DSA IR 23-8

MANUFACTURED WOOD-CHORD-METAL-WEB TRUSSES: 2025 CBC

Disciplines: Structural

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Division of the State Architect (DSA) documents referenced within this publication are available on the DSA Forms or DSA Publications webpages.

PURPOSE

This Interpretation of Regulations (IR) clarifies the criteria and process under which DSA will review, approve, and require inspection of manufactured wood trusses of the type defined in the SCOPE below on construction projects under DSA jurisdiction.

SCOPE

This IR is applicable to the design, fabrication, and installation of wood-chord-metal-web trusses utilizing pin-connected tubular or angular steel webs. This document does not address trusses utilizing web members made from sheet steel with integral teeth on each end for making connections to wood members. This document does not address metal-plate-connected wood trusses, which are covered in *IR 23-4: Metal-Plate Connected Wood Trusses.*

BACKGROUND

California Building Code (CBC) Section 2303.4 defines minimum standards and quality for wood trusses. CBC Sections 1704A.2.5 and 1705A.5 define special inspection requirements for manufactured wood-chord-metal-web trusses. Additionally, ICC Evaluation Service (ICC-ES) AC306: Acceptance Criteria for Pin-Connected Open-Web Trusses with Wood Chords and Tubular or Angular Steel Webs establishes minimum requirements for recognition of these trusses. Frequently used terms are defined in the Glossary below.

1. ACCEPTANCE CRITERIA

Wood-chord-metal-web trusses shall meet the requirements of ICC-ES AC306: Acceptance Criteria for Pin-Connected Open-Web Trusses with Wood Chords and Tubular or Angular Steel Webs. Trusses must be designed and fabricated in compliance with a valid evaluation report in accordance with *IR A-5: Product and Material Acceptance Based on a Valid Evaluation Report*. An acceptable evaluation report will indicate compliance with ICC-ES AC306.

1.1 Design

The design of trusses utilizing bearing clips that create an eccentricity between the truss support point and the first top chord panel point (i.e., a “no-notch” clip) shall limit the load transferred to the supporting structure to 80 percent of the listed capacity from the evaluation report.

1.2 Fabrication

Truss manufacturers shall maintain a quality control program with inspections performed by an accredited inspection agency as required by ICC-ES AC306 Section 5.0 and the product evaluation report. Truss fabrication inspection is required per Section 6 below.

1.1.1 ICC-ES AC306 Section 5.3 requires compliance with selected sections of AC14: Acceptance Criteria for Prefabricated Wood I-Joists.

1.1.2 Chord members spliced with finger end joints require both initial qualification testing and on-going quality assurance testing.

1.1.2.1 In accordance with ICC-ES AC306 Section 3.2, end joints must be qualified per Section 6.5 of ASTM D5055: Standard Specification for Establishing and Monitoring Structural Capacities of Prefabricated Wood I-Joists.

1.1.2.2 In accordance with ICC-ES AC14 Appendix B, Section 7, end joints are subject to quality assurance tests during production.

2. PROCESS

Design and installation of manufactured wood trusses on a specific project is typically a four-phase process. The phases outlined in this section constitute a deferred submittal process in accordance with California Administrative Code (CAC), Section 4-317(g). As an alternative to the deferred submittal process and at the discretion of the project applicant, the information in the truss submittal package described in Section 4 below may be incorporated into the construction documents described in Section 3 below. In this option, review and approval of the construction documents includes the trusses, and a deferred submittal is not required.

There are specific requirements and responsibilities for the truss manufacturer, truss designer, project design professionals, inspectors, and DSA in each phase of the process.

2.1 Review and Approval of Construction Documents

The project design professionals work with DSA to submit and obtain approval of the construction documents in accordance with the electronic plan review procedure. Refer to Section 3 below and Procedure (*PR) 18-04: Electronic Plan Review for Design Professionals*, Sections 1 through 4.

2.2 Review and Approval of Truss Submittal Package

The truss manufacturer, truss designer, and project design professionals work with DSA to submit and obtain approval of the truss submittal package in accordance with Section 4 below and PR 18-04 Section 5.

2.3 Truss Fabrication

After DSA approval of the truss submittal package, the truss manufacturer proceeds with fabrication of the trusses under the oversight of the fabrication special inspector. Any design change during fabrication requires DSA approval of a construction change document (CCD). The process of submitting a CCD for review and obtaining DSA approval requires contributions from the truss designer and project design professionals in addition to the truss manufacturer. Refer to Sections 5 and 6 below.

