

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 – 80 MPH Wind
Virginia
ATS# 16362-2

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:**
 - **80 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: 16362-2(A) Rev. B, 16362-2(B) Rev. B & 16362-2(C) Rev. B
Calculations Dated: September 11, 2019, Consisting of 370 pages

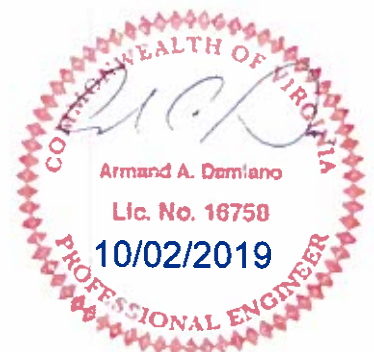
In accordance with the Virginia Department of Transportation Road and Bridge Specification, I am a registered Professional Engineer holding a valid license in the Commonwealth of Virginia.

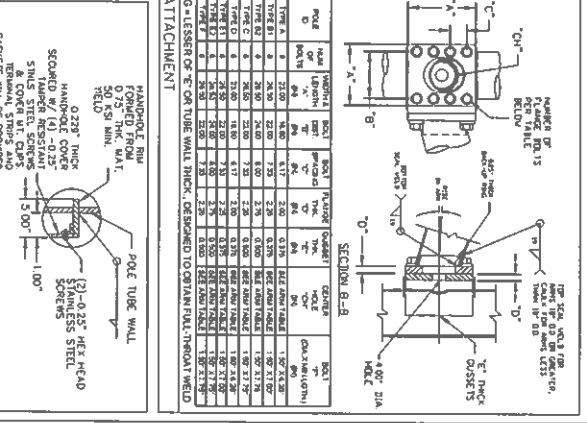
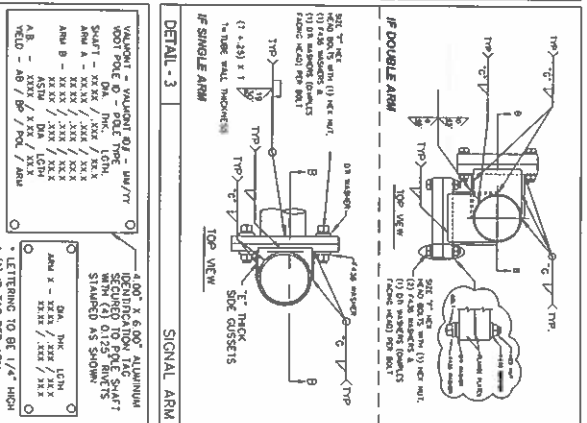
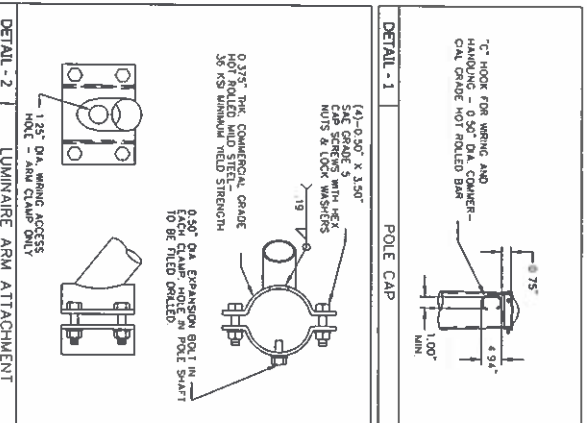
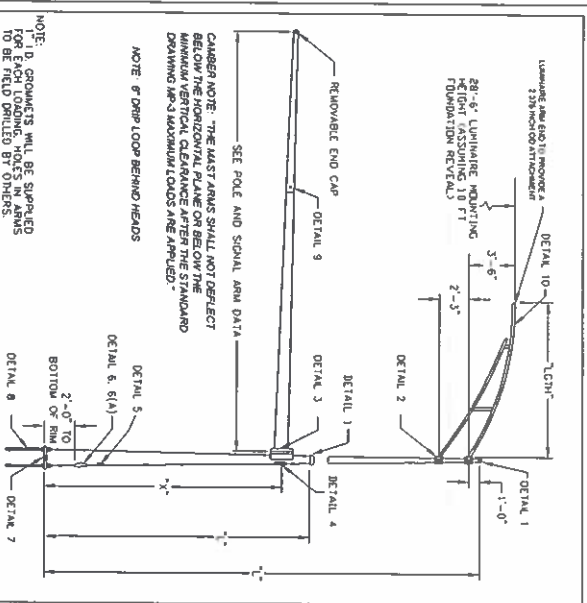
Sincerely,

