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USACE / NAVFAC / AFCEA / NASA      UFGS-05 21 19 (July 2007)  
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Preparing Activity:    NAVFAC      UFGS-05 21 00.00 20 (April 2006)  
                                     UFGS-05 21 02.00 10 (April 2006)

UNIFIED FACILITIES GUIDE SPECIFICATIONS

References are in agreement with UML dated January 2009

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### SECTION 05 21 19

#### OPEN WEB STEEL JOIST FRAMING 07/07

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NOTE: This guide specification covers the requirements for standard depth open web steel joist framing.

Use Section 05 21 23 for STEEL JOIST GIRDER FRAMING.

Use Section 05 21 13 for DEEP LONGSPAN STEEL JOIST FRAMING.

Use Section 05 21 16 for LONGSPAN STEEL JOIST FRAMING.

Edit this guide specification for project specific requirements by adding, deleting, or revising text. For bracketed items, choose applicable item(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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NOTE: Show the following information on the project drawings:

1. Joist series and size, joist spacing, and **kg kip** load on each panel point, span, and slope.

2. Design loads, including uplift and lateral forces in addition to gravity (dead and live) loads.

3. Method of anchoring, framing at openings,  
spacing and type of bridging.

4. Accessory details as applicable.

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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.

#### AMERICAN WELDING SOCIETY (AWS)

AWS B2.1 (2005; Errata 2006; Errata 2006) Welding Procedure and Performance Qualification

AWS D1.1/D1.1M (2008) Structural Welding Code - Steel

#### STEEL JOIST INSTITUTE (SJI)

SJI 279167 SPECS/LOADS (2006) 42nd Edition Standard Specifications and Load Tables for Steel Joists and Joist Girders

SJI MANUAL (2003) 75 Year Manual, 1928-2003

SJI TD 10 (2003) Technical Digest for the Design of Fire Resistive Assemblies with Steel Joists

SJI TD 8 (1983) Technical Digest for the Welding of Open Web Steel Joists

SJI TD 9 (2006) Technical Digest for the Handling and Erection of Steel Joists and Joist

## Girders

### THE SOCIETY FOR PROTECTIVE COATINGS (SSPC)

SSPC PS 14.01 (1982; E 2004) Steel Joist Shop Painting System

SSPC Paint 15 (1999; E 2004) Steel Joist Shop Primer/Metal Building Primer

### U.S. NATIONAL ARCHIVES AND RECORDS ADMINISTRATION (NARA)

29 CFR 1910.1200 Hazard Communication

29 CFR 1926 Safety and Health Regulations for Construction

29 CFR 1926.757 Steel Erection; Open Web Steel Joists

## 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.][for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for

the Government.] Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Welder qualification

Material Safety Data Sheet (MSDS) per OSHA 1910.1200

SD-02 Shop Drawings

Steel joist framing; G

SD-06 Test Reports

Erection inspection

Welding inspections

SD-07 Certificates

Accessories

Certification of Compliance

1.3 REGULATORY REQUIREMENT

All joist girder framing must conform to 29 CFR 1926.757. Secure all joist bridging and anchoring in place prior to the application of any construction loads. Distribute temporary loads so that joist capacity is not exceeded. Do not apply loads to bridging.

1.4 DELIVERY AND STORAGE

Handle, transport, and store joists [and joist girders] in a manner to prevent damage affecting their structural integrity. Store all items off the ground in a well drained location protected from the weather and easily accessible for inspection and handling.

1.5 QUALITY ASSURANCE

All work must comply with the requirements set forth in 29 CFR 1926.

1.5.1 Drawing Requirements

Submit steel joist framing drawings. Show joist type and size, layout in plan, and erection details including methods of anchoring, framing at openings, type and spacing of bridging, [requirements for field welding,] and details of accessories as applicable.

1.5.2 Certification of Compliance

Prior to construction commencement, submit Material Safety Data Sheet per 29 CFR 1910.1200 for steel joists, and certification for welder qualification, compliance with AWS B2.1, welding operation, and tacker, stating the type of welding and positions qualified for, the code and procedure qualified under, date qualified, and the firm and individual certifying the qualification tests.

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NOTE: Use the SJI MANUAL reference for projects  
involving existing joist girder and joist systems.  
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Submit certification of compliance for the following:  
[ SJI MANUAL]  
SJI TD 8  
SJI TD 9  
SJI TD 10  
29 CFR 1926  
29 CFR 1926.757

## PART 2 PRODUCTS

### 2.1 JOISTS[, JOIST GIRDERS,] AND ACCESSORIES

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NOTE: When extra stiffness is desired, for comfort  
or special material support, specify the allowable  
deflection for that span.  
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Provide design data from SJI 279167 SPECS/LOADS for the joist series indicated.

### 2.2 PAINTING

#### 2.2.1 Shop Painting

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NOTE: Omit bracketed text when field painting is  
not required.  
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Clean and prime joists in accordance with SSPC Paint 15 and SSPC PS 14.01, Steel Joist Shop Painting System, using only Type I, "Red Oxide Paint."  
[Finish coat of paint is specified in Section 09 90 00 PAINTING AND COATING.]

## PART 3 EXECUTION

### 3.1 INSTALLATION

#### 3.1.1 Handling and Erection

Conform to SJI 279167 SPECS/LOADS for the joist series indicated.

#### 3.1.2 Welding

All welding must conform to AWS B2.1 and AWS D1.1/D1.1M.

#### [3.2 BEARING PLATES

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NOTE: Use this paragraph for masonry or  
cast-in-place concrete applications only.  
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Provide bearing plates to accept full bearing after the supporting members have been plumbed and properly positioned, but prior to placing superimposed loads. The area under the plate must be damp-packed solidly with bedding mortar, except where nonshrink grout is indicated on the drawings. Bedding mortar and grout must be as specified in Section 03 31 00.00 10 CAST-IN-PLACE STRUCTURAL CONCRETE.

### ] 3.3 PAINTING

#### 3.3.1 Touch-Up Painting

After erection of joists [and joist girders], touch-up connections and areas of abraded shop coat with paint of the same type used for the shop coat.

#### [ 3.3.2 Field Painting

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NOTE: Omit bracketed text when field painting is  
not required.  
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Paint joists [and joist girders] requiring a finish coat in conformance with the requirements of Section 09 90 00 PAINTING AND COATING.

### ] 3.4 VISUAL INSPECTIONS

#### 3.4.1 Erection Inspection

AWS D1.1/D1.1M, Section 6. Perform erection inspection and field welding inspections with AWS certified welding inspectors. Welding inspectors must visually inspect and mark welds.

### [ 3.5 SCHEDULE

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NOTE: Delete this paragraph for non-metric projects.  
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SI dimensioning in this section is based on a mathematical conversion of inch-pound dimensions following the SJI specification SJI 279167 SPECS/LOADS. The SI and I-P units for the dimensions shown are as follows.

<u>Inch-Pound Units</u>	<u>SI Units</u>
20 feet	6096 mm
30 ksi	207 MPa

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