

**Transmission & Distribution
Material & Installation Specification**

Wood Crossarm - Wood Braces

I. Quantity

The base bid shall include the indicated quantities of the specified sizes of wood crossarms supplied and installed as hereinafter specified.

II. Material

GENERAL

A. Crossarms conforming to the Division of Power crossarm specification and approved shop drawings shall be installed as indicated on the project drawings.

PRODUCT REQUIREMENTS

- A. All materials shall be in strict compliance with the following applicable standards.
1. ANSI 05.1 - Specification and dimensions for wood pole latest revision.
 2. AWPA C-1-89 - Standard for preservative treatment by pressure process all timber products, latest revision.
 3. AWPA P-8-89 - Standards for oil-bourne preservatives.
 4. AWPA-C-9-87 - Standards for oil-bourne preservatives.
 5. REA 1728H-701 - Standard for preservative treatment by pressure process all timber products, latest revision.
- B. Species: All crossarms shall be manufactured from Douglas Fir timber, in accordance with REA specifications 1728H-701.
- C. Preservative Treatment: All crossarms shall be cured and have all manufacturing processes completed prior to treatment. Crossarms shall be cured in accordance

with the latest revision of the American Wood Preservers Association (AWPA) guidelines as published in the latest revision of their Book of Standards. Treatment shall be accomplished using a solution of pentachlorophenol, with methods, preparation and solvents as directed in the AWPA Book of Standards.

- D. Crossarm braces shall be Alumiform # RAAB-84 for alley arm construction and RA6018 for all other construction of Engineer approved equal
- E. Drilling: Dimensions and drilling shall be strictly in accordance with Division of Power drawing TDMIS-10.
- F. Retention shall be as follows:

<u>SPECIES</u>	<u>ASSAY ZONE (ins.)</u>	<u>MINIMUM RETENTION (pcfAs Pentachloropheanal)</u>
Douglas Fir	0.25-1.00	.40

Treated crossarms shall be tested for penetration and retention using AWPA Standards. Treatment reports shall be approved by the inspector and shall be furnished with the crossarm shipment.

Crossarms shall be incised to a depth of one-eighth (1/8") on all four (4) sides before treatment. Holes shall be drilled before treatment.

WARRANTY

- A. Crossarms shall be warranted for a minimum of one and one half (1 1/2) years from date of delivery and one (1) year from date of installation. Should any problems occur during the warranty period, the contractor shall, upon written notification and entirely at their expense, correct the problem by replacing the defective crossarms within sixty (60) days of receipt of the written notification.

III. Installation

- A. Single crossarms are used on straight lines where no excessive strain needs to be provided for. In general, single crossarms shall be mounted on alternative faces of the poles installed in a line (face to face and back to back). When a single crossarm is installed on the first pole from a corner or deadend it shall be mounted on the side of the pole away from the crossing or deadend. See TDMIS-10, sheet 7 & 8.

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- B. Double crossarms shall be used at line terminals, corners, angles, or at other points where there is an excessive strain. Where lines cross railroads, water or freeways, double arms shall be used, as more than ordinary safety is required at such locations. See TDMIS-10, sheet 9 & 10.
- C. Triple crossarms shall be used where spans are long, requiring the extra support of three crossarms. See TDMIS-10, sheet 11 & 12.
- D. Alley arms shall be used in alleys or other locations where it is necessary to clear buildings, etc. See TDMIS-10, sheet 5 & 6.

IV. Method of measurement

Shall be measured as completed units per each configuration detail including all materials, labor, transportation. Shall be measured as complete units for each length of crossarm with framing and will include brackets, bolts, braces, etc.

V. Basis of payment

Items	Unit	Description
TDMIS-10	Each	___ ft. wood crossarm with wood braces

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WOOD CROSSARM WOOD BRACES		
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SHEET 2 of 12		

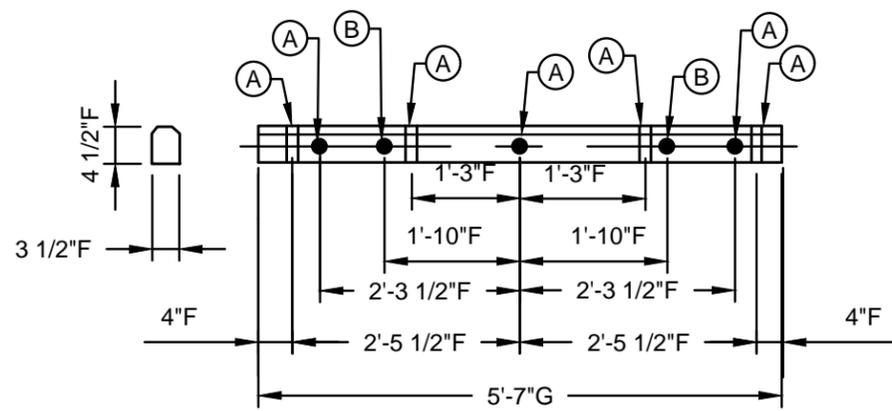
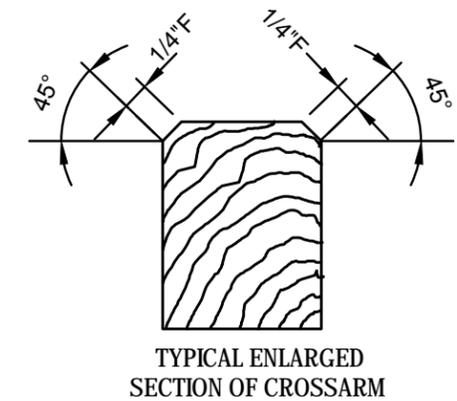


FIG. 1.

TOLERANCE SIZES OF HOLES			
NOMINAL	GO	NO GO	
(A)	11/16"	5/8"	3/4"
(B)	7/16"	3/8"	1/2"
(C)	9/16"	1/2"	5/8"
(D)	13/16"	3/4"	7/8"



TYPICAL ENLARGED SECTION OF CROSSARM

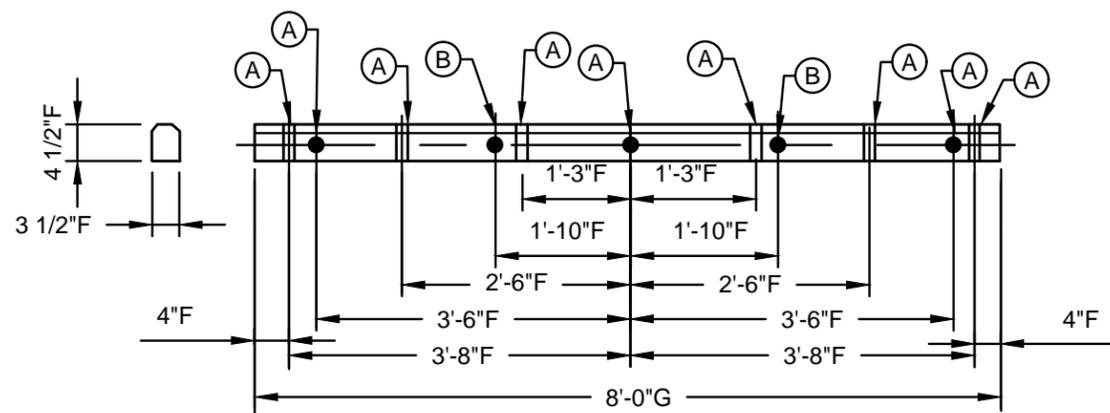


FIG. 2.

