

POLE TYPE	α ° ANGLE	MAST ARM DATA				FLANGE CONNECTION DATA				
		f ANGLE ST. (FT)	r RADIUS (FT)	g CURVE (FT)	h STRAIGHT (FT)	i PLATE SQ. (IN)	j ARM PL TK (IN)	k POLE PL TK (IN)	m BOLT CIRCLE (IN)	n BOLT SIZE (IN x IN)
CMA-20	13	5.1	56	9.8	0.9 - 5.4	12	1.25	1.25	12	1.25 x 3.5
CMA-25	13	7.6	74	12.9	0.3 - 4.8	13	1.50	1.25	13	1.25 x 3.5
CMA-30	13	9.2	80	14.0	2.7 - 7.2	13	1.50	1.25	13	1.25 x 3.5
CMA-35	13	7.1	120	20.9	2.9 - 7.4	15	1.75	1.25	15	1.25 x 3.5
CMA-40L *	10	13.8	135	16.5	5.5 - 10.0	15	1.75	1.25	15	1.25 x 3.5
CMA-40H	10	13.8	135	16.5	5.5 - 10.0	16	2.00	1.50	16	1.50 x 4.0
CMA-45	10	16.9	150	18.3	5.7 - 10.2	16	2.00	1.50	16/17 **	1.50 x 4.0
CMA-50	10	18.1	165	20.2	7.7 - 12.2	17	2.00	1.50	17/18 **	1.50 x 4.0
CMA-55	10	19.9	165	22.6	8.5 - 13.0	17	2.25	1.75	17/19 **	1.75 x 4.5

POLE TYPE	POLE DESIGN LOADING								
	HORIZONTAL DISTANCE FROM RISER TO APPURTENANCE (FT)								
	30" x 36" SIGN	5-SECTION HEAD	30" x 36" SIGN	3-SECTION HEAD	30" x 36" SIGN	3-SECTION HEAD	3-SECTION HEAD	18" x 14" SIGN	LUMINAIRE, 35' ABOVE BASE
CMA-20		19.5	16.5	11.5				10	20
CMA-25	24.5	21.5	16.5	13.5		5.5		10	20
CMA-30	29.5	26.5	21.5	18.5		10.5		10	20
CMA-35	34.5	31.5	26.5	23.5		15.5		10	20
CMA-40H	39.5	36.5	31.5	28.5		20.5		10	20
CMA-45	44.5	41.5	36.5	33.5	28.5	25.5	17.5	10	20
CMA-50	49.5	46.5	41.5	38.5	33.5	30.5	22.5	10	20
CMA-55	54.5	51.5	46.5	43.5	38.5	35.5	27.5	10	20

POLE DATA				
NOMINAL POLE TYPE	SPECIFIC POLE TYPE	MAX ALLOWABLE RISER (FT)	MAST ARM RANGE (FT)	BASE PLATE TYPE
1	CMA-20	25.5	5 - 20	200
1	CMA-25	24.5	20.5 - 25	200
1	CMA-30	24.0	25.5 - 30	200
1	CMA-35	23.5	30.5 - 35	200
1	CMA-40L *	22.0	35.5 - 40	200
2	CMA-40H	23.5	35.5 - 40	201 A
2	CMA-45	20.0	40.5 - 45	201 A
3	CMA-50	20.0	45.5 - 50	201 B
3	CMA-55	20.0	50.5 - 55	201 B

* LIGHTLY LOADED MAST ARMS: 4 SIGNS OR SIGNALS MAX.
 ** LARGER BOLT CIRCLE APPLIES ONLY TO ROUND CROSS-SECTIONS

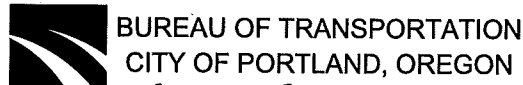
NOTES:

