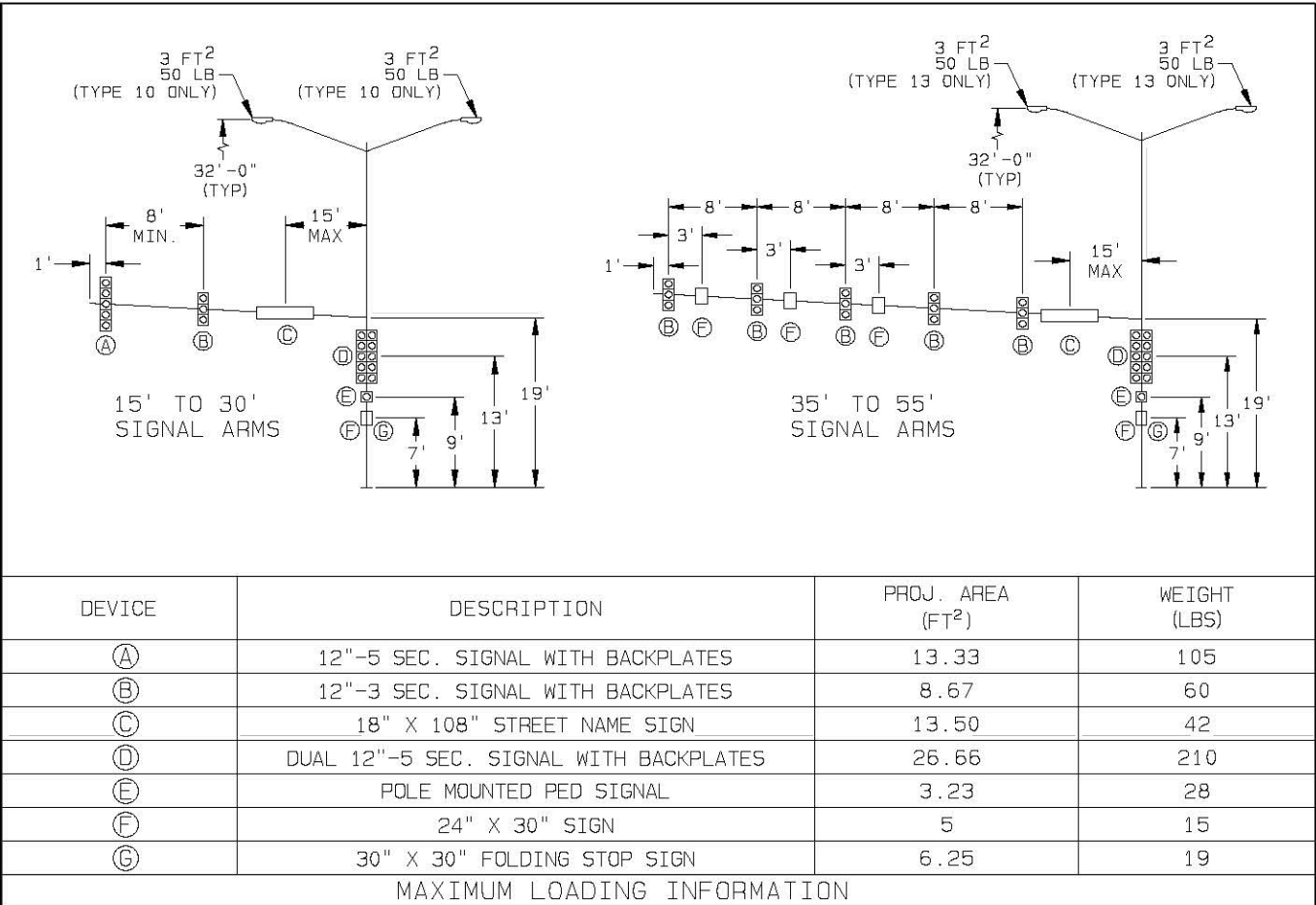
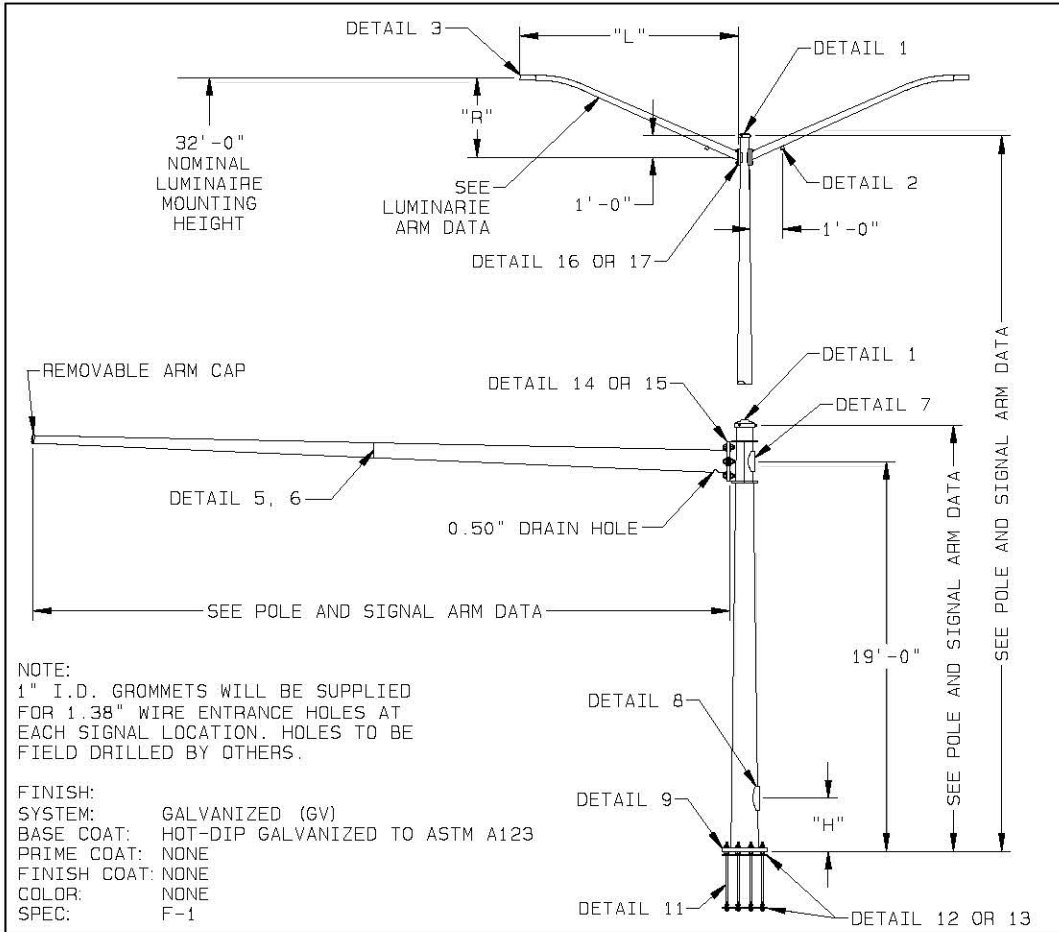




THE MAST ARM TRAFFIC STRUCTURES SHOWN ON THIS DRAWING HAVE BEEN DESIGNED IN ACCORDANCE WITH THE LOADING AND THE NOMINAL STRENGTH REQUIREMENTS OF THE 2015 AASHTO LRFD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINAIRES AND TRAFFIC SIGNALS, FIRST EDITION* SLTS-1. THE WIND LOADS WERE CALCULATED FROM AN ULTIMATE WIND VELOCITY OF 115 MPH WITH A MEAN RECURRENCE INTERVAL OF 700 YEARS, FATIGUE CATEGORY OF 3 USED FOR STRUCTURE TYPES 9 & 10. FATIGUE CATEGORY OF 2 USED FOR STRUCTURE TYPES 12 & 13. THE FATIGUE LOADS WERE CALCULATED ON THE REQUIREMENTS OF SECTION 11 OF THE CODE, AND THE FOLLOWING DESIGN CONDITIONS:

- STRUCTURES ARE DESIGNED TO RESIST NATURAL WIND GUSTS BASED ON THE YEARLY MEAN WIND VELOCITY OF 11.2 MPH.
