

1. Scope

This specification covers the minimum requirements for selected solid sawn Douglas fir or Yellow cedar distribution cross-arms. Douglas fir crossarms are full length pressure treated with copper naphthenate preservative solution and Yellow cedar crossarms are untreated. Where there is conflict between this specification and any standards referred to herein, this specification shall govern. The crossarms purchased under this specification will be used in the construction of overhead electrical distribution systems.

2. Material ID Numbers and Crossarm Sizes

This specification applies to the following District crossarms:

Material ID	Reference Figure	Type	Dimensions		
			Width (d)	Height (d)	Length (f)
872558	1	2-pin	3-3/4"	4-3/4"	7'
872566	2	4-pin	3-3/4"	5-3/4"	10'
873027	3	8-pin	3-3/4"	4-3/4"	11'
872160	4	6-pin	4-3/4"	5-3/4"	13'
5001063	--	4-pin	3-3/4"	5-3/4"	10'
Dimension Tolerances: (d) ± 1/8" (f) ± 1/4"					

3. Reference Standards

Except as modified by this specification, the crossarms furnished under this specification shall comply with the pertinent parts of the latest revisions of the following standards.

ANSI O5.3 American National Standard for Wood Products - Solid Sawn-Wood Crossarms and Braces - Specifications and Dimensions

AWPA A3 Standard Methods for Determining Penetration of Preservatives and Fire Retardants

AWPA A5 Standard Methods for Analysis of Oil-Borne Preservatives

AWPA A9 Standard Method for Analysis of Treated Wood and Treating Solutions by X-Ray Spectroscopy

AWPA A11 Standard Method for Analysis of Treated Wood and Treating Solutions by Atomic Absorption Spectroscopy

AWPA P8 Standard for Oil-Borne Preservatives

AWPA P9 Standards for Solvents and Formulations for Organic Preservative Systems

AWPA M1 Standard for the Purchase of Treated Wood Products

AWPA M2 Standard for Inspection of Wood Products Treated with Preservatives

AWPA M3 Standard Quality Control Procedures for Wood Preserving Plants

AWPA M4 Standard for the Care of Preservative-Treated Wood Products

AWPA T1 Use Category System: Processing and Treatment Standards

AWPA U1 Use Category System: User Specification for Treated Wood

WCLIB No. 17 Grading Rules for West Coast Lumber

4. Definitions

ANSI American National Standards Institute

AWPA American Wood-Preservers' Association

WCLIB West Coast Lumber Inspection Bureau

5. Material

All crossarms shall be manufactured from coastal Douglas fir or Yellow cedar grown in the West Coast region in accordance with ANSI O5.3 Section 12 and the applicable parts of WCLIB Standard No. 17. Material defects and seasoning requirements shall be in accordance with these standards.

6. Manufacture

6.1 Dimensions and Tolerances

All dimensions and tolerances shall conform to those shown on the drawings which are a part of this specification.

6.2 Pin and Bolt Holes

Pin and bolt holes shall be smoothly bored without undue splintering where bits break the surface. The center of any hole shall be within 1/8-inch of the centerline locations on the face in which it appears. The holes shall be perpendicular to the starting and finishing faces.

6.3 Shape

The shape of the crossarms at any cross section, except for permissible wane, shall be as shown on the drawings which are a part of this specification. The two top edges may be chamfered or rounded 3/8-inch radius. The two bottom edges may be slightly eased the entire length, 1/8-inch radius.

6.4 Incising

The lengthwise surfaces of Douglas fir crossarms shall be incised. The incisions shall be approximately 1/4-inch deep, shall be reasonably clean cut and their spacing pattern shall ensure uniform penetration of preservative. Yellow cedar crossarms shall not be incised.

6.5 Workmanship

All crossarms shall be of first quality workmanship. Crossarms shall be dressed on four sides.

6.6 End of Arm Plates

Yellow cedar crossarms shall have end of arm plates installed to reduce checking. Shakes, splits, or throughchecks at either end of the crossarm are not permitted except for those which are orthogonal to the pin holes and limited to 3 inches in length.

7. Marking

All crossarms shall be legibly and permanently marked or branded in accordance with ANSI O5.3, section 4. Markings shall include:

- a. Manufacturer's name or symbol
- b. Year of manufacture
- c. Wood species designation "DF" for Douglas fir and "YC" for Yellow cedar
- d. Preservative designation "N" for copper naphthenate
- e. Preservative retention in pounds per cubic foot of preservative

8. Treatment

All Douglas fir crossarms treated under this specification shall be treated by a pressure process with copper naphthenate to provide protection against insect attack and damage from decay. All Yellow cedar crossarms shall be untreated.

