



Guide Specifications for NUTRUSST™

Section 05430: Pre-engineered cold-formed steel trusses

PART I - GENERAL

1.1 SECTION INCLUDES

- A. Pre-engineered cold-formed steel trusses.
- B. Cold-formed steel roof system accessories.

1.2 RELATED SECTIONS

- A. Section 05310 - Steel Deck.
- B. Section 05400 - Cold Formed Metal Framing.

1.3 REFERENCES

- A. AISI North American Specification for the Design of Cold-Formed Steel Structural Members, 2001 Edition, American Iron and Steel Institute, Washington, DC.
- B. AISI Standard for Cold-Formed Steel Framing - General Provisions, 2001 Edition, American Iron and Steel Institute, Washington, DC.
- C. AISI Standard for Cold-Formed Steel Framing - Truss Design, 2001 Edition, American Iron and Steel Institute, Washington, DC.
- D. AISI Standard for Cold-Formed Steel Framing - Header Design, 2001 Edition, American Iron and Steel Institute, Washington, DC.
- E. AISI "Stub-Column Test Method for Effective Area of Cold-Formed Steel Columns", in the 1996 edition of the AISI Cold-Formed Steel Design Manual, American Iron and Steel Institute, Washington, DC.
- F. AISI "Test Methods for Mechanically Fastened Cold-Formed Steel Connections", in the 1996 edition of the AISI Cold-Formed Steel Design Manual, American Iron and Steel Institute, Washington, DC.
- G. ASTM A370-02e1, Standard Test Methods and Definitions for Mechanical Testing of Steel Products. American Society for Testing and Materials, West Conshohocken, PA.
- H. ASTM A1003/A1003M-02a, Standard Specification for Sheet Steel, Carbon, Metallic and Non-Metallic Coated for Cold-Formed Framing Members. American Society for Testing and Materials, West Conshohocken, PA.
- I. ASTM C645-00, Standard Specification for Nonstructural Steel Framing Members. American Society for Testing and Materials, West Conshohocken, PA.
- J. ASTM C955-01, Standard Specification for Load-Bearing (Transverse and Axial) Steel Studs, Runners (Tracks), and Bracing or Bridging for Screw Application of Gypsum Panel Products and Metal Plaster Bases. American Society for Testing and Materials, West Conshohocken, PA.
- K. ASTM A 653/A 653M-02a - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process. American Society for Testing and Materials, West Conshohocken, PA.
- L. SAE, J78, May, 1998, Steel Self-Drilling Tapping Screws, Society of Automotive Engineers, Warrendale, PA.



1.4 DEFINITIONS

- A. Building Designer: An individual or organization responsible for the overall building design in accordance with the statutes and regulations governing the professional registration and certification of architects or engineers of the jurisdiction where the building will be located.
- B. Chord Member: A structural member that forms the top or bottom component of a truss.
- C. Gusset Plate: A structural member used to facilitate the connection of truss chord or web members at a heel, ridge, or panel point.
- D. Hat-Shape: A singly-symmetric shape consisting of at least two vertical webs and a horizontal stiffened flange which is used as a chord member in a truss.
- E. Heel: The connection region between the top and bottom truss chords of a non-parallel chord truss.
- F. Panel Point: The connection region between a web and chord member.
- G. Ridge: The connection region between two top chord members at the junction of two upward sloping roof surfaces.
- H. Static Load: A load or series of loads that are supported by or are applied to a structure so gradually that forces caused by change in momentum of the load on the structural elements can be neglected and all parts of the system at any instant are essentially in equilibrium.
- I. Truss Designer: An individual or organization responsible for the design of cold formed steel trusses.
- J. Truss Component Manufacturer: The maker of the components (chords and webs) that will be assembled into trusses by the Truss Fabricator.
- K. Truss Fabricator: An individual or organization engaged in the manufacturing of in-plant trusses.
- L. Web Member: A structural member in a truss that is connected to the top and bottom chords, but is not a chord member.

