

ATS-Sales, LLC
14522-K Lee Rd, Chantilly VA 20151-1639

703.631.6661(O)
703.631.6694(F)

October 2, 2019

Re: Mast Arm Poles
MP-3 Standard Loads – 90 MPH Wind
Virginia
ATS# 16362-3

This is to certify that the traffic poles for the above referenced intersection were designed in accordance with:

- The project plans and specifications
- VDOT 2016 Road and Bridge Specifications
- The 2013 AASHTO Specification (LTS-6), Using:
 - 90 mph wind velocity with Appendix C
 - 25 Year Recurrence
 - Fatigue Category II (No fatigue loads for mast arms smaller than 50')
 - Natural Wind Gusts (11.2 MPH)
 - No Galloping Loads
 - No truck-induced Gust
 - Maximum Standard Loading (MP-3)

The following identifies this submittal's documents:

ATS Drawings: 16362-3(A) Rev. B, 16362-3(B) Rev. B & 16362-3(C) Rev. B
Calculations Dated: September 11, 2019, Consisting of 370 pages

In accordance with the Virginia Department of Transportation Road and Bridge Specification, I am a registered Professional Engineer holding a valid license in the Commonwealth of Virginia.

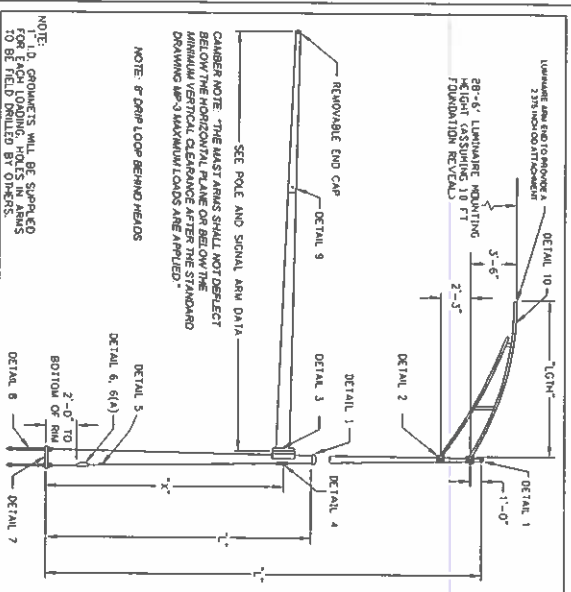
Sincerely,

Armand A. Damiano, P.E.

VIRGINIA DEPARTMENT OF TRANSPORTATION C.O. STRUCTURE AND BRIDGE REVIEW OF WORKING DRAWINGS	
Working drawings have been reviewed in accordance with Section 105.10 of the Specifications with the following comments.	
<input checked="" type="checkbox"/> Reviewed	<input type="checkbox"/> Revise and Resubmit
<input type="checkbox"/> Reviewed as Noted	
Reviewed by: Karl Larson 10/09/2019	

Armand A Damiano
2019.10.02 17:22:37 -05'00'