2.4 Field Installation of Trusses

After fabrication and delivery, wood truss installation at the job site is subject to inspection by the project inspector per Section 6.4 below.

3. REVIEW AND APPROVAL OF CONSTRUCTION DOCUMENTS

This phase typically occurs before a contract is awarded to a qualified wood truss manufacturer. The steps and requirements for this phase are described in this section.

3.1 Document Preparation

The project design professionals prepare construction documents for the project. In addition to the requirements in CBC Section 2303.4.3.1, Item 1, the portion of the construction documents pertaining to wood trusses must also include the following:

3.1.1 Structural framing plan including layout of trusses and all supporting elements.

3.1.2 Depths and profiles of trusses.

3.1.3 Loading diagrams for each truss with a unique profile (i.e., span, depth, geometry, etc.) or loading condition. Specified wind loads shall include cases for both positive (inward) and negative (outward) pressures.

3.1.4 Details of connections required for the transfer of loads and anchorage of each truss to the supporting structure per CBC Section 2303.4.4.

3.1.5 Specified requirements for the truss top chord dimensions, orientation, and adequacy to receive the specified diaphragm nailing.

3.1.6 Definition of the size and location of any building system components (e.g., ducts, pipes, etc.) occurring within the truss profile and requiring coordination with the truss design. Illustrating and dimensioning such obstructions on truss elevations or the loading diagrams is recommended.

3.1.7 Specified requirement that trusses and their manufacturer comply with Section 1 above.

3.1.8 Specifications and form *DSA-103: List of Required Structural Tests and Special Inspections* defining inspection requirements per Section 6 below. Refer to CBC Sections 1704A.2.3 and 1704A.3.

3.2 Coordination

The project design professionals should closely coordinate the wood truss design including all connections, non-standard products, and details with a qualified truss manufacturer prior to submitting construction documents for DSA review.

3.3 Submission, Review, and Approval

The project design professional submits an application, construction documents, and supporting documents to DSA for review in accordance with *PR 17-03: Project Submittal Appointment Process* and PR 18-04 Sections 1 and 2. After completion of the plan review and back check in accordance with PR 18-04 Sections 3 and 4, the approved construction documents will bear the DSA identification stamp.

4. REVIEW AND APPROVAL OF TRUSS SUBMITTAL PACKAGE

This phase will commonly occur after the contract for the wood trusses has been awarded to a qualified manufacturer. As such, this phase constitutes a deferred submittal in accordance with CAC Section 4-317(g). Refer to PR 18-04 Section 5. The steps and requirements for this phase are described in this section.

4.1 Truss Submittal Package Preparation

The truss manufacturer, working in a fully coordinated effort with the project design professionals, prepares the truss submittal package for DSA review and approval, in accordance with the requirements of CBC Section 2303.4.3 and the DSA-approved project construction documents.

4.1.1 If changes to the approved construction documents are required during the preparation of the truss submittal package, the project design professionals shall prepare and submit a CCD to DSA for review in accordance with *IR A-6: Construction Change Document Submittal and Approval Process*. These changes may include, but are not limited to, truss depths, layout, framing plans, loads, truss anchorage, etc. Depending on the nature and extent of changes, DSA may require the revised documents to be submitted and processed as a Revision. When a

CCD or Revision is required, it must be approved prior to or concurrent with approval of the truss submittal package.

4.1.2 In accordance with PR 18-04 Section 5, the truss submittal package must be organized into two separate electronic files: the approval document file and the supporting document file.

4.1.2.1 The approval document file contains documents that require DSA approval. Truss design drawings per Section 4.1.3 below and truss placement diagrams per CBC Section 2303.4.2 must be included in the approval document file.

4.1.2.2 The supporting document file contains information that is not directly approved by DSA but is necessary to substantiate approval of the truss submittal package. The supporting document file will include the truss calculations required by CBC Section 2303.4.3.1, applicable evaluation reports, and any other product data or information necessary to demonstrate the adequacy of the truss design.