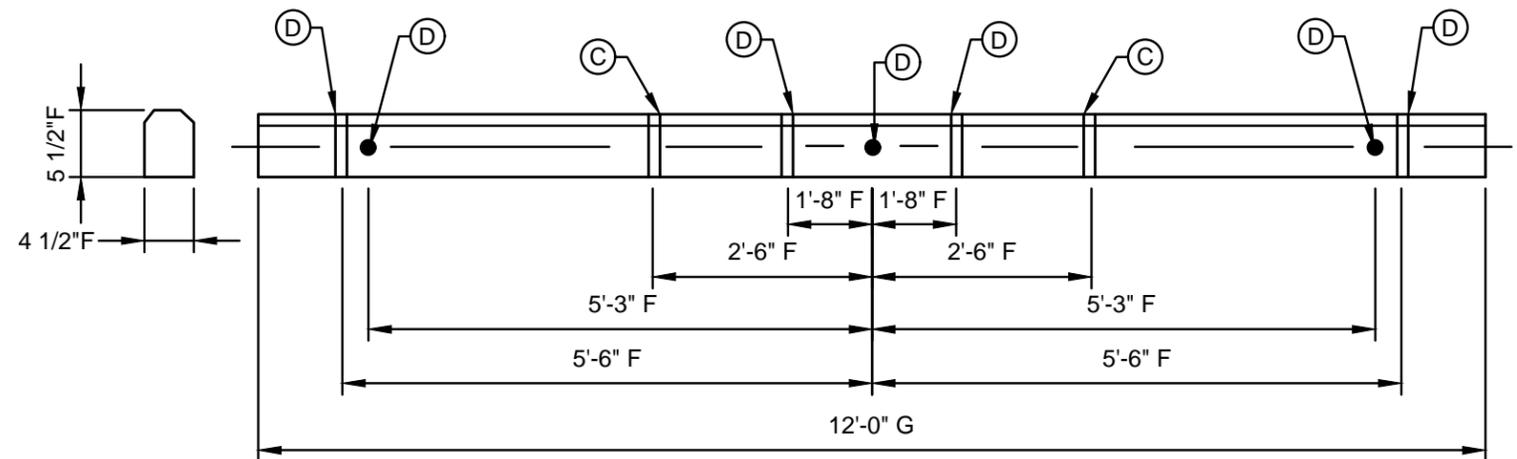


FIG. 4.

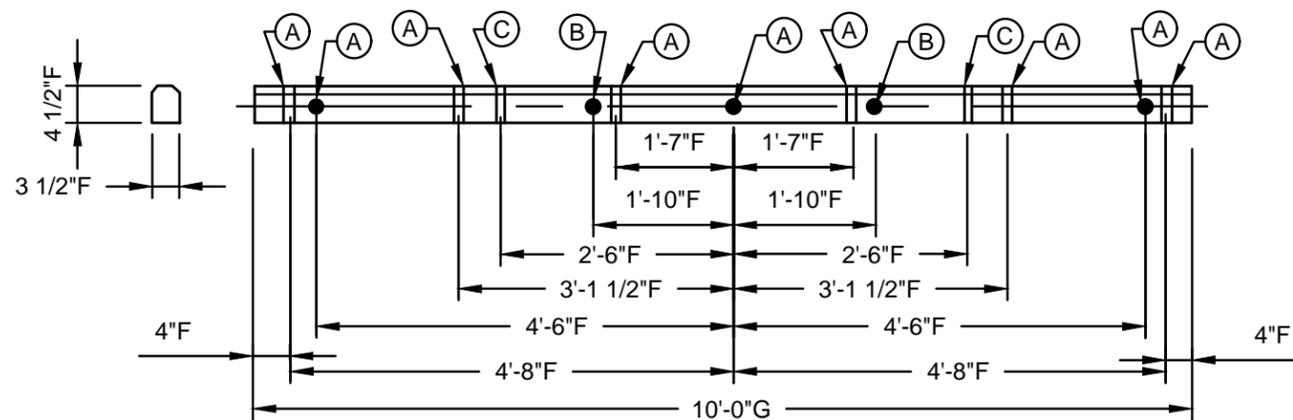
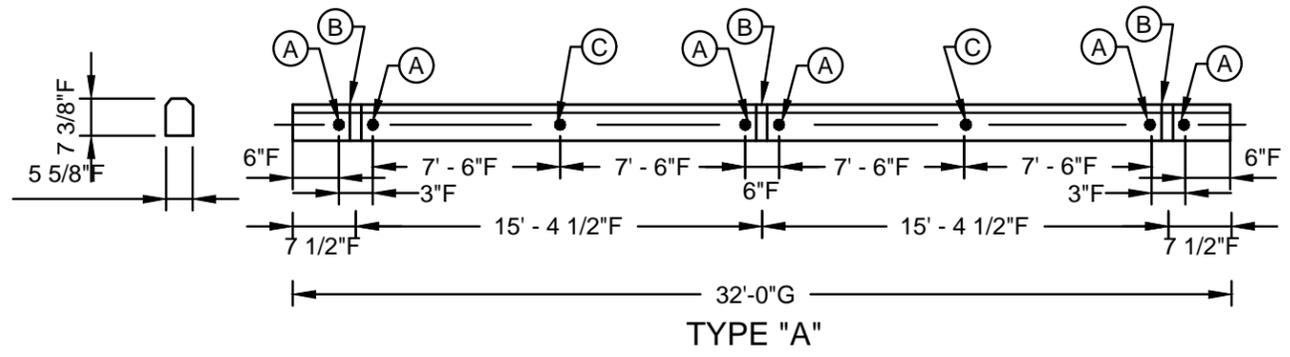


FIG. 3.

