

Specification E-1786

AUSTIN ENERGY, ELECTRIC UTILITY DEPARTMENT

PURCHASE SPECIFICATION

FOR

POLES, DIST, ST LIGHT, ALUMINUM, GREAT STREETS

DATE	PREPARED BY	ISSUANCE/REVISION	APPROVAL PROCESS SUPV. / MATERIALS SUPV.
12/8//14	Lee Emmick, PE	Issuance	M. Pittman, PE

This specification, until rescinded, shall apply to each future purchase and contract for the commodity described herein.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
DESIGN AND FABRICATION OF
GREAT STREETS ALUMINUM POLE**

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 the Aluminum Pole to be used for the Great Streets Projects in downtown Austin. This pole shall be unique and shall only be used in the parts of Austin that are designated as Great Streets.
- 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 structures for the Great Streets Project. The poles shall be made of Grade 6063-T6 Aluminum with a satin ground finish. 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 The term "Fabricator" refers to the party selected to design, fabricate, and furnish the product. The Fabricator shall have a minimum of five (5) years experience in the design and fabrication of aluminum poles.
- 1.1.6 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.

2.0 APPLICABLE STANDARDS

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

AISC	-	American Institute of Steel Construction
ANSI	-	American National Standards Institute
ASCE	-	American Society of Civil Engineers
ASME	-	American Society of Mechanical Engineers
AASHTO	-	American Association of State Highway and Transportation Officials
ASNT	-	American Society of Non-Destructive Testing
ASTM	-	American Society of Testing and Materials
AWS	-	American Welding Society
NEMA	-	National Electrical Manufacturers Association
NESC	-	National Electrical Safety Code
AAC	-	Aluminum Anodizers Council

3.0 PHYSICAL REQUIREMENTS

3.1 Material

3.1.1 All material used in the structure shall have a minimum yield strength equal to or greater than the value used in the design calculations. The bidders shall indicate the material used in each part of the structure and the specification covering the material.

3.2 Fabrication

3.2.1 Fabrication shall be in accordance with AISC specifications and shall be equal to the best shop practice of modern aluminum fabricating shops.

3.2.2 Welding

- A. Design of all joints or seams and all welding procedures shall be in accordance with Structural Welding Code AWS D1.2, including the latest addenda. The bidder shall provide welding procedures and processes to be used in the various joints or seams.
- B. Welders shall be qualified on all welds used during the fabrication process in accordance with AWS D1.2.
- C. Upon request by the Engineer, Bidder shall provide weld design calculations for arms, baseplates, and other joint details.
- D. The bidder shall indicate the inspection methods, which will be used to ensure that fabrication welds meet the design requirements.

3.2.3 Quality and Finish

A. Satin Ground Finish

1. All aluminum shall be shot blasted and have an 80 grit satin ground finish before anodizing. Pre-treatment shall be a non-alkaline soap, followed by a Sodium Hydroxide etch, and then a de-smut process. The structure shall be anodized to an architectural Class I clear finish in accordance with the AAC designation AA-M10-C32-AA-41. Clear coat shall be 0.7 mils uniform thickness over the entire structure and appurtenances.
2. Anodizing and clear coat shall be applied after all welding, including the base plate, arm plates, and arm fins have been welded and all holes drilled to insure a consistent finish.
3. The finish shall meet spray requirements of ASTM B 117 and the humidity resistance requirements of ASTM D 2247, latest revisions.

B. All punching and drilling shall conform to the following:

1. The finished diameter of the bolt holes shall be 1/8" larger than the nominal bolt diameter. A 1/16" clearance shall be used for all connecting bolt holes.
2. Finished edges shall be clean cut and free from burrs and chips. Roughness of oxygen-cut surfaces shall not be greater than that defined by AWS D1.2.
3. All holes shall be cylindrical and perpendicular to the principal surface. Slotting of mispunched holes is not permitted. All holes shall be drilled or cored.
4. Plugging and welding mispunched holes shall be kept to a minimum. Pieces that, in the opinion of the Engineer, have excessive plugs and welds will be rejected.
5. All holes drilled in the pole wall shall be plugged by an insert capable of remaining in place for the life of the pole.
6. Connections shall be arranged to minimize the eccentricity of loading on the member.

3.2.4 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 $\pm 1/8"$
2. Center to center distance of end

- holes on a piece $\pm 1/16"$
- 3. Variation of gage lines $\pm 1/32"$
- 4. Variation of center to center spacing of a group or cluster of holes $\pm 1/32"$
- 5. Compression members shall be straight to a tolerance of 1/1000 of the total length $\pm 1/32"$
- 6. All material shall be free of deformations, bends, twists, or kinks. Straightening of damaged material shall not be permitted.