- FABRICATION SHALL CONFORM TO AASHTO'S 2001 "STANDARD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINAIRES AND TRAFFIC SIGNALS", 4TH EDITION WITH 2002, 2003, AND 2006 INTERIM REVISIONS, 100 MPH, 3.0 SEC GUST, GUST FACTOR = 1.14, IR = 1.0 I.E. 50 YEAR RECUR. INT. FATIGUE CATEGORY 2, NO GALLOPING, TRUCK SPEED = 55 MPH.
- POLES AND ARMS SHALL BE OCTAGONAL OR ROUND IN CROSS-SECTION AND HAVE A TAPER OF 0.14 INCHES PER FOOT.
- POLE END CAP SHALL BE RAIN TIGHT AND MATCH THE SHAPE OF THE POLE WITH AN INCH OF OVERLAP ON ALL SIDES.
- STEEL USED IN BASE PLATES, FLANGE PLATES & GUSSET PLATE SHALL CONFORM TO ASTM A572 GR50. SILICON CONTENT OF THE BASE METAL SHALL BE 0.0% TO 0.04% OR 0.15% TO 0.25%.
- ANCHOR BOLTS : ASTM F1554 GR 55, NUTS : ASTM A563 GR DH HEAVY HEX.
- HEX CONNECTION BOLTS: ASTM A325. (1.25-1.50 INCH DIAMETER)
ASTM A354BC. (1.75 INCH DIAMETER)
- ANCHOR BOLT AND CONNECTION WASHERS: ASTM F436 TYPE 1.
- PIPE TENONS AND WIRE GUIDES : ASTM A53 GR B.
- HANDHOLE COVERS : ASTM A1011 GR 50.
- GALVANIZING : ASTM A123 & A153.
- STRAIGHT SECTION (h) SHALL BE A MINIMUM 1 DEGREE ABOVE HORIZONTAL WHEN FULLY LOADED AND A MAXIMUM OF 4 DEGREES ABOVE HORIZONTAL WHEN UNLOADED.
- STEEL IN TUBES SHALL CONFORM TO A572 GR 50 OR A595 GR A

COMBINATION MAST ARM POLE

COMBINATION MAST ARM TABLE OF VARIABLES

The selection and use of this Standard Drawing, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user.



**BUREAU OF TRANSPORTATION
CITY OF PORTLAND, OREGON**

Steve Tomlin
Chief Engineer

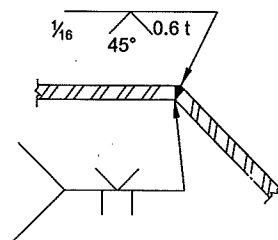
Standard Drawing Title

COMBINATION MAST ARM POLE DETAILS

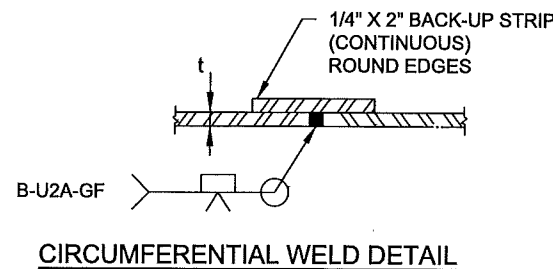
Effective Date: 12-05-15	Standard Drawing No.
Calc. Book No.:	P-602
Baseline Report Date:	

Note: All material and workmanship shall be in accordance with the City of Portland Standard Construction Specifications.

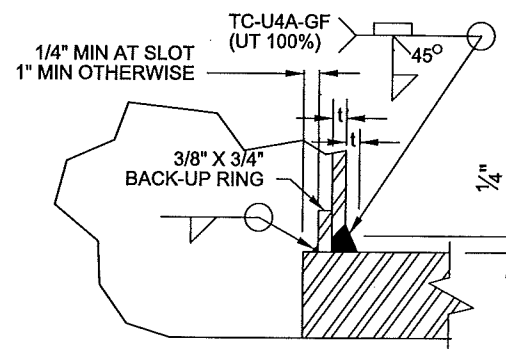
NOTE: BACK GOUGE OUTSIDE WITHIN 6" OF TUBE ENDS OR CIRCUMFERENTIAL WELDS TO OBTAIN 100% PENETRATION (B-U4B)



LONGITUDINAL WELD DETAIL
TWO PER TUBE AT 180 DEG.



MAST ARM POLE WELD DETAILS



BASE WELD DETAIL