

**Transmission & Distribution
Material & Installation Specification**

Wood Crossarm - Steel 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 pentachlorophenal, with methods, preparation and solvents as directed in the AWPA Book of Standards.

- D. Drilling: Dimensions and drilling shall be strictly in accordance with Division of Power drawing TDMIS-11.
- E. 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-11, sheet 7 & 10.
- 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,

CITY OF COLUMBUS DEPT. OF PUBLIC UTILITIES – DIVISION OF POWER WOOD CROSSARM STEEL BRACES		
DRAWN BY: AEC	DATE: 01/01/2018	TDMIS-11
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	SHEET 1 of 12	

double arms shall be used, as more than ordinary safety is required at such locations. See TDMIS-11, sheet 8 & 11.

- C. Triple crossarms shall be used where spans are long, requiring the extra support of three crossarms. See TDMIS-11, sheet 9 & 12.
- D. Alley arms shall be used in alleys or other locations where it is necessary to clear buildings, etc. See TDMIS-11, 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-11	Each	___ ft. wood crossarm with steel braces

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WOOD CROSSARM STEEL BRACES		
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SHEET 2 of 12		

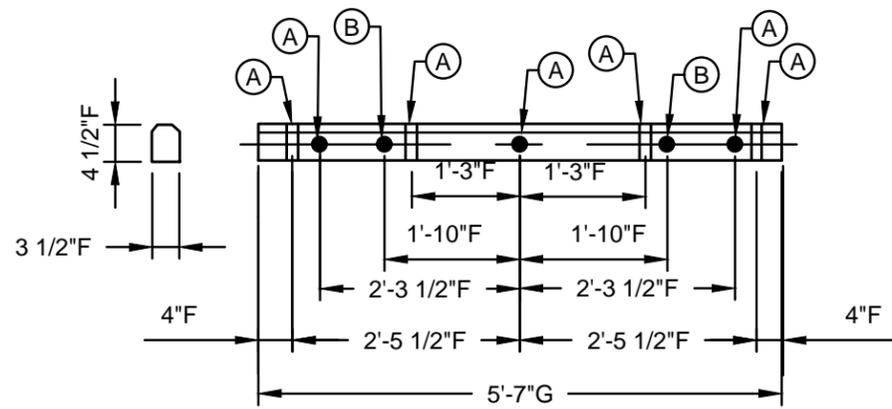
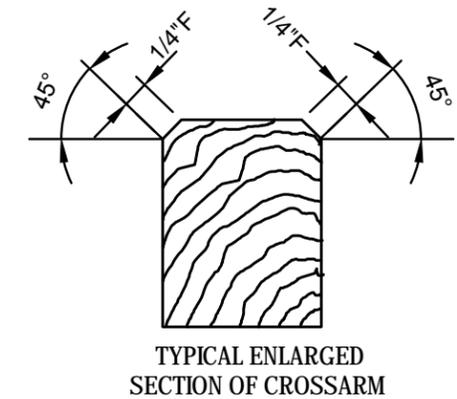


FIG. 1.

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

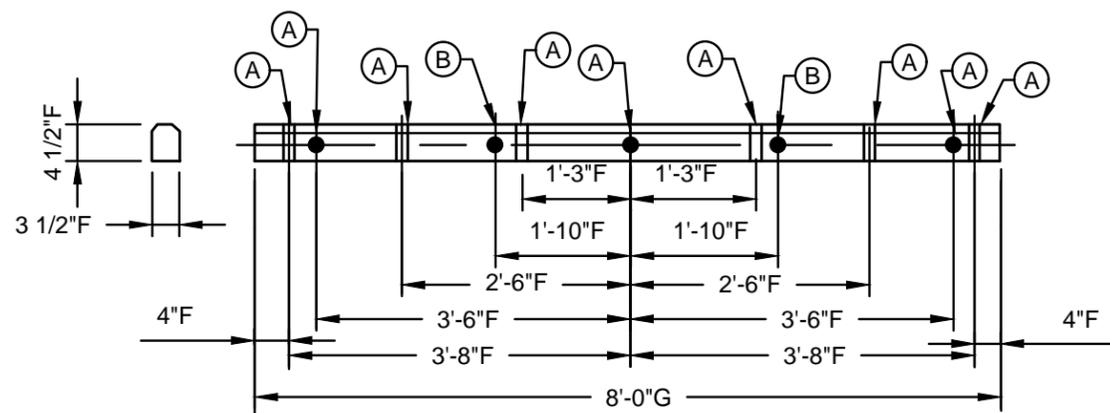


FIG. 2.

