SECTION 337116 - ELECTRICAL POLES

This Section specifies wood poles and accessories for overhead electrical and communications circuits on Site.

1. GENERAL
	* + 1. SUMMARY
				1. Section Includes:

Wood poles.

Cross arms.

Pole hardware.

* + - * 1. Related Requirements:

List other Sections directly related to or affecting Work of this Section. Include Sections specifying information expected to be found in this Section as well as Sections required to describe complete system or assembly requirements.

Section 337126 - Transmission and Distribution Equipment: Line conductors and accessories for overhead power distribution.

Section 337900 - Site Grounding: Requirements for grounding components as specified in this Section.

* + - 1. REFERENCE STANDARDS

List reference standards included within text of this Section, with designations, numbers, and complete document titles.

LEED requires compliance with specific editions of referenced standards. Consider including publication dates for referenced standards in this Section to ensure that the correct standard is used for LEED compliance.

* + - * 1. American National Standards Institute:

ANSI O5.1 - Wood Poles - Specifications and Dimensions.

* + - * 1. American Wood Protection Association:

AWPA U1 - Use Category System: User Specification for Treated Wood.

* + - * 1. ASTM International:

ASTM A123 - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.

ASTM A475 - Standard Specification for Zinc-Coated Steel Wire Strand.

* + - * 1. The Institute of Electrical and Electronics Engineers, Inc.:

IEEE C2 - National Electrical Safety Code (NESC).

IEEE C135.1 - Standard for Zinc-Coated Steel Bolts and Nuts for Overhead Line Construction.

IEEE C135.2 - Standard for Threaded Zinc-Coated Ferrous Strand-Eye Anchor Rods and Nuts for Overhead Line Construction.

* + - * 1. UL, Inc.:

UL 96 - Standard for Lightning Protection Components.

* + - 1. PREINSTALLATION MEETINGS
				1. Convene minimum [**one week**] [**<\_\_\_\_\_\_\_\_> weeks**] prior to commencing Work of this Section.
			2. SUBMITTALS

Only request submittals needed to verify compliance with Project requirements.

* + - * 1. Section 013300 - Submittals: Requirements for submittals.
				2. Submittals for this section are subject to the re-evaluation fee identified in Article 4 of the General Conditions.
				3. Manufacturer’s installation instructions shall be provided along with product data.
				4. Submittals shall be provided in the order in which they are specified and tabbed (for combined submittals).
				5. Product Data: Submit manufacturer information showing materials and construction of hardware.
				6. Shop Drawings: Indicate pole locations and details of pole line construction.
				7. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.

Include separate paragraphs for additional certifications.

* + - * 1. Manufacturer Instructions: Submit detailed instructions on installation requirements, including storage and handling procedures.
				2. Field Quality-Control Submittals: Indicate results of Contractor-furnished tests and inspections.
				3. Qualifications Statement:

Coordinate following subparagraph with requirements specified in QUALIFICATIONS Article.

Submit qualifications for installer.

Remove paragraph if not a LEED project.

* + - 1. SUSTAINABLE DESIGN SUBMITTALS
				1. Section 018113 - LEED Documentation Requirements: Requirements for sustainable design submittals.
				2. Manufacturer's Certificate:

Certify that products meet or exceed specified sustainable design requirements.

Insert material certifications list below to suit products specified in this Section and Project sustainable design requirements. Specific certificate submittal and supporting data requirements are specified in Section 018113.

Sustainable Sites Certificate: Certify paving materials Solar Reflectance Index (SRI).

Materials Resources Certificates:

Certify source and origin for [**salvaged**] [**and**] [**reused**] products.

Certify source for regional materials and distance from Project Site.

Certify that lumber is harvested from Forest Stewardship Council (FSC) Certified well-managed forest.

* + - * 1. Product Cost Data:

Submit cost of products to verify compliance with Project sustainable design requirements.

Exclude cost of labor and equipment to install products.

