

Specification E-1710

AUSTIN ENERGY, ELECTRIC UTILITY DEPARTMENT

PURCHASE SPECIFICATION

FOR

POLES, DISTRIBUTION, UTILITY, TAPERED FIBERGLASS

DATE	PREPARED BY	ISSUANCE/REVISION	APPROVAL PROCESS SUPV. / MATERIALS SUPV.
10/14/08	Arthur Gonzalez Jr.	Issuance	
05/17/10	Arthur Gonzalez Jr.	Revision	
01/22/14	Lee Emmick, PE	Revision	
09/10/14	Lee Emmick, PE	Revision	
11/21/17	Michael Pittman, PE	Add 35-5 pole.	
04/05/18	Dennis Patrick	Revision	
11/26/18	Michael Pittman, PE	Revision	Labels, drawing measurements.
03/15/2019	Dennis Patrick	Revision	
10/29/2020	Julius Heslop	Add pole step (3.3.1) & Attachment 3	
09/24/26	Marco Villarreal	Revision to 3.3.1 & Attachment 3	

This specification, until rescinded, shall apply to each future purchase and contract for the commodity described herein.
Retain for future reference

CITY OF AUSTIN ELECTRIC UTILITY DEPARTMENT
PURCHASE SPECIFICATION
FOR
TAPERED FIBERGLASS UTILITY
DISTRIBUTION POLES

1.0 SCOPE AND CLASSIFICATION

1.1 Scope

- 1.1.1 This specification sets forth the requirements for design, material, fabrication, finishing and shipping of fiberglass distribution structures.
- 1.1.2 The City of Austin Electric Utility Department is hereinafter referred to as Austin Energy (AE).
- 1.1.3 Austin Energy (AE) requires a qualified Supplier to supply distribution structures. The poles shall be made of fiberglass. The poles shall be symmetrical about the transverse and longitudinal axis, with a gradual and constant taper.
- 1.1.4 The term "Engineer" refers to the Standards Engineer at 4411-B Meinardus St., Austin TX, 78744.
- 1.1.5 During the bidding process, any exceptions must be noted in the bid documents and are subject to rejection by the AE Engineer. After award of contract to successful bidder, any modifications must be approved in writing by the AE Engineer.

1.2 Classification

- 1.2.1 Attachments 1 and 2 define the design requirements for distribution structures.

2.0 APPLICABLE STANDARDS

Reference to standard specifications shall be the latest revision of such specifications with abbreviations as listed below:

ANSI O5.1	-	Utility Poles
ASTM A153	-	Zinc Coating on Iron and Steel Hardware
ASTM D635	-	Burning of Self Supporting Plastics
ASTM D4634	-	Accelerated Outdoor Weathering of Plastics
ASTM G154	-	Operating Light & Water Exposure Apparatus for Non-Metallic Materials
ASTM G90	-	Accelerated Outdoor Weathering of Non-Metallic Materials
ASTM D1036	-	Test Method (Modified Fixture for Tubular Pole)

3.0 PHYSICAL REQUIREMENTS

3.1 Fabrication

3.1.1 Material

- A. The pole shall meet loading requirements for class 1, class 3, and class 5 poles in accordance with ANSI O5.1.
- B. The pole shall be manufactured to a minimum ultimate strength rating as tested per ASTM D1036 (modified fixture for tubular pole). The load specified in Attachment 1 will be applied two feet from the tip of the pole and the pole shall be supported at a burial depth of 12% of the overall length of the pole plus two feet.

3.1.2 Weather and UV Protection

UV inhibitors shall be added to the polyester resin mixture. Poles shall be tested in accordance with ASTM D4364, G90, and G154. There shall be a minimum QUV testing of 15,000 hours. Test results shall be submitted at time of bid.

3.1.2 Color

Color of the finished product shall be brown or gray in color, as specified on the bid request. The resin shall be pigmented to match the final color of the product.

3.1.3 Pole Shaft

- A. The pole shaft shall have a taper rate of .14" per foot.
- B. Shaft sections 35, 40, or 45 feet in length shall be furnished as two or three pieces unless otherwise specified on the bid request. Shaft sections 50, 55, or 60 feet in length shall be furnished as at least three pieces unless otherwise specified on the bid request.
- C. Multi piece poles shall be proportionate to one another in length so that no sections has a percent difference greater than 43% when compared to another sections length.
- D. Each pole section shall be pre-fitted for a telescoping type of assembly. The upper section at a joint shall telescope over the lower section. Structure sections shall be numbered to relate to the structure identification. At the joints, both sections shall be clearly marked so that the related faces can be correctly matched in the field assembly. The joint area will have a typical overlap of thirty-six inches (36)
- E. The pole top deflection shall be within 10% of the calculated deflection of Western Red Cedar as specified by the MOE and dimensions in ANSI O5.1.
- F. A composite cap shall be securely mounted to the top of the pole. The cap must remain in place when subjected to maximum wind loads of 85 mph.
- G. The bottom of the pole shall be securely plugged. The plug shall be made of composite material and shall have a drain opening to permit any water from collecting in the base of the pole.