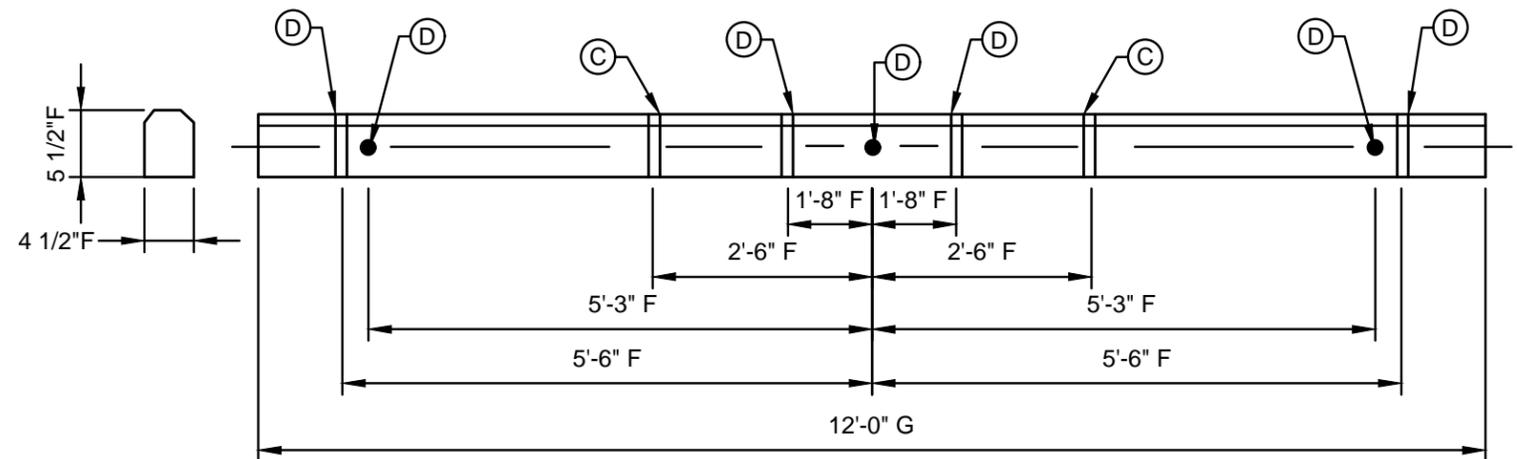


FIG. 4.

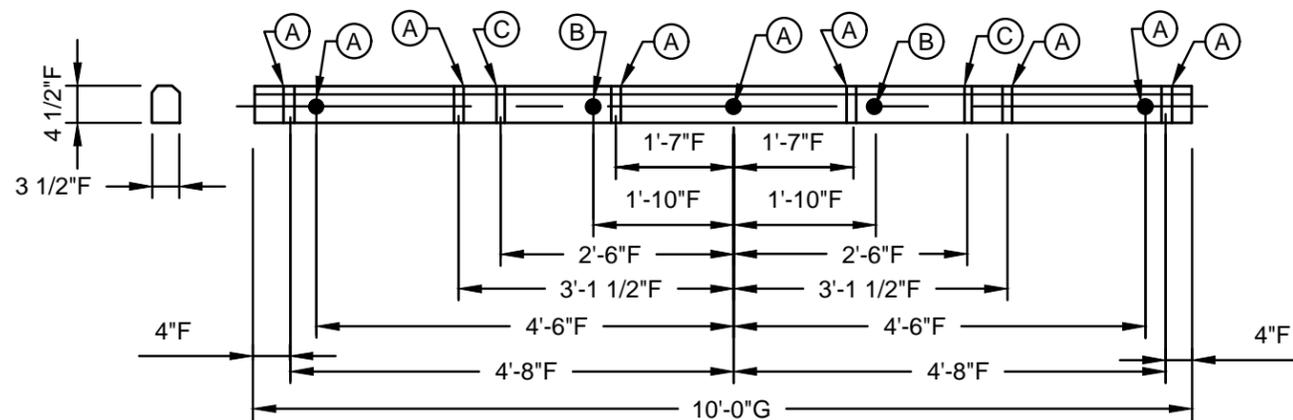
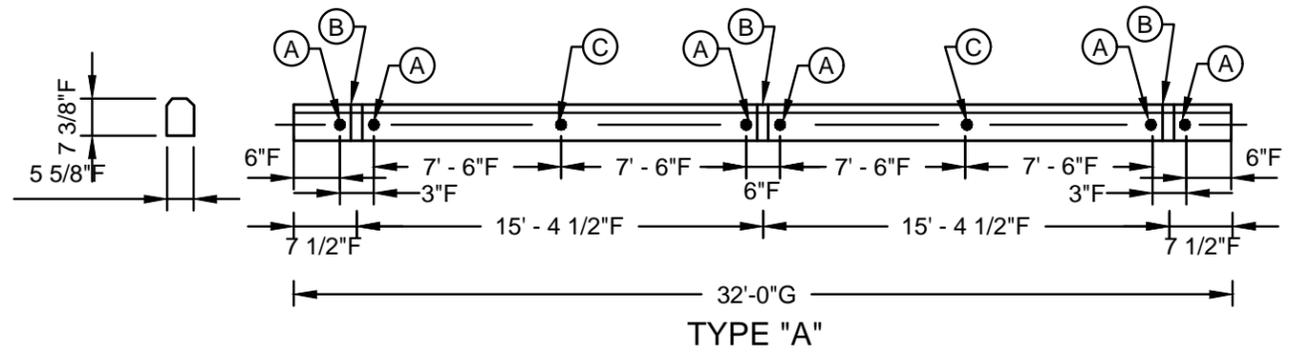


FIG. 3.

