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USACE / NAVFAC / AFCEA / NASA                      UFGS-33 71 39.13 40 (January 2007)  
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Preparing Activity:    NASA                              Superseding  
    UFGS-33 71 39.13 40 (June 2006)

## UNIFIED FACILITIES GUIDE SPECIFICATIONS

References are in agreement with UMRL dated January 2008

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### SECTION 33 71 39.13 40

#### OVERHEAD HIGH-VOLTAGE WIRING

01/07

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NOTE: This specification covers the requirements for overhead primary wiring. Use Section 26 26 00.00 40 POWER DISTRIBUTION UNITS for appurtenant pole-line work, insulators and hardware. Medium-voltage is 2400 volts to 69000 volts in accordance with ANSI C84.1-1995.

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.

ASTM INTERNATIONAL (ASTM)

- |                   |   |
|-------------------|---|
| ASTM B 1          | (2001; R 2007) Standard Specification for Hard-Drawn Copper Wire  |
| ASTM B 232/B 232M | (2001e1) Standard Specification for Concentric-Lay-Stranded Aluminum Conductors, Coated-Steel Reinforced (ACSR) |
| ASTM B 398/B 398M | (2002) Standard Specification for Aluminum-Alloy 6201-T81 Wire for Electrical Purposes                          |
| ASTM B 399/B 399M | (2004) Standard Specification for Concentric-Lay-Stranded Aluminum-Alloy 6201-T81 Conductors                    |
| ASTM B 8          | (2004) Standard Specification for Concentric-Lay-Stranded Copper Conductors, Hard, Medium-Hard, or Soft         |

INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS (IEEE)

- |         |   |
|---------|---|
| IEEE C2 | (2007; Errata 2007) National Electrical Safety Code |
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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-03 Product Data

Manufacturer's product data shall be submitted for the following items:

Conductors  
Splices  
Hardware  
Clamps  
Stringing Sheaves

#### SD-08 Manufacturer's Instructions

##### Overhead Medium-Voltage Wiring Systems

### 1.3 GENERAL REQUIREMENTS

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NOTE: If Section 26 00 00.00 20 BASIC ELECTRICAL MATERIALS AND METHODS is not included in the project specification, applicable requirements therefrom should be inserted and the following paragraph deleted.

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Section 26 00 00.00 20 BASIC ELECTRICAL MATERIALS AND METHODS applies to work specified in this section.

## PART 2 PRODUCTS

### 2.1 CONDUCTORS

Line conductors shall be bare [hard-drawn stranded copper of the sizes indicated, conforming to ASTM B 1 ASTM B 8.] [aluminum conductors, steel reinforced, (ACSR), of the sizes indicated, conforming to ASTM B 232/B 232M

ASTM B 232/B 232M.] [All Aluminum-Alloy Conductor (AAAC), of the sizes indicated, conforming to ASTM B 398/B 398M and ASTM B 399/B 399M]

## 2.2 SPLICES

Splicing material shall be UL approved.

Splices under tension shall be the compression type with strength not less than that of the conductor spliced and made of suitable noncorrosive materials.

## 2.3 HARDWARE

Hardware shall be UL approved.

Tie wires shall be 4.12 millimeter diameter No. 6 AWG [medium-hard drawn bare copper.] [strong aluminum alloy or 5.19 millimeter diameter No. 4 AWG annealed aluminum;] armor shall be as recommended by the manufacturer.

# PART 3 EXECUTION

## 3.1 MANUFACTURER'S INSTRUCTIONS

Manufacturer's instructions shall be submitted for Overhead Medium-Voltage Wiring Systems indicating the manufacturer's recommended operation instructions.

## 3.2 INSTALLATION

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NOTE: For installations in California, use California Public Utilities Commission, Dgs Gen. Ord. 95, "Rules for Overhead Electric Line Construction," in lieu of IEEE C2.  
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Installation shall comply with the requirements and recommendations of IEEE C2 for medium loading conditions, Grade B construction.

[Tie] [Clamp] conductors to insulators in accordance with insulator manufacturer written installation instructions.

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NOTE: Delete the following paragraph if aluminum conductors are not used.  
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Conductors shall be armored at all points of support. For spans less than 60 meter 200 feet, flat armor may be used.

Dead ends shall be made with clamps designed for the purpose, with a strength not less than that of the conductor.

Care shall be taken in handling and stringing conductors to prevent cuts, scratches, and kinks. Conductors shall not be drawn over rough or rocky ground or around sharp bends. When drawn by machine power, conductors shall be drawn from the mounted reels through stringing sheaves in approximately straight lines and clear of all obstructions.

Where conductors pass through trees, the trees shall be trimmed at least

2400 millimeter 8-feet clear of conductors vertically and horizontally, and no branch shall overhang the horizontal clearance. A climbing space at least 1200 millimeter 48-inches square shall be provided.

Initial stringing sags and tensions shall be in accordance with approved values for the conductors furnished. Indicated clearances shall be maintained.

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NOTE: Omit the following paragraph if a static wire  
is not required.  
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A static wire of stranded copper-coated steel, of size as indicated, shall be installed above the conductors to afford a 30-degree cone of lightning protection. Static wires shall be grounded at each pole and structure.

A neutral conductor of material the same as phase conductors, of size as indicated, shall be installed at an elevation equal to or below phase conductors in accordance with clearance requirements of IEEE C2.

-- End of Section --