- STRUCTURES ARE DESIGNED TO RESIST GALLOPING-INDUCED CYCLIC LOADS.
- STRUCTURES ARE DESIGNED FOR TRUCK-INDUCED GUST LOADS, AS REQUIRED BY THE OWNER OF THE STRUCTURES.

AASHTO 2015 SPECIFICATIONS

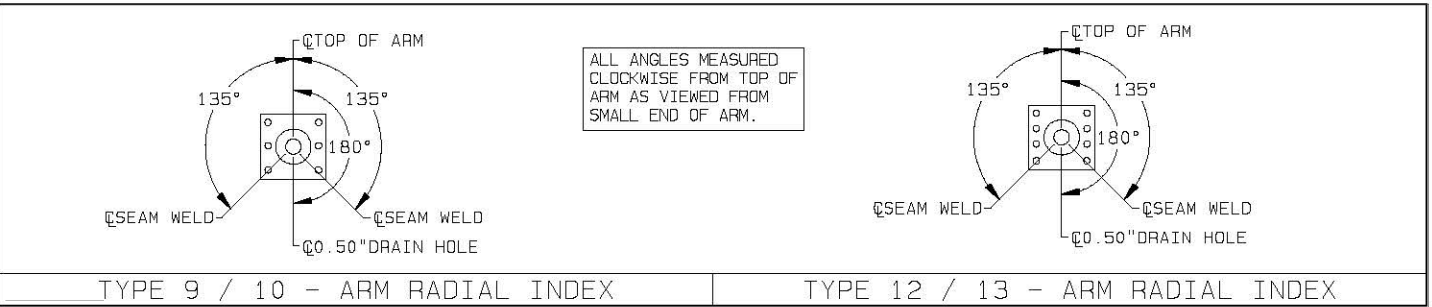
ALTHOUGH RARE, VIBRATIONS SEVERE ENOUGH TO CAUSE DAMAGE CAN OCCASIONALLY OCCUR IN STRUCTURES OF ALL TYPES. BECAUSE THEY ARE INFLUENCED BY MANY INTERACTING VARIABLES, VIBRATIONS ARE GENERALLY UNPREDICTABLE. THE USER'S MAINTENANCE PROGRAM SHOULD INCLUDE OBSERVATION FOR EXCESSIVE VIBRATION AND EXAMINATION FOR ANY STRUCTURAL DAMAGE OR BOLT LOOSENING. THE VALMONT WARRANTY SPECIFICALLY EXCLUDES FATIGUE FAILURE OR SIMILAR PHENOMENA RESULTING FROM INDUCED VIBRATION, HARMONIC OSCILLATION OR RESONANCE ASSOCIATED WITH MOVEMENT OF AIR CURRENTS AROUND THE PRODUCT.