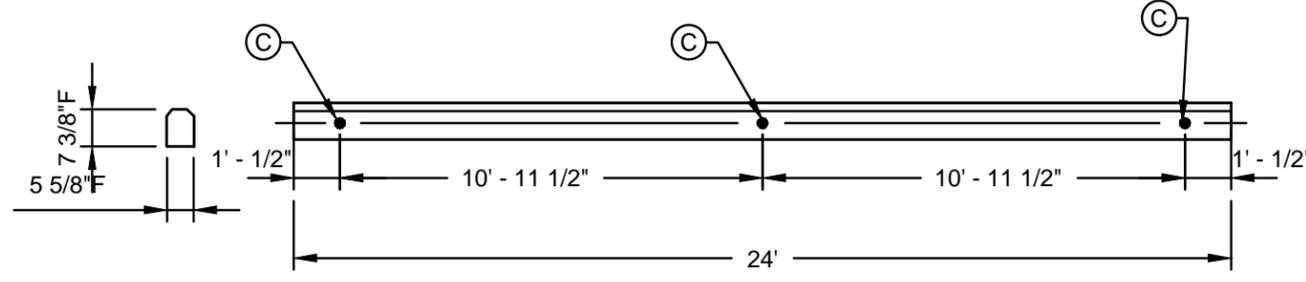
F ----- 1/8"±
 G ----- 1/4"±

DETAIL 1
CROSSARM DRILLING GUIDE - DISTRIBUTION

CITY OF COLUMBUS, OHIO DEPT. OF PUBLIC UTILITIES - DIVISION OF POWER		
WOOD CROSSARM DRILLING GUIDE - DISTRIBUTION 03S0040		
DRAWN BY: AEC	DATE: 01/01/2018	TDMIS-11
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SCALE: NTS	SHEET: 3 OF 12	

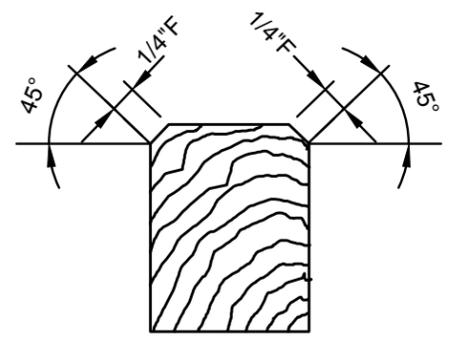


TYPE "A"



TYPE "B"

F ----- 1/8"±
 G ----- 1/4"±

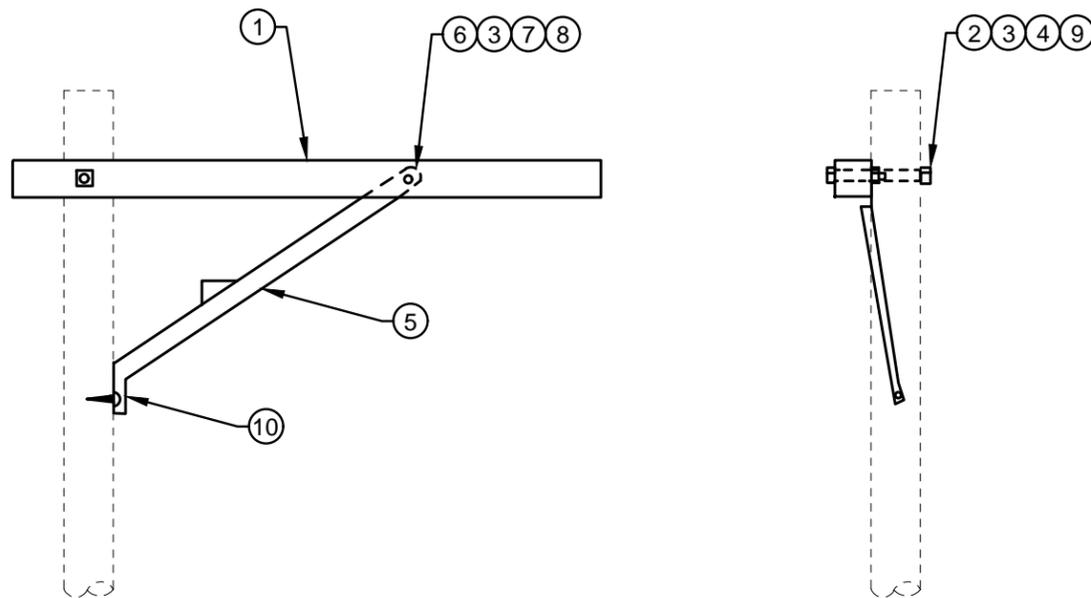


TYPICAL ENLARGED SECTION OF CROSSARM

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"

DETAIL 2
CROSSARM DRILLING GUIDE - TRANSMISSION

CITY OF COLUMBUS, OHIO DEPT. OF PUBLIC UTILITIES - DIVISION OF POWER		
WOOD CROSSARM DRILLING GUIDE - TRANSMISSION 03S0075		
DRAWN BY: AEC	DATE: 01/01/2018	TDMIS-11
APPROVED: R. SPRITE		
SCALE: NTS	SHEET: 4 OF 12	