1.5 SUBMITTALS

- A. Submit manufacturer's product data and installation instructions for cold-formed steel trusses and accessories.
- B. Shop drawings showing member type, configuration, location, spacing, size and thickness of members, method of attachment to supporting members, method of connecting member to member, erection details, bracing, strapping, splices, bridging, and other accessories and details required for proper installation.
- C. Submit detailed floor truss and roof truss layouts.
- D. Submit truss drawings, sealed and signed by a qualified registered Professional Engineer, verifying ability to meet local code and design requirements. Include:

Description of design criteria:

1. Engineering analysis depicting member stresses and truss deflection.
2. Truss member sizes, gauges and connections at truss joints.
3. Truss support reactions.
4. Top chord, bottom chord and web bracing requirements.



1.6 QUALITY ASSURANCE

- A. Fabricator Qualifications: Fabrication shall be performed in a quality controlled manufacturing environment by an experienced cold-formed steel truss fabricator with references indicating multiple satisfactory experiences designing and fabricating cold formed steel truss systems equal in material, design and extent to the systems required for this project.
 - B. Pre-Installation Meeting: Meet at job site prior to scheduled beginning of installation to review requirements:
 - 1. Attendees: Require attendance by representatives of the following:
 - a. Truss Fabricator, if requested by installer.
 - b. Installer of this Section.
 - C. Other entities directly affecting, or affected by, construction activities of this Section, including but not limited to, the following:
 - 1) Installer of truss support framing.
 - 2) Installer of mechanical systems.
 - 3) Installer of electrical systems.
2. Review potential interface conflicts; coordinate layout and support provisions.

1.7 DELIVERY, STORAGE, AND HANDLING OF STEEL TRUSSES

- A. Trusses should not be unloaded on uneven surfaces or terrain which could cause damage to the truss.
- B. Trusses must be stored on a slight slope and supported by blocking to allow for drainage of water and prevent ponding of water on the interior of the truss members.
- C. Tarping of trusses during storage must allow for proper ventilation to prevent undue condensation. Do not lift bundled trusses by the bands.
- D. Do not store bundles of trusses upright unless properly braced. Do not break the bands until bundles are placed in a stable position. Upon cutting the bands, immediately inspect the trusses to ensure there is no damage to the chord or web members.
- E. Do not overload trusses during construction with stacks of construction material. Design loads should not be applied until all permanent bracing, including sheathing when used, has been properly attached.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable Truss Component Manufacturers:
 - 1. NUCONSTEEL™ Commercial Corp., Denton, TX and Dallas, GA
 - 2. Substitutions: Under provisions of Section 01600
- B. Other NUCONSTEEL™ Authorized Fabricators:
 - 1. Rib Roof Inc., Rossville, TN
 - 2. Premium Steel, Roanoke, VA



