

Information Provided by FDOT to Proposers for RFRP 15/16-001: Wind Effects on Mast Arms

Current Mast Arm Standards

Please refer to Design Standard Indices 17743 and 17745 on the FDOT Roadway Design Office Website at: <http://www.dot.state.fl.us/rddesign/DS/17/STDs.shtm>

Outdated Mast Arm Standards

Please refer to Design Standard Indices 17742 and 17744 on the FDOT Roadway Design Office Website at: <http://www.dot.state.fl.us/rddesign/DS/02/STDs.shtm>

Also see Appendix A for outdated mast arms specific to FDOT District 6.

Mast Arm Analysis Program

Please refer to the 'MastArm' program on the FDOT Structures Design Office Website at: <http://www.dot.state.fl.us/structures/ProgLib.shtm>

Current Design Guidance

Please refer to the AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals (LTS-6) and Volume 3 of the FDOT Structures Manual on the FDOT Website at:
<http://www.dot.state.fl.us/structures/StructuresManual/CurrentRelease/StructuresManual.shtm>

Inventory Data including condition

Please see Excel data. The key to the data is as follows:

DISTRICT: FDOT District Number
(<http://www.dot.state.fl.us/publicinformationoffice/moreDOT/districts/district.shtm>)

BRKEY: Identification Number, multiple mast arms at a given intersection share the same structure number

YEARBUILT: Year of construction

CUSTODIAN:

01 State Highway Agency

02 County Highway Agency

03 Town or Township Highway Agency

04 City or Municipal Highway Agency
11 State Park, Forest, or Reservation Agency
12 Local Park, Forest, or Reservation Agency
21 Other State Agencies
25 Other Local Agencies
26 Private (other than railroad)
27 Railroad
31 State Toll Authority
32 Local Toll Authority
33 Turnpike
60 Other Federal Agencies (not listed below)
61 Indian Tribal Government
62 Bureau of Indian Affairs
63 Bureau of Fish and Wildlife
64 U.S. Forest Service
66 National Park Service
67 Tennessee Valley Authority
68 Bureau of Land Management
69 Bureau of Reclamation
70 Corps of Engineers (Civil)
71 Corps of Engineers (Military)
72 Air Force
73 Navy/Marines
74 Army
75 NASA
76 Metropolitan Washington Airport Service
80 Unknown

DESIGN MAIN:

01 Slab

02 Multi-beam or Multi-girder
03 Girder-Floorbeam (GF) or Girder-Floorbeam-Stringer
04 Tee Beam, or Double Tee Beam
05 Box Beam or Girders - Multiple*
06 Box Beam or Girders - Single or spread*
07 Frame (except frame culverts)
08 Orthotropic
09 Truss - Deck
10 Truss - Thru or Pony
11 Arch - Deck
12 Arch - Thru
13 Suspension
14 Cable Stayed Girder
15 Movable – Lift
16 Movable - Bascule
17 Movable - Swing
18 Tunnel
19 Culvert (includes frame culverts)
21 Segmental Box Girder
22 Channel Beam
88 Sign-Monotube-Span **
89 Sign-Monotube-Cantilever **
91 Cantilever Sign Structure **
92 Span Sign Structure **
93 Butterfly Sign Structure **
94 Cable Sign Structure (not part of a structure)
96 High Mast Light Standard (not part of a structure)
97 Traffic Signal Mast Arm
98 Earth Retaining Wall (not part of a structure)

99 Sea Retaining Wall (not part of a structure)

00 Other

ELEMKEY:

480 Mast Arm Foundation (Each)

481 Painted Steel Mast Arm Vertical (Each)

482 Galvanized Steel Mast Arm Vertical (Each)

483 Miscellaneous Material Mast Arm Vertical (Each)

484 Painted Steel Mast Arm Horizontal (Each)

485 Galvanized Steel Mast Arm Horizontal (Each)

486 Miscellaneous Material Mast Arm Horizontal (Each)

QUANTITY: Number of each element

QTYSTATE: lists the number of each element per condition state. Here is the condition state language:

Mast Arm Foundations:

Condition state descriptions

1 The element shows little or no deterioration. There may be discoloration, efflorescence, and/or superficial cracking but without affect on strength and/or serviceability.

2 Minor cracks and spalls may be present but there is no exposed reinforcing or surface evidence of rebar corrosion.

3 Some delaminations and/or spalls may be present and some reinforcing may be exposed. Corrosion of rebar may be present but loss of section is incidental and does not significantly affect the strength and/or serviceability of either the element or the bridge.

4 Advanced deterioration. Corrosion of reinforcement and/or loss of concrete section and/or settlement or rotation of foundations is sufficient to warrant review to ascertain the effect on the strength and/or serviceability of either the element or the bridge.

Painted Steel Mast Arms:

Condition state descriptions

1 There is no evidence of active corrosion and the paint system is sound and functioning as intended to protect the metal surface.

2 There is little or no active corrosion. Surface corrosion has formed or is forming. The paint system may be chalking, peeling, curling or showing other early evidence of paint system distress but there is no exposure of metal.

3 Surface corrosion is prevalent. There may be exposed metal but there is no active corrosion which is causing loss of section.

