GUAM POWER AUTHORITY
P.O. BOX 2977
AGANA, GUAM 96932

TRANSMISSION & DISTRIBUTION SPECIFICATION

SPECIFICATION NO. E-024

FOR

SECONDARY UNDERGROUND CABLE 600V

EFFECTIVE DATE: 5-22-24	ISSUED:	APPROVED:

SECONDARY UNDERGROUND CABLE 600V

TABLE OF CONTENTS

1.0 SCOPE

1.1 This specification covers GPA requirements for single or triplexed assembled secondary underground conductors rated at 600 Volts.

1.2 The cable shall be suitable for use in wet and dry locations in underground conduits or direct earth burials.

1.3 The cable shall be operated at normal conductor temperatures not exceeding 90°C. The emergency rating will be 130°C for periods, which will not exceed 100 hours per year. For the life of the cable, there shall be no more than five occurrences of 100-hour overload periods.

2.0 APPLICABLE PUBLICATIONS

2.1 The cables shall meet the latest requirements of the IPCE-NEMA Standard Publication for Crosslinked-Thermosetting-Polyethylene-Insulated Wire and Cable for the Transmission and Distribution of Electrical Energy, IPCEA Pub. No. S-66-524, NEMA Pub. No. WC7.

2.2 Except as specified herein, the cables shall equal or exceed the latest requirements of all applicable industry conductor, insulation and cable standards and specifications, i.e., ANSI, ASTM, EEI, IPCEA, NEMA and Underwriter's Laboratory.

3.0 DEVIATIONS AND NON-CONFORMANCE REQUIREMENTS

3.1 All deviations from this specification must be specified in writing by the vendor and submitted as part of their bid submittal prior to bid opening. Failure to provide this information may be grounds for immediate bid rejection.

3.2 Deviations from this specification or changes in the material or design after the purchase order has been placed must be approved by the GPA Engineering department and acknowledged by a Purchase Order Amendment issued by GPA.

3.3 Units received with deviations or non-conformances that are not acknowledged per Section 3.1 are subject to rejection. The Supplier of rejected units is responsible for any corrective action including but not limited to materials, labor and transportation necessary to dispose of or make the units conform to the specification.

3.4 Notification of defective units discovered before or after installation that are believed to be inherent to manufacturing problems or workmanship shall be made and forwarded to the Supplier. The description of the item, documentation of the problem and the described information, disposition and/or follow-up (as appropriate) that GPA expects from the Supplier

will be specified. The Supplier's response shall be made within thirty (30) days unless an extension is acknowledged and approved in writing by the GPA Manager of Engineering.

4.0 SUBMITTALS

4.1 The bidder shall provide with their bid catalog cuts, part numbers, shop drawings, and other relevant information necessary to evaluate the submittal.

4.2 Upon award of bid, vendor shall provide final shop drawings to GPA for review and approval. GPA shall be allowed two (2) weeks to review and approve documents without affecting the shipping date. Delays in delivery due to drawings that are disapproved during this review period are the responsibility of the Vendor/Supplier.

4.3 Drawings returned to the Vendor/Supplier as approved shall be considered authorization to proceed with the work. The approval of GPA shall in no way abrogate the requirements of this specification.

5.0 CERTIFIED LABORATORY TEST REPORTS

5.1 Certified tests shall be conducted in accordance with applicable standards. The Supplier shall furnish two (2) copies of certified test reports for all tests to the GPA Manager of Engineering within two (2) weeks of delivery along with a statement certifying that the cable meets all the requirements of the applicable standards and this specification.

5.2 All tests required by this specification and latest ICPEA Publication No. S-66-624 shall be performed.

5.3 Each reel of completed cable shall withstand a 60-Hertz AC test voltage for a period of five minutes in accordance with Paragraphs 3.6 and 6.14 of latest IPCEA S-66-524.

5.4 Single conductor cables shall be immersed in water for at least six hours, and multiple conductor cables for at least one hour prior to insulation resistance testing. Cables shall be tested in accordance with Paragraph 6.15 of IPCEA S-66-524.

6.0 DESIGN AND CONSTRUCTION

6.1 CONDUCTOR

6.1.1 The cable shall be supplied in accordance with the data shown in the attached Tables A and B.

6.1.2 Copper wire shall be annealed copper.

6.1.3 The stranding shall be Class B concentric.

6.1.4 For multiplex underground cable, the neutral conductor shall be insulated.

6.1.5 Conductor size shall be in accordance with Table A for single conductor and Table B for Triplex Conductor. This shall be as specified on the Purchase Order.

