



Document Title:

**Aluminum Lighting Pole**

Document Type:

**Specification**

Engineering Type

**Material Specification**

Document No.:

**4402.005**

Department

**Distribution**

Version:

**03**

Effective Date:

**Jun 19, 2024**

**Shared document with: N/A**

*\*Select the Departments impacted by the document*

**For others, specify here**

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Date

**Jun 18, 2024**

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**Jun 18, 2024**

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Ricardo Castro PE

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**Jun 19, 2024**

**Management Approval (If apply)**

**Approver**

Name

Position

Signature and Date

**N/A**

**Related/Referenced Documents**

N/A

**Document History**

Version	Date	Revision Comments
1	November 15, 2022	Added Page Cover and Modify Specification
2	June 6, 2023	Modifications Sections: 10.1 (c, f), and 16.
3	June 14, 2024	Modifications Sections: 9.1 b, f (2), g, i, and drawing added.



## Item Version History

Warehouse Catalog #	Asset Suite #	Version	Date
026-00609	56205	11	6/14/2024



## 1. Introduction

This is a general specification for covering 37 ft aluminum lighting poles for single and truss type arms to be used for roadway street lighting on the distribution system in Puerto Rico. Further information will be provided by LUMA Energy at the time of order placement and will provide information on site specific conditions, quantity, and other requirements. This document includes the general mechanical characteristics of the material.

## 2. Special Requirements

Samples shall be furnished as requested by LUMA Energy. Vendors that have supplied this equipment/material to LUMA on previous orders will not have to furnish samples at bid opening. The equipment/material will be received at the LUMA's general warehouse (O11) at Palo Seco, Puerto Rico. Shipping will include transportation and unloading at the indicated warehouse.

## 3. Literature

Descriptive and technical literature must be supplied by the vendor at time of bidding. This literature may include, but is not limited to details of material, drawings, documented testing, and instructions for use and installation. Failure to submit documents on time will cause bidder disqualification. Evidence of LUMA Energy's approval of the equipment/material shall be supplied by the vendor if requested by LUMA Energy.

## 4. Markings

- 4.1. Containers shall be marked outside with LUMA Energy's purchase order and item number.
- 4.2. Packaging labels and tags shall be waterproof.

## 5. Packaging

All equipment/material shall be packaged and marked in such a way as to facilitate handling and protection from damage and that the receiving warehouse can readily identify it and send it, in one complete unit, to a field location without opening crates or boxes to sort items and/or parts.

## 6. Number per Package (Logistics)

Each manufacturer shall define the number of poles per packages depending on the shipping containers and platforms for delivery according to LUMA requirements.

## 7. Acceptance Criteria

7.1. The manufacturer shall provide a mill certificate that shows the chemical composition and properties of the steel used to manufacture each batch of poles.

7.2. International Codes and Reference Standards:

AASHTO American Association of State Highway and Transportation Officials

AA Aluminum Association Standards

ASTM American Society for Testing and Materials

## 8. Quality Certifications

8.1. Certified vertical and horizontal load resistance tests.

8.2. Latest applicable codes, standards, and other regulations: AASHTO – ASTM-AA

## 9. Description

This specification is for the purpose of the purchase of aluminum pole to support the electrical distribution system. The Technical Specifications will include the material, design, pole shaft, assembly structure, shoe base, holes, and markings.

9.1. Technical Specifications:

### a. Material

1. All welding shall be performed by the electrode inert gas shielding or MIG metal arc welding method and shall be free of cracks and porosity.
2. The assembly be heat – treated after welding to a T6 temper.
3. The finish each pole shall be satin.

### b. Design

The supplier is responsible of the design. The bid proposal shall include and comply with the following:

1. The 37 ft long street lighting tapered aluminum pole for one or two, single or truss arms.
2. The pole shaft length shall be 37 ft for a 40 ft mounting height.
3. This pole shall be manufactured to be used in a complete assembly with arm and luminaire supplied by others, to withstand a 160 miles per hour wind according to Luma Distribution System Design Manual. Shall be equipped with an approved internal impact type damping device.