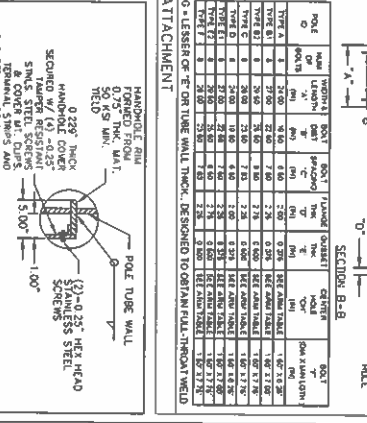
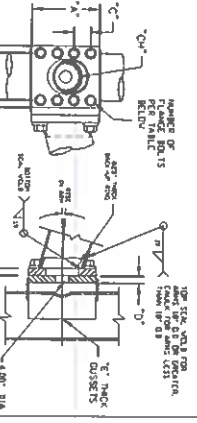
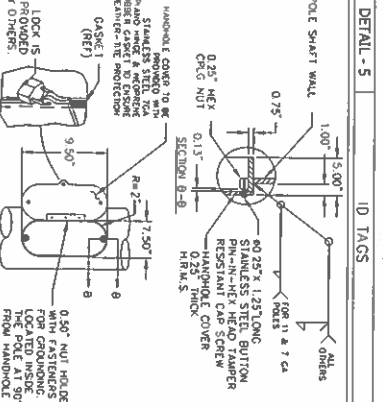
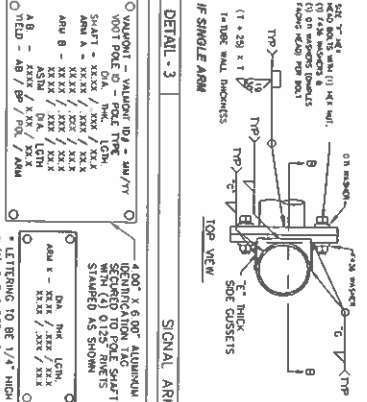
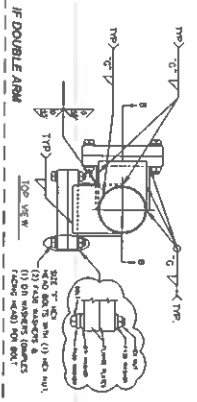
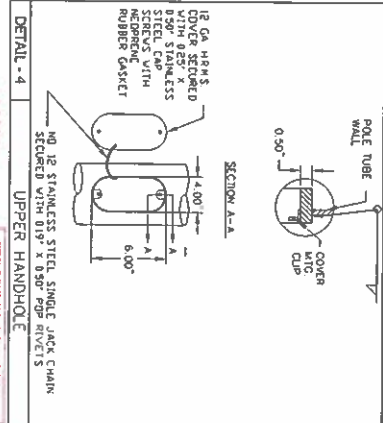
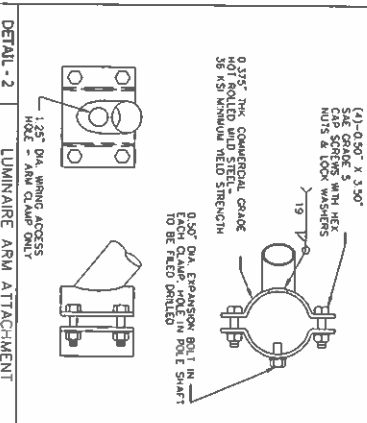
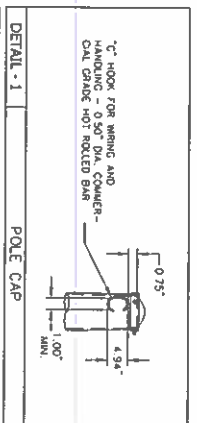
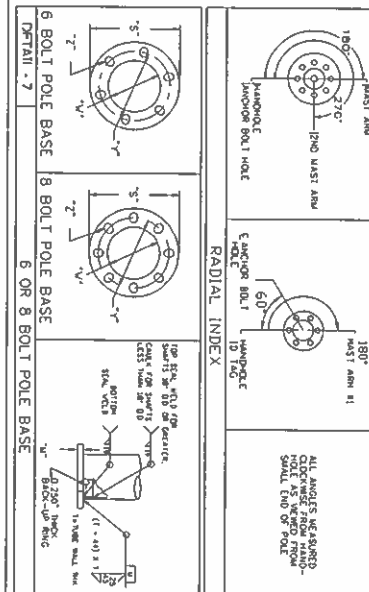




MATERIAL DATA

COMPONENT	ASTM DESIGNATION	MIN. YIELD (ksi)	COMPONENT	ASTM DESIGNATION	MIN. YIELD (ksi)
POLE SHAFT - 11.75/3.04	A595 OR A597 OR A598 OR A599 OR A600	55	*ARM CONNECTING BOLTS (ALL)	F3125 OR A325 OR A449	55
POLE SHAFT - ALL OTHERS	A595	55	GUARDING - POLLS	A133	55
ARM SHEET - 11.75/3.04	A595 OR A597 OR A598 OR A599 OR A600	55	LUM ARM ATTACHMENT	A427 OR A572	55
ARM SHEET - ALL OTHERS	A595	55	LUM ARM CONNECTING BOLTS	S4E OR S5E	55
ANCHOR BOLTS	F1554 OR S5	55	LUM THUS ARM	SECTION 10	36
RE-VENTING SEALANT	CP90				
FINISH: GALV. ONLY, POWDER COATED OVER GALV. (AS REQUESTED)					