3.1.4 Quality and Finish

- A. Finish of structures shall be as specified below. Any exceptions shall be noted in the bid documents and are subject to rejection by the Engineer.
- B. Finished edges shall be clean cut and free from burrs and chips.
- C. Pieces containing incorrect hole placement will be rejected.
- D. Connections shall be arranged to minimize the eccentricity of loading on the member.
- E. All poles shall be consistent and uniform in color.
- F. All material shall be free of deformations, bends, twists, or kinks.

3.1.5 Identification Marking

- A. Each piece of structure shall be marked 12 inches from the point where the two poles have minimum required overlap.
- B. Each piece of structure, except the bottom piece, shall have a steel or aluminum name plate permanently affixed 5 feet above the base. The bottom piece of structure shall have the steel or aluminum name plate permanently affixed 14 feet above the pole base for pole 55ft or less, 18ft for poles greater than 55ft. The plate shall be stamped with the information listed below:
 - 1. AE
 - 2. LENGTH-CLASS
 - 3. (Tube #)
 - 4. (Tube Weight: Lbs)
 - 5. (Name of Manufacturer)
 - 6. (Date of Manufacturer: MM/YY)

3.1.6 Tolerances

- A. The finished work shall conform to the tolerances set forth in these specifications and shall be sufficiently accurate to permit field erection without reaming and with only a moderate amount of drifting. Maximum tolerance allowed on finished work shall conform to the following:
 - 1. Cutting length $\pm 2"$
 - 2. Center to center distance of end holes on a piece $\pm 1/16"$
 - 3. Variation of gage lines $\pm 1/2"$
 - 4. Variation of center to center spacing of a group or cluster of holes $\pm 1/8"$
 - 5. Compression members shall be straight to a tolerance of 1/1000 of the total length $\pm 1"$

- B. The Contractor shall size assembly bolts with allowances for washers, unless specifically requested. All bolts shall be of such a length that they pass entirely through the nut and have a minimum projection of two complete threads.

3.1.7 Modifications

- A. Structures are to be fabricated in accordance with detailed drawings furnished by the Contractor for approval of the Engineer.
- B. For fabrication only orders, minor deviations in member layout to accommodate variations in shop practices will be permitted provided that these deviations do not materially alter the configuration of the structures and do not reduce the strength of the structures. When such deviations in member layout are made, drawings showing these deviations shall be submitted to the Engineer for approval and the originals of such drawings shall become the property of the Austin Energy upon completion of the order.

3.2 Embedment

- 3.2.1 The poles will be embedded to a depth as set forth in Attachment 1.

3.3 Structure Attachments

- 3.3.1 All pole shafts must include pole step attachments that accommodate the Hubbell PS6236/MacLean J6236 removable pole step (see attachment 3). They should also be securely fastened to the pole to resist unauthorized removal. However, the installation must allow qualified crews to remove and replace the attachments in the event of damage (See attachment 3 for an example of acceptable pole step attachments). The quantity of pole step attachments will vary by pole height and shall be furnished to match the number of steps required (ie 18 steps on 40 pole). The lowest step shall be located 120 inches above the ground line and the remaining step attachments shall be located on two (2) opposite sides of the pole, 180 degrees from each other. The ascending steps that are located above the lowest step shall ascend the entire length of the pole until they are within 60 inches from the top of the pole. Pole step attachments shall be vertically spaced 30 inches on centers on each side of the pole (15 inches between consecutive steps). In addition, working step attachments shall be located on four (4) faces of all poles, 90 degrees from each other, at sixty inches (60), ninety-six inches (96), one hundred twenty-five inches (125), and one hundred eighty-five inches (185) below the top of the pole. Holes for pole steps shall be 1-1/8". Removable pole steps do not need to be included with pole, only pole step attachments.

- 3.3.2 All parts bearing the same identification marking shall be interchangeable.

4.0 GENERAL REQUIREMENTS AND INFORMATION

4.1 Design Loading

- 4.1.1 All structures shall be designed to withstand the horizontal loading at the embedment depths set forth in Attachment 1, without the yielding or failure of any part of the structure.
- 4.1.2 The Contractor is responsible for all design and loading calculations for the requirements described herein and in Attachments 1 and 2. All design calculations and drawings shall be sealed by the Contractor's registered Professional Engineer who is licensed in the state of Texas.