8.1 Preservative

The only acceptable wood preservative shall be copper naphthenate. The copper naphthenate concentrate used to prepare wood preserving solutions shall contain not less than 6-percent nor more than 8-percent copper in the form of copper naphthenate and shall conform to AWPA Standard P8 when analyzed in accordance with AWPA Standard A5. The preservative shall not contain any chlorinated compounds.

8.2 Solvents and Co-Solvents

If an organic preservative system is used, the solvent and any co-solvents shall conform to AWPA Standard P9 Type A or Type C, shall have the lowest concentration of polycyclic aromatic hydrocarbons (PAHs) possible, and shall not trigger the Washington Department of Ecology carcinogenic PAH testing requirement outlined under WAC 173-340-900 (Table 830-1) or as otherwise determined by the Department of Ecology. The preservative solvents and co-solvents shall not contain any chlorinated compounds.

8.3 Penetration

Penetration by the preservative in Douglas fir crossarms shall be in accordance with AWPA Standard T1, 8.1.12, except as specified herein, as determined in accordance with AWPA Standard A3. Penetration shall be 100-percent of the sapwood. In the heartwood, penetration shall be not less than 2-1/2-inches longitudinally from the edge of holes and ends and not less than 3/16-inches deep from the surface of any incised face.

8.4 Retention

Retention of the preservative shall be 0.04 pounds per cubic foot as specified in AWPA U1, 6.A.3.0, UC3A and UC3B and as determined in accordance with AWPA Standard A5, A9 or A11.

8.5 Retreatment

Retreatment of crossarms, which initially do not meet the penetration and retention requirements of this specification, shall not be done more than twice in accordance with AWPA Standard T1, 6.

8.6 Cleanliness

After treatment, crossarms shall be reasonably clean to the touch, and shall remain so. Surfaces shall be free from tarry, greasy, or sticky material and from oil exudation.

9. Quality Control

In accordance with ANSI O5.3 section 7., inspection and determination of conformance to the requirements of this specification shall be performed by the manufacturer at the place of manufacture. The District, or a District representative, may also perform inspections at the place of manufacture, the treating plant or the delivery destination.

10. Rejection

Any crossarm found to be defective or nonconforming under this specification within 1-year after receipt by the District shall be rejected and shall be promptly replaced by the supplier at the supplier's expense.

11. Packaging

Crossarms shall be packaged in neat bundles. The bundles shall have spacer strips between each lay of arms and each bundle shall be securely bound with flat metal strapping.

12. Shipment

12.1

Shipment shall be:

FOB PUD No. 1 of Snohomish County
Operations Center Receiving
1802 75th St SW
Everett, WA 98203-6264

12.2

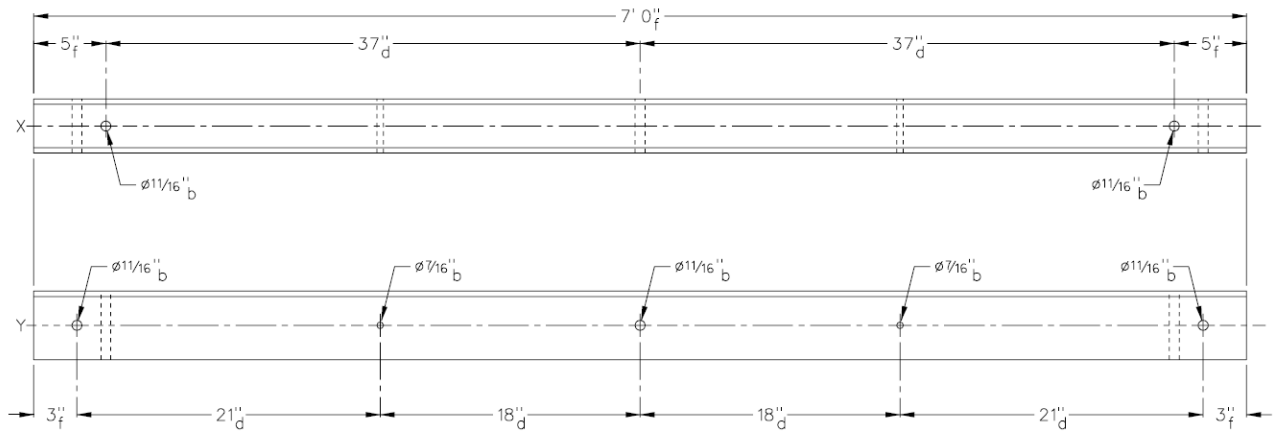
Crossarms shall be shipped on open flatbed trucks in a manner suitable for handling with a forklift. Shipping in enclosed vans is unacceptable.