* LUBRICATE IN THE FIELD IF NECESSARY. (AS REQUESTED)



Professional Engineer
 Lic. No. 16750
 10/02/2019
 Approved & Sealed
 10/02/2019

REVISION BASED ON:
 - ASHVD 5TH EDITION
 - 90 MPH APPENDIX C WIND
 - 25 YEAR RETURN PERIOD
 - NO FATIGUE CATEGORY II FOR 90 ARMS OR LONGER
 - NO FATIGUE REQUIREMENTS FOR ARMS 49' LONG OR SMALLER
 - NO GALVANIC LOADS
 - NO BRUCK GUST
 - MP-3 STANDARD LOADS

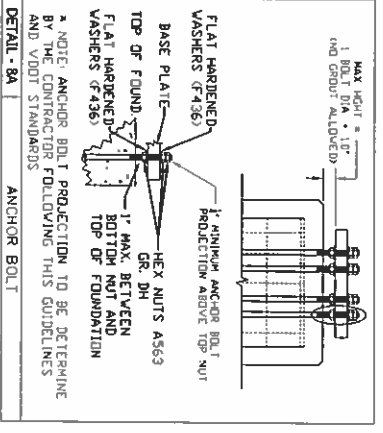
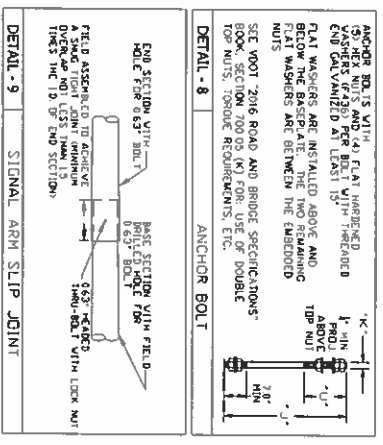
Valmont
 Mast Arm Pole Details
 90 MPH - MP-3 STANDARDS
 VIRGINIA
 DATE: 04/04/19
 DRAWING: 16362-3(A) B

POLE TYPE	QTY.	SHAFT						BASE PLATE						ANCHOR BOLT		ARM	LUM. ARM
		BASE DIA. (IN)	TOP DIA. (IN)	LGTH. (FT)	WALL THICK (IN)	ARM ATTACH ELEV. (FT)	ARM DIA. (IN)	BOLT CIRCLE DIA. (IN)	CENTER HOLE DIA. (IN)	THK. (IN)	HOLE DIA. (IN)	HOLE QTY.	DIA. (IN)	LGTH. (IN)	THREAD LENGTH (IN)		
A	-	17.00	14.27	19.5	0.250	18.0	30.0	24.0	12.50	2.00	2.25	6	2.00	60.0	14.0	49	NA
B1	-	20.00	17.27	19.5	0.375	18.0	32.0	26.0	15.25	2.00	2.25	8	2.00	60.0	14.0	75 Case 1	NA
B2	-	22.50	19.77	19.5	0.375	18.0	35.0	29.0	17.75	2.00	2.25	8	2.00	60.0	14.0	75 Case 2	NA
C	-	20.50	17.77	19.5	0.375	18.0	32.0	26.0	15.75	2.00	2.25	8	2.00	60.0	14.0	70/60	NA
D	-	17.50	14.00	25.0	0.250	18.0	30.0	24.0	13.00	2.00	2.25	6	2.00	60.0	14.0	49	24.0
E1	-	20.00	16.50	25.0	0.375	18.0	32.0	26.0	15.25	2.00	2.25	8	2.00	60.0	14.0	75 Case 1	24.0
E2	-	22.50	19.00	25.0	0.375	18.0	35.0	29.0	17.75	2.00	2.25	8	2.00	60.0	14.0	75 Case 2	24.0
F	-	21.00	17.50	25.0	0.375	18.0	35.0	29.0	15.25	2.00	2.25	8	2.00	60.0	14.0	70/60	24.0