4.1.3 The truss submittal package must include truss design drawings in accordance with CBC Section 2303.4.1.1 and 2303.4.3 with details of any permanent individual truss member restraint and permanent individual truss member diagonal bracing as required by CBC Section 2303.4.1.2. The truss design drawings must be prepared by the truss designer (see Glossary below) who shall stamp and sign each individual sheet per CBC Section 2303.4.1.4.1. In addition to the items required by the CBC, the truss design drawings must include the following:

4.1.3.1 Truss profile with overall dimensions, roof slopes, member sizes, panel point dimensions, size of connection pins, locations of bracing points, and support connection types.

4.1.3.2 Listing of the evaluation report for wood trusses and any applicable components.

4.1.3.3 Details and locations of bottom chord bracing if required.

4.1.4 Where subject to compression forces from net wind uplift or any other applied load, calculations must demonstrate the truss bottom chords comply with the National Design Specification (NDS) for Wood Construction, Section 3.7. Compliance includes slenderness limits and application of the column stability factor, which may utilize the buckling length coefficients given in NDS Appendix G.

4.2 Review and Acceptance by Project Design Professionals

The truss manufacturer submits the truss submittal package to the project design professionals for review and approval. This process may take multiple exchanges between the project design professionals and the truss manufacturer to finalize the package for submission to DSA.

4.2.1 The project design professionals and truss manufacturer shall coordinate the documents with respect to the following:

4.2.1.1 Mechanical, electrical, and plumbing systems including the locations and sizes of roof mounted, floor mounted, and suspended equipment and distribution systems (e.g., ducts, pipes, conduits, etc.).

4.2.1.2 Roof pitch or slope.

4.2.1.3 Top elevations of supporting elements.

4.2.2 When the project design professionals approve the truss submittal package, they shall sign a statement of general conformance (SoGC) per *IR A-18: Use of Construction Documents Prepared by Other Design Professionals*.

4.2.2.1 The design professional in general responsible charge shall sign the SoGC in Part 5 of the form *DSA 140: Application for Submittal of Post-Approval Document* in accordance with IR A-18 Section 2.3.2.

4.2.2.2 The structural engineer of record (SEoR) shall affix and sign a SoGC to the first sheet of the truss submittal package in accordance with IR A-18 Section 2.3.3.

4.2.3 The design professional shall prepare the DSA 140 and submit the truss submittal package to DSA for review and approval in accordance with CAC Section 4-317(g).

4.3 DSA Review and Approval

The DSA review and approval process may require cycles of plan review comments and corrections to the truss submittal package if DSA determines the initial version to be incomplete or not code compliant. Each revised version of the package is subject to the process required by Section 4.2 above prior to being resubmitted to DSA.

When DSA determines the truss submittal package is complete and code compliant, it will affix the DSA approval stamp to the approval document described in Section 4.1.2.1 above.

5. TRUSS FABRICATION

The fabrication of wood trusses shall not occur prior to DSA approval of the truss submittal package per Section 4 above. The steps and requirements for this phase are described in this section.

5.1 Shop Drawings

The truss manufacturer prepares shop drawings from the DSA-approved construction documents and truss design drawings. Changes to the approved truss design drawings must be reviewed and approved by DSA prior to the fabrication of any effected trusses in accordance with Section 5.3 below.

5.2 Inspection

The truss manufacturer notifies the project design professional who, in turn, notifies the project inspector and fabrication special inspector of the fabrication schedule. Fabrication may not start without the presence of the fabrication special inspector per Section 6 below. Notification of the project design professional by the manufacturer may occur through the general contractor.

5.3 Changes During Fabrication

If changes to the DSA-approved construction documents or the truss submittal package are necessary, the truss manufacturer and the project design professionals, working together, shall prepare and submit a CCD to DSA for review and approval in accordance with IR A-6. Depending on the nature and extent of changes, DSA may require the revised documents to be submitted and processed as a Revision. DSA approval of all changes is required prior to the fabrication or construction of the effected trusses.

6. TESTING AND INSPECTION

A fabrication special inspector shall provide continuous inspection during wood truss fabrication in accordance with CBC Section 1704A.2.5 and CAC Section 4-335(f). The project inspector shall inspect the field installation of the wood trusses. These inspection requirements are in addition to and independent of the quality control program provided by the truss manufacturer.

6.1 Fabrication Special Inspector Qualifications

The fabrication special inspector shall be approved by DSA for each project prior to fabrication. Qualified fabrication special inspectors for wood trusses comply with all the following:

6.1.1 Possess knowledge of the special inspection and reporting requirements of CAC Section 4-335, wood truss special inspection requirements of the CBC, and all applicable reference standards.