4. Include the design calculations at the time of bid evaluation. The supplier that does not comply with this requirement will be immediately disqualified.
- c. Pole Shaft**
1. Shaft shall be tapered from 10 in. at the bottom and 6 in. at the top; by a cold working process from seamless extruded tubing 6063-T6 or 6005-T5 wrought aluminum alloy free of longitudinal welds with a T6 temper, heat treated for final mechanical strength the 6 in. diameter section shall accommodate lighting arms clamped 6 in. from the top or 20 ½ in. from the top.
  2. Arms shall be designed to permit vertical orientation to achieve the desired mounting height depending on the use of shoe base or transformer breakaway base configuration.
  3. Pole and related hardware shall be furnished in compliance to latest AASHTO standard specifications for structural support for highway signs, luminaires and traffic signals, and Aluminum Association (AA) standards.
  4. The pole shall include a vibration damper which is primarily used to reduce vibration caused by wind.
- d. Assembly Structure**
1. The assembly structure shall consist of two 50 lb. luminaires and two 80 lb. dead weight 4, 6 or 8 ft. long single member arms or two 80 lb. dead weight 10, 12 or 15 ft. long truss member arms at 180 degrees clamp supported to the shaft.
  2. At the base the structure shall be supported by a shoe base or a break away base.
  3. The total assembly weight shall not exceed 700 lb. Total height shall 40 ft. from pavement.
- e. Shoe Base**
1. Pole shall be provided with a 356-T6 cast aluminum alloy shoe base welded to the pole lower end as specified by Aluminum Association and AASHTO with 14-15 in. diameter bolt circle.
  2. Base shall be of sufficient size to sustain the specific design load by four (4) anchor holes within the 13 in. square to receive the 1 in. anchor bolts and shall be free of cracks, pits, and blowholes.
  3. Base shall be manufactured to accommodate 1 in. diameter bolt breakaway couplings.
  4. Shoe base 1 in. anchor holes shall be 1/8 in. slotted longitudinally to the bolt circle center line.
  5. Shoe base cast aluminum bolt covers shall be provided.

**f. Holes**

1. Hand Hole:

- a. A 4 x 6 in. reinforced handhole assembly shall be provided for electrical connections at 18 in. from the bottom of pole and shall be closed by a properly secured curved handhole cover.
- b. Shaft shall be reinforced inside the frame with two (2) longitudinal welds at handhole locations.
- c. Shaft shall be tapped at the base inside for a 5/16 in. ground stud., ground stud shall be furnished already installed.

2. Holes:

- a. Two (2) 1 ½ in. diameter wide holes (back-to-back) shall be provided for arm installation at 6 in. and 20 ½ in. measured from the top of the pole and aligned with the hand hole.
- b. Two (2) rubber grommets and two (2) rubber caps shall be provided for each pole (included in the order).

**g. Stamped Markings**

1. The top pole cap shall be welded.
2. The top cap and the hand cover shall be engraved on the outside with the initials PREPA in legible letters.

**h. Drawings**

The bid proposal drawings shall include original documents with the following information:

1. The assembled pole showing all its components and their location.
2. General dimensions of all the structural components.
3. Weight for each Pole (galvanized with all accessories installed).
4. A bill of materials.
5. Pole grounding attachment detail.
6. Details of all accessories including rivnuts, ground pads, top cap, bearing plate, etc.

**i. Final Approval before Manufacture**

1. Shop drawings shall be submitted for LUMA approval before fabrication begins.
2. After approval, one final set of drawings and design calculations in PDF format plus a digital copy of drawings in AutoCAD 3D (.DWG) shall be sent to our files.



3. All drawings shall include our purchase order number.

**j. Failure to Meet the Specification**

1. Should any piece of equipment fail to meet the requirements of these specifications within the warranty period, it shall be optional for the engineer to accept the pole or reject it and direct the manufacturer to proceed at once to make alterations or furnish such new parts as may be necessary to make it meet the warranty and requirements.
2. All expenses for furnishing any replacement parts shall be borne by the manufacturer.

**a. Delivery of Material**

1. The distribution poles will be delivered at the LUMA General Warehouse in Palo Seco (011), Puerto Rico, unless otherwise indicated and coordinated with another area provided by the company.
2. LUMA may take delivery at a designated location with the delivering carrier's equipment.
3. The manufacturer shall coordinate with LUMA to ensure a smooth and efficient delivery of the poles.
4. LUMA shall provide all labor, equipment, and materials for unloading the poles at the project site.
5. A pole is considered delivered when it is lifted from the delivery carrier's trailer or semi-trailer.

**10. Inspection**

The acceptance of any equipment/material shall in no way relieve the vendor from his responsibility to meet all the requirements of this specification, and it would not prevent subsequent rejection if such equipment/material were found later to be defective.

**11. Proposal Information**

11.1. Submitted proposals must include:

- a. Technical information
- b. Table of Compliance completed by the bidder with reference (see Appendix 1).

