NUCONSTEEL
A NUCOR Company
525 South Locust
Denton, TX 76201
Phone: (940) 891-3050
Fax: (940) 891-3090
E-mail: info@nuconsteel.com
www.nuconsteel.com

This MANU-SPEC® utilizes the Construction Specifications Institute (CSI) *Project Resource Manual* (PRM), including *MasterFormat*™, *SectionFormat*™ and *PageFormat*™. A MANU-SPEC is a manufacturer-specific proprietary product specification using the proprietary method of specifying applicable to project specifications and master guide specifications. Optional text is indicated by brackets [ ]; delete optional text in final copy of specification. Specifier Notes typically precede specification text; delete notes in final copy of specification. Trade/brand names with appropriate symbols typically are used in Specifier Notes; symbols are not used in specification text. Metric conversion, where used, is soft metric conversion.

This MANU-SPEC specifies NUTRUSS® Pre-Engineered Cold-Formed Steel Trusses. These products are manufactured by NUCONSTEEL Corp. Revise MANU-SPEC section number and title below to suit project requirements, specification practices and section content. Refer to CSI *MasterFormat* for other section numbers and titles.

# SECTION 05 44 00
# COLD-FORMED METAL TRUSSES

## PART 1 GENERAL

1.01 SUMMARY

Specifier Note: Revise paragraph below to suit project requirements. Add section numbers and titles per CSI *MasterFormat* and specifier's practice.

A. Section Includes:
   1. Pre-engineered cold-formed steel roof and floor trusses.
   2. Cold-formed steel roof and floor system accessories.

B. Related Sections:
   1. Division 05 Section: Steel Deck.

Specifier Note: Article below may be omitted when specifying manufacturer's proprietary products and recommended installation. Retain Reference Article when specifying products and installation by an industry reference standard. If retained, list standard(s) referenced in this section. Indicate issuing authority name, acronym, standard designation and title. Establish policy for indicating edition date of standard referenced. Conditions of the Contract or Division 01 References Section may establish the edition date of standards. This article does not require compliance with standard, but is merely a listing of references used. Article below should list only those industry standards referenced in this section. Retain only those reference standards to be used within the text of this Section. Add and delete as required for specific project.

1.02 REFERENCES

A. American Iron and Steel Institute (AISI):
   1. AISI S100-01 North American Specification for the Design of Cold-Formed Steel Structural Members, 2001 Edition, with 2004 Supplement.
   2. AISI S200-04 Standard for Cold-Formed Steel Framing - General Provisions, 2004 Edition.
   3. AISI S214-04 Standard for Cold-Formed Steel Framing - Truss Design, 2004 Edition.
   4. AISI S212-04 Standard for Cold-Formed Steel Framing - Header Design, 2004 Edition.
   5. AISI "Stub-Column Test Method for Effective Area of Cold-Formed Steel Columns," in the 2002 edition of the AISI

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Cold-Formed Steel Design Manual.

6. AISI “Test Methods for Mechanically Fastened Cold-Formed Steel Connections,” in the 2002 edition of the AISI Cold-Formed Steel Design Manual.

B. ASTM International:

1. ASTM A370 Standard Test Methods and Definitions for Mechanical Testing of Steel Products.
2. ASTM A653/A653M Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
3. ASTM A1003/A1003M Standard Specification for Steel Sheet, Carbon, Metallic- and Nonmetallic-Coated for Cold-Formed Framing Members.
4. ASTM C645 Standard Specification for Nonstructural Steel Framing Members.
5. ASTM A924/A924M Standard Specification for General Requirements for Steel Sheet, Metallic-Coated by the Hot-Dip Process.
6. ASTM C955 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.
7. ASTM C1513 Standard Specification for Steel Tapping Screws for Cold-Formed Steel Framing Connections.

C. International Code Council (ICC):

1. International Building Code (IBC), 2006 edition.
2. International Residential Code (IRC), 2006 edition.

Specifier Note: Article below should be restricted to statements describing design or performance requirements and functional (not dimensional) tolerances of a complete system. Limit descriptions to composite and operational properties required to link components of a system together and to interface with other systems.

1.03 SYSTEM DESCRIPTION

A. Design Requirements: Provide products and systems that have been manufactured, fabricated and installed to the following criteria:

1. Comply with AISI [Specify applicable standard.].
2. Comply with ASTM [Specify applicable standard.].

B. Design Loads: [Specify applicable standard.].

1. Dead loads.
2. Live loads.
3. Roof load.
4. Snow load.
5. Wind speed and exposure.
6. Seismic load.

C. Design trusses for uplift forces where indicated.

D. Manufacture trusses to withstand stresses induced during fabrication, erection and handling.

E. Limit roof truss deflection due to live load to [_____] of span [And deflection due to total load to {_____} of span].

Specifier Note: Article below includes submittal of relevant data to be furnished by Contractor before, during or after construction. Coordinate this article with Architect’s and Contractor’s duties and responsibilities in Conditions of the Contract and Division 01 Submittal Procedures Section.