VIBRATION DISCLAIMER

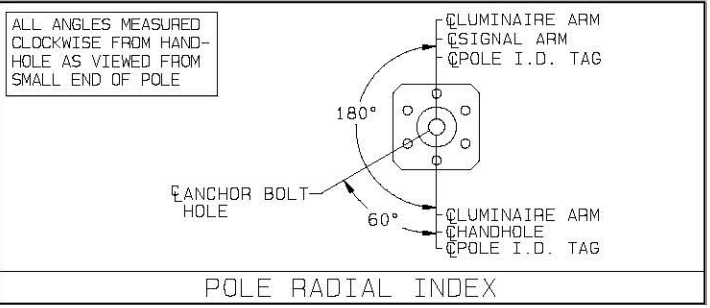
MATERIAL DATA					
COMPONENT	ASTM DESIGNATION	MIN. YIELD (KSI)	COMPONENT	ASTM DESIGNATION	MIN. YIELD (KSI)
TAPERED TUBES	A595 GR. A OR A572	55	LUMINAIRE ARM ATTACH. LUM. ARM CONN. BOLTS	A36 A325*	36
POLE BASE	A572 GR.50	50	ANCHOR BOLTS W/ SUPPLEMENTARY SPEC S4	F1554 GR.55	55
SIGNAL ARM ATTACHMENT	A36	36	ANCHOR BOLT TEMPLATE	A36	36
SIGNAL ARM CONN. BOLTS	A325*				
GALVANIZING STRUCTURE	A123				
GALVANIZING HARDWARE	HOT DIP ZINC				

* LUBRICATE IN THE FIELD IF NECESSARY

LUMINAIRE ARM DATA				
ARM SPAN "L" (FT)	FIXED END DIA. (IN)	FREE END DIA. (IN)	GAUGE	RISE "R" (FT)
6.00	3.39	2.40	11	3.00
8.00	3.63	2.40	11	3.00
10.00	3.88	2.40	11	3.00
12.00	4.16	2.40	11	3.00
15.00	4.56	2.40	11	3.00



POLE AND SIGNAL ARM DATA																		
STRUCTURE TYPE	POLE TUBE				POLE BASE					ANCHOR BOLT DATA					SIGNAL ARM TUBE			
	BASE DIA. (IN)	TOP DIA. (IN)	LENGTH (FT)	GAUGE OR THK. (IN)	SQUARE "S" (IN)	BOLT CIRCLE "Y" (IN)	THK. "M" (IN)	CENTER HOLE "P" (IN)	BOLT HOLE "Z" (IN)	DIA. "K" (IN)	LENGTH "J" (IN)	THREAD LENGTH "U1" (IN)	THREAD LENGTH "U2" (IN)	ANCHOR BOLT QTY.	FIXED END DIA. (IN)	FREE END DIA. (IN)	GAUGE OR THICK (IN)	SPAN (FT)
TYPE 9	11.50	8.56	21.00	7	19.00	15.00	2.00	10.14	1.75	1.50	52.00	10.00	5.50	6	8.00	5.90	7	15.00
															8.00	5.20	7	20.00
															9.00	5.50	7	25.00
															9.00	4.80	7	30.00
TYPE 10	11.50	7.30	30.00	7	19.00	15.00	2.00	10.14	1.75	1.50	52.00	10.00	5.50	6	8.00	5.90	7	15.00
															8.00	5.20	7	20.00
															9.00	5.50	7	25.00
															9.00	4.80	7	30.00