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 16:33:28 -05'00'

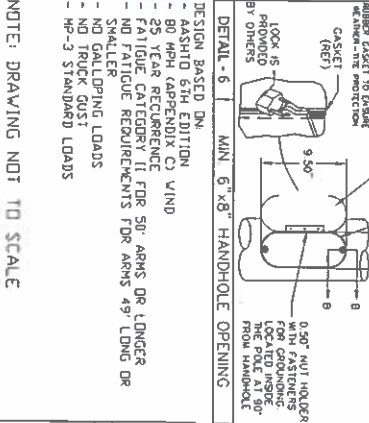
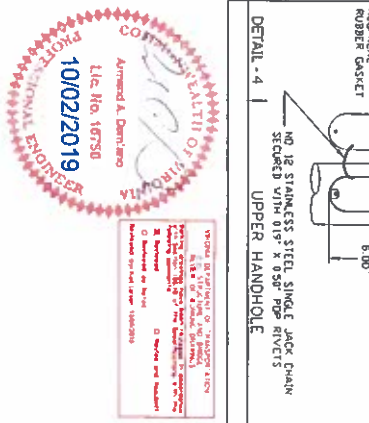
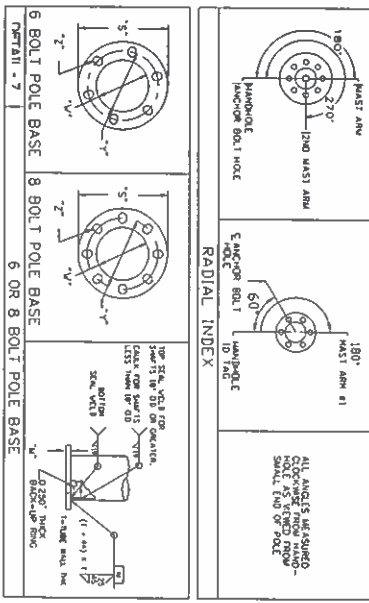




MATERIAL DATA

COMPONENT	ASTM DESIGNATION	MIN. YIELD (KSI)	COMPONENT	ASTM DESIGNATION	MIN. YIELD (KSI)
POLE SHAWT - 11, 23 GA.	A595 GR. A	55	* ARM CONNECTING BOLTS	F1555 GR. A35 OR A49	
POLE SHAWT - ALL OTHERS	A572 GR. 55	55	ARM CONNECTING BOLTS	A132	
POLE BASE	A36	36	WELDING - POLLS	A133	
ARM SHAWT - 11, 23 GA.	A595 GR. A	55	WELDING - HARDWARE	A133	
ARM SHAWT - ALL OTHERS	A572 GR. 55	55	LUM ARM ATTACHMENT	A27 GR. 53	
ARM CONNECTION	A572 GR. 50	50	LUM ARM CONNECTING BOLTS	S&C GR. 5	
ANCHOR BOLTS	F1554 GR. 55	55	LUM TRUSS ARM	SECTION 10	36
ANCHORING FLANGE	C350				

NOTE: 1. DRAWINGS WILL BE SUPPLIED FOR THE FIELD DRILLED BY OTHERS.



MATERIAL DATA

COMPONENT	ASTM DESIGNATION	MIN. YIELD (KSI)	COMPONENT	ASTM DESIGNATION	MIN. YIELD (KSI)
POLE SHAWT - 11, 23 GA.	A595 GR. A	55	* ARM CONNECTING BOLTS	F1555 GR. A35 OR A49	
POLE SHAWT - ALL OTHERS	A572 GR. 55	55	ARM CONNECTING BOLTS	A132	
POLE BASE	A36	36	WELDING - POLLS	A133	
ARM SHAWT - 11, 23 GA.	A595 GR. A	55	WELDING - HARDWARE	A133	
ARM SHAWT - ALL OTHERS	A572 GR. 55	55	LUM ARM ATTACHMENT	A27 GR. 53	
ARM CONNECTION	A572 GR. 50	50	LUM ARM CONNECTING BOLTS	S&C GR. 5	
ANCHOR BOLTS	F1554 GR. 55	55	LUM TRUSS ARM	SECTION 10	36
ANCHORING FLANGE	C350				

NOTE: 1. DRAWINGS WILL BE SUPPLIED FOR THE FIELD DRILLED BY OTHERS.