**12. Table 1: Warehouse and Asset Suite Identification Number**

Item	Description	Warehouse Number	Asset Suite
1	Aluminum Lighting Pole - 37 ft.	026-00609	56205

— End of Specification —



## Appendix



### Appendix 1: Table of Compliance:

Line	Criteria	Description	Pass/Fail (P/F)	Comments
1	Specification	The Proponent complies with the corresponding specification document (4402.005)		
2	Industry Standards	The Proponent complies with the industry standards established in the specification document. (ASTM)		
3	Material	All welding shall be performed by the electrode inert gas shielding or MIG metal arc welding method and shall be free of cracks and porosity.		
		The assembly be heat – treated after welding to a T6 temper.		
		The finish each pole shall be satin.		
4	Design	37 ft long street lighting tapered aluminum pole for one or two, single or truss arms.		
		Withstand a 160 miles per hour wind.		
5	Pole Shaft	Tapered from 10 in. at the bottom and 6 in. at the top, tubing 6063-T6 or 6005-T5 wrought aluminum alloy free of longitudinal welds with a T6 temper, heat treated for final mechanical strength the 6 in. diameter section shall accommodate lighting arms clamped 6 in. from the top or 20 ½ in. from the top.		
		Arms shall be designed to permit vertical orientation to achieve the desire mounting height depending on the use of shoe base or transformer breakaway base configuration.		
		Include a vibration damper.		
6	Hand Hole	A 4 x 6 in. reinforced handhole assembly shall be provided for electrical connections at 18 in. from the bottom of pole and shall be closed by a properly secured curved handhole cover.		
		Shaft shall be reinforced inside the frame with two (2) longitudinal welds at handhole locations.		
		Shaft shall be tapped at the base inside for a 5/16 in. ground stud., ground stud shall be furnished already installed.		
7	Holes	Two (2) 1 ½ in. diameter wide holes (back-to-back) shall be provided for arm installation at 6 in. and 20 ½ in. measured from the top of the pole and aligned with the hand hole.		
		Two (2) rubber grommets and two (2) rubber caps shall be provided for each pole (included in the order).		
8	Stamped Markings	The top pole cap shall be welded.		
		The top cap and the hand cover shall be engraved on the outside with the initials PREPA in legible letters.		
9	Final Approval before Manufacture	Shop drawings shall be submitted for LUMA approval before fabrication begins.		



