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USACE / NAVFAC / AFCEA / NASA UFGS-05 21 02.00 10 (April 2006)  
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Preparing Activity: USACE Replacing without change  
UFGS-05210A (December 2002)

UNIFIED FACILITIES GUIDE SPECIFICATIONS

References are in agreement with UMRL dated 19 March 2007

Latest change indicated by CHG tags

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### SECTION 05 21 02.00 10

#### STEEL JOISTS 04/06

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NOTE: This guide specification covers the requirements for open web, long span steel joists and joist girders.

Edit this guide specification for project specific requirements by adding, deleting, or revising text. For bracketed items, choose applicable items(s) or insert appropriate information.

Remove information and requirements not required in respective project, whether or not brackets are present.

Comments and suggestions on this guide specification are welcome and should be directed to the technical proponent of the specification. A listing of technical proponents, including their organization designation and telephone number, is on the Internet.

Recommended changes to a UFGS should be submitted as a Criteria Change Request (CCR).

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## PART 1 GENERAL

### 1.1 REFERENCES

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NOTE: This paragraph is used to list the publications cited in the text of the guide specification. The publications are referred to in the text by basic designation only and listed in this paragraph by organization, designation, date, and title.

Use the Reference Wizard's Check Reference feature when you add a RID outside of the Section's Reference Article to automatically place the

reference in the Reference Article. Also use the Reference Wizard's Check Reference feature to update the issue dates.

References not used in the text will automatically be deleted from this section of the project specification when you choose to reconcile references in the publish print process.

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The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

STEEL JOIST INSTITUTE (SJI)

SJI Specs & Tables

(2005) Standard Specifications and Load  
Tables for Steel Joists and Joist Girders

## 1.2 SUBMITTALS

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NOTE: Review submittal description (SD) definitions in Section 01 33 00 SUBMITTAL PROCEDURES and edit the following list to reflect only the submittals required for the project. Submittals should be kept to the minimum required for adequate quality control.

A "G" following a submittal item indicates that the submittal requires Government approval. Some submittals are already marked with a "G". Only delete an existing "G" if the submittal item is not complex and can be reviewed through the Contractor's Quality Control system. Only add a "G" if the submittal is sufficiently important or complex in context of the project.

For submittals requiring Government approval on Army projects, a code of up to three characters within the submittal tags may be used following the "G" designation to indicate the approving authority. Codes for Army projects using the Resident Management System (RMS) are: "AE" for Architect-Engineer; "DO" for District Office (Engineering Division or other organization in the District Office); "AO" for Area Office; "RO" for Resident Office; and "PO" for Project Office. Codes following the "G" typically are not used for Navy, Air Force, and NASA projects.

Choose the first bracketed item for Navy, Air Force and NASA projects, or choose the second bracketed item for Army projects.

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Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for [Contractor Quality Control approval.][information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the

Government.] The following shall be submitted in accordance with Section  
01 33 00 SUBMITTAL PROCEDURES:

#### SD-02 Shop Drawings

##### Steel Joists

Detail drawings shall include fabrication and erection details, specifications for shop painting, and identification markings of joists [and joist girders].

#### SD-07 Certificates

##### Steel Joists

Certificates stating that the steel joists [and joist girders] have been designed and manufactured in accordance with **SJI Specs & Tables**. Complete engineering design computations may be submitted in lieu of the certification.

### 1.3 GENERAL REQUIREMENTS

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**NOTE:** The structural steel design must meet the requirements of OSHA Steel Erection Standard, 29 CFR Part 1926, Subpart R-Steel Erection, Effective Date January 18, 2002.

Drawings will show size, spacing and method of anchoring. Size will be indicated by reference to appropriate SJI designations. Mechanical and electrical layout drawings and specifications for ceiling suspensions should contain notes indicating that hanger loads between panel points in excess of 222 N (50 pounds) shall have the excess hanger loads suspended from panel points. When joists or girders are to be designed to resist uplift and/or lateral forces, such joists and girders and the forces they must resist will be indicated on the drawings. Also, proper anchorages and bracings will be designed to resist those forces, as required.

