

## SECTION 05220

### STEEL JOISTS

#### PART 1 - GENERAL

##### 1.1 SUMMARY

- A. **Drawings and general provisions of Contract**, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.
- B. **This Section includes** steel joists and joist girders for floor and roof framing. Types of joists required include the following:
  - 1. K-Series Open Web Steel Joists.
- C. **Related Sections:**
  - 1. Section 03300 - Cast-In-Place Concrete: Embedded Work.
  - 2. Section 05120 - Structural Steel.
  - 3. Section 05310 - Metal Deck.

##### 1.2 SUBMITTALS

- A. **General:** Submit the following in accordance with Conditions of Contract and Division 1 Specification Sections.
- B. **Product data and installation instructions** for each type of joist and accessories.
  - 1. Include manufacturer's certification that joists comply with SJI "Specifications."
- C. **Shop drawings showing** layout of joist members, special connections, joining and accessories. Include mark, number, type, location and spacing of joists and bridging.
  - 1. Provide templates or location drawings for installation of anchor bolts and metal bearing plates.
- D. **Design Calculations** for non-standard joists indicated on the drawings with specific loads.

##### 1.3 QUALITY ASSURANCE

- A. **General:** Provide joists fabricated in compliance with Steel Joist Institute (SJI) "Standard Specifications, Load Tables and Weight Tables for Steel Joists and Joist Girders," unless noted otherwise. Design all joists for a net uplift of 30 PSF. Design joists for loadings indicated on drawings for joist with special loading conditions. Submit design calculations by a Structural Engineer licensed in the State of Louisiana for uplift and vertical load design.
- B. **Qualification of Field Welding:** Qualify welding processes and welding operators in accordance with American Welding Society (AWS) "Structural Welding Code - Steel," AWS D1.1.
- C. **Inspection:** Inspect joists and girders in accordance with SJI "Specifications."

## 1.4 DELIVERY, STORAGE AND HANDLING

- A. **Deliver, store and handle steel joists** as recommended in SJI "Specifications." Handle and store joists in a manner to avoid deforming members and to avoid excessive stresses.

## PART 2 - PRODUCTS

### 2.1 MATERIALS

- A. **Steel:** Comply with SJI "Specifications" for chord and web sections.
- B. **Steel Bearing Plates:** ASTM A 36.
- C. **Unfinished Threaded Fasteners:** ASTM A 307, Grade A, regular hexagon type, low carbon steel.
- D. **Steel Prime Paint:** Comply with SJI "Specifications."
- E. **Steel Prime Paint:** Manufacturer's standard.

### 2.2 FABRICATION

- A. **General:** Fabricate steel joists in accordance with SJI "Specification."
- B. **Holes in Chord Members:** Provide holes in chord members where shown for securing other work to steel joists; however, deduct area of holes from the area of chord when calculating strength of member.
- C. **Extended End:** Provide extended ends on joists where indicated, complying with SJI "Specifications" and load tables unless loading is specified on drawings.
- D. **Ceiling Extension:** Provide ceiling extensions in areas having ceilings attached directly to joist bottom chord. Provide either an extended bottom chord element or a separate unit, to suit manufacturer's standards, of sufficient strength to support ceiling construction. Extend ends to within 1/2 inch of finished wall surface, unless otherwise indicated.
- E. **Top Chord Extension:** Provide top chord extensions ("S" type) on joists where indicated, complying with SJI "Specifications" and load tables or loads indicated on drawings.
- F. **Bridging:** Provide horizontal or diagonal type bridging for joists and joist girders, complying with SJI "Specifications."
  - 1. Provide bridging anchors for ends of bridging lines terminating at walls or beams.
  - 2. Provide bridging at end panel points for all joist to provide uplift bracing.
- G. **End Anchorage:** Provide end anchorages, including steel bearing plates, to secure joists to adjacent construction, complying with SJI "Specifications."

- H. **Header Units:** Provide header units to support tail joists at openings in floor or roof system not framed with steel shapes.
- I. **Shop Painting:** Remove loose scale, heavy rust, and other foreign materials from fabricated joists and accessories before application of shop paint.
  - 1. Apply one shop coat of steel prime paint to joists and accessories, by spraying, dipping, or other method to provide a continuous dry paint film thickness of not less than 0.50 mil.

### **PART 3 - EXECUTION**

#### **3.1 ERECTION**

- A. **Place and secure steel joists** in accordance with SJI "Specifications," final shop drawings, and as herein specified.
- B. **Anchors:** Furnish anchor bolts, steel bearing plates, and other devices to be built into concrete and masonry construction.
  - 1. Provide unfinished threaded fasteners for anchor bolts, unless high strength bolts indicated.
- C. **Placing Joists:** Do not start placement of steel joists until supporting work is in place and secured. Place joists on supporting work, adjust and align in accurate locations and spacing before permanently fastening.
- D. **Provide temporary bridging,** connections, and anchors to ensure lateral stability during construction.
  - 1. Where "open-web" joist lengths are 40 feet and longer, install a center row of bolted bridging to provide lateral stability before slackening of hoisting lines.
- E. **Bridging:** Install bridging simultaneously with joist erection, before construction loads are applied. Anchor ends of bridging lines at top and bottom chords where terminating at walls or beams.
- F. **Fastening Joists:** Comply with the following:
  - 1. Field weld joists to supporting steel framework and steel bearing plates where indicated in accordance with SJI "Specifications" for type of joists used. Coordinate welding sequence and procedure with placing of joists.
- G. **Touch-Up Painting:** After joist installation, wire brush welded areas, abraded or rusty surfaces, and clean with solvent. Paint field-applied bolt heads and nuts and prepared surfaces on joists and steel supporting members. Use same type of paint as used for shop painting.

END OF SECTION