



GUAM POWER AUTHORITY
AGANA, GUAM

SPECIFICATION No. E-044

REVISION: 1
October 23, 2009

PREPARED BY THE ENGINEERING DEPT.

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

TRANSMISSION & DISTRIBUTION SPECIFICATION

SPECIFICATION NO. E-044

FOR

**CROSSARMS: WOODEN
8 FOOT AND 10 FOOT**

EFFECTIVE DATE: 10/23/09	ISSUED: <i>[Signature]</i>	APPROVED: <i>[Signature]</i>
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1.0 SCOPE

- 1.1 This specification covers GPA requirements for 8' and 10' wooden crossarms used in GPA's Transmission and Distribution System.
- 1.2 The wooden crossarms are intended for use in tropical weather conditions with a corrosive sea air atmosphere, sustained winds of 155 miles per hour with gusts to 180 miles per hour and subject to moderate to severe earthquakes.

2.0 APPLICABLE PUBLICATIONS

The wooden crossarms must meet the requirements of the following standards, including the latest revision with respect to material, design and tests.

- 2.1 RURAL ELECTRIC ADMINISTRATION (REA)
BULLETIN 1728H-701
- 2.2 AMERICAN WOOD PROTECTION ASSOCIATION (AWPA) BOOK OF
STANDARDS 1991

3.0 DEVIATIONS AND NON-CONFORMANCE REQUIREMENTS

- 3.1 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.
- 3.2 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.
- 3.3 Notification of defective units discovered before or after installation that are believed to be inherent to manufacturing problems or workmanship must 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 must 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 bidders shall provide with their bid catalogs cuts, part numbers and other relevant information necessary to evaluate the submittal.
- 4.2 GPA shall be allowed two (2) weeks to review and approve documents provided in Section 4.1 without affecting the shipping date. Delays in delivery due to drawings that are disapproved during this review period are the responsibility of the Supplier.
- 4.3 Documents returned to the 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.