REVISIONS
 4/08/08/19 VDOT REVIEW COMMENTS
 3/10/02/19 VDOT REVIEW COMMENTS

ATS-SALES
 Valmont
 Valley, NC 28684-0818
 (484) 393-4201

DATE: 04/04/19
 DRAWING: 16362-2(A) B



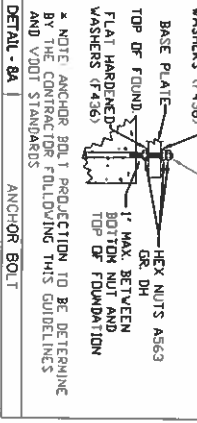
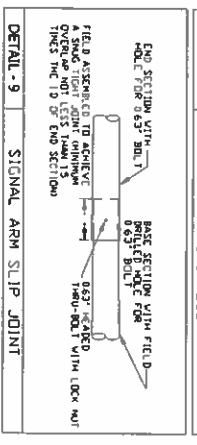
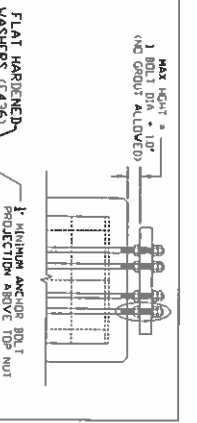
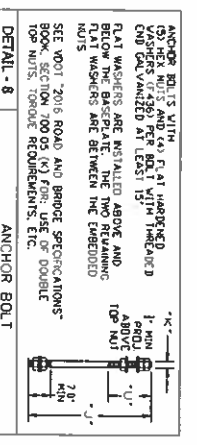
PROFESSIONAL ENGINEER
 License No. 167350
 Armand A. Damiano
 State of Virginia
 10/02/2019

DECISION BASED ON:
 - ASHSPD 6TH EDITION
 - 80 MPH APPENDIX C WIND
 - 25 YEAR REFERENCE
 - FATIGUE CATEGORY II FOR 50' ARMS OR LONGER
 - NO FATIGUE REQUIREMENTS FOR ARMS 49' LONG OR SMALLER
 - NO GALLOPING LOADS
 - NO TRUCK GUST LOADS
 - HP-3 STANDARD LOADS

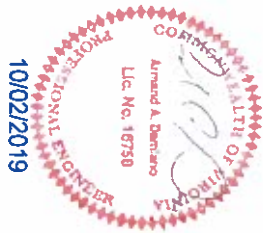
NOTE: DRAWING NOT TO SCALE

POLE TYPE	QTY.	SHAFT					BASE PLATE					ANCHOR BOLT			ARM	LUM. ARM
		BASE DIA. (IN)	TOP DIA. (IN)	LGTH. "L" (FT)	WALL THICK (IN)	ARM ATTACH ELEV "X" (FT)	DIA. "S" (IN)	BOLT CIRCLE "Y" (IN)	CENTER HOLE DIA. "W" (IN)	THK. "M" (IN)	HOLE "Z" (IN)	HOLE QTY.	DIA. "K" (IN)	LGTH. "J" (IN)		
A	-	16.00	13.27	19.5	0.250	18.0	30.0	24.0	11.50	2.00	2.25	2.00	60.0	14.0	49	NA
B1	-	19.50	16.77	19.5	0.313	18.0	32.0	26.0	14.75	2.00	2.25	2.00	60.0	14.0	Case 1	NA
B2	-	20.50	17.77	19.5	0.375	18.0	32.0	26.0	15.75	2.00	2.25	2.00	60.0	14.0	Case 2	NA
C	-	19.00	16.27	19.5	0.375	18.0	32.0	26.0	14.25	2.00	2.25	2.00	60.0	14.0	70/60	NA
D	-	16.00	12.50	25.0	0.250	18.0	30.0	24.0	11.50	2.00	2.25	2.00	60.0	14.0	49	24.0
E1	-	19.50	16.00	25.0	0.313	18.0	32.0	26.0	14.75	2.00	2.25	2.00	60.0	14.0	Case 1	24.0
E2	-	20.50	17.00	25.0	0.375	18.0	32.0	26.0	15.75	2.00	2.25	2.00	60.0	14.0	Case 2	24.0
F	-	19.00	15.50	25.0	0.375	18.0	32.0	26.0	14.25	2.00	2.25	2.00	60.0	14.0	70/60	24.0