1.04 SUBMITTALS

A. General: Submit listed submittals in accordance with Conditions of the Contract and Division 01 Submittal Procedures.

B. Product Data: Submit manufacturer's product data and installation instructions for cold-formed steel trusses and accessories, including manufacturer’s SPEC-DATA® product sheet.

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C. Drawings:

1. Submit 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.
2. Submit detailed floor truss and roof truss layouts.
3. Submit truss drawings, sealed and signed by a qualified registered Professional Engineer, verifying ability to meet local code and design requirements. Include description of following design criteria:
   a. Engineering analysis depicting member stresses and truss deflection.
   b. Truss member sizes, material thicknesses and connections at truss joints.
   c. Truss support reactions.
   d. Top chord, bottom chord and web bracing requirements.

D. Quality Assurance:

1. Test Reports: Certified test reports showing compliance with specified performance characteristics and physical properties.
2. Certificates: Product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.
3. Manufacturer's Instructions: Manufacturer's installation instructions.

E. Closeout Submittals: Submit following:

1. Warranty: Warranty documents specified.
2. Operation and Maintenance Data: Operation and maintenance data for installed products in accordance with Division 01 Closeout Submittals (Maintenance Data and Operation Data) Section. Include methods for maintaining installed products, and precautions against cleaning materials and methods detrimental to finishes and performance.

1.05 QUALITY ASSURANCE

A. Qualifications:

1. Installer experienced in performing work of this section who has specialized in installation of work similar to that required for this project.
2. Manufacturer Qualifications: Manufacturer capable of providing field service representation during construction and approving application method.
3. Fabricator Qualifications: Fabrication performed in quality controlled manufacturing environment by 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 systems required for this project.

Specifier Note: Paragraph below should list obligations for compliance with specific code requirements particular to this section. General statements to comply with a particular code are typically addressed in Conditions of the Contract and Division 01 Regulatory Requirements Section. Repetitive statements should be avoided. Current data on building code requirements and product compliance may be obtained from filter manufacturer technical support specialists. Products are tested and listed by Underwriters Laboratories, Inc.

B. Regulatory Requirements: Provide trusses and components that comply with following requirements:

1. Local Building Code.
2. International Building Code/ International Residential Code.
3. [Code agency name].
   a. [Report or approval number].

C. Preinstallation Meetings: Conduct preinstallation meeting to verify project requirements, manufacturer's installation instructions and manufacturer's warranty requirements. Comply with Division 01 Project Management and Coordination (Project Meetings).

1.06 DELIVERY, STORAGE & HANDLING

A. General: Comply with Division 01 Product Requirements.

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B. Ordering: Comply with manufacturer's ordering instructions and lead time requirements to avoid construction delays.

C. Delivery:

1. Unload trusses on even surfaces or terrain.

D. Storage and Protection:

1. Store trusses on a slight slope and support with blocking to allow for drainage of water and to prevent ponding on interior of truss members.
2. Allow proper ventilation when tarping trusses to prevent condensation.
3. Do not lift bundled trusses by bands.
4. Properly brace trusses when storing upright.
5. Break bands once bundles are placed in stable position, and inspect for damage to chord and web members.
6. Apply design loads only after all permanent bracing, including sheathing when used, has been properly attached. Do not overload trusses during construction with stacks of construction material.

Specifier Note: Coordinate article below with Conditions of the Contract and with Division 01 Closeout Submittals (Warranty).

1.07 WARRANTY

A. Project Warranty: Refer to Conditions of the Contract for project warranty provisions.

B. Manufacturer's Warranty: Submit, for Owner's acceptance, manufacturer's standard warranty document executed by authorized company official. Manufacturer's warranty is in addition to, and not a limitation of, other rights Owner may have under Contract Documents.

Specifier Note: Coordinate paragraph below with manufacturer's warranty requirements.

C. Warranty: Contact manufacturer for complete warranty details.

**PART 2 PRODUCTS**

Specifier Note: Retain article below for proprietary method specification. Add product attributes, performance characteristics, material standards and descriptions as applicable. Use of such phrases as "or equal" or "or approved equal" or similar phrases may cause ambiguity in specifications. Such phrases require verification (procedural, legal and regulatory) and assignment of responsibility for determining "or equal" products.

2.01 PRE-ENGINEERED COLD FORMED STEEL TRUSSES

A. Manufacturer: NUCONSTEEL, A NUCOR Company.

1. Contact: 525 South Locust, Denton, TX 76201; Telephone: (940) 891-3050; Fax: (940) 891-3090; E-mail: info@nuconsteel.com; website: www.nuconsteel.com.

