PART 1 GENERAL

SECTION 05.21.00
STEEL JOIST FRAMING

1.01 SECTION INCLUDES
A. Open web steel joists, with bridging, attached seats and anchors.
B. Loose bearing members, such as plates or angles, and anchor bolts for site placement.
C. Supplementary framing for floor and roof openings greater than 18 inches.

1.02 RELATED REQUIREMENTS
A. Section 05.12.00 - Structural Steel Framing: Grouting base plates and bearing plates. Superstructure framing.
B. Section 05.12.00 - Structural Steel Framing: Superstructure framing.
C. Section 05.31.00 - Steel Decking: Support framing for openings less than 18 inches in decking.
D. Section 05.50.00 - Metal Fabrications: Non-framing steel fabrications attached to joists.

1.03 REFERENCE STANDARDS
F. ASTM A325M - Standard Specification for Structural Bolts, Steel, Heat Treated 830 MPa Minimum Tensile Strength (Metric); 2014.
Q. AWS D1.1/D1.1M - Structural Welding Code - Steel; American Welding Society; 2011 w/Errata.

S. RCSC (HSBOLT) - Specification for Structural Joints Using High-Strength Bolts; Research Council on Structural Connections; 2009.

T. SJI (SPEC) - Catalog of Standard Specifications and Load Tables for Steel Joists and Joist Girders; Steel Joist Institute; 2011.

U. SJI Technical Digest No. 9 - Handling and Erection of Steel Joists and Joist Girders; Steel Joist Institute; 2008.

V. SSPC-Paint 15 - Steel Joist Shop Primer/Metal Building Primer; Society for Protective Coatings; 1999 (Ed. 2004).


X. SSPC-SP 2 - Hand Tool Cleaning; Society for Protective Coatings; 1982 (Ed. 2004).

1.04 SUBMITTALS

A. See Section 01.30.00 - Administrative Requirements, for submittal procedures.

B. Shop Drawings: Indicate standard designations, joist coding, configurations, sizes, spacings, cambers, locations of joists, joist leg extensions, bridging, connections, and attachments.

C. Welders' Certificates: Submit manufacturer's certificates, certifying welders employed on the Work, verifying AWS qualification within the previous 12 months.

D. Manufacturer's Qualification Statement: Provide documentation showing steel fabricator is accredited under IAS AC172.

1.05 QUALITY ASSURANCE

A. Design connections not detailed on the drawings under direct supervision of a Professional Structural Engineer experienced in design of this work and licensed in Tennessee.

B. Perform Work, including that for headers and other supplementary framing, in accordance with SJI Standard Specifications Load Tables and SJI Technical Digest No. 9.

C. Fabricator Qualifications: A qualified steel fabricator that is accredited by the International Accreditation Service (IAS) Fabricator Inspection Program for Structural Steel (AC172).

D. Erector Qualifications: Company specializing in performing the work of this section with minimum 5 years documented experience.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Transport, handle, store, and protect products to SJI requirements.

PART 2 PRODUCTS

2.01 MATERIALS

A. Open Web Joists: SJI Type K Joists:
   1. Provide bottom chord extensions as indicated.
   2. Minimum End Bearing on Steel Supports: Comply with referenced SJI standard.
   3. Minimum End Bearing on Concrete or Masonry Supports: Comply with referenced SJI standard.
   4. Finish: Shop primed.

C. High-Strength Structural Bolts, Nuts, and Washers: ASTM A325 or ASTM A325M, Type 1, medium carbon, galvanized, with matching compatible ASTM A563 or ASTM A563M nuts and ASTM F436 washers.
D. Tension Control Bolts: Twist-off type; ASTM F1852 or ASTM F2280.
E. Structural Steel For Supplementary Framing and Joist Leg Extensions: ASTM A36/A36M.
F. Welding Materials: AWS D1.1/D1.1M; type required for materials being welded.
G. Shop and Touch-Up Primer: SSPC-Paint 15, complying with VOC limitations of authorities having jurisdiction.
H. Touch-Up Primer for Galvanized Surfaces: SSPC-Paint 20, Type I - Inorganic, complying with VOC limitations of authorities having jurisdiction.

2.02 FABRICATION
A. Drill holes in chords for attachment of wood nailers where indicated.
B. Frame special sized openings in joist web framing as detailed.

2.03 FINISH
A. Shop prime joists as specified.
   1. Galvanize steel ledger angles.
B. Prepare surfaces to be finished in accordance with SSPC-SP 2.
C. Galvanizing: Provide minimum 1.7 oz/sq ft galvanized coating to ASTM A123/A123M requirements.

2.04 SOURCE QUALITY CONTROL
A. High-Strength Bolts: Provide testing and verification of shop-bolted connections in accordance with RCSC "Specification for Structural Joints Using High-Strength Bolts", testing at least 10 percent of bolts at each connection.
B. Welded Connections: Visually inspect all shop-welded connections and test welds in accordance with SJI and IAS standards, using one of the following:
   1. Radiographic testing performed in accordance with ASTM E94.
   2. Ultrasonic testing performed in accordance with ASTM E164.
   3. Liquid penetrant inspection performed in accordance with ASTM E165/E165M.
   4. Magnetic particle inspection performed in accordance with ASTM E709.

PART 3 EXECUTION
3.01 EXAMINATION
A. Verify existing conditions prior to beginning work.

3.02 ERECTION
A. Erect joists with correct bearing on supports.
B. Allow for erection loads. Provide sufficient temporary bracing to maintain framing safe, plumb, and in true alignment.
C. Coordinate the placement of anchors for securing loose bearing members furnished as part of the work of this section.
D. After joist alignment and installation of framing, field weld joist seats to steel bearing surfaces.
E. Position and field weld joist chord extensions and wall attachments as detailed.
F. Install supplementary framing for floor and roof openings greater than 18 inches.
G. Do not permit erection of decking until joists are braced, bridged, and secured or until completion of erection and installation of permanent bridging and bracing.

H. Do not field cut or alter structural members without approval of joist manufacturer.

I. After erection, prime welds, damaged shop primer, damaged galvanizing, and surfaces not shop primed, except surfaces specified not to be primed.

3.03 TOLERANCES

A. Maximum Variation From Plumb: 1/4 inch.

B. Maximum Offset From True Alignment: 1/4 inch.

3.04 FIELD QUALITY CONTROL

A. An independent testing agency will perform field quality control tests, as specified in Section 01.43.25.

B. High-Strength Bolts: Provide testing and verification of field-bolted connections in accordance with RCSC "Specification for Structural Joints Using High-Strength Bolts", testing at least 10 percent of bolts at each connection.

C. Welded Connections: Visually inspect all field-welded connections.

END OF SECTION