ARM SPAN (FT)	QTY.	SIGNAL ARM DATA						SEC. LGTH. (FT)	CENTER HOLE "CH" (IN)
		FIXED END DIA. (IN)	FREE END DIA. (IN)	GAUGE OR THK (IN)	OR THK (IN)	SEC. LGTH. (FT)	CENTER HOLE "CH" (IN)		
30.0	-	12.00	7.80	0.179	0.179	30.00	7.00		
30.0 - Double	-	14.00	9.80	0.179	0.179	30.00	6.00		
40.0	-	13.00	7.40	0.179	0.179	40.00	8.00		
40.0 - Double	-	14.00	8.40	0.179	0.179	40.00	6.00		
49.0	-	14.00	7.14	0.219	0.219	49.00	5.00		
50.0	-	14.00	7.00	0.250	0.250	50.00	5.00		
60.0	-	15.58	12.27	0.250	0.250	23.69	7.00		
60.0	-	13.00	7.54	0.179	0.179	39.00	7.00		
65.0	-	16.28	12.27	0.313	0.313	28.69	6.00		
70.0	-	13.00	7.54	0.179	0.179	39.00	7.00		
70.0	-	17.50	14.00	0.313	0.313	25.00	7.00		
75.0 - Case 1	-	14.79	8.09	0.188	0.188	47.92	7.00		
75.0 - Case 1	-	18.50	14.58	0.313	0.313	28.00	7.00		
75.0 - Case 1	-	15.37	8.38	0.188	0.188	49.99	7.00		
75.0 - Case 2	-	19.00	14.94	0.375	0.375	29.00	7.00		
75.0 - Case 2	-	15.87	9.01	0.250	0.250	49.04	7.00		

VIRGINIA DEPARTMENT OF TRANSPORTATION
 C.O. STRUCTURE AND BRIDGE
 REVIEW OF WORKING DRAWINGS
 REVIEW DATE: 10/02/2019
 REVIEWED BY: [Signature]
 DATE: 10/02/2019
 APPROVED BY: [Signature]
 DATE: 10/02/2019

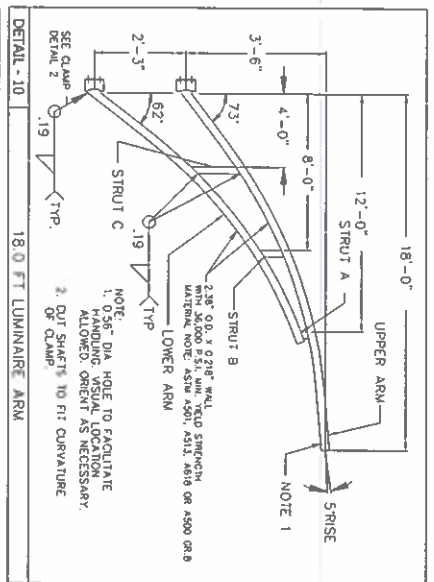
NOTE: ANY ARM MAY BE SUBSTITUTED WITH A LONGER ARM AND TRIMMED TO THE CORRECT LENGTH IF THE FLANGE SIZE CORRESPONDS TO WHAT IS REQUIRED BY THE SHAFT.



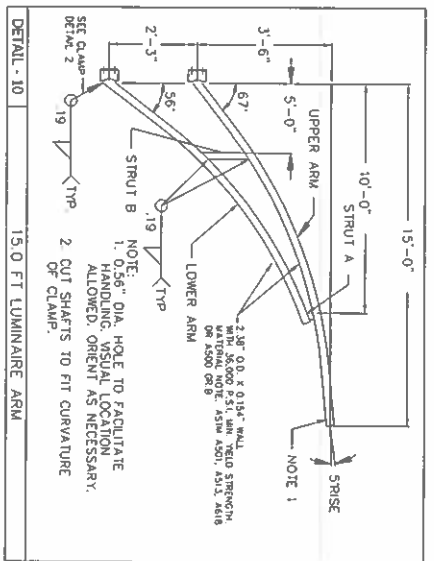
REV	DATE	BY	REVISION
1	08/08/19	VDI	REVIEW COMMENTS
2	10/02/19	VDI	REVIEW COMMENTS