B. Proprietary Products/Systems: Trusses, including the following:

1. Truss chord and web components:

a. Manufactured with rolled or closed edges.

b. Manufactured from ASTM A1003 or ASTM A653 galvanized sheet steel with minimum G60 coating (per ASTM A924) with yield strengths of Grade 33 or 50, as indicated, in shapes, sizes and thicknesses indicated on shop drawings.

c. Nominal 27 mil (22 gauge) Members: Minimum uncoated steel thickness - 0.0269 inch (27 mil); Maximum design thickness - 0.0283 inch (28 mil).

d. Nominal 33 mil (20 gauge) Members: Minimum uncoated steel thickness - 0.0329 inch (33 mil); Maximum design thickness - 0.0346 inch (35 mil).

e. Nominal 43 mil (18 gauge) Members: Minimum uncoated steel thickness - 0.0428 inch (43 mil); Maximum design thickness - 0.0451 inch (45 mil).

f. Nominal 54 mil (16 gauge) Members: Minimum uncoated steel thickness - 0.0538 inch (54 mil); Maximum design thickness - 0.0566 inch (57 mil).

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2. Fasteners: Self-drilling, self-tapping, corrosion resistant screws of sufficient size and number to ensure strength of connection, as specified by truss designer.
3. Components:
   a. Fabricated straight, level and true, without rack.
   b. Tolerance maximum of 1/2 inch (12.7 mm) variation from design length for trusses up to 30 feet (9.2 m) long.
      1) Tolerance maximum of 3/4 inch (19.1 mm) variation from design length for trusses over 30 feet (9.2 m) long.
   c. Tolerance maximum of 1/4 inch (6.4 mm) variation from design height for trusses up to 5 feet (1.5 m) high.
   d. Tolerance maximum of 1/2 inch (12.7 mm) variation from design height for trusses over 5 feet (1.5 m) high.
4. Acceptable Material: NUTRUSS manufactured by NUCONSTEEL Corp.

Specifier Note: Edit Article below to suit project requirements. If substitutions are permitted, edit text below. Add text to refer to Division 01 Project Requirements (Product Substitutions Procedures) Section.

2.02 PRODUCT SUBSTITUTIONS

A. Substitutions: No substitutions permitted.

**PART 3 EXECUTION**

3.01 MANUFACTURER'S INSTRUCTIONS

Specifier Note: Article below is an addition to the CSI *SectionFormat* and a supplement to MANU-SPEC. Revise article below to suit project requirements and specifier's practice.

A. Compliance: Comply with manufacturer's written data, including product technical bulletins, product catalog installation instructions, product carton installation instructions and NUCONSTEEL SPEC-DATA sheets.

3.02 EXAMINATION

A. Site Verification of Conditions:
   1. Verify substrate conditions, which have been previously installed under other sections, are acceptable for product installation in accordance with manufacturer's instructions.
   2. Verify that bearing surfaces and substrates are ready to receive steel trusses.
   3. Verify that truss bearing surfaces are within following tolerances:
      a. Variation from Level or Specified Plane: Maximum 1/8 inch (3.2 mm) in 10 feet (3.1 m).
      b. Variation from Specified Position: Maximum 1/4 inch (6.4 mm).
   4. 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.
   5. Inspect conditions under which installation is to be performed and submit written notification if such conditions are unacceptable to installer.

3.03 INSTALLATION

A. Install trusses in accordance with truss fabricator's shop drawings using correct fasteners.
B. Place components at spacing indicated on shop drawings.
C. Install construction (temporary installation) bracing in compliance with truss fabricator's guidelines before application of any loads.
D. Install permanent bracing in compliance with truss building designer's 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. Employ proper construction procedures to ensure adequate distribution of temporary construction loads so that carrying capacity of any single truss or group of trusses is not exceeded.
G. Obtain advanced approval from truss designer before altering, cutting or removing any truss members or components.

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H. Repair or replace damaged chords, webs or complete trusses as directed in writing by truss designer.

I. Align truss bottom chord with load-bearing studs on steel framed walls, or continuously reinforce wall top track to transfer roof loads to structure.

J. Anchor trusses securely at bearing points with fasteners and/or accessories in accordance with truss fabricator's recommendations and guidelines, as indicated in shop drawings.

K. Provide proper lifting equipment, suited to sizes and types of trusses required for project. Provide industry accepted spreader devices to lift trusses into place without stress or damage to truss components.

3.04 FIELD QUALITY CONTROL

Specifier Note: Use the following Articles only when manufacturer's field services are desired to verify the quality of the installed components. Establish the number and duration of periodic site visits required by Manufacturer and specify below. Consult Manufacturer for services required. Delete if field services are not required.

A. Have manufacturer of products supplied under this Section review Work involved in handling, installation/application, protection and cleaning of its product[s], and submit written reports in acceptable format to verify compliance of Work with Contract.

B. Manufacturer's Field Services: Provide manufacturer's field services consisting of product use recommendations and periodic site visits for inspection of product installation in accordance with manufacturer's instructions.

C. Schedule site visits to review Work at stages listed:

1. After delivery and storage of products, and when preparatory Work on which Work of this Section depends is complete, but before installation begins.

2. Upon completion of Work.

D. Obtain reports within [Three] days of review and submit.

3.05 COMPLETION & CLEANUP

A. Upon completion and verification of performance of installation, remove surplus materials, excess materials, rubbish, tools and equipment.

**END OF SECTION**

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