13. Drawings

The crossarms furnished under this specification shall be shaped, dimensioned and framed in accordance with the drawings shown in Figures 1 through 4 on the following pages.

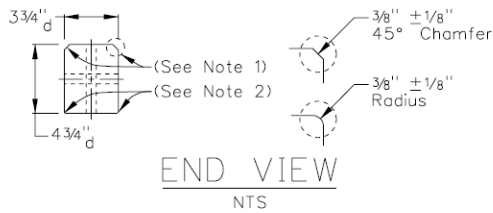
14. Figures

Figure 1: 7 Ft. 2-PIN Arm - Material ID 872558



NOTES:

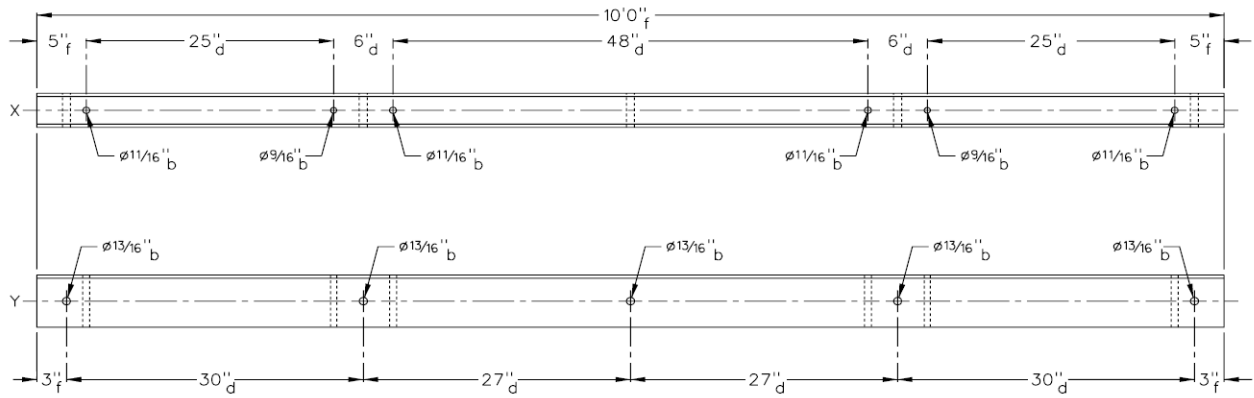
1. The two top edges (only) shall be chamfered or rounded. The manufacturer may choose the shape preferred.
2. The two bottom edges may be slightly eased for the entire length $\frac{1}{8}" \pm \frac{1}{16}"$ radius.



TOLERANCES		
Dimensional Class	Over (inch)	Under (inch)
(b)	1/32	1/32
(d)	1/8	1/8
(f)	1/4	1/4

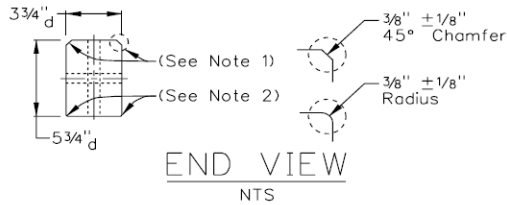
Cross-section dimensions have "d" tolerances. Center lines "X" and "Y" have "d" tolerances.

Figure 2: 10 Ft. 4-PIN Arm - Material ID 872566



NOTES:

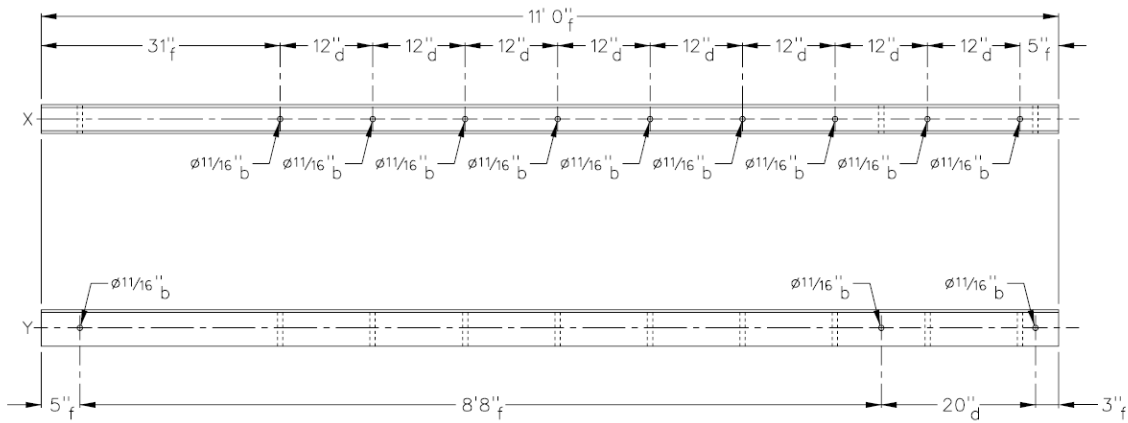
1. The two top edges (only) shall be chamfered or rounded. The manufacturer may choose the shape preferred.
2. The two bottom edges may be slightly eased for the entire length $1/8'' \pm 1/16''$ radius.