Provide cost data for following products:

Edit list of material cost data below to suit products specified in this Section and Project sustainable design requirements. Specific cost data requirements are specified in Section 018113.

Salvaged, refurbished, and reused products.

Regional products.

Certified wood products.

<**\_\_\_\_\_\_\_\_**>.

* + - 1. CLOSEOUT SUBMITTALS
				1. Project Record Documents:

Record actual locations of poles, guys, and anchors.

Record actual dimension of required horizontal and vertical clearances.

* + - 1. QUALITY ASSURANCE

Include this Article to specify compliance with overall reference standards affecting products and installation included in this Section.

See IEEE C2 to determine required loading conditions and construction grade.

* + - * 1. Perform Work according to IEEE C2 for <**\_\_\_\_\_\_\_\_**> loading conditions and Grade <**\_\_\_\_\_\_\_\_**> construction.

Include following paragraph only when cost of acquiring specified standards is justified.

* + - * 1. Maintain <**\_\_\_\_\_\_\_\_**> [**copy**] [**copies**] of each standard affecting Work of this Section on Site.
			1. QUALIFICATIONS

Coordinate following paragraph with requirements specified in SUBMITTALS Article.

* + - * 1. Installer: Company specializing in performing Work of this Section with minimum [**three**] <**\_\_\_\_\_\_\_\_**> years' [**documented**] experience.
			1. DELIVERY, STORAGE, AND HANDLING
				1. Inspection: Accept materials on Site in manufacturer's original packaging and inspect for damage.
				2. Handling:

Handle treated poles with tools that do not produce indentations greater than 1 inch deep.

Do not drag treated poles along ground.

Do not apply tools to section of treated poles between 1 foot above and 2 feet below ground line.

* + - * 1. Storage:

Store poles according to manufacturer instructions.

Stack poles stored for more than two weeks on decay-resistant skids arranged to support poles without noticeable pole distortion.

* + - * 1. Protection:

Protect poles from damage and decay by stacking to allow free circulation of air.

Maintain 1-foot minimum spacing between bottom pole and ground or ground vegetation.

Do not store poles above decayed or decaying wood.

Provide additional protection according to manufacturer instructions.

1. PRODUCTS
	* + 1. POLES
				1. Wood Poles:

Comply with ANSI O5.1.

Material: Treated [**Douglas fir**] [**southern pine**].

Minimum Length: [**As indicated on Drawings**] [**<\_\_\_\_\_\_\_\_> feet**].

Minimum Class: [**As indicated on Drawings**] <**\_\_\_\_\_\_\_\_**>.

* + - * 1. Preservative Type: [**Oil-borne**] [**Waterborne**] <**\_\_\_\_\_\_\_\_**>.
			1. CROSS ARMS
				1. Cross Arms and Timbers:

Material: Straight-grained [**Douglas fir**] [**southern pine**].

Tolerance: Free of bends and twists to within [**0.1 inch/foot**] [**1 percent**] of length.

* + - * 1. Wood Preservative:

Type: Pressure treatment.

Comply with AWPA U1.

Preservative Type: [**Oil-borne**] [**Waterborne**] <**\_\_\_\_\_\_\_\_**>.

* + - * 1. Size: [**4.25**] <\_\_\_\_\_\_\_\_> inches by [**5.25**] <\_\_\_\_\_\_\_\_> inches by [**9**] <\_\_\_\_\_\_\_\_> feet.

Remove paragraph if not a LEED project.

* + - 1. SUSTAINABILITY CHARACTERISTICS

Insert sustainable design characteristics in this Article to suit content of this Section and Project sustainable design requirements as specified in Section 018113.

* + - * 1. Section 018113 - Sustainable Design Requirements: Requirements for sustainable design compliance.

Regional Materials: Furnish materials extracted, processed, and manufactured within 500 miles of Project Site [**including:**] [**.**]

Insert list of materials specified in this Section required to be regional materials.