TYPE 12	19.20	16.26	21.00	0.313	29.00	24.00	2.00	12.00	2.00	1.75	86.00	11.00	5.50	6	14.50	9.60	0.250	35.00
															15.50	9.90	0.250	40.00
															17.00	10.70	0.250	45.00
															16.00	9.38	DET.5	50.00
															16.25	8.93	DET.5	55.00
TYPE 13	19.20	15.00	30.00	0.313	29.00	24.00	2.00	12.00	2.00	1.75	86.00	11.00	5.50	6	14.50	9.60	0.250	35.00
															15.50	9.90	0.250	40.00
															17.00	10.70	0.250	45.00
															16.00	9.38	DET.5	50.00
															16.25	8.93	DET.5	55.00
F	NKL 05/13/24	NKL 05/13/24	WAS 2013 AASHTO DESIGN															
E	NKL 10/12/16	NKL 10/12/16	REVISED LUMINAIRE/MAST ARM DATA															
D	NKL 12/16/15	NKL 12/16/15	REVISED ANCHOR BOLT DATA															



F	NKL 05/13/24	NKL 05/13/24	WAS 2013 AASHTO DESIGN
E	NKL 10/12/16	NKL 10/12/16	REVISED LUMINAIRE/MAST ARM DATA
D	NKL 12/16/15	NKL 12/16/15	REVISED ANCHOR BOLT DATA
C	NKL 01/21/15	NKL 01/21/15	ADDED THREAD LENGTH TO BOLT
B	NKL 12/17/14	NKL 12/17/14	POLE SIZES TYPE 12/13 / ADD PAGE 3 DETAIL
A	NKL 03/11/14	NKL 03/11/14	REVISED TYPE 12/13 SIZES
—	AC19 11/27/13	NKL 12/03/13	—
REV	DRAWN BY-DATE	CHECK BY-DATE	DESCRIPTION

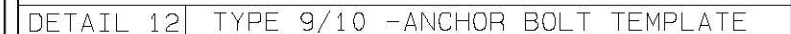
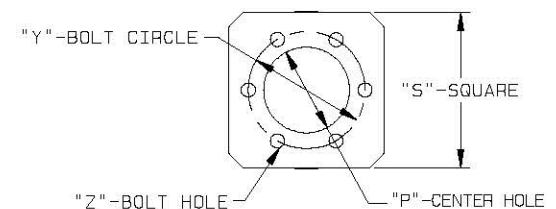
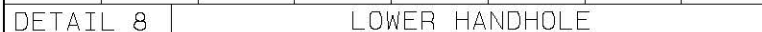
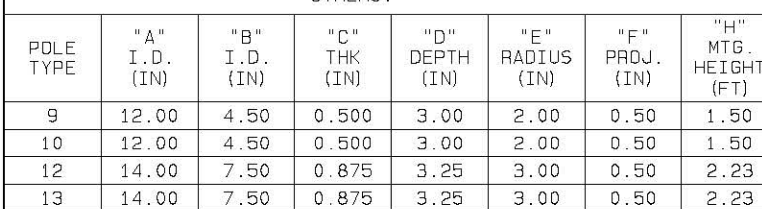
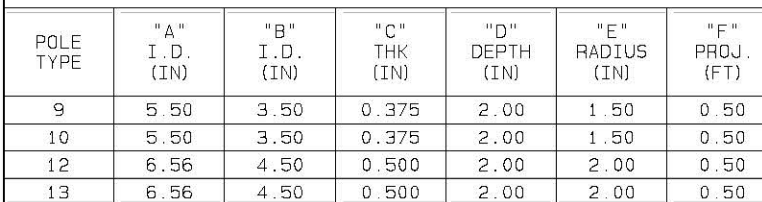
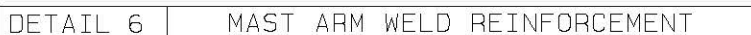
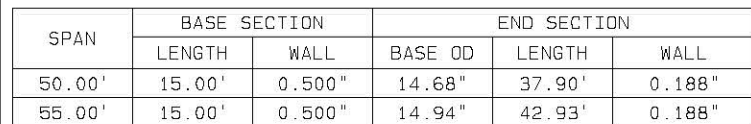
TITLE WISCONSIN DEPARTMENT OF TRANSPORTATION
TYPES 9,10,12, & 13 TRAFFIC SIGNAL STRUCTURES
AASHTO 2015

VALMONT INDUSTRIES, INC. RESERVES THE RIGHT TO INSTALL VARIOUS, ENGINEER APPROVED, MATERIAL HANGING ACCOMMODATIONS TO FACILITATE THE MANUFACTURING PROCESS.