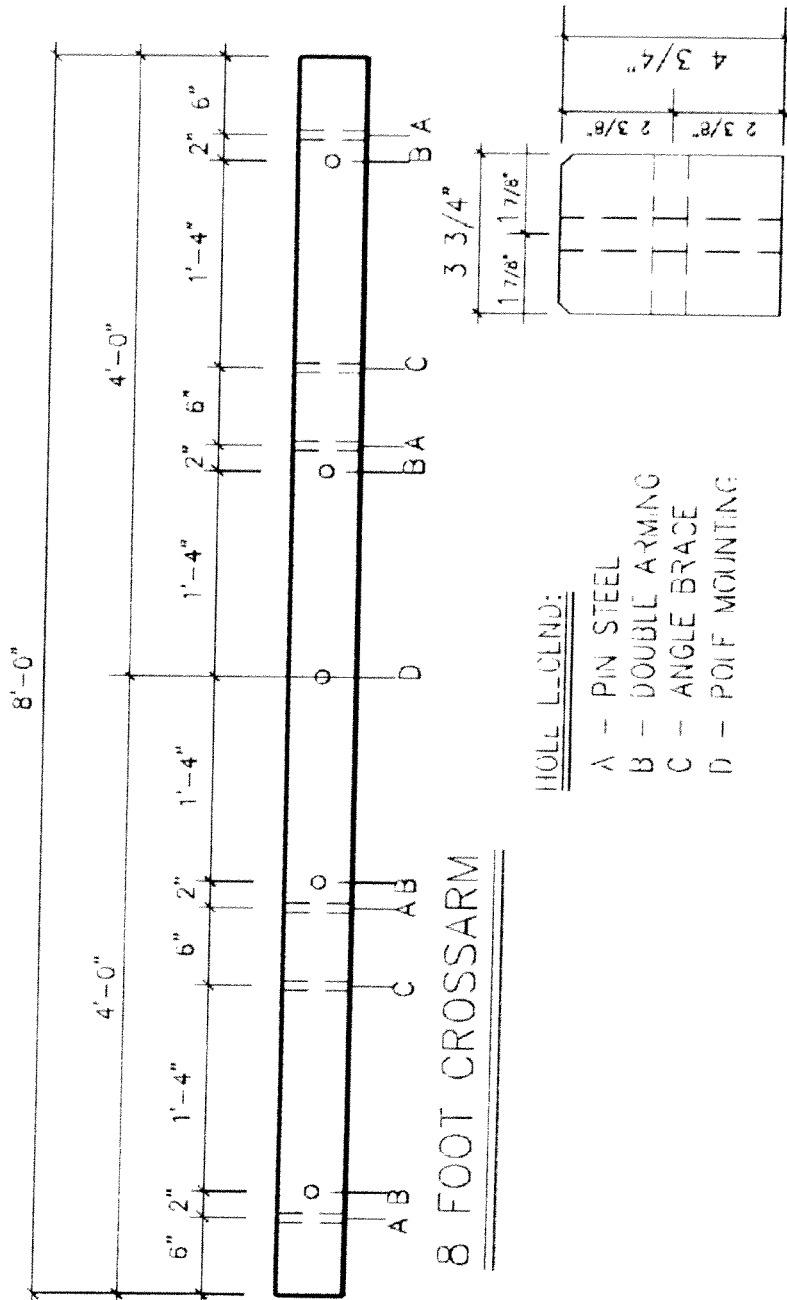
5.0 DESIGN

- 5.1 The dimensions and drilling details of crossarms must conform to the drawings as shown in Figures 1 and 2.
- 5.2 Holes must be smoothly bored with no splintering. The center of the hole must be perpendicular to the start and finishing faces.
- 5.3 The shape of the crossarms at any cross section must have the two top edges rounded to a 3/8 inch radius.
- 5.4 The bottom edges of the crossarms shall be slightly eased the entire length to a 1/8 inch radius.
- 5.5 Lateral surfaces of the crossarms must be incised approximately 1/4 inch deep. Their spacing must guarantee consistent application of preservative.
- 5.6 All holes shall be drilled on center lines before treating.
- 5.7 For 8 foot crossarms, all holes shall be 11/16" diameter except the angle brace holes which shall be 9/16" diameter.
- 5.8 For 10 foot crossarms, double arming holes shall be 13/16" diameter. Pin steel and pole mounting holes shall be 11/16" diameter. Angle brace holes shall be 11/16" diameter.

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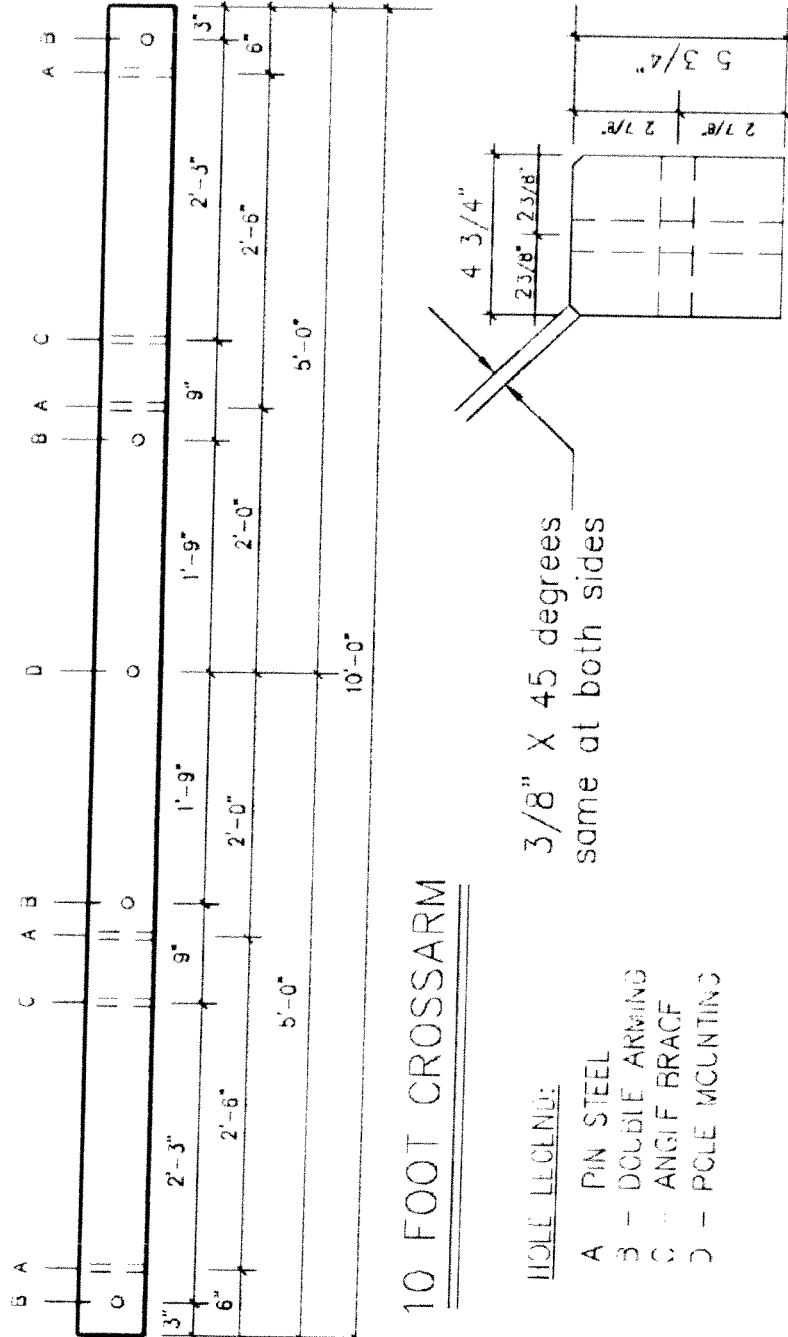