4.1.3 Preliminary drawings shall include structure configuration, dimensions, weights and stress diagrams, computer printout of maximum loading and loading conditions, and a computer file.

4.1.4 The design details shall also include maximum ground line moments, horizontal shear and vertical loading, uplift or bearing.

4.2 Drawings and Test Reports

4.2.1 The Contractor shall submit the following drawings and test reports with each purchase order:

A. Approval drawings

B. Test reports

C. Final structure drawings (including fabrication drawings)

4.3 Packing

4.3.1 When specified, each pole shall be adequately packaged for protection during shipping and storage. Standard shipping procedure is to bundle poles into groups of 2 to 4 for stacking on a flat bed truck. Standard Packing does not include wrapping of poles.

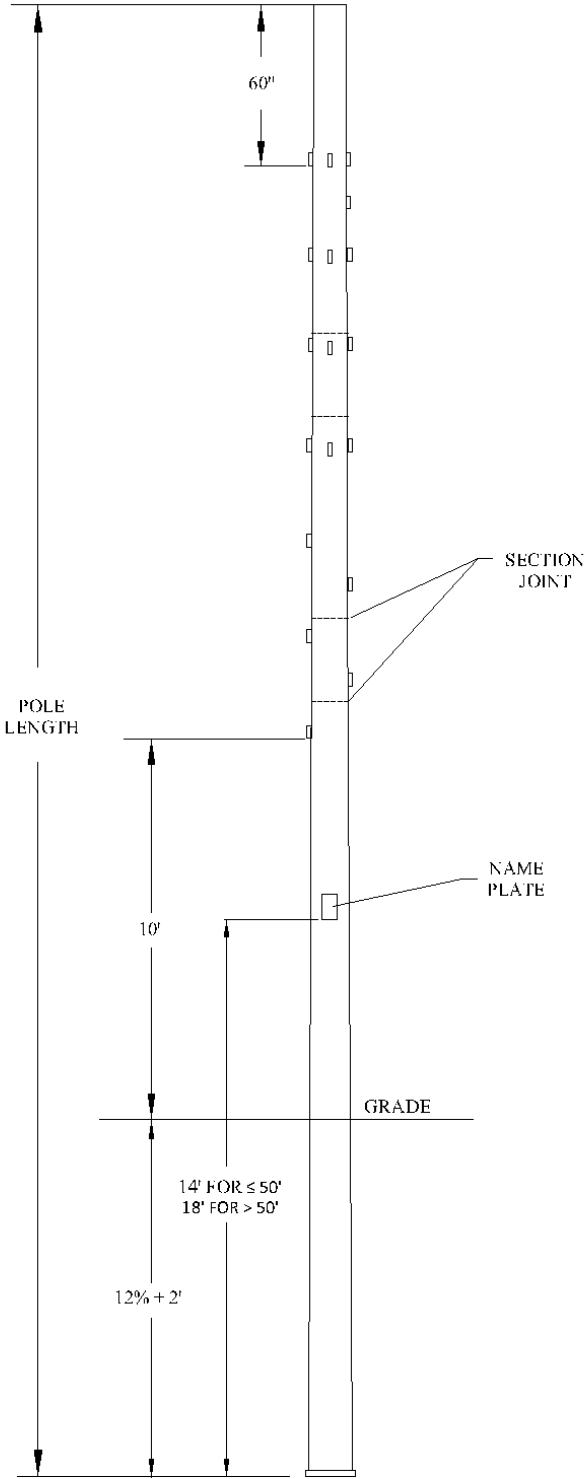
ATTACHMENT 1

DISTRIBUTION DESIGN DATA

POLE APPLICATION GUIDE

Fiberglass Pole Application Information		
Pole Length (Ft)	Setting Depth (Ft)	Horizontal Load applied 2 Ft. from top of the Pole (Lbs)
Class 1 Wood Pole Equivalent		
40	6' 10"	4500
45	7' 5"	4500
50	8' 0"	4500
55	8' 7"	4500
60	9' 2"	4500
Class 3 Wood Pole Equivalent		
40	6' 10"	3000
45	7' 5"	3000
50	8' 0"	3000
55	8' 7"	3000
60	9' 2"	3000
Class 5 Wood Pole Equivalent		
35	6' 2"	1900
40	6' 10"	1900
45	7' 5"	1900
50	8' 0"	1900
55	8' 7"	1900
60	9' 2"	1900

ATTACHMENT 2
FIBERGLASS POLE ATTACHMENTS



ATTACHMENT 3
FIBERGLASS POLE STEP

PS6236/J6236 Removable Pole Step



Acceptable Pole Step Attachment Design