valmont
Valley, NE 68064
(402) 359-2201

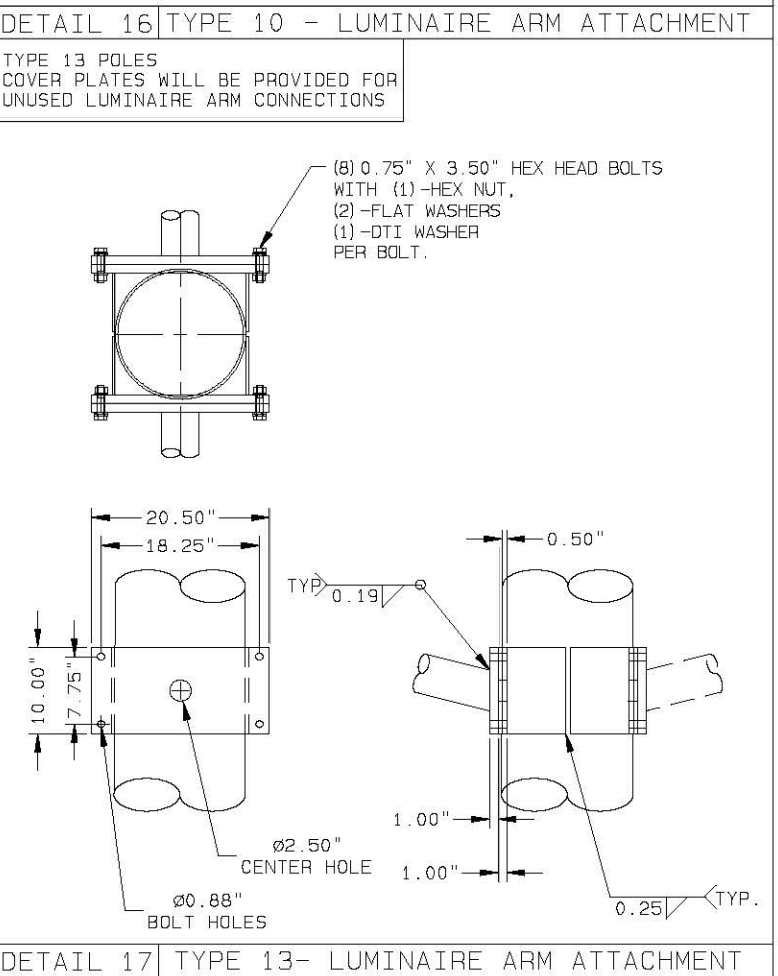
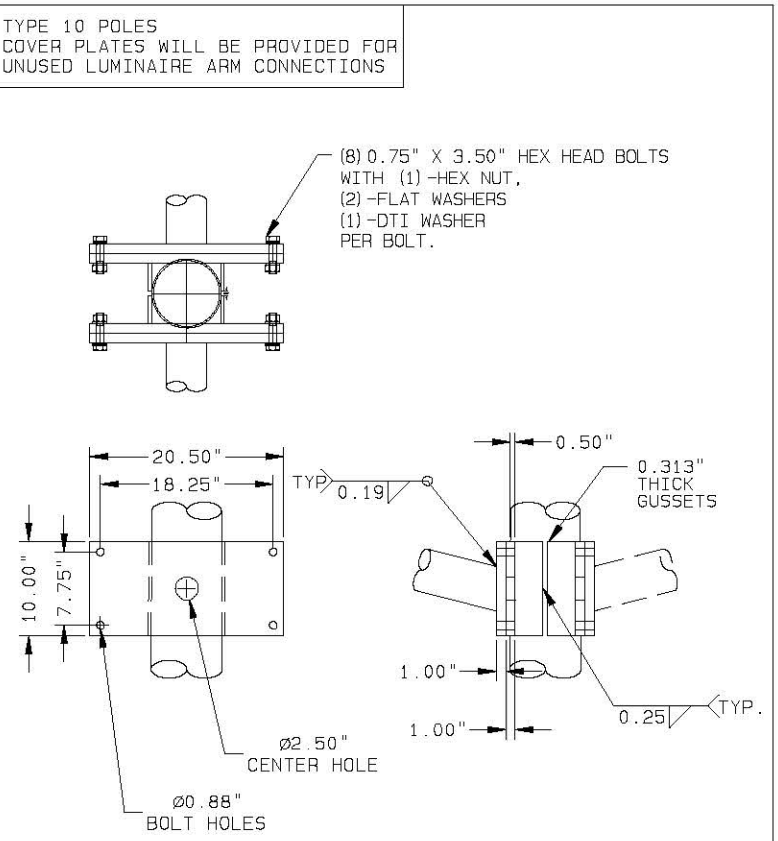