TOLERANCES		
Dimensional Class	Over (inch)	Under (inch)
(b)	1/32	1/32
(d)	1/8	1/8
(f)	1/4	1/4

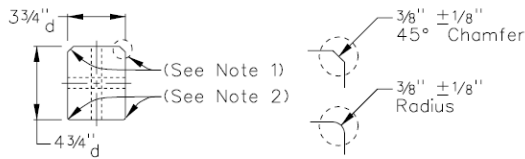
Cross-section dimensions have "d" tolerances. Center lines "X" and "Y" have "d" tolerances.

Figure 3: 11 Ft. 8-PIN Arm - Material ID 873027



NOTES:

1. The two top edges (only) shall be chamfered or rounded. The manufacturer may choose the shape preferred.
2. The two bottom edges may be slightly eased for the entire length $1/8'' \pm 1/16''$ radius.



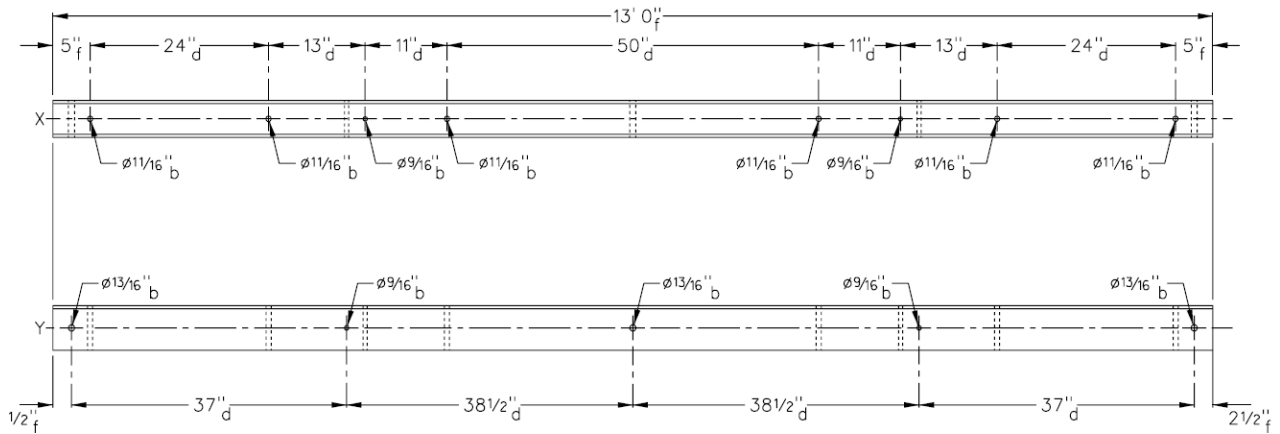
END VIEW

NTS

TOLERANCES		
Dimensional Class	Over (inch)	Under (inch)
(b)	1/32	1/32
(d)	1/8	1/8
(f)	1/4	1/4

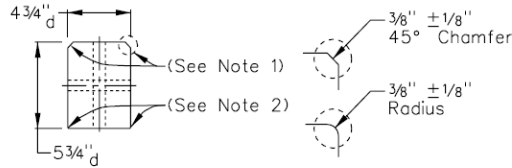
Cross-section dimensions have "d" tolerances. Center lines "X" and "Y" have "d" tolerances.

Figure 4: 13 Ft. 6-PIN Arm - Material ID 872160



NOTES:

1. The two top edges (only) shall be chamfered or rounded. The manufacturer may choose the shape preferred.
2. The two bottom edges may be slightly eased for the entire length $1/8'' \pm 1/16''$ radius.



END VIEW

NTS

TOLERANCES		
Dimensional Class	Over (inch)	Under (inch)
(b)	1/32	1/32
(d)	1/8	1/8
(f)	1/4	1/4

Cross-section dimensions have "d" tolerances. Center lines "X" and "Y" have "d" tolerances.