DETAIL 3
ALLEY ARM WITH STEEL BRACES

SCHEDULE

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

ITEM LIST

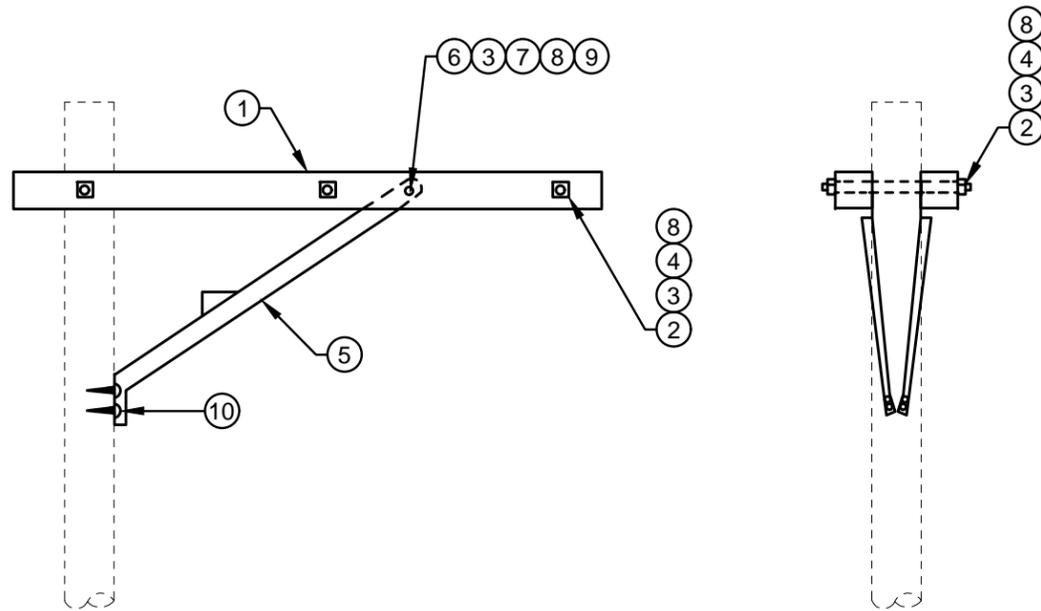
ITEM #	DESCRIPTION	PART #	QTY.
①	CROSSARM, WOODEN, 3 1/2"X4 1/2"	SEE SCH	1
②	BOLT, MACHINE 5/8"XLENGTH AS REQUIRED	42369	1
③	NUT, SQ. FLAT 2"X2"X3/16", 11/16" HOLE DIA.	18901	3
④	NUT, SQ. 5/8" - 11 UNC (CARRIAGE BOLT INCLUDED)	XXXXX	1
⑤	BRACE, STEEL ANGLE	19186	1
⑥	BOLT, MACHINE 1/2"X6"	18934	1
⑦	NUT, SQUARE 1/2" - 13UNC INCLUDED WITH MACHINE BOLT	XXXXX	1
⑧	WASHER, SPRING LOCK 11/16" DIA. HOLE, DOUBLE COIL	18893	1
⑨	WASHER, SQU. CURVED 2 1/4"X2 1/4"X3/16", 11/16" HOLE DIA.	18897	1
⑩	SCREW, LAG 1/2"X5 GALVANIZED	18985	2

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WOOD CROSSARM
ALLEY ARM, STEEL BRACES
MPAA

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APPROVED: R. SPRITE	
SCALE: NTS	SHEET: 5 OF 12

TDMIS-11

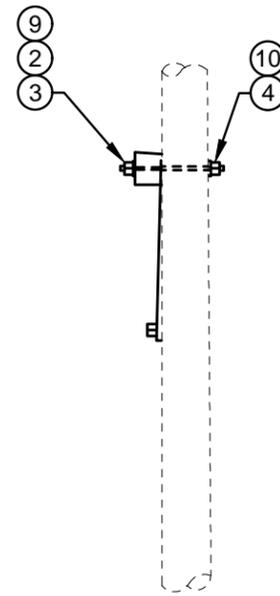
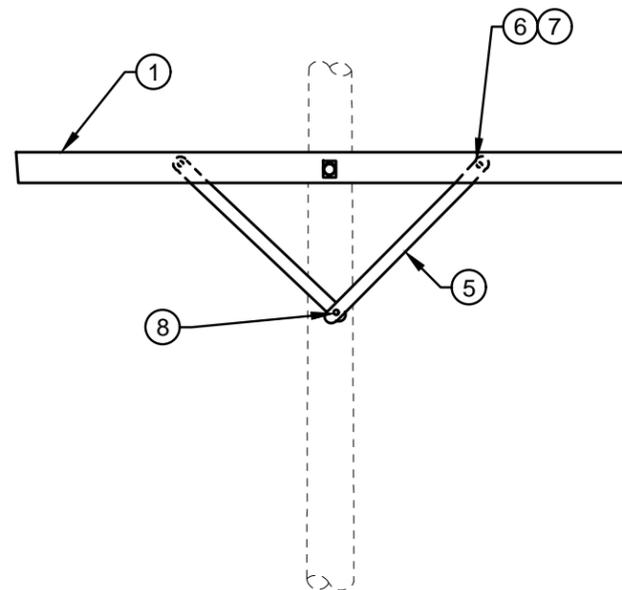


DETAIL 4
DOUBLE ALLEY ARM WITH STEEL BRACES

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

ITEM LIST			
ITEM #	DESCRIPTION	PART #	QTY.
①	CROSSARM, WOODEN, 3 1/2"X4 1/2"	SEE SCH	2
②	BOLT, DOUBLE ARMING, 5/8" X LENGTH AS REQUIRED	42370	3
③	WASHER, SQUARE FLAT 2"X2"X3/16", 11/16" HOLE DIA.	18901	6
④	NUT, SQUARE 5/8" - 11 UNC (DOUBLE ARMING BOLT INCLUDED)	XXXXX	2
⑤	BRACE, STEEL ANGLE	19186	2
⑥	BOLT, MACHINE 1/2"X6"	18934	2
⑦	NUT, SQUARE 1/2" - 13UNC INCLUDED WITH MACHINE BOLT	XXXXX	2
⑧	WASHER, SPRING LOCK, 11/16" DIA. HOLE, DOUBLE COIL	18893	7
⑨	WASHER, ROUND, FLAT, 1 1/2" DIA. 9/16" DIA. HOLE	XXXXX	2
⑩	SCREW, LAG 1/2"X5" GALVANIZED	18985	4