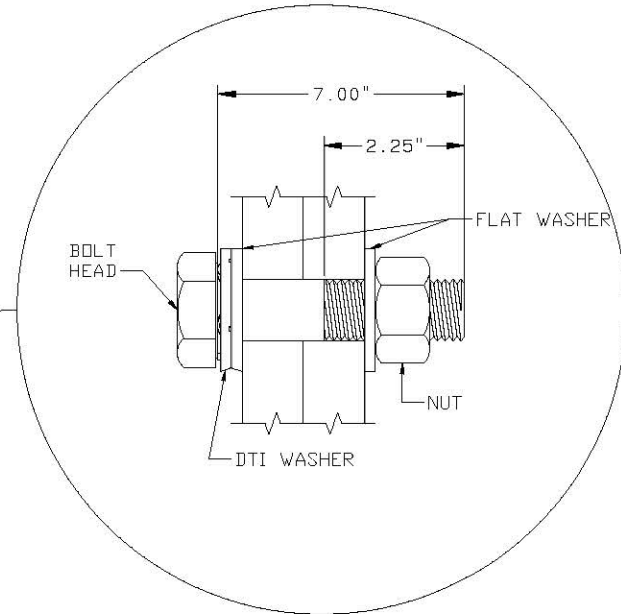
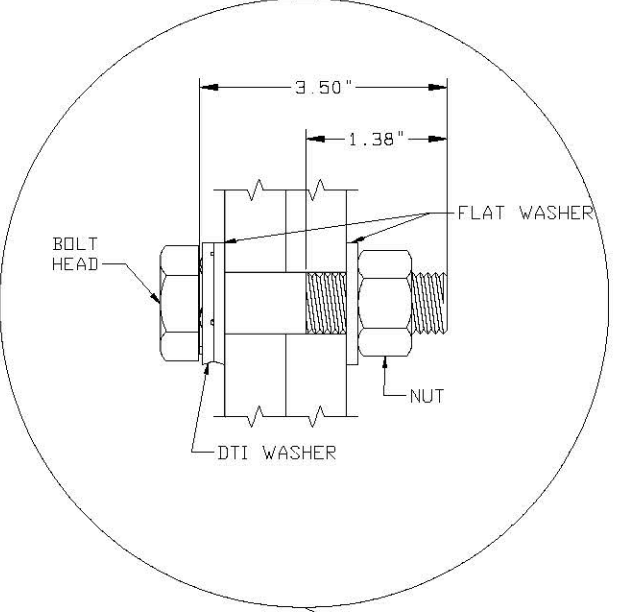
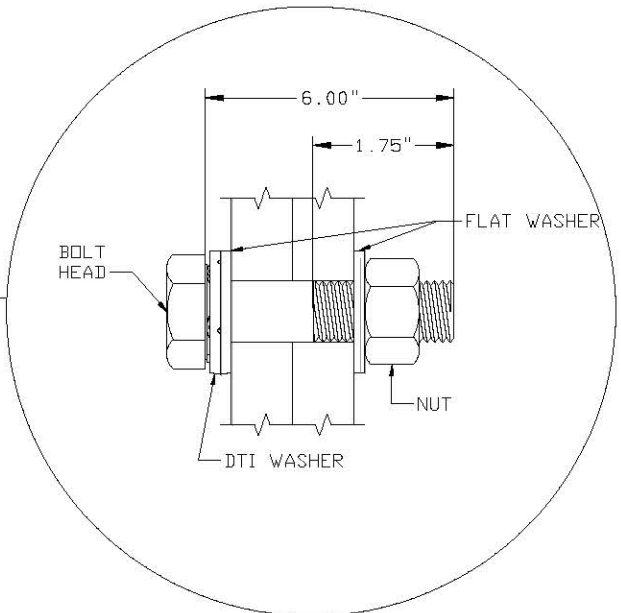
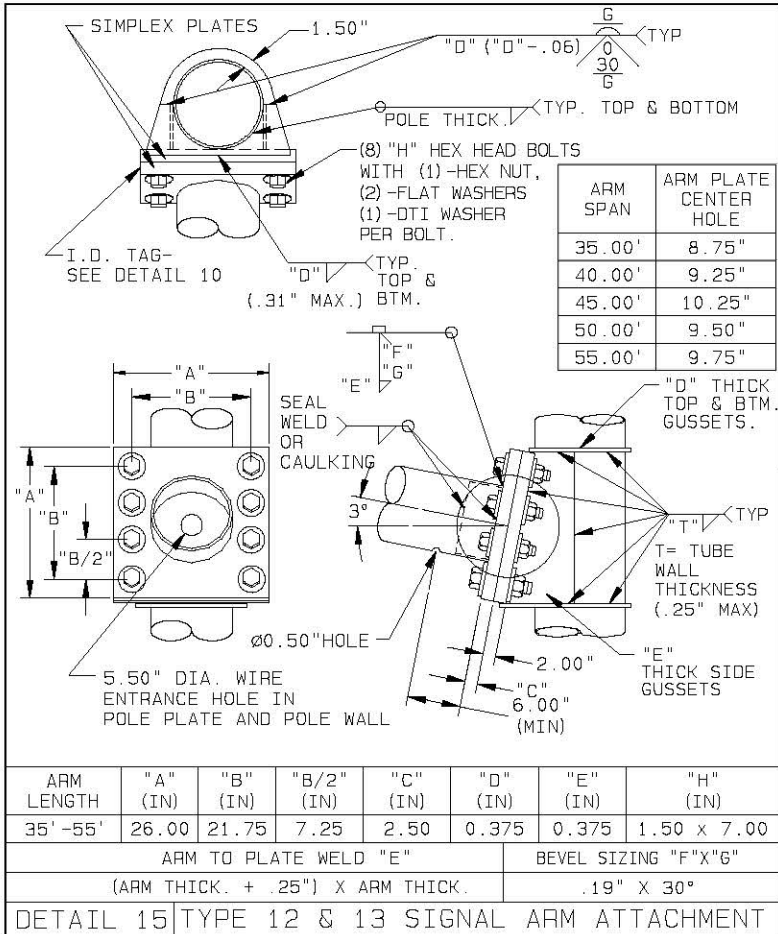
