

SECTION 05 21 00
STEEL JOIST FRAMING

PART 1 – GENERAL

1.1 SUMMARY

A. Description

1. This section includes K-series steel joists, KCS-type joists, LH-series longspan steel joists, DLH-series longspan steel joists, joist girders, composite joists, and joist bridging and accessories.

B. References

As indicated in SJI Standard Specifications (SJI 100) Section 2.1.

Refer to the General Notes of the Construction Drawings for the applicable building code and additional referenced standards

1. Steel Joist Institute (SJI)

- a. SJI 100 –Standard Specification and Standard Load Tables for Steel Joists and Standard Weight Tables for Joist Girders

1.2 QUALITY ASSURANCE

A. Manufacturer Qualifications: A manufacturer certified by SJI to manufacture joists complying with applicable standard specifications and load tables of SJI “Standard Specification”

B. Manufacturer Responsibilities: Joists shall be designed by qualified engineering professionals to comply with the specified performance requirements

C. SJI Specifications: Comply with all applicable requirements of SJI’s “Standard Specification” for the types of joists indicated on the Construction Drawings and/or Joist Layout Drawings and with all applicable requirements of SJI Technical Digest No. 9

1.3 PERFORMANCE REQUIREMENTS

A. Structural Performance: Provide joists capable of withstanding all design loads indicated on the approved Joist Layout Drawings in accordance with SJI Specifications.

B. Serviceability Performance: Design joist to withstand design loads with live or snow load deflections in accordance with SJI Specifications

1.4 SUBMITTALS

A. Joist Layout Drawings: Indicate joist designations, non-standard configurations, non-standard cambers, layout, extensions, bridging and other accessories provided by the joist manufacturer, connections to structure, and field splices

B. Joist Calculations: Provide stamped joist calculations for all joists on the approved Shop Drawings

C. Sustainability

1. Environmental Product Declarations (EPD): Submit steel joists manufacturer's EPD per the following:
 - a. 1. All EPDs are to be third-party verified in accordance with the current version of ISO 14025 (validated by a date that has not yet expired) and indicate the following Impact Categories:
 - a. Global Warming Potential (GWP): All GWP information submitted shall be in the form of kgCO₂eq/kg.
 - b. Ozone Depletion Potential (ODP): All ODP information shall be in the form of kgCFC-11/kg.
 - c. Acidification Potential (AP): All AP information shall be submitted in the form of kgSO₂/kg.
 - d. Eutrophication Potential (EP): All EP information submitted shall be in the form of kgN/kg.
 - e. Smog Formation Potential (SFP): All SFP information shall be submitted in the form of kgO₃/kg.
 - f. Energy Consumption: All energy consumption information shall be submitted in the form of MJ.
 - b. Manufacturer-specific GWP information will be one of the decision criteria when awarding this scope. The manufacturer EPD must indicate GWP information from the specific mill or plant facility from which the material is procured. EPDs including GWP information for more than one facility are acceptable as long as each facility's GWP information is reported separately. EPDs reporting GWP values as averages from multiple facilities only or industry-wide EPDs are not acceptable.
 - c. EPDs must clearly indicate the Product Flow Diagram disclosing if product fabrication is included within the "cradle-to-gate" life cycle scope (product stages A1-A3) of the EPD.
2. Recycled Content of Steel Products: Provide documentation in accordance with the current version of ISO 14021 from the manufacturer of steel floor and roof decking products. For each product, both the post-consumer and preconsumer recycled content percentage by weight must be indicated.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, and handle joists in accordance with the requirements of SJI's "Standard Specification" and Technical Digest No. 9
- B. Protect joists from corrosion, deformation, and other damage during delivery, storage, and erection

PART 2 – PRODUCTS

2.1 MANUFACTURERS

- A. Nucor | Vulcraft www.vulcraft.com (basis of design)
- B. Any other manufacturer meeting the requirements of this Specification

2.2 MATERIALS

- A. Steel: Comply with the requirements of SJI's "Standard Specification" for web and steel-angle chord members
 - 1. Round bar chord members are not permitted
 - 2. Top chord members shall be hot rolled angles
- B. Accessories: Comply with the requirements of SJI's "Standard Specification" and "Code of Standard Practice for Steel Joists and Girders"
- C. Welding Materials: Comply with the requirements of SJI Technical Digest #3 and AWS D1.1/D1.1M for the materials being welded
- D. Shop and Touchup Primer: Comply with the requirements of SSPC-Paint Specification No. 15 and the VOC limitations of the authorities having jurisdiction

2.3 FINISHES

- A. Prepare surfaces to be prime painted in accordance with SSPC-SP 2 Surfaces to be prime painted shall be free of dirt and loose mill scale, cleaned in accordance with standard shop practices
- B. Apply one (1) coat of manufacturer standard gray shop primer to joists and joist accessories with a continuous dry film

2.4 SUSTAINABILITY

- A. The joist supplier must have product EPDs meeting the sustainability requirements listed in this specification.

2.5 COMPOSITE JOISTS

- A. See Section 05 22 00 for all requirements for composite joists and composite floor systems

PART 3 – EXECUTION

3.1 EXAMINATION

- A. Examine all supporting structural members, embedded bearing plates, and abutting structural framing for compliance with requirements for installation tolerances and other conditions affecting performance
 - 1. Proceed with erection and installation only after any unsatisfactory conditions have been corrected

3.2 ERECTION

- A. Do not install joists until supporting construction is in place and secured
- B. Handle and erect joists in accordance with SJI's "Standard Specification", SJI's "Code of Standard Practice for Steel Joists and Girders", SJI Technical Digest #9, manufacturer's instructions, Contract Drawings, and approved Joist Layout Drawings
- C. Do not field cut or otherwise alter structural members without Engineering approval
- D. All field welds to conform to the requirements of AWS D1.1/D1.1M for the material being welded

END OF SECTION 05 2100