



Document Title:
Aluminum Cable, 3-C, Service-Drop

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Related/Referenced Documents

N/A

Version History

Version	Date	Revision Comments
1	Jun. 13, 2022	Initial Release
2	Feb. 14, 2024	General format modifications. Table of Compliance and Cover Page added. Models on Table 12 updated. Cable 1/0 weight corrected on Table 1. Adding requirement to include "Property of PREPA" and SFM as part of the jacket markings of all Items. Weight and strength modified on Table 1 for all Items.



Item Version History

Warehouse Catalog #	Asset Suite #	Version	Date
042-00788	37631	8	2/14/2024
042-00408	37627	5	2/14/2024
042-00994	56731	8	2/14/2024
042-00440	37629	8	2/14/2024
042-00804	37632	6	2/14/2024



1. Introduction

This is a general specification that covers the minimum requirements for aluminum (AAC or AAAC with bare neutral ACSR), 600 V, triplex cable to be used in 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 electrical and mechanical characteristics of the equipment/material.

2. Special Requirements

- 2.1. Samples shall be furnished as requested by LUMA Energy. All documented testing required by applicable specifications and standards shall be submitted with product samples, including mechanical and electrical drawings, prior to approval. Vendors that have supplied this equipment/material to LUMA Energy on previous orders will not have to furnish samples at bid opening. If any material or design changes were made to an approved product, it must be re-submitted to the material specification engineer for approval before shipping.
- 2.2. Upon inspection of incoming equipment/material, the purchaser reserves the right to refuse product shipments and to determine the acceptability or rejection of product received. The Supplier shall be liable for all costs incurred for products that are refused/rejected.
- 2.3. The equipment/material will be received at the LUMA's general warehouse (011) at Palo Seco, Puerto Rico. Shipping will include transportation and unloading at the indicated warehouse.
- 2.4. Vendor shall submit two (2) quotes: one for conductor on steel reel and another for conductor on wood reel. See detail of reels in section 6.

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 equipment, drawings, documented testing, and instructions for use and installation. Failure to submit documents on time will cause bidder disqualification.

4. Markings

- 4.1. Reels and coils shall be marked outside with LUMA Energy's purchase order, item number, description of wire & specification date, code name, net length & size, gross & tare weights, and manufacturer's name & lot/production number.
- 4.2. Packaging labels and tags shall be waterproof.

5. Compatible to

- 5.1. For compatible supplier and model see Table 1.
- 5.2. These models are examples of the equipment/material described in this document and do not represent a preference. LUMA will evaluate equally any model not listed here during any acquisition event.

6. Packaging

- 6.1. 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.
- 6.2. Cables #2, #1/0 & 3/0 shall be shipped continuously in a non-returnable new reel (for cable length see Table 1). Cables won't be accepted by sections less than specified on table 1.
- 6.3. Cables #4 & #6 shall be palletized respectively and shipped in individual plastic wrapped coils (for cable length see Table 1).
- 6.4. Wood reels shall be made of treated wood conforming with AWPA (U1 & T1-17), with a retention of 0.3 lbs./cu ft (4.81 kg/cu m) of pentachlorophenol or chromated-copper-arsenate (CCA).
- 6.5. Treatment material shall comply with AWPA P9.
- 6.6. Steel reel shall consist of a finishing high pressure hot phosphate wash and bonding agent, zinc chromate-iron oxide primer, and a final enamel coat to provide the necessary extra durability.
- 6.7. Reels shall have a minimum arbor hole diameter of 2.5" (6.35 cm).
- 6.8. Each end of the conductor shall be firmly and properly secured to reel.
- 6.9. Reels shall be protected against damage in ordinary handling and shipping.
 - a. Manufacturer shall protect the upper layers with pieces of wood along the transverse section of reel for conductor protection NEMA level 2 wrapping of protective material.
 - b. Manufacturer shall protect conductor ends from water entrance or damage by means of an adequate seal.
- 6.10. Other types of reels will be evaluated by Luma Energy.

7. Number Per Package (Logistics)

- 7.1. See Table 1 for length per reel/coils or as requested by LUMA.
- 7.2. For cables #4 and #6 will be sixteen (16) coils each in a wooden pallet or as requested by LUMA.

8. Acceptance Criteria

- 8.1. Test required: certified by external laboratories.
- 8.2. Product shall be manufactured in accordance with the latest issue ANSI/ASTM, APWA, NEMA, and ICEA specifications. When conflicts occur between purchaser's specifications and the ANSI/ASTM, AWPA, NEMA, or ICEA specifications, the purchaser's specification shall prevail.
- 8.3. Latest applicable codes, standards, and other regulations:
 - a. ANSI/ASTM B230: For aluminum 1350–H19 (extra hard) round wire for electrical purposes.
 - b. ANSI/ASTM B231: For concentric lay stranded aluminum 1350 conductors.
 - c. ANSI/ASTM B232: For concentric-lay-stranded aluminum conductors, coated-steel reinforced (ACSR), made from round aluminum 1350-H19 wires and round, coated steel core wire for use as overhead electrical conductors.
 - d. ANSI/ASTMB398: For aluminum-alloy 6201-T81 and 6201-T83 wire for electrical purposes.
 - e. ANSI/ASTMB399: For concentric-lay-stranded aluminum-alloy 6201-T81 conductors.
 - f. AWPA P9: For solvents and formulations for organic preservative systems.
 - g. AWPA U1 & T1: For wood treatment.
 - h. ICEA S-76-474: Applies to the materials, constructions, and testing of assemblies or single conductors intended for field lashing, of extruded dielectric insulated electric current **carrying phase conductors and bare or covered neutral electrical conductors** used as weather resistant wires and cables suspended from supporting structures for the overhead distribution of electrical energy.
 - i. NEMA Standard Publication No. WC 26 – Binational Wire and Cable Packaging Standard.