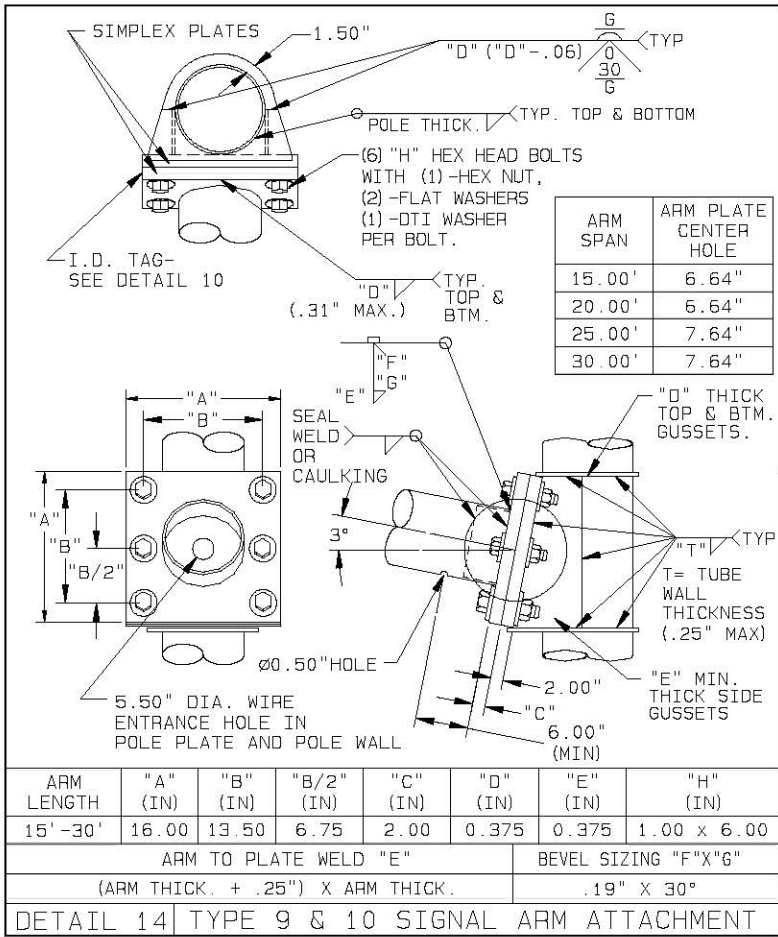
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RECOMMENDED BOLT ASSEMBLY