CUSTOMER: MAST ARM POLE DETAILS
 90 MPH - MP-3 STANDARDS
 VIRGINIA

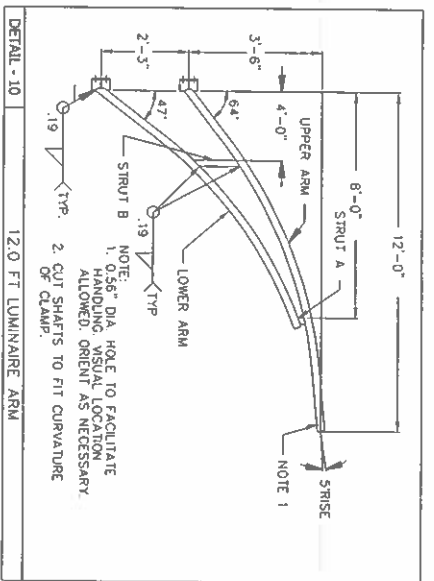
DATE: 04/04/19
 DRAWING: 16362-3(B) B



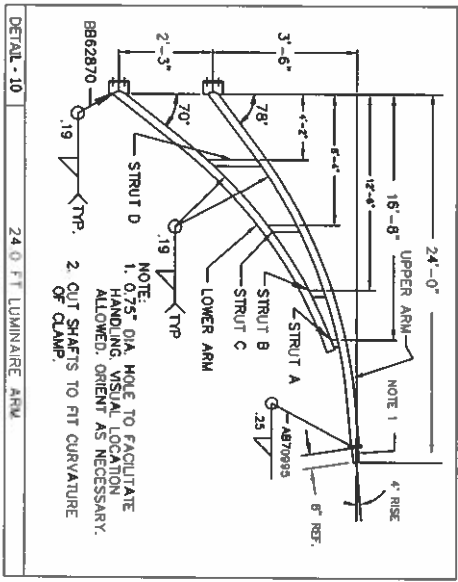
STRUT DATA			ARM DATA			
STRUT	THK	WIDTH	ARM	O.D.	WALL	LENGTH
A	0.38"	2.00"	UPPER	2.38"	0.218"	18' - 4.81"
B	0.38"	2.00"	LOWER	2.38"	0.218"	13' - 7.25"
C	0.38"	2.00"				
TOTAL A36 MATERIAL =			2' - 4.78"			



STRUT DATA			ARM DATA			
STRUT	THK	WIDTH	ARM	O.D.	WALL	LENGTH
A	0.38"	2.00"	UPPER	2.38"	0.154"	15' - 6.63"
B	0.38"	2.00"	LOWER	2.38"	0.154"	11.13"
TOTAL A36 MATERIAL =			1' - 1.81"			

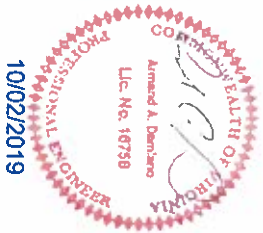


STRUT DATA			ARM DATA			
STRUT	THK	WIDTH	ARM	O.D.	WALL	LENGTH
A	0.38"	2.00"	UPPER	2.38"	0.154"	12' - 8.02"
B	0.38"	2.00"	LOWER	2.38"	0.154"	9' - 11.81"
TOTAL A36 MATERIAL =			22' - 7.81"			



STRUT DATA			ARM DATA			
STRUT	THK	WIDTH	ARM	O.D.	WALL	LENGTH
A	0.50"	0.50"	UPPER	2.88"	2.4"	7.42"
B	0.50"	0.50"	LOWER	2.88"	0.28"	17' - 8.58"
C	0.50"	0.50"				
D	0.50"	0.50"				
TOTAL S-70 MATERIAL =			3' - 5.31"			
TOTAL S109 MATERIAL =			42' - 3.80"			

VIRGINIA DEPARTMENT OF TRANSPORTATION
 REVIEW OF WORKING DRAWINGS
 REVIEW OF WORKING DRAWINGS
 REVISIONS TO BE MADE IN ACCORDANCE WITH THE FOLLOWING COMMENTS:
 O Delete and Realign
 X Realign
 C Deleted as Note
 Rep. based on: 10/02/2019



DATE	REVISION	DATE	REVISION
8/10/02/19	VDOT REVIEW COMMENTS	04/04/19	
CUSTOMER:		Vermont	
MAST ARM POLE DETAILS		Vermont 6886' Poles	
90 MPH - MF-3 STANDARDS		Vermont 6886' Poles	
VIRGINIA		Vermont 6886' Poles	
DATE	BY	DATE	BY
04/04/19	16362-3(C) B		