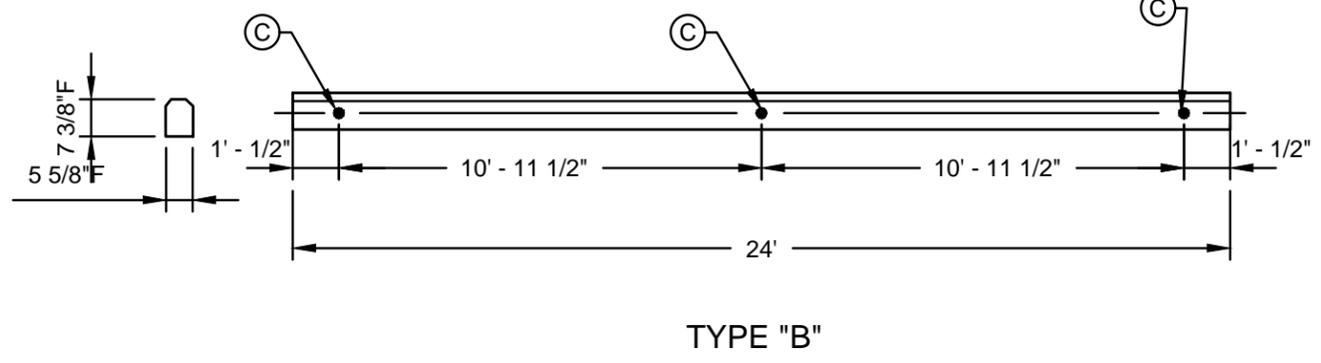
F ----- 1/8"±
G ----- 1/4"±

DETAIL 1
CROSS ARM DRILLING GUIDE- DISTRIBUTION

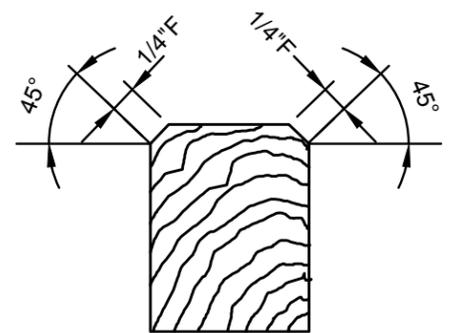
CITY OF COLUMBUS, OHIO DEPT. OF PUBLIC UTILITIES - DIVISION OF POWER		
WOOD CROSSARM DRILLING GUIDE - DISTRIBUTION 03S0040		
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TOLERANCE SIZES OF HOLES			
	NOMINAL	GO	NO GO
(A)	11/16"	5/8"	3/4"
(B)	9/16"	1/2"	5/8"
(C)	15/16"	3/4"	1"



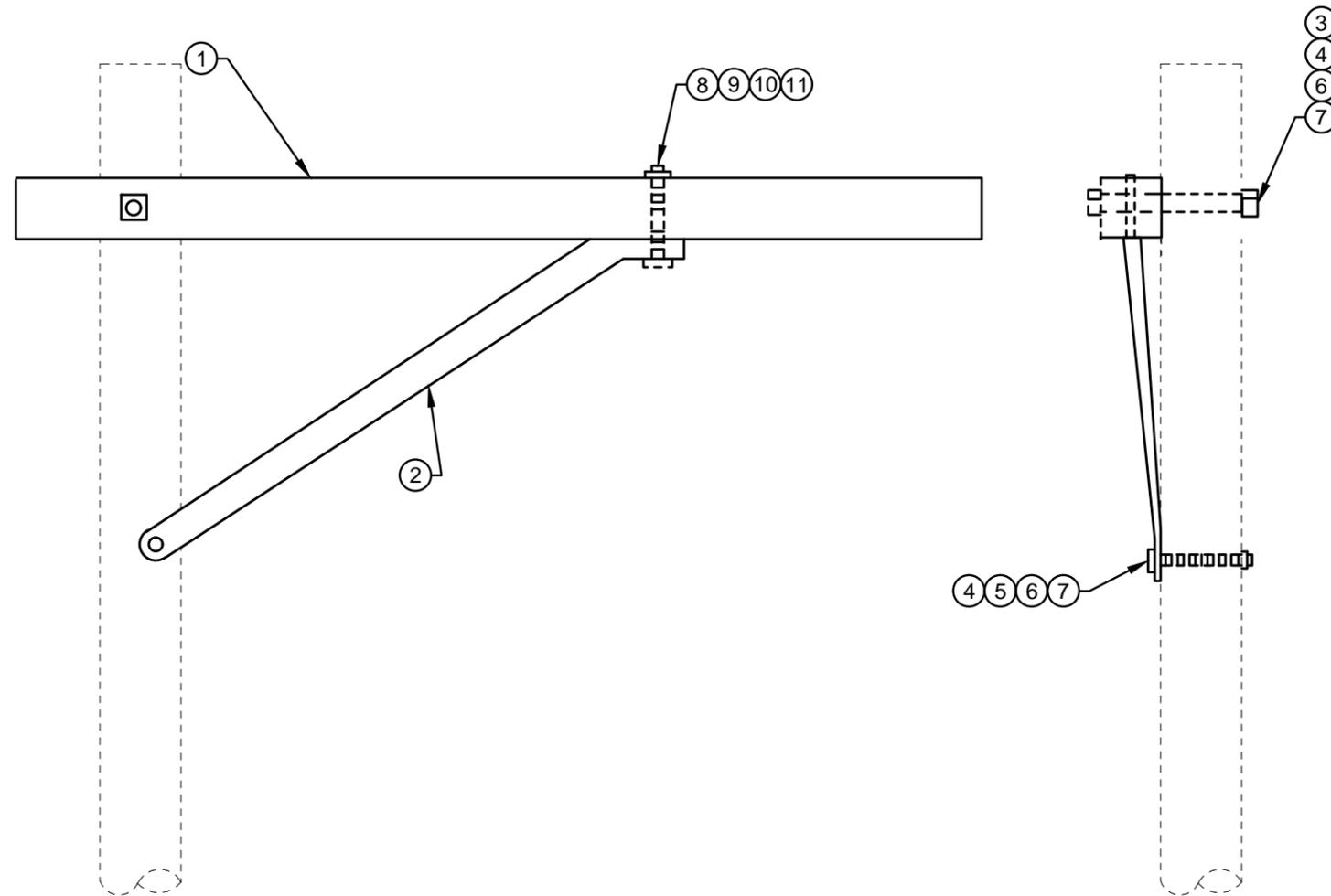
F ----- 1/8"±
 G ----- 1/4"±



TYPICAL ENLARGED SECTION OF CROSSARM

DETAIL 2
CROSS ARM DRILLING GUIDE - TRANSMISSION

CITY OF COLUMBUS, OHIO DEPT. OF PUBLIC UTILITIES - DIVISION OF POWER		
WOOD CROSSARM DRILLING GUIDE - TRANSMISSION 03S0075		
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APPROVED: R. SPRITE		
SCALE: NTS	SHEET: 4 OF 12	