8 Foot Wood Crossarm Detail
Figure 1

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10 Foot Wood Crossarm Detail
Figure 2

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6.0 PRESERVATIVES

- 6.1 The preservative shall be either Creosote or Pentachlorophenol.
- 6.2 Pentachlorophenol must contain not less than 95 percent chlorinated phenols and must conform to AWWA Standard P8.
- 6.3 Creosote must conform to the requirements of AWWA Standard P1.

7.0 CONDITIONING PRIOR TO TREATMENT

- 7.1 Crossarms must be made of lumber which has been kiln-dried with a moisture content of 20 percent or less when dry.
- 7.2 Moisture content shall be measured at $\frac{1}{4}$ the length and $\frac{1}{5}$ the depth of the crossarm's thickness.
- 7.3 A minimum of 20 crossarms per treating charge must be measured to verify moisture content.

8.0 PRESERVATIVE TREATMENT

- 8.1 Timber products must be treated by either a pressure or a thermal process with the preservative.
- 8.2 Materials shall be conditioned by steaming or heating in hot oil with the following limits:
 - Steam: 3 hours maximum at 220 degrees F.
 - Hot oil: 3 hours maximum at 210 degrees F.
- 8.3 A final steam bath shall be performed for cleaning purposes. The duration of the bath cannot exceed 2 hours and the temperature cannot exceed 240 degrees F.
- 8.4 A quality control designee must test or supervise the testing of each treatment.
- 8.5 The preservative must penetrate 100 percent of the sapwood in crossarms.
- 8.6 A borer core sample must be taken from at least 20 crossarms for each treatment cycle to test for preservative penetration. The borings can be taken from any face except the top face.

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8.7 Crossarms cannot have any tarry, greasy, or sticky material from oil and pentachlorophenol crystallization.

8.8 Retreatment shall be done no more than two times.

9.0 MARKINGS

9.1 All crossarms must be stamped legibly and to a depth of 1/16 of an inch before treatment. Letters and figures must be at least 1/2 inch in height. The marking must include:

- a. The manufacturer's identifying symbol.
- b. Month and year of manufacture.
- c. Species of timber:
 - DF for Douglas-fir
 - SP for Southern Yellow Pine
- d. Preservative:
 - C for Creosote
 - P for Pentachlorophenol

e. Example:

M-7-09	Manufacturer – Month – Year
DF-C	Douglas-fir – creosote treated

9.2 The stamp must be placed on the wide surface of the crossarm, with letters right side up towards the top of the arm and about 1 foot from the midpoint of the arm. The mark shall be at the same location on all arms of the same type as produced by each producer.

10.0 QUALITY CONTROL

10.1 The supplier must 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.

10.2 Documentation of the quality control program must 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.

10.3 The supplier shall be available at the time of delivery to assist GPA warehouse personnel to perform quality control inspections. Inspection failures shall be grounds for rejection of the shipment in whole or in part at the discretion of the GPA representative.

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11.0 PACKING AND SHIPPING

- 11.1 The supplier must have adequate work and inspection instructions from the manufacturer for handling, storage, packing and shipping to protect the quality of the crossarms and to prevent damage, loss and deterioration of the material.
- 11.2 The crossarms must be packed with suitable materials to prevent damage and injury during shipment and handling operations.

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ISSUED: *BC*

APPROVED: *Joan M. ...*