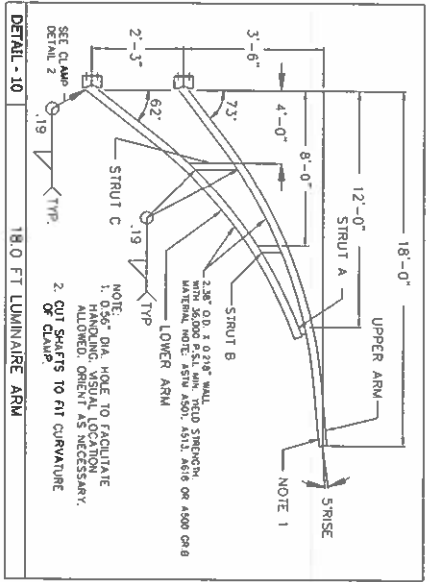
ARM SPAN (FT)	QTY.	SIGNAL ARM DATA				
		FIXED DIA. (IN)	FREE END DIA. (IN)	GAUGE OR THK (IN)	SEC LGTH. (FT)	CENTER HOLE "CH" (IN)
30.0	-	11.00	6.80	0.179	30.00	6.50
30.0 - Double	-	13.00	8.80	0.179	30.00	4.00
40.0	-	12.00	6.40	0.179	40.00	7.00
40.0 - Double	-	13.00	7.40	0.179	40.00	4.00
49.0	-	13.00	6.14	0.209	49.00	4.00
50.0	-	13.00	6.00	0.239	50.00	4.00
60.0	-	15.58	12.27	0.250	23.69	8.00
60.0	-	13.00	7.54	0.179	39.00	8.00
65.0	-	16.28	12.27	0.250	28.69	8.00
70.0	-	13.00	7.54	0.179	39.00	8.00
75.0 - Case 1	-	17.50	14.00	0.250	25.00	9.00
75.0 - Case 1	-	14.79	8.09	0.188	47.92	9.00
75.0 - Case 1	-	18.00	14.08	0.250	28.00	9.50
75.0 - Case 1	-	14.87	7.88	0.188	49.93	9.50
75.0 - Case 2	-	19.00	14.80	0.313	30.00	6.50
75.0 - Case 2	-	15.66	8.94	0.219	48.02	6.50



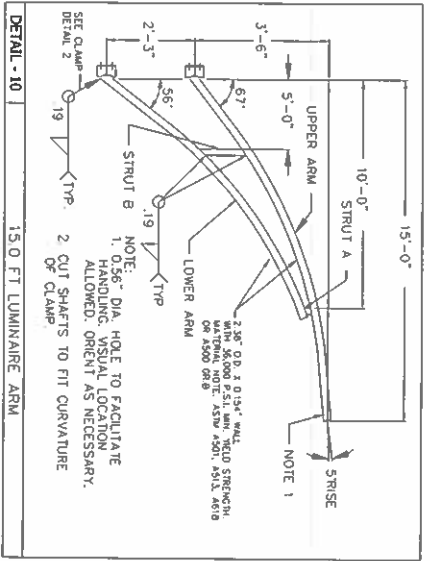
VERMONT DEPARTMENT OF TRANSPORTATION
 REVIEWED BY: [Signature]
 DATE: 10/02/2019
 LIC. NO. 16738
 APPROVED BY: [Signature]
 DATE: 10/02/2019