DETAIL 3
ALLEY ARM WITH WOOD BRACES

SCHEDULE

ITEM #	SUFFIX NO.	LENGTH	BRACES	PART#
1	5	5'-7"	60" BRACES	19293
1	8	8'-0"	76" BRACES	19294
1	10	10'-0"	84" BRACES	19295

ITEM LIST

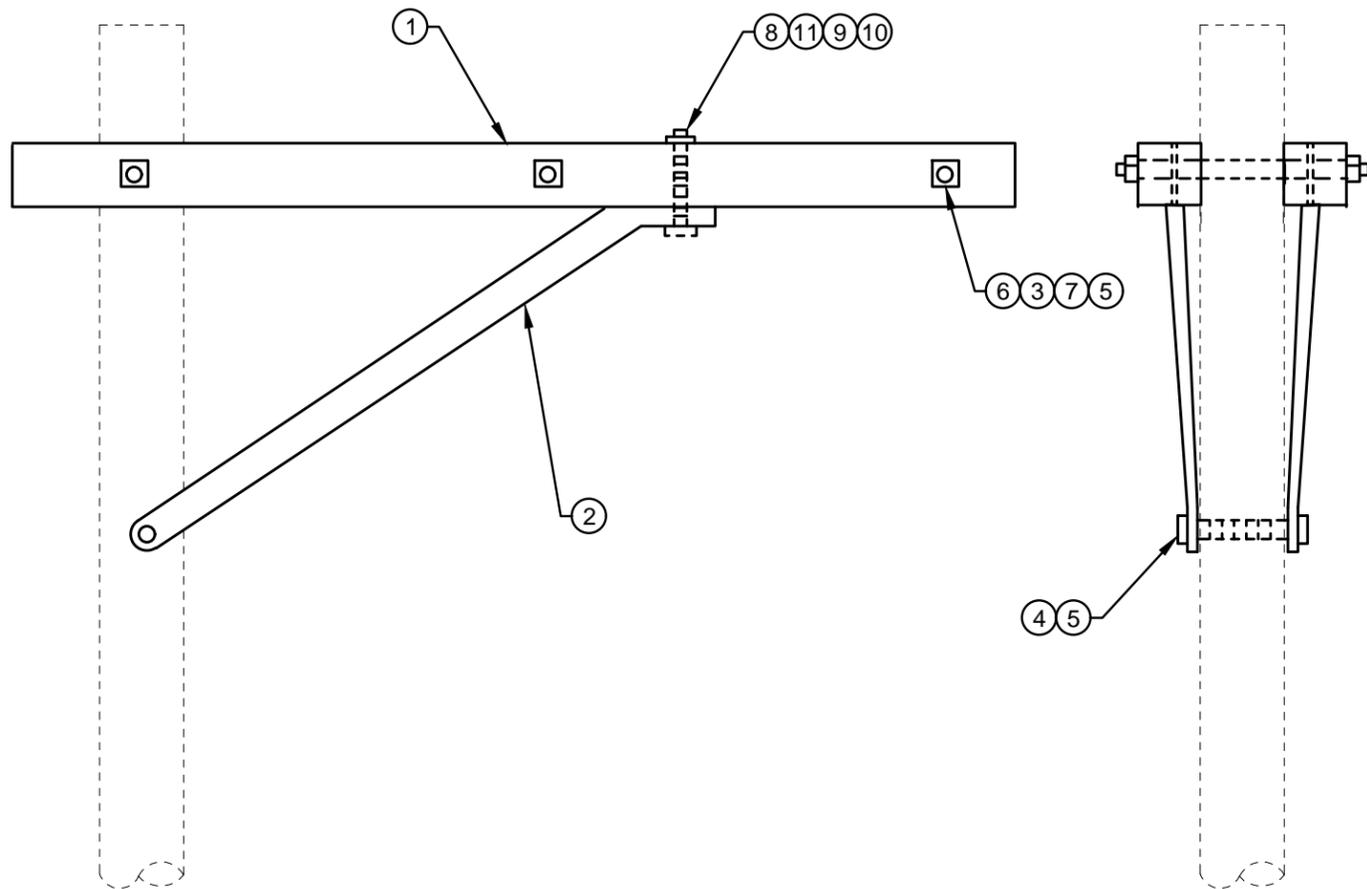
ITEM #	DESCRIPTION	PART #	QTY.
①	CROSSARM, WOODEN, 3 1/2" X 4 1/2"	SEE SCH	1
②	BRACE, WOOD	*	1
③	WASHER, SQUARE FLAT 2 1/4"X2 1/4"X3/16", 11/16" HOLE DIA.	18901	1
④	BOLT, MACHINE, 5/8" X LENGTH AS REQUIRED	42369	2
⑤	WASHER, SPRING LOCK, 11/16" DIA. HOLE, DOUBLE COIL	18895	1
⑥	WASHER, SQUARE CURVED 2 1/4"X2 1/4"X3/16", 11/16" HOLE DIA.	18897	2
⑦	NUT, SQUARE 5/8" - 11 UNC	XXXXX	2
⑧	WASHER, DOUBLE COIL SPRING LOCK, 1/2"	*	1
⑨	BOLT, MACHINE 1/2"X6"	18934	1
⑩	NUT, SQUARE 1/2" - 13 UNC	XXXXX	1
⑪	1/2" GALVANIZED ROUND WASHER	*	1

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WOOD CROSSARM
ALLEY ARM, WOOD BRACES

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SCALE: NTS SHEET: 5 OF 12

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DETAIL 4
DOUBLE ALLEY ARM WITH WOOD BRACES

SCHEDULE

ITEM #	SUFFIX NO.	LENGTH	BRACES	PART#
1	5	5'-7"	60" BRACES	19293
1	8	8'-0"	76" BRACES	19294
1	10	10'-0"	84" BRACES	19295

ITEM LIST

ITEM #	DESCRIPTION	PART #	QTY.
①	CROSSARM, WOODEN, 3 1/2" X 4 1/2"	SEE SCH	2
②	BRACE, WOOD	*	2
③	WASHER, SQUARE FLAT 2 1/4"X2 1/4"X3/16", 11/16" HOLE DIA.	18901	10
④	BOLT, MACHINE, 5/8" X LENGTH AS REQUIRED	42369	1
⑤	WASHER, SPRING LOCK, 11/16" DIA. HOLE, DOUBLE COIL	18895	6
⑥	BOLT, DOUBLE ARMING, 5/8" X LENGTH AS REQUIRED	42370	3
⑦	NUT, SQUARE 5/8" - 11 UNC	XXXXX	1
⑧	WASHER, DOUBLE COIL SPRING LOCK, 1/2"	*	2
⑨	BOLT, MACHINE 1/2"X6"	18934	2
⑩	NUT, SQUARE 1/2" - 13 UNC	XXXXX	2
⑪	1/2" GALVANIZED ROUND WASHER	*	2

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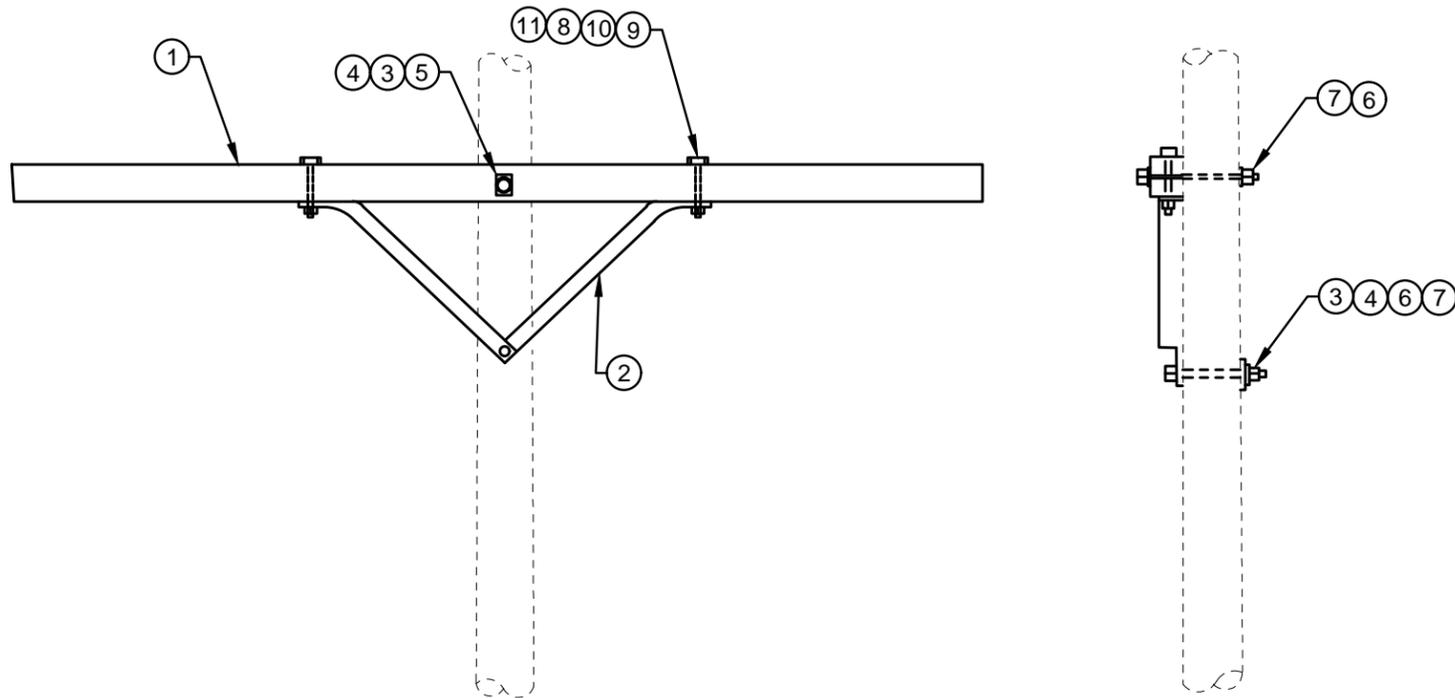
WOOD CROSSARM
DOUBLE ALLEY ARM, WOOD BRACES