2.2 COMPONENTS

- A. Pre-Engineered Cold-Formed Steel Trusses: Truss component system; providing a complete horizontal framing system, ready for deck installation, meeting specified requirements.
1. Truss Type, Span, and Height: As indicated on drawings.
 2. Comply with requirements of International Building Code, 2000 edition.
 3. Shop fabricate in accordance with shop drawings, using jiggling systems to ensure consistent component placement and alignment of components, and to maintain specified tolerances; field fabrication is strictly prohibited unless performed by authorized Truss Fabricator using Truss Fabricator's shop assemblers and proper jiggling systems.
 4. Shop fabrication of other cold-formed steel framing components into assemblies prior to erection is permitted; fabricate assemblies in accordance with shop drawings.
 5. Fasten connections within truss assembly with Truss Component Manufacturers screws only and as shown on the shop drawings; welding and other fasteners are prohibited except as specified by the Truss Designer.
 6. Fabricate straight, level, and true, without rack, and to following tolerances:
 - Trusses up to 30 feet long: Maximum 1/2 inch variation from design length.
 - Trusses over 30 feet long: Maximum 3/4 inch variation from design length.
 - Trusses up to 5 feet high: Maximum 1/4 inch variation from design height.
 - Trusses over 5 feet high: Maximum 1/2 inch variation from design height.
- B. Truss Chord and Web Components: Components, with rolled or closed edges to minimize the danger of cutting during handling; chord and web components without rolled edges are prohibited.
1. Shapes, Sizes, and Thicknesses: As required to suit design and as indicated on shop drawings.
 2. Chords and Webs: Cold-formed from ASTM A 653/A 653M galvanized steel sheet, minimum G60 coating (ASTM A924); and yield strengths Grade 33 or 50 as indicated.
 - a. Nominal 22 gauge members:
 - 1) Minimum uncoated steel thickness: 0.0269 inch (27 mils).
 - 2) Maximum design thickness: 0.0283 inch.
 - b. Nominal 20 gauge members:
 - 1) Minimum uncoated steel thickness: 0.0329 inch (33 mils).
 - 2) Maximum design thickness: 0.0346 inch.
 - c. Nominal 18 gauge members:
 - 1) Minimum uncoated steel thickness: 0.0428 inch (43 mils).
 - 2) Maximum design thickness: 0.0451 inch.
 - d. Nominal 16 gauge members:
 - 1) Minimum uncoated steel thickness: 0.0538 inch (54 mils).
 - 2) Maximum design thickness: 0.0566 inch.
- C. Fasteners: Utilize manufacturer's recommended self-drilling, self-tapping screws with corrosion resistant finish. Fasteners shall be of sufficient size and number to ensure the strength of the connection, as specified by the Truss Designer. All connection points shall utilize mechanical fasteners, welded connections are prohibited.



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 inch in 10 feet.
 - 2. Variation from Specified Position: Maximum 1/4 inch.
- C. Verify that rough-in utilities and chases that will penetrate plane of trusses are in correct 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 to installer.
 - 1. Notify Architect/Engineer-of-Record 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 installers acceptance of conditions.

3.2 INSTALLATION

- A. Install trusses in accordance with Truss Fabricator's shop drawings. Use correct fasteners.
- B. Place components at spacing indicated on the shop drawings.
- C. Install all construction (temporary installation) bracing in compliance with truss fabricators guidelines before application of any loads.
- D. Install all permanent bracing in compliance with truss Building Designers guidelines before application of any loads.
- E. Provide bracing that holds trusses straight and plumb and in safe condition until decking and permanent truss bracing has been fastened to form a structurally sound framing system.
- F. All sub-contractors shall employ proper construction procedures to insure adequate distribution of temporary construction loads so that the carrying capacity of any single truss or group of trusses is not exceeded.
- G. Do not alter, cut or remove any truss members or components, unless approved in advance in writing by the Truss Designer.
- H. Repair or replace damaged chords, webs, or complete trusses as directed in writing by the Truss Fabricator.
- I. On steel framed walls, align truss bottom chord with load-bearing studs, or continuously reinforce wall top track to transfer roof loads to structure.
- J. Anchor trusses securely at all bearing points with fasteners and/or accessories per the truss fabricator's recommendations and guidelines, as indicated in the shop drawings.
- K. Provide proper lifting equipment, suited to the sizes and types of trusses required for this project. Provide industry accepted spreader devices to lift the trusses into place without stress or damage to the truss components.



- L. Install trusses to a maximum allowable tolerance variation from plumb, level, and true to line of 1/8 inch in 10 feet. Space individual trusses no more than plus or minus 1/8 inch from plan location. Cumulative error shall not exceed minimum fastening requirements of sheathing or other finish materials.
- M. Never disassemble a factory built truss on site for any reason. Should installation problems or field conditions require the removal of truss components, contact the truss manufacturer prior to any such modifications.

3.3 FIELD QUALITY CONTROL

- A. If requested by the Architect or Owner, with prior approval and scheduling, truss manufacturer shall provide field inspection of truss installation to insure that installer has completed the truss installation in compliance with the truss manufacturer's plans, specifications and shop drawings.