B. Fabricator shall size assembly bolts without allowances for washers, unless specifically requested. Hand hole screws shall be tamper resistant stainless steel. Anchor bolts shall be completely hot dip galvanized.

C. A five (5) percent overage of bolts and self-locking nuts shall be included.

3.2.5 Modifications

A. No modifications will be allowed, structures are to be fabricated in accordance with detailed drawings furnished by the Fabricator for approval of the Engineer.

3.3 Pole Shafts

3.3.1 Pole shafts used in the structures shall be circular and tapered. Taper shall not exceed 0.4 inches per linear foot.

3.3.2 The pole top deflection shall not be greater than 10% of the total pole height under full loading conditions with overloads.

3.3.3 Pole tops shall be capped with a cast aluminum assembly as shown in the drawings. There shall be no protrusions of the assembly beyond the circumference of the pole.

3.4 Base Plate

3.4.1 The cast aluminum base shall be made of 356-T6 aluminum alloy per B108, latest revisions. The bolting ring section of the base shall be a minimum of 5/8" thick, and be cast as an integral part of the base casting. The bolt circle shall be 11" with four (4) 1-1/4" slotted holes drilled at 90 degrees. Base shall come with aluminum bolt covers and stainless steel screws.

3.4.2 All castings shall be done in a workmanlike manner, which shall result in uniform castings. All ornamentation and markings shall be sharp and clearly defined.

3.4.3 All castings shall be free from abnormal physical qualities, pouring faults, porosity, cracks, blow holes, shrinkage defects, or flaws which affect the strength, value, or suitability of the castings for their intended use. Each casting will be cleaned and ground to eliminate all sand, burrs, machine marks and imperfections.

3.5 Structure Attachments

- 3.5.1 All pole shafts shall have provisions for one (1) frame tapped ½"-13NC for Grounding on the interior of the Pole directly across from the handhole.
- 3.5.2 A 4" x 8" handhole shall be placed cantered at 1'-6" above the base. The handhole shall be reinforced so as to result in no loss of shaft strength. The handhole shall have a vandal proof cover finished to match the pole and attached with stainless steel screws. The aluminum cover shall be weatherproof. Integral center pin to be installed at the factory.
- 3.5.3 Pole Top arms shall be 2-1/2" SCH 80 aluminum pipe (2-7/8" O.D.) made of 6063-T6 aluminum alloy. Pole bottom arm shall be 2-1/2" SCH 40 aluminum pipe (2-7/8" O.D.) made of 6063-T6 aluminum alloy. The arms shall attach to the pole via aluminum pole plates using no less than four (4) ½"-13NC stainless steel bolts, and sized to allow the 2-1/2" SCH 80 pipe with 6" fins top and bottom to be welded to the plate. Arm length will be sized according to attachment 1 and attachment 2. Arms to carry Luminaires shall have a 2" x 10" NPS Slipfitter tenon.
- 3.5.4 Pole arms shall have a fin on the top and bottom that tapers from 6" at the base of the arm where it meets the pole plate and ends at the end of the 2-1/2" SCH 80 pipe arm (does not include the tenon for the 2" slipfitter). The fin shall be made of 6061-T6 aluminum alloy and shall be welded the full length of the pipe and plate on both sides.
- 3.5.5 Pole top cap shall be cast aluminum and shall be supplied with stainless steel screws.

4.0 GENERAL REQUIREMENTS AND INFORMATION

4.1 Design Loading

- 4.1.1 All structures shall be designed to meet AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals – Latest Edition (except Breakaway) for a 90 mph wind velocity with the loading from two (2) luminaires placed as shown in Attachment 1 with an EPA 2.0 ft² each, and a weight of 50 lbs. each. The pole shall also be fitted with two (2) fixed banners that are each 2'-8" W x 7'-6" to 8'-6" L on opposite sides of the pole parallel with the luminaires. Banner brackets shall be Britten Banner Saver brackets or Engineer approved equal. Bracket holes shall be pre-drilled as shown in Attachment 1 no straps shall be allowed.
- 4.1.2 The Supplier is responsible for all design and loading calculations for the requirements described herein and in Attachment 1. All design calculations and drawings shall be sealed by the Fabricator'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, and computer printout of maximum loading and loading conditions.

4.1.4 The design details shall also include maximum ground line moments.

4.2 Design Data and Files

4.2.1 The Fabricator shall submit all design data in the form of a PLS-POLE Steel Pole Properties (.spp) file or in a spreadsheet organized as specified by the Engineer. All design data and calculations shall be sealed by a professional engineer licensed in the State of Texas.