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DETAIL 5
CROSSARM WITH WOOD BRACES

SCHEDULE

ITEM #	SUFFIX NO.	LENGTH	PART#
1	5	5'-7"	19293
1	8	8'-0"	19294
1	10	10'-0"	19295

ITEM LIST

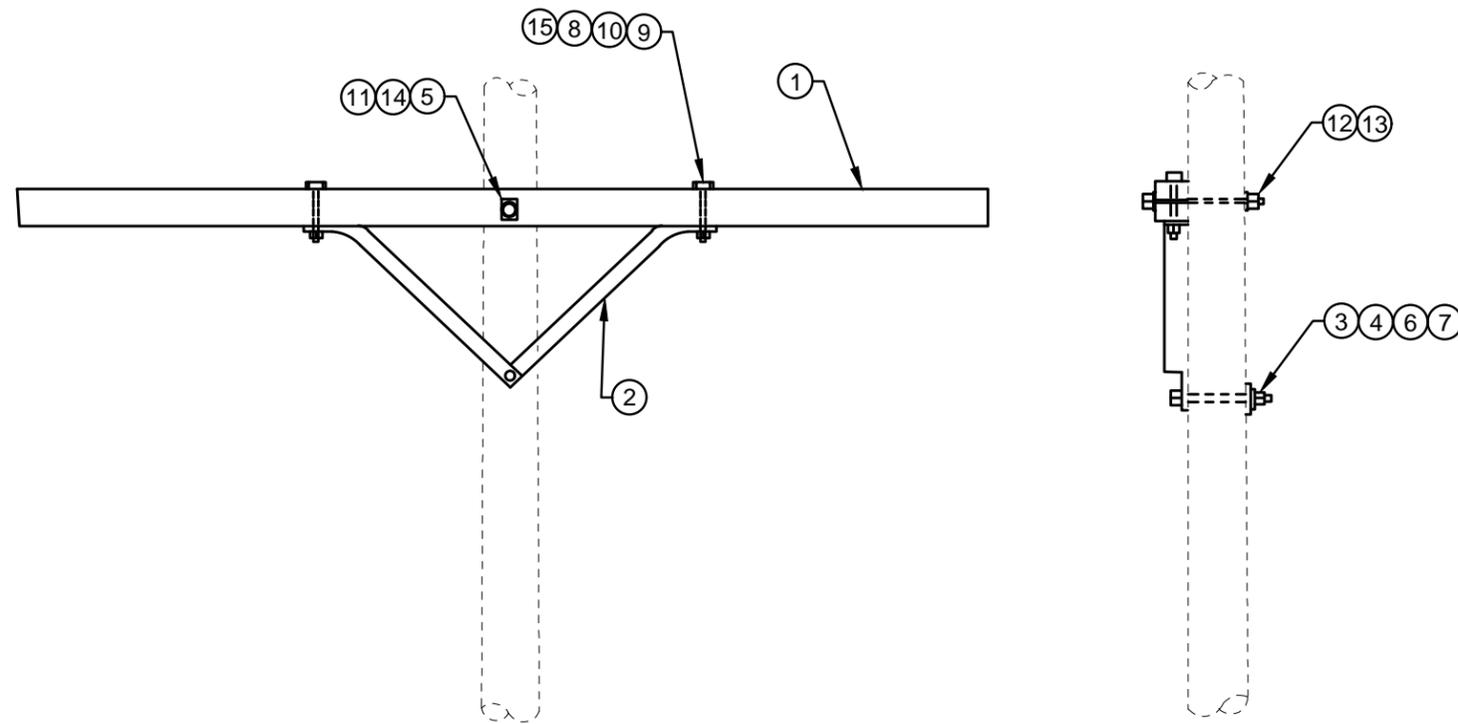
ITEM #	DESCRIPTION	PART #	QTY.
①	CROSSARM, WOODEN, 3 1/2" X 4 1/2"	SEE SCH	1
②	BRACE, WOOD	*	2
③	WASHER, SQUARE FLAT 2 1/4"X2 1/4"X3/16", 11/16" HOLE DIA.	18901	2
④	BOLT, MACHINE, 5/8" X LENGTH AS REQUIRED	42369	2
⑤	WASHER, SPRING LOCK, 11/16" DIA. HOLE, DOUBLE COIL	18895	2
⑥	WASHER, SQUARE CURVED 2 1/4"X2 1/4"X3/16", 11/16" HOLE DIA.	18897	1
⑦	NUT, SQUARE 5/8" - 11 UNC	XXXXX	2
⑧	WASHER, DOUBLE COIL SPRING LOCK, 1/2"	*	2
⑨	BOLT, MACHINE 1/2"X6"	18934	2
⑩	NUT, SQUARE 1/2" - 13 UNC	XXXXX	2
⑪	WASHER, 1/2" ROUND GALVANIZED	*	2

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WOOD CROSSARM
CROSSARM, WOOD BRACES

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DETAIL 6
CROSSARM, 12FT, WITH WOOD BRACES