6.2 INSULATION

6.2.1 The insulation shall be high quality, black (yellow or white for neutral conductor), extruded thermosetting crosslinked polyethylene of high dielectric strength and electrical stability. The insulation shall have excellent heat, moisture, ozone, and corona-resistant properties.

6.2.2 The insulation shall be applied in one continuous extrusion and shall be homogenous, solid and applied with good workmanship. It shall be free stripping from the conductor.

6.2.3 If a polyester film or similar thin separator is used between the conductor and insulation, it shall be nonhygroscopic, colored and shall be clearly recognizable.

6.2.4 The thickness of the insulation shall be in accordance with Table A and Table B.

6.2.5 Insulation shall not crack when stored outdoors.

6.3 IDENTIFICATION OF CABLE

6.3.1 Each cable shall incorporate a durable lifetime identification which shall include the manufacturer's name, year of manufacture, insulation type, voltage, conductor size, conductor material, and sequential footage marker, all at intervals of not more than two feet printed on the outer surface of the insulation.

6.3.2 The insulation color for the neutral conductor of multiple conductor cables shall be yellow or white.

6.4 REELS

6.4.1 The inner drum end of the cable, when allowed to project through the flange of the reel shall be protected to avoid injury to the cable or cable seal.

6.4.2 Reels shall be designated to support the weight of the cable and withstand handling in accordance with industry practices. Reels shall be steel.

6.4.3 The mandrel hole size shall be three inches, minimum.

6.4.4 A durable, non-fading label shall be securely attached to a flange of the reel. The label shall plainly indicate the following:

A. GPA Purchase Order number
B. Shipping length in feet of the cable on the reel
C. Beginning and ending sequential footage number
D. Number, type, thickness and size of conductor
E. Thickness and type of insulation
F. Voltage rating
G. Tare weight

6.4.5 Each reel shall be marked with an arrow and suitable stenciled wording, on the flange of the reel, indicating the direction the reel should be rolled.

7.0 QUALITY CONTROL

7.1 The Supplier shall have a quality control program to ensure compliance with the requirements of this specification. The program shall be documented and available for GPA's review if requested.

7.2 Documentation of the quality control program shall indicate where in the production and manufacturing process the quality checks are taken, describe the purpose of the checks, and describe the nature of the check, e.g. if check is visual only or if electrical or mechanical testing is used.

8.0 PACKING AND SHIPPING

8.1 Each end of each length of cable shall be durably sealed before shipment to prevent entrance of moisture. Evidence of water in the cable as received shall be cause for rejection.

8.2 The cable shall be placed on the reels in such a manner that it will be protected from injury during shipment. Care shall be taken to prevent the reeled cable from becoming loose. Each end of the cable shall be firmly and properly secured to the reel.

8.3 The reels shall be lagged or covered with suitable material to provide physical protection for the cables during transit and during ordinary handling operations and storage. GPA Engineering shall approve the materials and system used to accomplish this.

8.4 The reels shall be securely blocked in position so that they will not shift during transit.

8.5 The Supplier shall have adequate work and inspection instructions for handling, interim storage, preservation, packaging, and shipping to protect the quality of the cable and prevent damage, loss and deterioration.

9.0

TABLE A. SINGLE CONDUCTOR

CONDUCTOR			Approximate Dimension		AMPACITY
Size: AWG or KCMIL	No. of Strands	Insulation Thickness (MILS)	Net. Wt. (Lbs/M Ft)	O.D. (Inches)	90°C (In Ducts)
12	Solid	45	28	.17	-
10	Solid	45	42	.19	-
8	Solid	60	68	.25	50
12	7	45	30	0.18	40
10	7	45	44	0.21	55
8	7	60	71	0.27	80
6	7	60	106	0.31	105
4	7	60	159	0.36	140
2	7	60	243	0.42	190
1	19	80	312	0.50	220
1/0	19	80	386	0.54	260
2/0	19	80	477	0.58	300
4/0	19	80	736	0.69	405
250	37	95	875	0.76	455
500	37	95	1690	0.99	700
750	61	110	2516	1.21	885
1000	61	110	3321	1.36	1055

TABLE B. TRIPLEX CONDUCTOR

Phase Conductor			Neutral Conductor			Dimension		Ampacity (Amps)
Size (AWG)	No. of Strands	Insulation Thickness (MILS)	Size (AWG)	No. of Strands	Insulation Thickness (MILS)	O.D. (Inches)	Weight Per 1000 Feet (Lbs)	In Ducts
2	7	60	2	7	60	0.87	721	130
2/0	19	80	2/0	19	80	1.23	1,428	195