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WOOD CROSSARM DOUBLE ALLEY ARM, STEEL BRACES MPDAA	
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APPROVED: R. SPRITE	TDMIS-11
SCALE: NTS	



DETAIL 5
CROSSARM WITH STEEL BRACES

SCHEDULE

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

ITEM LIST

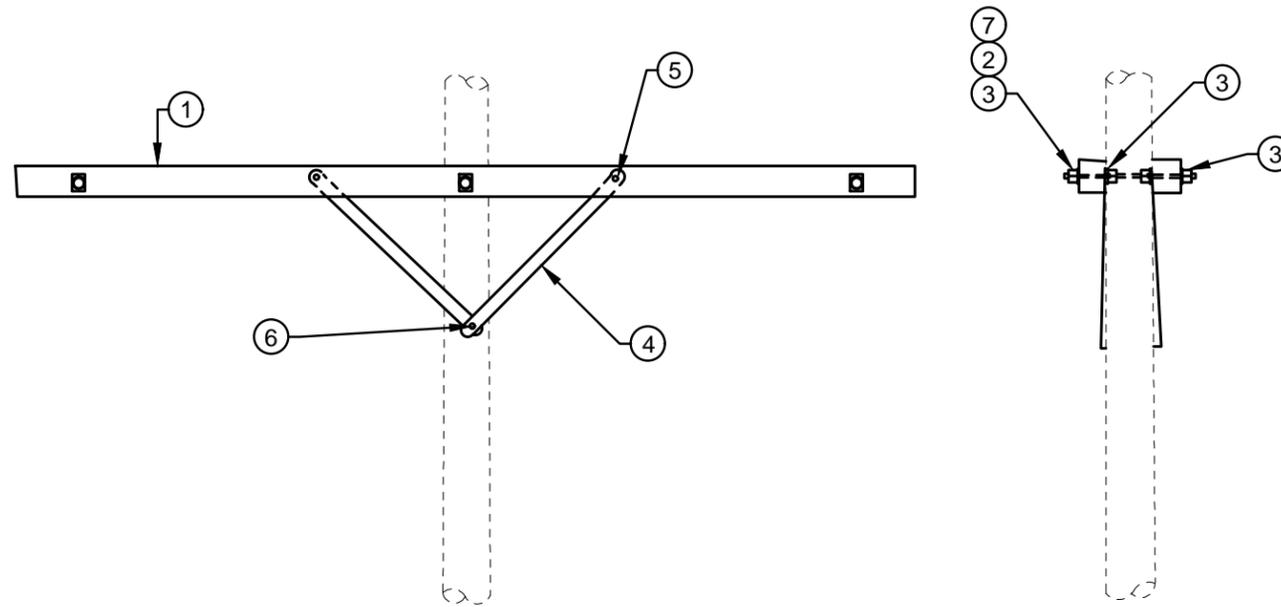
ITEM #	DESCRIPTION	PART #	QTY.
①	CROSSARM WOODEN, 3 1/2"X4 1/2"	SEE SCH	1
②	BOLT, MACHINE 5/8"XLENGTH AS REQUIRED	42369	1
③	WASHER, SQUARE FLAT, 2 1/4"X2 1/4"X3/16", 11/16" HOLE DIA.	18901	1
④	NUT, SQUARE 5/8" - 11 UNC (CARRIAGE BOLT INCLUDED)	XXXXX	1
⑤	BRACE, 32" STEEL, FLAT	19189	2
⑥	BOLT, CARRIAGE 3/8"X4 1/2"	19091	2
⑦	NUT, SQUARE 3/8" - 16UNC (INCLUDED WITH CARRIAGE BOLTS)	XXXXX	2
⑧	SCREW, LAG 1/2"X5" GALVANIZED	18985	1
⑨	WASHER, SPRING LOCK 11/16" DIA. HOLE, DOUBLE COIL	18895	1
⑩	WASHER, SQUARE CURVED 2 1/4"X2 1/4"X3/16", 11/16" HOLE DIA.	18897	1