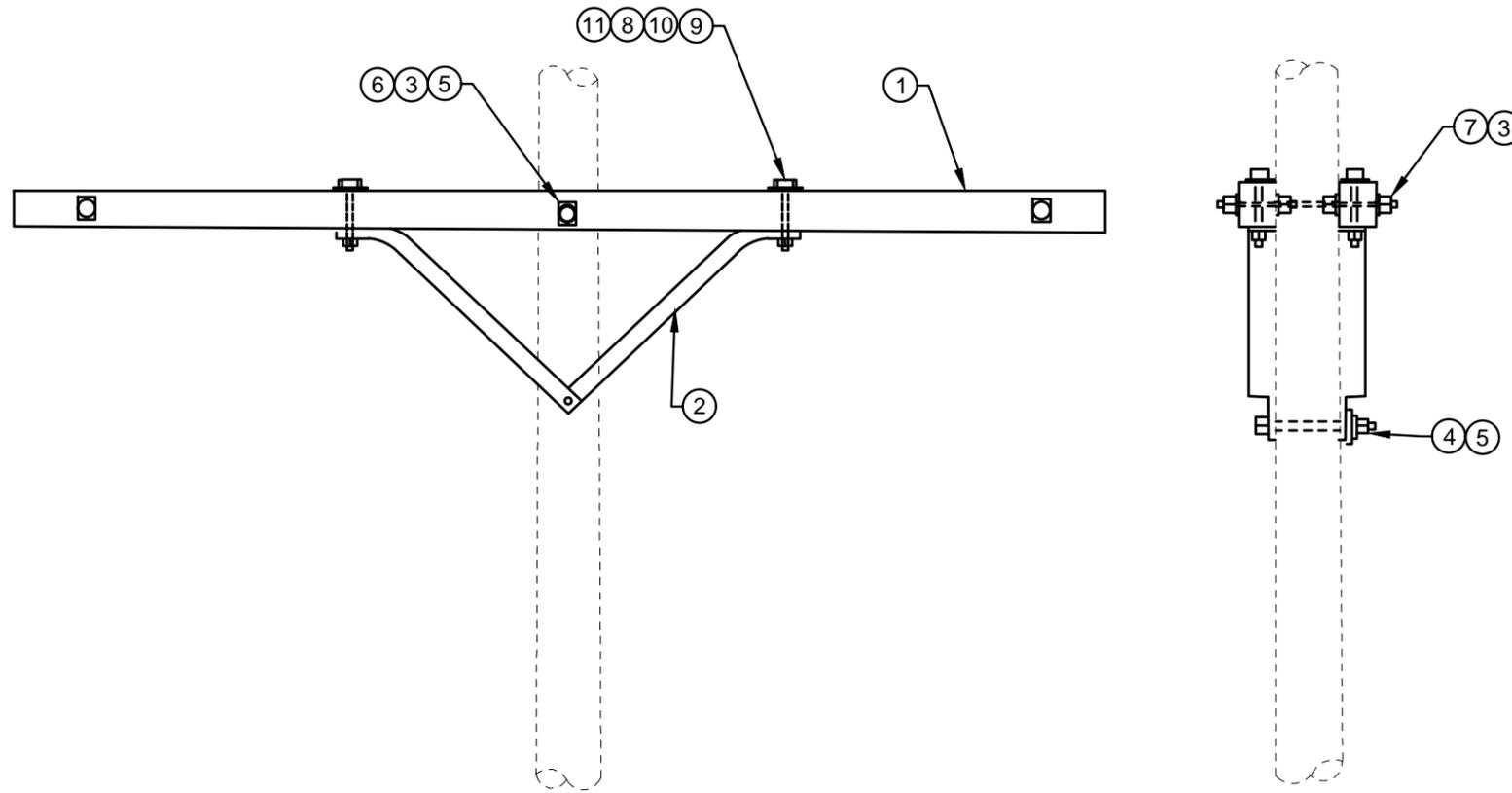
ITEM LIST			
ITEM #	DESCRIPTION	PART #	QTY.
①	CROSSARM, WOODEN, 4 1/2" X 5 1/2"X12'	19297	1
②	BRACE, WOOD	*	2
③	WASHER, SQUARE FLAT 2 1/4"X2 1/4"X3/16", 11/16" HOLE DIA.	18901	1
④	BOLT, MACHINE, 5/8" X LENGTH AS REQUIRED	42369	1
⑤	WASHER, SPRING LOCK, 13/16" DIA. HOLE, DOUBLE COIL	18894	1
⑥	WASHER, SQUARE CURVED 2 1/4"X2 1/4"X3/16", 11/16" HOLE DIA.	18897	1
⑦	NUT, SQUARE 5/8" - 11 UNC	XXXXX	1
⑧	WASHER, DOUBLE COIL SPRING LOCK, 1/2"	*	2
⑨	BOLT, MACHINE 1/2"X6"	18934	2
⑩	NUT, SQUARE 1/2" - 13 UNC	XXXXX	2
⑪	BOLT, MACHINE, 3/4" X LENGTH AS REQUIRED	42372	1
⑫	NUT, SQUARE, 3/4" - 11 UNC	XXXXX	1
⑬	WASHER, SQUARE CURVED 4"X4"X1/4", 15/16" HOLE DIA.	18900	1
⑭	WASHER, SQUARE FLAT, 4"X4"X1/4", 15/16" HOLE DIA.	18903	1
⑮	WASHER, 1/2" ROUND GALVANIZED	*	2

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WOOD CROSSARM
CROSSARM, 12FT, WOOD BRACES

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DETAIL 7
DOUBLE CROSSARM WITH WOOD BRACES

SCHEDULE			
ITEM #	SUFFIX NO.	LENGTH	PART#
1	5	5'-7"	19293
1	8	8'-0"	19294
1	10	10'-0"	19295

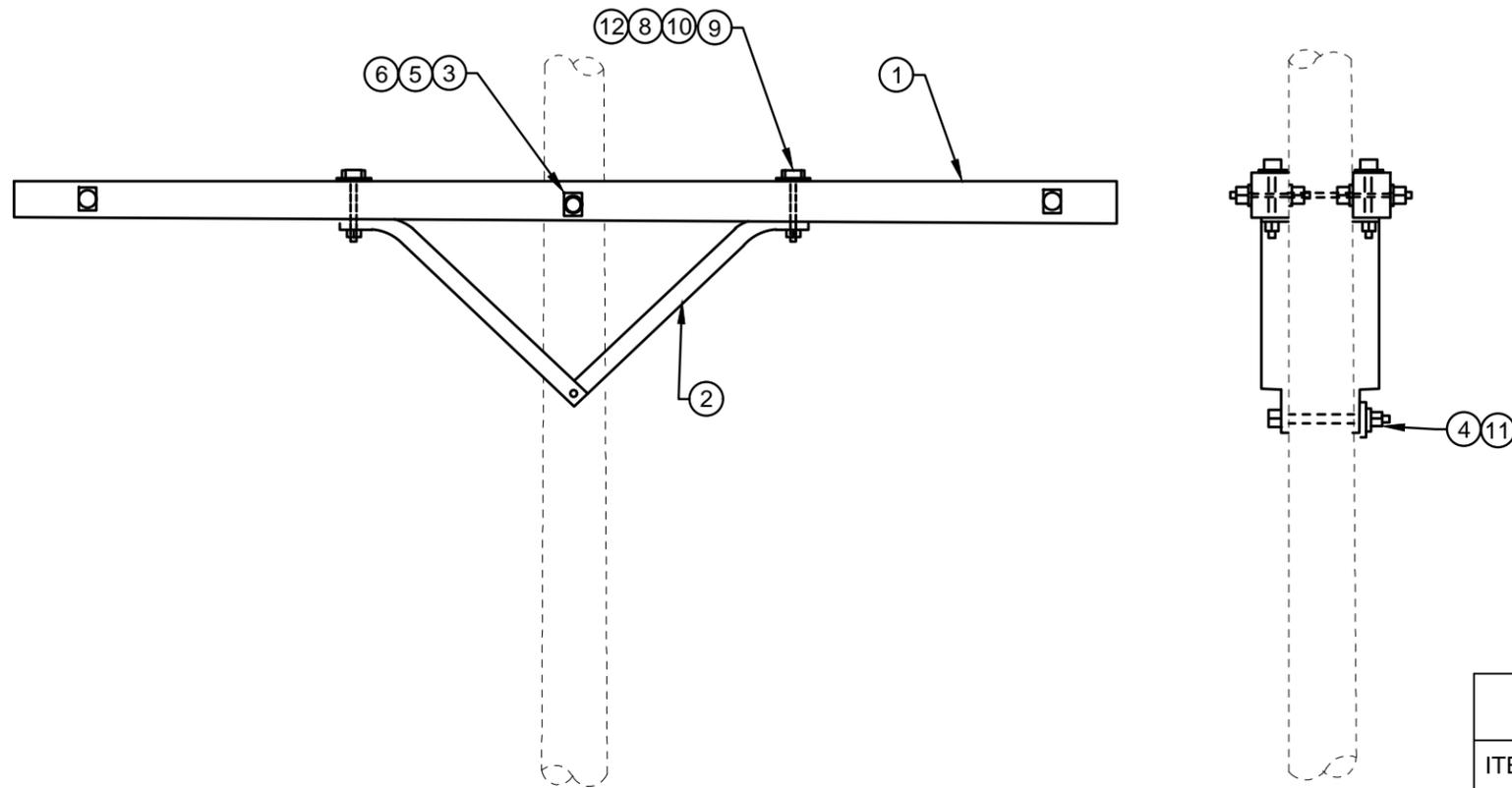
ITEM LIST			
ITEM #	DESCRIPTION	PART #	QTY.
①	CROSSARM, WOODEN, 3 1/2" X 4 1/2"	SEE SCH	2
②	BRACE, WOOD	*	4
③	WASHER, SQUARE FLAT 2 1/4"X2 1/4"X3/16", 11/16" HOLE DIA.	18901	10
④	BOLT, MACHINE, 5/8" X LENGTH AS REQUIRED	42369	1
⑤	WASHER, SPRING LOCK, 11/16" DIA. HOLE, DOUBLE COIL	18895	6
⑥	BOLT, DOUBLE ARMING, 5/8" X LENGTH AS REQUIRED	42370	3
⑦	NUT, SQUARE 5/8" - 11 UNC	XXXXX	1
⑧	WASHER, DOUBLE COIL SPRING LOCK, 1/2"	*	4
⑨	BOLT, MACHINE 1/2"X6"	18934	4
⑩	NUT, SQUARE 1/2" - 13 UNC	XXXXX	4
⑪	1/2" GALVANIZED ROUND WASHER	*	4