The standard joist tables cannot be used verbatim when the depth of the joist is reduced near the ends to accommodate two-way top chord slopes in excess of 10 mm per meter (1/8 inch per foot). Before using standard designations for these joists, the designer must verify the adequacy of the joist members.

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**Steel joists** [and joist girders] are designated on the drawings in accordance with the standard designations of the Steel Joist Institute. Joists of other standard designations or joists with properties other than those shown may be substituted for the joists designated provided the structural properties are equal to or greater than those of the joists shown and provided all other specified requirements are met.

#### 1.4 DELIVERY AND STORAGE

Materials shall be delivered to the site in undamaged condition and stored off the ground in a well drained location, protected from damage, and easily accessible for inspection and handling.

### PART 2 PRODUCTS

#### 2.1 OPEN WEB STEEL JOISTS

Open web steel joists shall conform to **SJI Specs & Tables**, K-Series. Joists shall be designed to support the loads given in the standard load tables of **SJI Specs & Tables**.

#### 2.2 LONGSPAN STEEL JOISTS

[Longspan steel joists] [and] [deep longspan steel joists] shall conform to **SJI Specs & Tables**, [LH-Series] [DLH-Series]. Joists designated [LH] [and] [DLH] shall be designed to support the loads given in the applicable standard load tables of **SJI Specs & Tables**.

#### 2.3 JOIST GIRDERS

Joist girders shall conform to **SJI Specs & Tables**.

#### 2.4 ACCESSORIES AND FITTINGS

Accessories and fittings, including end supports and bridging, shall be in accordance with the standard specifications under which the members were designed.

#### 2.5 SHOP PAINTING

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NOTE: The requirements of the paragraph will be coordinated with the requirements of Section 09 90 00 PAINTING, GENERAL. In crawl spaces and other high humidity areas where greater protection than that provided by a primer paint is required and the joists or girders will not be finish painted, the paragraph will be revised to require that the joists or girders be shop painted with an asphalt-base type paint.  
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Joists [, joist girders] and accessories shall be shop painted with a rust-inhibiting primer paint. For joists [and joist girders] which will be finish painted under Section 09 90 00 PAINTING, GENERAL, the primer paint shall be limited to a primer which is compatible with the specified finish paint.

### PART 3 EXECUTION

#### 3.1 ERECTION

Installation of joists [and joist girders] shall be in accordance with the standard specification under which the member was produced. Joists [and joist girders] shall be handled in a manner to avoid damage. Damaged joists [and joist girders] shall be removed from the site, except when

field repair is approved and such repairs are satisfactorily made in accordance with the manufacturer's recommendations. Joists [and joist girders] shall be accurately set, and end anchorage shall be in accordance with the standard specification under which the joists [and joist girders] were produced. For spans over 12 m 40 ft through 18 m 60 ft one row of bridging nearest midspan shall be bolted diagonal bridging; for spans over 18 m 60 ft bolted diagonal bridging shall be used instead of welded horizontal bridging. Joist bridging and anchoring shall be secured in place prior to the application of any construction loads. Any temporary loads shall be distributed so that the carrying capacity of any joist is not exceeded. Loads shall not be applied to bridging during construction or in the completed work. Abraded, corroded, and field welded areas shall be cleaned and touched up with the same type of paint used in the shop painting.

### 3.2 BEARING PLATES

Bearing plates shall be provided with full bearing after the supporting members have been plumbed and properly positioned, but prior to placing superimposed loads. The area under the plate shall be damp-packed solidly with bedding mortar, except where nonshrink grout is indicated on the drawings. Bedding mortar and grout shall be as specified in Section 03 31 00.00 10 CAST-IN-PLACE STRUCTURAL CONCRETE.

-- End of Section --