CITY OF COLUMBUS, OHIO
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WOOD CROSSARM
CROSSARM, STEEL BRACES
MPXA

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SCALE: NTS	SHEET: 7 OF 12

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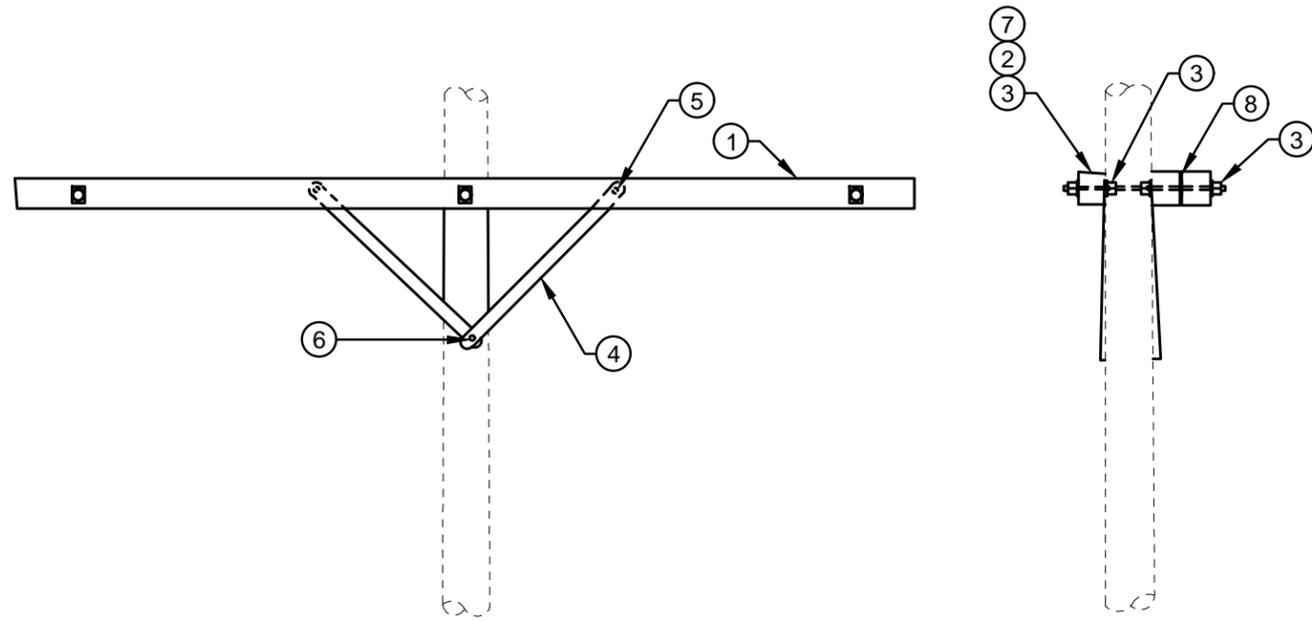


DETAIL 6
DOUBLE CROSSARM WITH STEEL BRACES

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

ITEM LIST			
ITEM #	DESCRIPTION	PART #	QTY.
①	CROSSARM WOODEN, 3 1/4"X4 1/2"	SEE SCH	2
②	SCREW, LAG 1/2"X5" GALVANIZED	43270	3
③	WASHER, SQUARE FLAT, 2 1/4"X2 1/4"X3/16", 11/16" HOLE DIA.	18901	10
④	BRACE, 32" STEEL, FLAT	19189	4
⑤	BOLT, CARRIAGE 3/8"X4 1/2"	19091	4
⑥	SCREW, LAG 1/2"X5" GALVANIZED	18985	2
⑦	WASHER, SPRING LOCK 11/16" DIA. HOLE, DOUBLE COIL	18893	5

CITY OF COLUMBUS, OHIO DEPT. OF PUBLIC UTILITIES - DIVISION OF POWER	
WOOD CROSSARM DOUBLE CROSSARM, STEEL BRACES MPDXA	
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APPROVED: R. SPRITE	TDMIS-11
SCALE: NTS	