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WOOD CROSSARM
DOUBLE CROSSARM, WOOD BRACES

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SCALE: NTS	SHEET: 9 OF 12

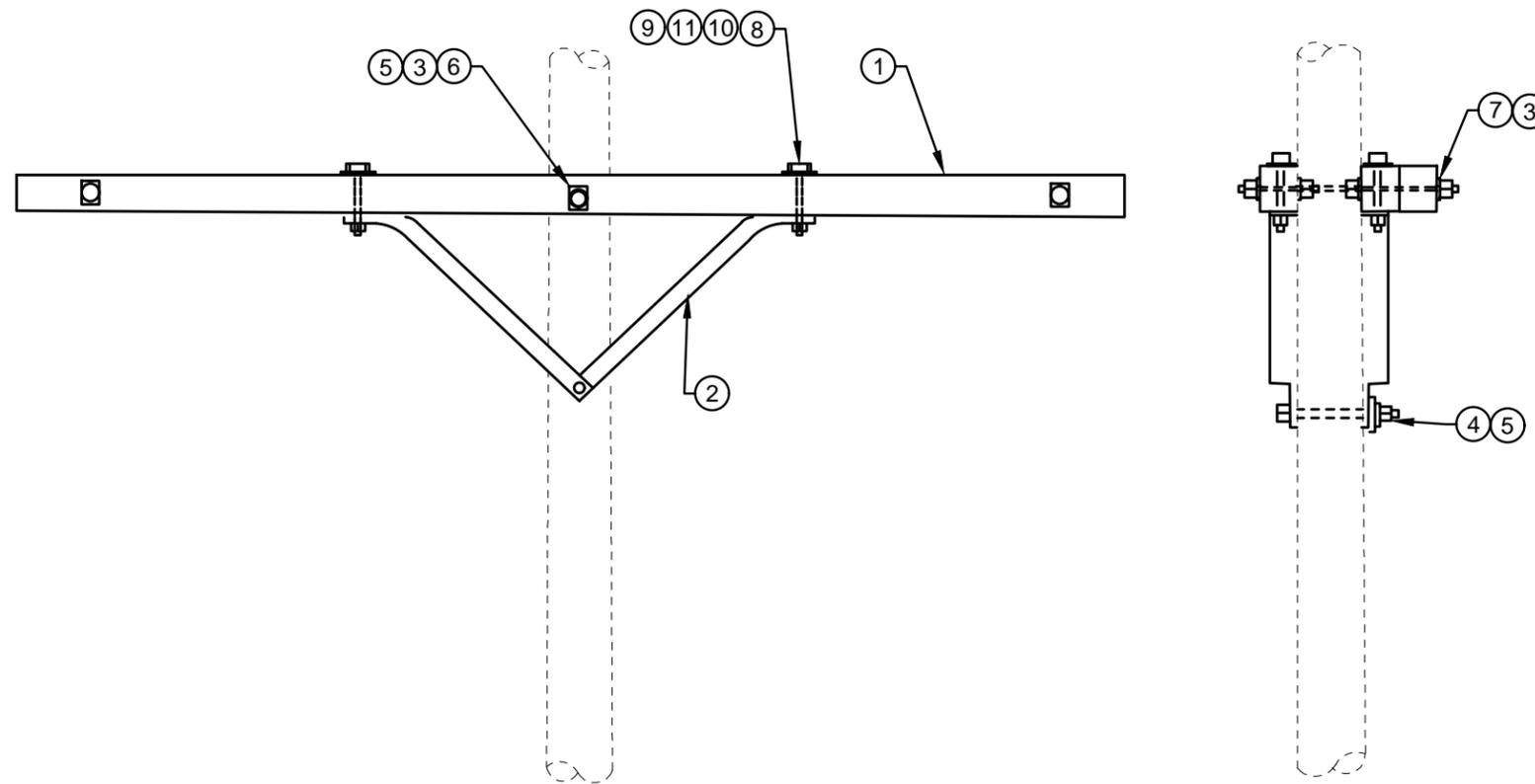
TDMIS-10



DETAIL 8
DOUBLE CROSSARM, 12FT WITH WOOD BRACES

ITEM LIST			
ITEM #	DESCRIPTION	PART #	QTY.
①	CROSSARM, WOODEN, 4 1/2" X 5 1/2"X12'	19297	2
②	BRACE, WOOD	*	4
③	WASHER, SQUARE FLAT 4"X4"X1/4", 13/16" HOLE DIA.	18905	10
④	BOLT, MACHINE, 5/8" X LENGTH AS REQUIRED	42372	1
⑤	WASHER, SPRING LOCK, 13/16" DIA. HOLE, DOUBLE COIL	18894	5
⑥	BOLT, DOUBLE ARMING, 3/4" X LENGTH AS REQUIRED	*	3
⑦	NUT, SQUARE 5/8" - 11 UNC	XXXXX	1
⑧	BOLT, MACHINE 1/2"X6"	18934	4
⑨	NUT, SQUARE 1/2" - 13 UNC	XXXXX	4
⑩	1/2" GALVANIZED ROUND WASHER	*	4
⑪	WASHER, DOUBLE COIL SPRING LOCK, 11/16" DIA. HOLE	18895	1
⑫	WASHER, DOUBLE COIL SPRING LOCK, 1/2" DIA. HOLE	*	4