4.3 Warranty

4.3.1 The Fabricator shall warranty the pole for a minimum of ten (10) years from the date of delivery.

4.4 Deliverables

4.4.1 The Fabricator shall submit the following deliverables with each purchase order:

- A. Approval drawings
- B. Test reports
- C. Final structure drawings (including fabrication drawings)
- D. PLS-Pole (.SPP) file or engineer approved spreadsheet, and a copy of all design calculations .

4.5 Packaging

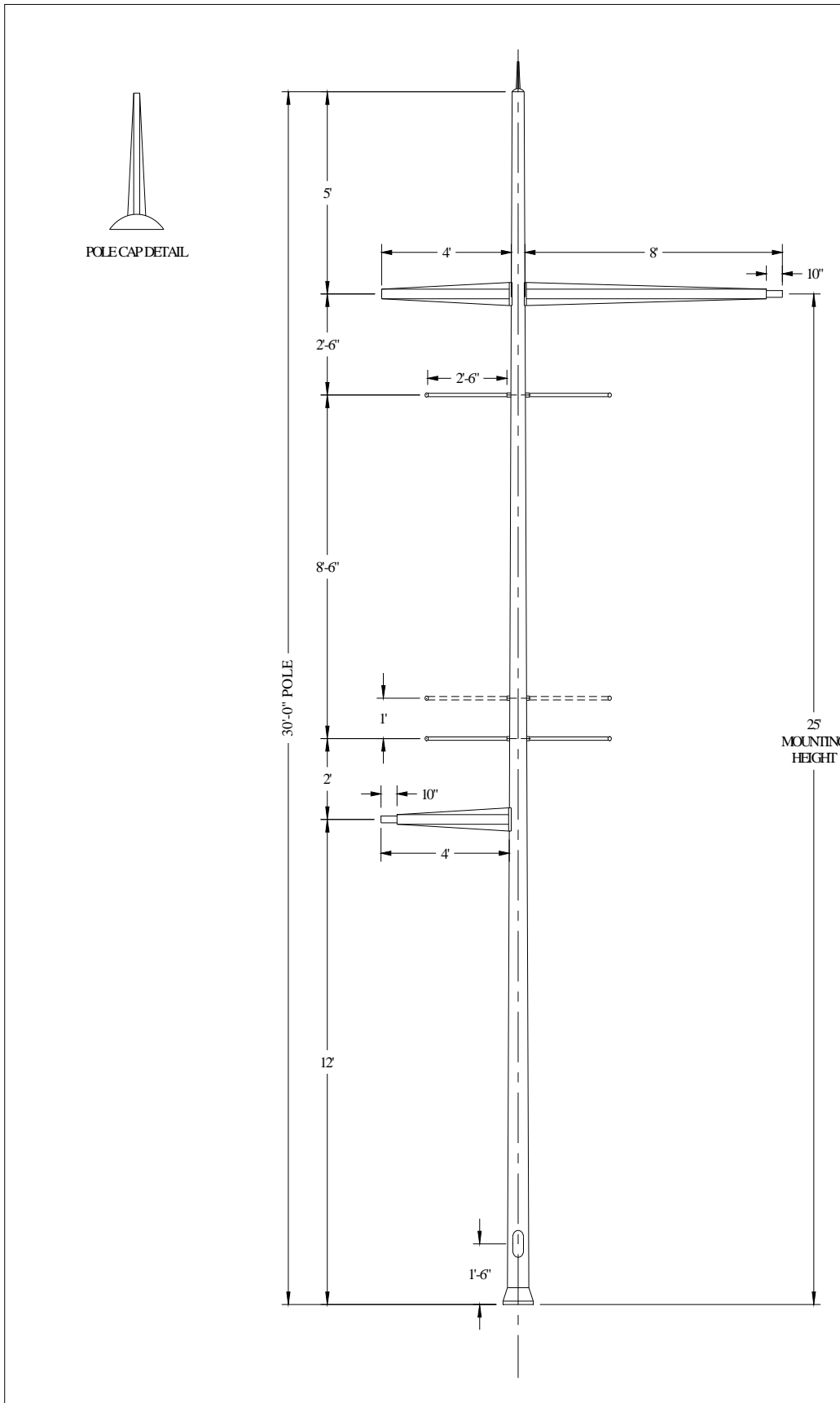
4.5.1 Poles and arms shall be protected with a spiral wrapping of heavy material for protection during shipping and outside storage under all weather conditions without deterioration. A method shall be provided for easy removal of the wrapping.

4.5.2 shipping containers shall be legibly marked with:

- A. Manufacturer's name
- B. Manufacturer's Catalog Number
- C. Product description
- D. Parts List
- E. Quantity Contained
- F. Austin Energy Stock Number (#23534)

ATTACHMENT 1

Pole Assembly Drawing



ATTACHMENT 2

Pole Arm Detail