9. Description

- 9.1. These cables are used for service-drop installations.
- 9.2. The service-drop cable shall consist of three (triplex) concentric lay stranded aluminum conductors in accordance with ASTM B399:
 - a. Two of them shall be seven (7) strands each, AAC or AAAC 1350 H19 grade hard-drawn in accordance with ASTM B230/231, with a cross-link polyethylene (XLP) insulation (see Table 1 for thickness) in accordance with ICEA S-76-474.
 - b. The other one is for neutral and shall be bare ACSR 6/1 strands in accordance with ASTM B232 or AAAC 6201-T81, seven (7) strands in accordance with ASTM B398.
 - c. The two insulated conductors shall be twisted around the bare one.
- 9.3. The cable shall be rated at 600V and a maximum temperature of 90°C (194°F).
- 9.4. The outside cable jacket markings shall include “Property of PREPA”, sequential footage marks (SFM), and all required markings as per the applicable standards and regulations. The supplier shall provide an example of the final legend at bid opening.
- 9.5. For package, neutral ultimate strength, insulation thickness, ampere rating, and weight see Table 1.

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/materials were found later to be defective.

11. Warranty

The cable shall be designed and manufactured to provide a minimum life expectancy of 40 years. Replacement costs associated with premature conductor failure due to inadequate design or faulty manufacturing is to be the responsibility of the supplier/manufacturer. The supplier/manufacturer shall guarantee that each part of the finished cable has been manufactured in accordance with the requirements of the referenced specifications and standards. The supplier/manufacturer shall agree to replace any length of cable for two years after date of delivery if defective material or workmanship is found during installation or if the cable fails from normal use during its first year of service. In either case, the supplier/manufacturer shall be given a reasonable opportunity to inspect such defect or failure. A technical report detailing the cause(s) of the defect and the corrective measures implemented to prevent recurrence shall be provided upon request of the purchaser.



12. Table 1: Warehouse and Asset Suite Identification Number

Item	Warehouse Catalog #	Asset Suite #	Package	Neutral Approx. Breaking Strength	Insulation Approx. Thickness	Amp Rating	Weight/ 1000 ft	Compatible Supplier & Model
Cable 6 AWG	042-00788	37631	500 ft (152.4 m) per coil	1,190 lbf (5.29 kN)	45 mils (1.14 mm)	85	117 lbs (174 kg/km)	Viakon (Voluta) AWG (Voluta/XLP)
Cable 4 AWG	042-00408	37627	500 ft (152.4 m) per coil	1,862 lbf (8.28 kN)	45 mils (1.14 mm)	115	176 lbs (262 kg/km)	Viakon (Periwinkle) AWG (Periwinkle/XLP)
Cable 2 AWG	042-00994	56731	1,000 ft (304.8 m) per reel	2,845 lbf (12.66 kN)	45 mils (1.14 mm)	150	267 lbs (398 kg/km)	Viakon (Conch) AWG (Conch/XLP)
Cable 1/0 AWG	042-00440	37629	1,000 ft (304.8 m) per reel	4,380 lbf (19.48 kN)	60 mils (1.52 mm)	205	432 lbs (644 kg/km)	Viakon (Neritina) AWG (Neritina/XLP)
Cable 3/0 AWG	042-00804	37632	500 ft (152.4 m) per reel	6,620 lbf (29.45 kN)	60 mils (1.52 mm)	250	660 lbs (984 kg/km)	Viakon (Cherrystone) AWG (Cherrystone/XLP)

— End of Specification —



Document Title: Aluminum Cable, 3-C, Service-

Drop

Document No.: 4350.061

Department: Distribution

Appendix



Appendix 1: Table of Compliance

Line	Criteria	Description	Pass/Fail (P / F)	Comments
1	Specification	The Proponent complies with the corresponding specification document (4350.061).		
2	Industry Standards	The Proponent complies with the industry standards established in the specification document (ANSI/ASTM, AWWA, ICEA).		
3	Type	Triplex for service drop.		
4	Material	Two AAC or AAAC 1350 H19 with insulating jacket.		
		One ACSR or AAAC 6201-T81 bare.		
		Jacket: XLP		
5	Product Requirement	The two insulated cables twisted around the bare one.		
		Concentric Lay Stranded.		
		Rated for 600V and 90°C.		
		Ampacity Rating as per Table 1.		
		Ultimate Strength as per Table 1.		
		Insulation thickness as per Table 1.		
		Strands: 7 for AAC or AAAC and 6/1 for ACSR.		
Jacket markings including "Property of PREPA", SFM, and all required as per the applicable standards and regulations.				











4350.061 AI Cable 3C Service Drop (2-14-24)

Final Audit Report

2024-02-14

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