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WOOD CROSSARM DOUBLE CROSSARM, 12FT, WOOD BRACES	
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APPROVED: R. SPRITE	TDMIS-10
SCALE: NTS	



DETAIL 9
TRIPLE CROSSARM WITH WOOD BRACES

SCHEDULE

ITEM #	SUFFIX NO.	LENGTH	PART#
1	5	5'-7"	19293
1	8	8'-0"	19294
1	10	10'-0"	19295

ITEM LIST

ITEM #	DESCRIPTION	PART #	QTY.
①	CROSSARM, WOODEN, 3 1/2" X 4 1/2"	SEE SCH	3
②	BRACE, WOOD	*	4
③	WASHER, SQUARE FLAT 2 1/4"X2 1/4"X3/16", 11/16" HOLE DIA.	18901	10
④	BOLT, MACHINE, 5/8" X LENGTH AS REQUIRED	42369	1
⑤	WASHER, SPRING LOCK, 11/16" DIA. HOLE, DOUBLE COIL	18895	6
⑥	BOLT, DOUBLE ARMING, 5/8" X LENGTH AS REQUIRED	42370	3
⑦	NUT, SQUARE 5/8" - 11 UNC	XXXXX	1
⑧	WASHER, DOUBLE COIL SPRING LOCK, 1/2"	*	4
⑨	BOLT, MACHINE 1/2"X6"	18934	4
⑩	NUT, SQUARE 1/2" - 13 UNC	XXXXX	4
⑪	1/2" GALVANIZED ROUND WASHER	*	4

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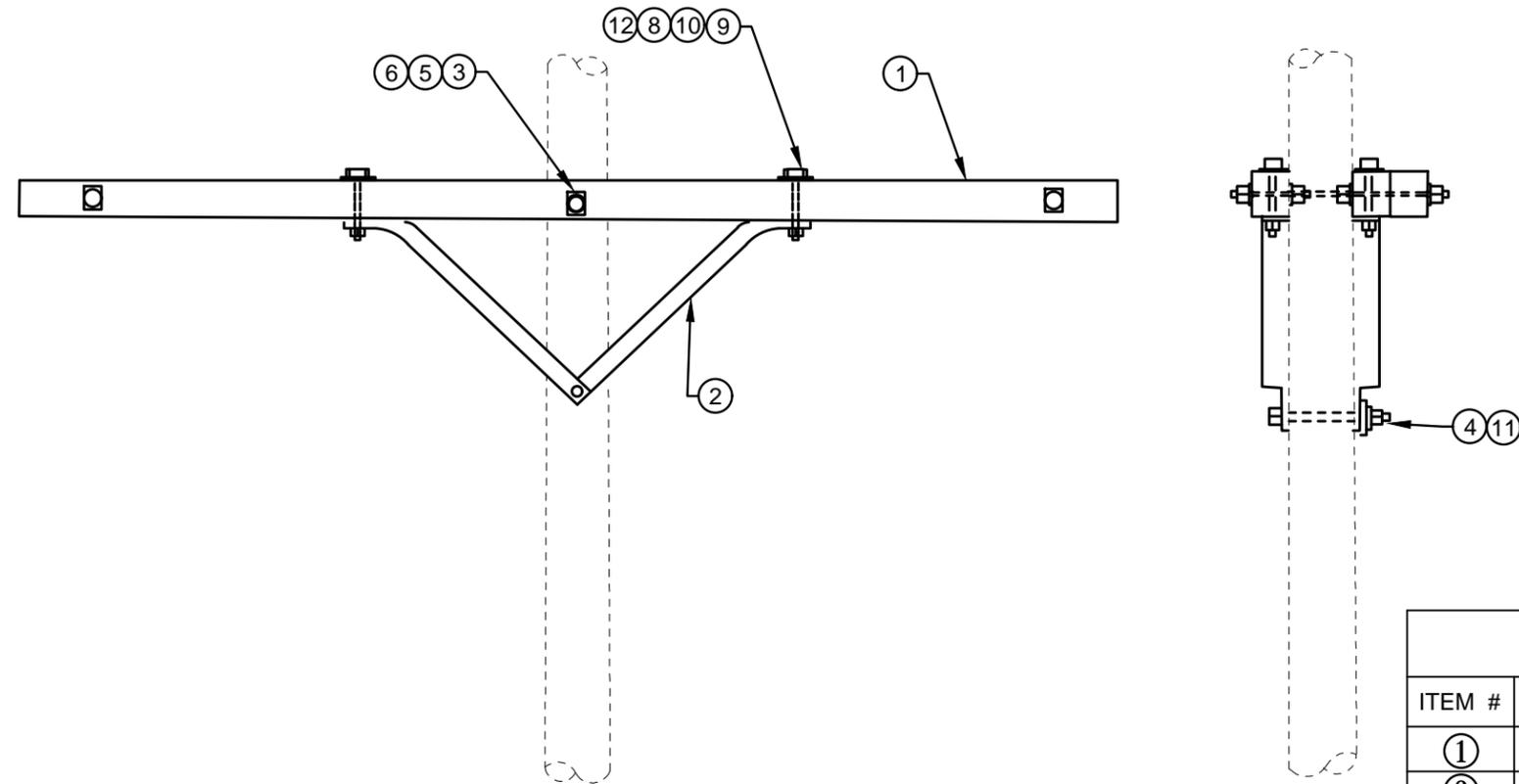
WOOD CROSSARM
TRIPLE CROSSARM, WOOD BRACES

DRAWN BY: AEC DATE: 01/01/2018

APPROVED: R. SPRITE

SCALE: NTS SHEET: 11 OF 12

TDMIS-10



DETAIL 10
TRIPLE CROSSARM, 12FT, WITH WOOD BRACES

ITEM LIST			
ITEM #	DESCRIPTION	PART #	QTY.
①	CROSSARM, WOODEN, 4 1/2" X 5 1/2"X12'	19297	3
②	BRACE, WOOD	*	4
③	WASHER, SQUARE FLAT 4"X4"X1/4", 13/16" HOLE DIA.	18905	10
④	BOLT, MACHINE, 5/8" X LENGTH AS REQUIRED	42372	1
⑤	WASHER, SPRING LOCK, 13/16" DIA. HOLE, DOUBLE COIL	18894	5
⑥	BOLT, DOUBLE ARMING, 3/4" X LENGTH AS REQUIRED	*	3
⑦	NUT, SQUARE 5/8" - 11 UNC	XXXXX	1
⑧	BOLT, MACHINE 1/2"X6"	18934	4
⑨	NUT, SQUARE 1/2" - 13 UNC	XXXXX	4
⑩	1/2" GALVANIZED ROUND WASHER	*	4
⑪	WASHER, DOUBLE COIL SPRING LOCK, 11/16" DIA. HOLE	18895	1
⑫	WASHER, DOUBLE COIL SPRING LOCK, 1/2" DIA. HOLE	*	4

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WOOD CROSSARM TRIPLE CROSSARM, 12FT, WOOD BRACES	
DRAWN BY: AEC	DATE: 01/01/2018
APPROVED: R. SPRITE	TDMIS-10
SCALE: NTS	