<**\_\_\_\_\_\_\_\_**>.

Certified Wood Materials: Furnish wood materials certified according to FSC standards [**including:**] [**.**]

Insert list of materials specified in this Section required to be certified wood.

<**\_\_\_\_\_\_\_\_**>.

* + - 1. ACCESSORIES
				1. Cross-Arm Braces:

Material: Galvanized structural steel.

Comply with ASTM A123.

* + - * 1. Miscellaneous Pole Hardware: Hot-dip galvanized after fabrication.
				2. Angle Braces:

Span: [**60**] <\_\_\_\_\_\_\_\_> inches.

Drop: [**18**] <\_\_\_\_\_\_\_\_> inches.

Fabrication: Drop-formed in one piece from 1-3/4-by-1-3/4-inch angle.

* + - * 1. Flat Braces:

Size: 1/4 by 1-1/4 inches.

* + - * 1. Anchor Rods and Nuts: Comply with IEEE C135.2.
				2. Bolts and Nuts: Comply with IEEE C135.1.
				3. Butt Plate: Copper.

Class B galvanizing provides twice as thick zinc coating as does Class A galvanizing. Actual zinc coating weight varies by wire diameter.

* + - * 1. Guy Strand:

Description: High-strength, seven-strand galvanized-steel cable.

Comply with ASTM A475.

Class: [**A**] [**B**].

* + - * 1. Guy Termination Type: [**Automatic**] [**Preformed**] [**Three-bolt clamp**].
				2. Guy Guards:

Material: [**Galvanized steel**] [**Plastic**].

Length: 8 feet.

Color: [**Yellow**] <**\_\_\_\_\_\_\_\_**>.

* + - * 1. Ground Wire:

Conductors: Soft-drawn copper.

Minimum Size: 6 AWG.

* + - * 1. Air Terminal:

Material: Copper.

Height: <\_\_\_\_\_\_\_\_> inches.

Comply with UL 96.

1. EXECUTION
	* + 1. PREPARATION
				1. Plug unused holes in poles using dowel pins of treated wood.
				2. Treat field-cut gains and field-bored holes with preservative.
				3. Cut gains on face of pole, with gained surfaces in parallel planes.
				4. Shortening:

Shorten poles as required by cutting from top end.

Apply hot preservative to shortened end of pole.

* + - * 1. Existing Work:

Remove abandoned poles and hardware.

Extend existing pole line installations using materials and methods [**compatible with existing installations or**] as specified.

Repair existing poles and hardware.

Remove abandoned cross arms and hardware from existing poles.

* + - 1. INSTALLATION
				1. Setting Holes:

Dig setting holes large enough to permit use of tampers to full depth.

Place earth in maximum 6-inch layers, and compact to [**45**] [**90**] [**95**] <**\_\_\_\_\_\_\_\_**> percent of maximum density.

* + - * 1. Poles:

Set poles in straight line.

Place curved poles with curvature in line with lead pole.

Maintain even grade.

Set poles plumb.

Rake poles located at corners, angles, and dead ends such that poles are plumb after line installation.

Do not install poles along edge of cuts and embankments or where soil is in danger of washing out.

* + - * 1. Cross Arms:

Set cross arms at right angles to line for straight runs.

Set cross arms to bisect angle of turns in line direction.

Install two braces for each cross arm.

* + - * 1. Install anchor rods, guy strands, and accessories.
				2. Install [**ground rods**] [**butt plates**] and ground wire, as specified in Section 337900 - Site Grounding.
				3. Identification:

Identify each pole using aluminum marker stamped with characters minimum 2.5 inches high.

Locate markers for maximum visibility [**from roadway**] and fasten with aluminum nails.

Obtain identifying characters from <**\_\_\_\_\_\_\_\_**>.

* + - 1. FIELD QUALITY CONTROL
				1. Field Test:

Minimum Quantity: One anchor of each capacity installed.

Capacity: Rated holding power.

END OF SECTION 337116