6.1.2 Meet the experience requirements of CAC Section 4-335(f). Applicable experience includes construction work or special inspection work similar to wood truss fabrication. Experience as either a truss manufacturer's quality control manager or as an inspector employed by an accredited inspection agency per Section 1.2 above is preferred but not required.

6.2 Fabrication Special Inspector Responsibilities

Failure to inspect the work in a professional and competent manner, report defective work, file all required reports in a truthful and timely manner, or fulfill any other duties defined by the code may result in withdrawal of the fabrication special inspector's DSA acceptance or withdrawal of the laboratory of record's DSA acceptance. Refer to CAC Sections 4-335.1, 4-374, and 4-375. This includes, but is not limited to, withdrawal of approval to work on any current or future projects under DSA jurisdiction. The fabrication special inspector is responsible for the following tasks related to fabrication of the wood trusses:

6.2.1 Verify the truss manufacturer complies with Section 1 above.

6.2.2 Continuously inspect each truss during all stages of fabrication, including verification of material grades, dimensions, joint details, and all other aspects of truss fabrication.

6.2.3 Mark each inspected truss with a stamped identification mark. At a minimum, the identification mark must include the special inspector's initials and date.

6.2.4 Provide detailed daily inspection reports that clearly describe the work inspected in accordance with *IR 17-12: Special Inspection Reporting Requirements* and CAC 4-335(f)4 to the project inspector and others designated to receive such reports. A special inspection report template (form *DSA 250: Special Inspection Report*) is available on the DSA forms webpage.

6.2.5 Bring any rejected work to the immediate attention of the truss manufacturer, contractor, and project inspector.

6.2.6 Provide a verified report to the design professional in general responsible charge and DSA in accordance with CAC Section 4-335(e) or 4-335(f) and CBC Section 1705A.5.4.

6.3 Inspection of Field Installation

Working from the DSA-approved construction documents, truss submittal package, and any CCD, the project inspector shall verify truss size, fabrication special inspector's identification mark, placement (i.e., location), and all truss installation details including bridging, bracing, connections, etc.

REFERENCES:

2025 California Code of Regulations (CCR) Title 24
Part 1: California Administrative Code (CAC), Sections 4-316, 4-317, 4-333, 4-335, 4-335.1, 4-374, 4-375.
Part 2: California Building Code (CBC), Sections 1704A.2, 1704A.3, 1705A.5, 2303.4.

GLOSSARY

Fabrication Special Inspector

A special inspector who provides continuous inspection during the fabrication of wood trusses. The inspector may contract directly with the school district and be independently approved for the project by DSA, or the inspector may be employed by a DSA-accepted laboratory. Refer to CAC Section 4-335.

Project Design Professional

The architect or structural engineer in general responsible charge of a project in accordance with CAC Section 4-316(a) and the structural engineer with delegated responsibility in accordance with CAC Section 4-316(b). These individuals are sometimes referred to as the architect of record and the structural engineer of record, and both are intended when this term is used in the plural form in this IR.

Project Inspector

A DSA-certified inspector responsible for inspection of the project who is employed by the school district and approved by DSA per CAC Section 4-333(b).

Truss Design Drawings

As defined by CBC Section 2303.4.1.1. Truss design drawings are prepared, stamped, and signed by the truss designer per CBC Section 2303.4.1.4.1. The truss design drawings are part of the truss submittal package.

Truss Designer

A California registered professional engineer retained by the truss manufacturer who is responsible for the design of the trusses per CBC Section 2303.4.1.4 and CAC Section 4-316(c) and who stamps and signs the truss design drawings per CBC Section 2303.4.1.4.1.

Truss Placement Diagram

As defined by CBC Section 2303.4.2. The truss placement diagram identifies the location for each individually designated truss and references the corresponding truss design drawing. The truss placement diagram is part of the truss submittal package and must accompany the shipment of trusses to the jobsite. Truss placement diagrams that serve only as a guide for installation and do not deviate from the DSA-approved construction drawings are not required to be stamped and signed by the truss designer.

Truss Submittal Package

As defined by CBC Section 2303.4.3. The truss submittal package is prepared by the truss manufacturer and submitted to DSA for review and approval through the project design professional as described in this IR.