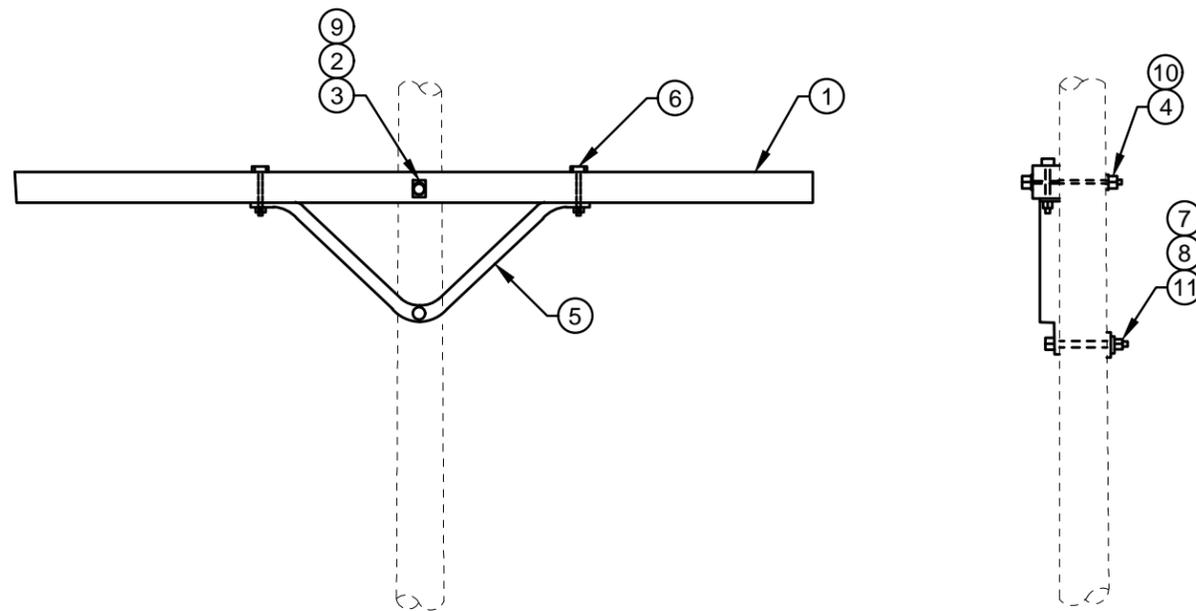


DETAIL 7
TRIPLE CROSSARM WITH STEEL BRACES

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

ITEM LIST			
ITEM #	DESCRIPTION	PART #	QTY.
①	CROSSARM WOODEN, 3 1/2"X4 1/2"	SEE SCH	3
②	BOLT, DOUBLE ARMING, 5/8" X LENGTH AS REQUIRED	42370	3
③	WASHER, SQUARE FLAT, 2 1/4"X2 1/4"X3/16", 11/16" HOLE DIA.	18901	10
④	BRACE, 32" STEEL, FLAT	19189	4
⑤	BOLT, CARRIAGE 3/8"X4 1/2"	19091	4
⑥	SCREW, LAG 1/2"X5" GALVANIZED	18985	2
⑦	WASHER, SPRING LOCK 11/16" DIA. HOLE, DOUBLE COIL	18895	5
⑧	WASHER, FLAT, 4"X4"X1/4", 13/16" DIA. HOLE	18902	3

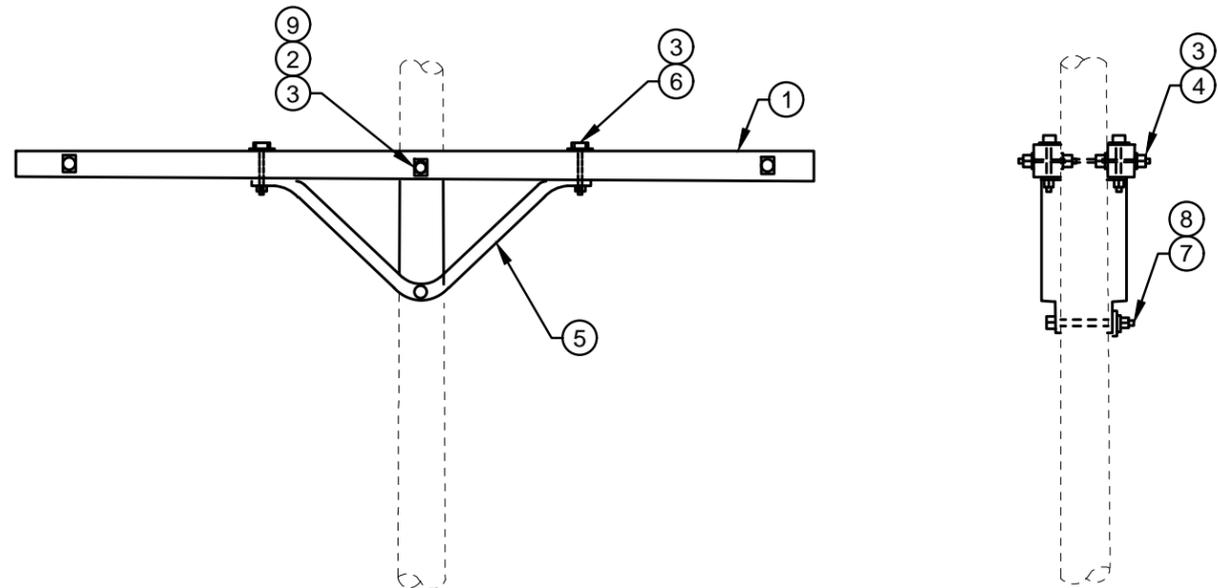
CITY OF COLUMBUS, OHIO DEPT. OF PUBLIC UTILITIES - DIVISION OF POWER	
WOOD CROSSARM TRIPLE CROSSARM, STEEL BRACES MPTXA	
DRAWN BY: AEC	DATE: 01/01/2018
APPROVED: R. SPRITE	TDMIS-11
SCALE: NTS	



DETAIL 8
CROSSARM, WITH STEEL BRACES, 12'

ITEM LIST			
ITEM #	DESCRIPTION	PART #	QTY.
①	CROSSARM WOODEN, 4 1/2"X5 1/2"X12'-0"	19297	1
②	BOLT, MACHINE 3/4"XLENGTH AS REQUIRED	42372	1
③	WASHER, SQUARE FLAT, 4"X4"X1/4", 13/16" HOLE DIA.	18903	1
④	NUT, SQUARE 3/4" - 11 UNC (CARRIAGE BOLT INCLUDED)	XXXXX	1
⑤	BRACE, DOUBLE SPAN, 60"	19191	1
⑥	BOLT, MACHINE 1/2"X6"	19093	2
⑦	BOLT, MACHINE 5/8" X LENGTH S REQUIRED	42396	1
⑧	WASHER, SPRING LOCK 11/16" DIA. HOLE, DOUBLE COIL	18895	1
⑨	WASHER, SPRING LOCK 13/16" DIA. HOLE, DOUBLE COIL	18894	1
⑩	WASHER, SQUARE CURVED 4"X4"X1/4", 13/16" HOLE DIA.	18900	1
⑪	WASHER, SQUARE CURVED 2 1/4"X2 1/4"X3/16", 13/16" HOLE DIA.	18897	1

