trusses straight and plumb and in safe condition until permanent bracing and decking has been installed in accordance with the LGSEA Field Installation Guide.
- F. Furnish and install all permanent bracing and decking in accordance with the drawings prepared by the engineer-of-record before the application of any permanent loads.
- G. Removal, cutting, or alteration of any truss chord, web, bracing member, or truss connections in the field by any sub-contractor is prohibited, unless approved in advance by the truss designer.
- H. All sub-contractors shall employ proper construction procedures to insure adequate distribution of temporary construction loads, so as not to exceed the carrying capacity of any individual truss or group of trusses.

3.3 REPAIRS

- A. Physical Repairs: Damaged truss chord, web, or bracing members, truss connections, or complete trusses shall be repaired or replaced as directed and approved in advance by the truss designer.
- B. Galvanized Coating Repairs: Damaged galvanized coatings shall be repaired with repair paint in accordance with ASTM A-780 and the paint manufacturer's instructions.