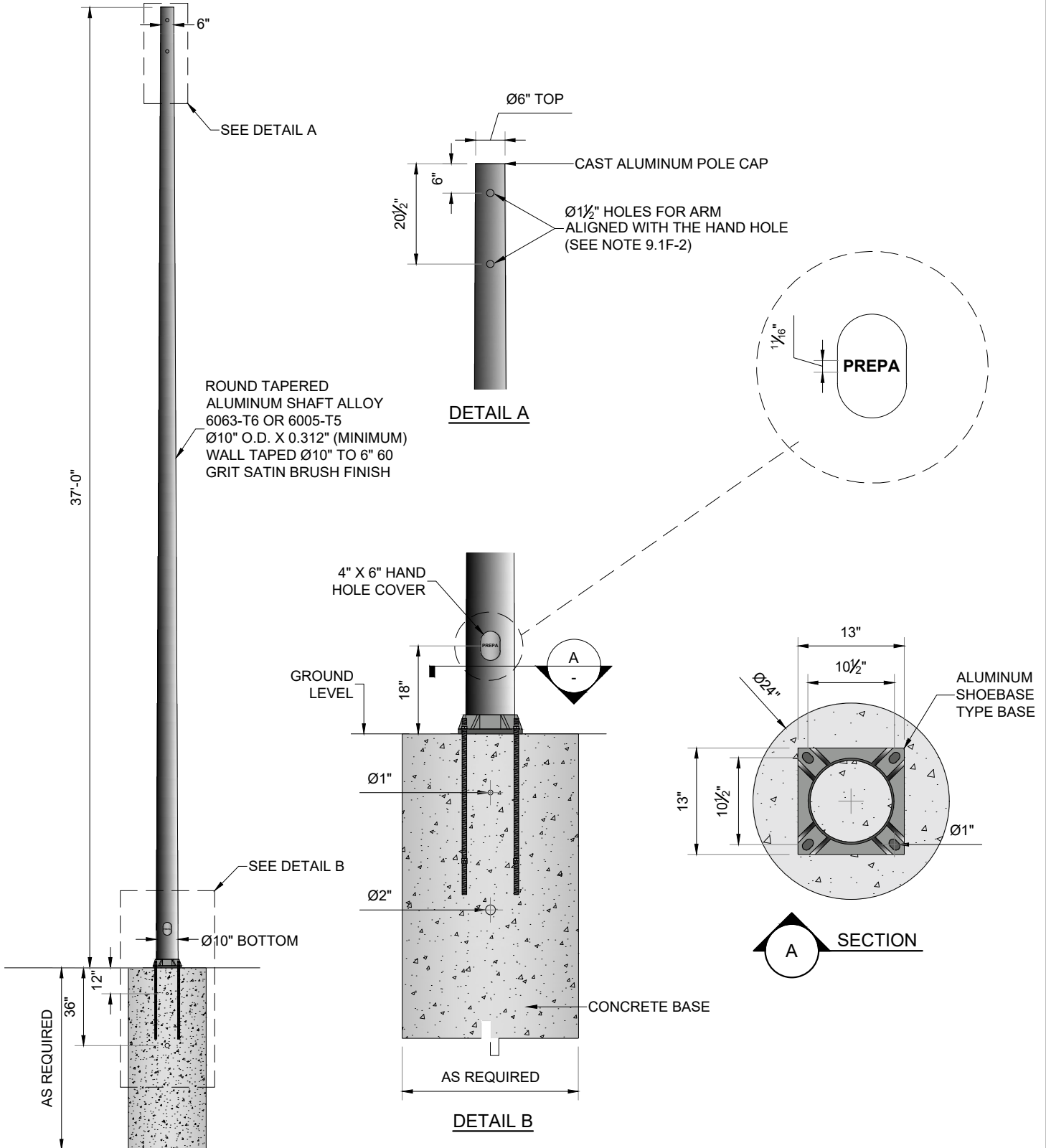
# DISTRIBUTION ENGINEERING

STREET LIGHTING  
SPECIFICATION MATERIAL

TITLE:

## ALUMINUM LIGHTING POLE

DOCUMENT NO.	4402.005	VERSION	1
PAGE	1 OF 1	DATE	MAY 30, 2024
SUBMITTED	ROSALIA ALVERIO GONZALEZ		
REVIEWED	RAFAEL TORRES LIC. 14593		
APPROVED	RICARDO CASTRO LIC. 12135		
DIGITIZED	VICTOR R. FEBRES LIC. 3412		














# 4402.005 Aluminum Lighting Pole (6-18-2024)

Final Audit Report

2024-06-19

Created:	2024-06-18
By:	Rosalia Alverio (rosalia.alverio@lumapr.com)
Status:	Signed
Transaction ID:	CBJCHBCAABAA1np3pt7YCcN_zhqU2cMFNBmm04BI5qrc

## "4402.005 Aluminum Lighting Pole (6-18-2024)" History

-  Document created by Rosalia Alverio (rosalia.alverio@lumapr.com)  
2024-06-18 - 9:05:17 PM GMT
-  Document emailed to Rosalia Alverio (rosalia.alverio@lumapr.com) for signature  
2024-06-18 - 9:05:28 PM GMT
-  Email viewed by Rosalia Alverio (rosalia.alverio@lumapr.com)  
2024-06-18 - 9:06:02 PM GMT
-  Document e-signed by Rosalia Alverio (rosalia.alverio@lumapr.com)  
Signature Date: 2024-06-18 - 9:06:33 PM GMT - Time Source: server
-  Document emailed to Rodolfo Flores (rodolfo.floresortiz@lumapr.com) for signature  
2024-06-18 - 9:06:35 PM GMT
-  Email viewed by Rodolfo Flores (rodolfo.floresortiz@lumapr.com)  
2024-06-18 - 9:07:30 PM GMT
-  Document e-signed by Rodolfo Flores (rodolfo.floresortiz@lumapr.com)  
Signature Date: 2024-06-18 - 9:08:34 PM GMT - Time Source: server
-  Document emailed to Ricardo Castro (ricardo.castro@lumapr.com) for signature  
2024-06-18 - 9:08:36 PM GMT
-  Email viewed by Ricardo Castro (ricardo.castro@lumapr.com)  
2024-06-19 - 2:38:01 PM GMT
-  Document e-signed by Ricardo Castro (ricardo.castro@lumapr.com)  
Signature Date: 2024-06-19 - 2:38:09 PM GMT - Time Source: server
-  Agreement completed.  
2024-06-19 - 2:38:09 PM GMT