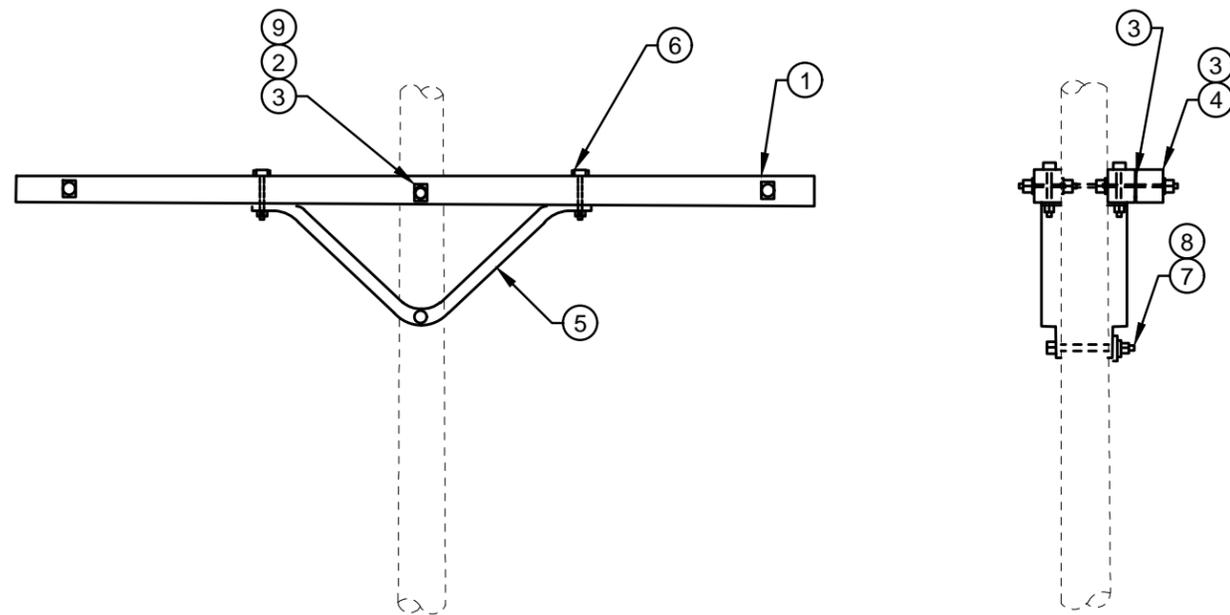
CITY OF COLUMBUS, OHIO DEPT. OF PUBLIC UTILITIES - DIVISION OF POWER	
WOOD CROSSARM CROSSARM, 12FT, STEEL BRACES MPXA12	
DRAWN BY: AEC	DATE: 01/01/2018
APPROVED: R. SPRITE	TDMIS-11
SCALE: NTS	



DETAIL 9
DOUBLE CROSSARM WITH STEEL BRACES, 12'

ITEM LIST			
ITEM #	DESCRIPTION	PART #	QTY.
①	CROSSARM WOODEN, 4 1/2"X5 1/2"X12'-0"	19297	2
②	BOLT, MACHINE 3/4" X LENGTH AS REQUIRED	42372	1
③	WASHER, SQUARE FLAT, 4"X4"X1/4", 15/16" HOLE DIA.	18903	14
④	NUT, SQUARE 3/4" - 11UNC	XXXX	1
⑤	BRACE, DOUBLE SPAN, 60"	19091	2
⑥	BOLT, MACHINE 1/2"X6"	19093	4
⑦	BOLT, MACHINE 5/8" X LENGTH AS REQUIRED, W/ NUT	42369	1
⑧	WASHER, SPRING LOCK 11/16" DIA. HOLE, DOUBLE COIL	18895	1
⑨	WASHER, SPRING LOCK 13/16" DIA. HOLE, DOUBLE COIL	18894	5

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WOOD CROSSARM DOUBLE CROSSARM, 12FT, STEEL BRACES MPDXA12	
DRAWN BY: AEC	DATE: 01/01/2018
APPROVED: R. SPRITE	TDMIS-11
SCALE: NTS	



DETAIL 10
TRIPLE CROSSARM WITH STEEL BRACES, 12'

ITEM LIST			
ITEM #	DESCRIPTION	PART #	QTY.
①	CROSSARM, WOODEN, 4 1/2"X5 1/2"X12'-0"	19297	3
②	BOLT, MACHINE 3/4" X LENGTH AS REQUIRED	42372	1
③	WASHER, SQUARE FLAT, 4"X4"X1/4", 15/16" HOLE DIA.	18903	13
④	NUT, SQUARE, 3/4" - 11 UNC	XXXXX	1
⑤	BRACE, DOUBLE SPAN, 60"	19191	2
⑥	BOLT, MACHINE 1/2"X6"	42371	4
⑦	BOLT, MACHINE 5/8" X LENGTH AS REQUIRED	42369	1
⑧	WASHER, SPRING LOCK 11/16" DIA. HOLE, DOUBLE COIL	18895	1
⑨	WASHER, SPRING LOCK 13/16" DIA. HOLE, DOUBLE COIL	18894	5

CITY OF COLUMBUS, OHIO DEPT. OF PUBLIC UTILITIES - DIVISION OF POWER	
WOOD CROSSARM TRIPLE CROSSARM, 12FT, STEEL BRACES MPTXA12	
DRAWN BY: AEC	DATE: 01/01/2018
APPROVED: R. SPRITE	TDMIS-11
SCALE: NTS	