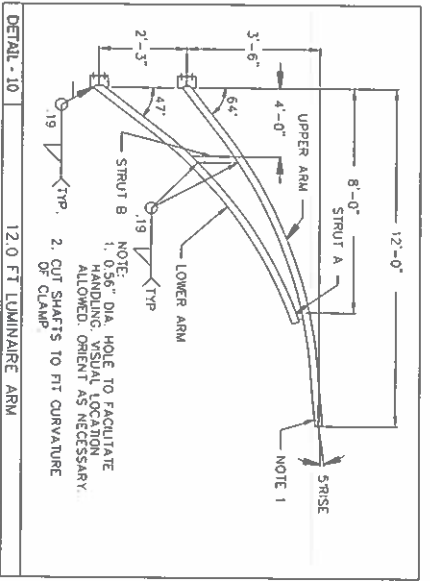
REV. DATE	REVISION	DATE	BY
4/9/08/7/9	VDOT REVIEW COMMENTS		
8/10/02/7/9	VDOT REVIEW COMMENTS		
CUSTOMER	VALMONT		
	MAST ARM POLE DETAILS		
	80 MPH - MP-3 STANDARDS		
	VIRGINIA		
DATE	BY	DATE	BY
04/04/19	Valmont	16362-2(B)	B



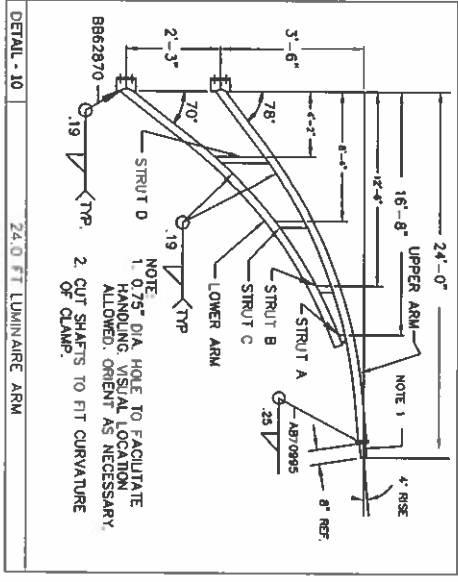
STRUT DATA				ARM DATA			
STRUT	THK	WIDTH	LENGTH	ARM	O.D.	WALL	LENGTH
A	0.38"	2.00"	4.09"	UPPER	2.38"	0.218"	18 - 4.81"
B	0.38"	2.00"	9.13"	LOWER	2.38"	0.218"	13 - 7.25"
C	0.38"	2.00"	3.56"				
TOTAL A36 MATERIAL = 2' - 4.78"				36,000 P.S.I. MIN. YIELD STRENGTH			



STRUT DATA				ARM DATA			
STRUT	THK	WIDTH	LENGTH	ARM	O.D.	WALL	LENGTH
A	0.38"	2.00"	2.69"	UPPER	2.38"	0.154"	15 - 6.63"
B	0.38"	2.00"	11.13"	LOWER	2.38"	0.154"	11 - 7.13"
TOTAL A36 MATERIAL = 1' - 1.81"				36,000 P.S.I. MIN. YIELD STRENGTH			



STRUT DATA				ARM DATA			
STRUT	THK	WIDTH	LENGTH	ARM	O.D.	WALL	LENGTH
A	0.38"	2.00"	2.38"	UPPER	2.38"	0.154"	12 - 8.00"
B	0.38"	2.00"	9.44"	LOWER	2.38"	0.154"	9 - 11.81"
TOTAL A36 MATERIAL = 0' - 11.82"				36,000 P.S.I. MIN. YIELD STRENGTH			



STRUT DATA				ARM DATA			
STRUT	THK	WIDTH	LENGTH	ARM	O.D.	WALL	LENGTH
A	0.50"	0.28"	0.43"	UPPER	2.88"	0.28"	24 - 7.42"
B	0.50"	0.28"	0.46"	UPPER	2.88"	0.28"	17 - 8.58"
C	0.50"	0.28"	1.00"	LOWER	2.88"	0.28"	17 - 8.58"
D	0.50"	0.28"	0.67"	LOWER	2.88"	0.28"	17 - 8.58"
TOTAL S-70 MATERIAL = 3' - 5.31"				TOTAL S109 MATERIAL = 42' - 3.80"			

VIRGINIA DEPARTMENT OF TRANSPORTATION
 REVIEW OF SHOPPING DRAWINGS
 REVIEWED BY: KATHLEEN LOMBERG
 DATE: 10/02/2019



REV	DATE	DESCRIPTION	BY
1	08/07/19	VDOT REVIEW COMMENTS	AS
2	10/02/19	VDOT REVIEW COMMENTS	AS

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

DATE: 04/04/19
 VALMONT: 16362-2(C) B