4 Corrosion may be present but any section loss due to active corrosion does not yet warrant structural review of element.

5 Corrosion has caused section loss and is sufficient to warrant structural review to ascertain the impact on the ultimate strength and/or serviceability of the unit.

Galvanized Steel Mast Arms:

Condition state descriptions

1 There is no evidence of active corrosion and the coating system is sound and functioning as intended to protect the metal surface.

2 There is little or no active corrosion. Surface corrosion has formed or is forming. The coating system may be chalking, peeling, curling or showing other early evidence of paint system distress but there is no exposure of metal.

3 Surface corrosion is prevalent. There may be exposed metal but there is no active corrosion which is causing loss of section.

4 Corrosion may be present but any section loss due to active corrosion does not yet warrant structural review of the element.

5 Corrosion has caused section loss and is sufficient to warrant structural review to ascertain the impact on the ultimate strength and/or serviceability of the unit.

Miscellaneous Material Mast Arms:

Condition state descriptions

1 There is no evidence of active corrosion and the coating system is sound and functioning as intended to protect the metal surface.

2 There is little or no active corrosion. Surface corrosion has formed or is forming. The coating system may be chalking, peeling, curling or showing other early evidence of paint system distress but there is no exposure of metal.

3 Surface corrosion is prevalent. There may be exposed metal but there is no active corrosion which is causing loss of section.

4 Corrosion may be present but any section loss due to active corrosion does not yet warrant structural review of the element.

5 Corrosion has caused section loss and is sufficient to warrant structural review to ascertain the impact on the ultimate strength and/or serviceability of the unit.

Appendix A: Outdated Mast Arm Standards Specific to FDOT District 6

1998

MATERIAL SPECIFICATIONS

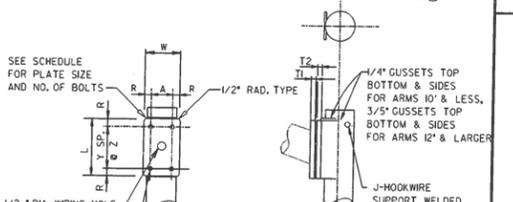
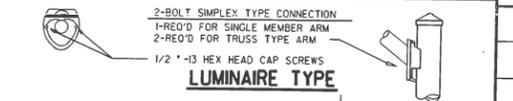
1. TAPERED UPRIGHT POLES AND MAST ARMS SHALL BE ROUND OR POLYGONAL (MIN 12 SIDES) IN CROSS-SECTION, FABRICATED FROM SAE 1020 STEEL PROCESSED TO ACHIEVE A MINIMUM YIELD STRESS OF 55,000 PSI AND CONFORMING TO THE REQUIREMENTS OF ASTM A 595 (GRADE A) FOR POLES OF UP TO 13" AND A572 (GRADE 60) FOR POLES 15" AND OVER.
2. CAST ANCHOR BASE AND HANDHOLE FRAME - ASTM A27 GRADE 65-35. (SEE NOTE 2)
3. HANDHOLE COVER PLATE - 11 GAUGE STEEL SAE 1015.
4. CAST ALUMINUM POLE TOP CAP - ALUMINUM ALLOY #43.
5. ANCHOR BOLTS TO BE HIGH STRENGTH STEEL HAVING 55,000 PSI MINIMUM YIELD STRESS 95,000 PSI ULTIMATE CONFORMING TO ASTM A 576. (SEE NOTE 2)
6. ALL NUTS AND BOLTS LESS THAN 1/2" DIAMETER TO BE PASSIVATED STAINLESS STEEL A193-300 SERIES, COMMERCIAL GRADE.
7. ALL OTHER NUTS AND BOLTS 1/2" DIAMETER AND OVER SHALL CONFORM TO ASTM A 307 AND BE GALVANIZED IN ACCORDANCE WITH ASTM A 153 SPECIFICATION.
8. WELDING ROD ASTM A 233-CLASS E 60 XX OR E 70 XX. (SEE NO. 14)
9. GALVANIZING OF ALL STEEL COMPONENTS SHALL CONFORM TO ASTM A 123 SPECIFICATION SPECIAL ATTENTION SHOULD BE GIVEN TO PARAGRAPH 9A WHICH COVERS APPEARANCE OF THE GALVANIZED SURFACE. SURFACE MUST HAVE A REASONABLE UNIFORMITY OF APPEARANCE, WITH NO EXCESSIVE BUILDUP OF DROSS OR FLUX, AND NO UNCOATED OR BLACK SPOTS. FAILURE TO COMPLY WITH THESE REQUIREMENTS WILL BE CAUSE FOR REJECTION.
10. STEEL PLATE FOR TRAFFIC ARM CONNECTION TO UPRIGHT POLE - ASTM A 36.
11. BASE PLATE FOR UPRIGHT POLE ASTM A36.
12. POLE TOP CAP AND ARM END CAP A48 CLASS 30 SECURED IN PLACE WITH 3 SET SCREWS PLATED HARDWARE.
13. ACCESSORIES NOT DIP GALVANIZED TO ASTM A153.
14. ALL WELDING RODS OMAW E70S-3 OR ER80 S0-2 AS APPROPRIATE FOR THE STEEL USED.
15. ARM END CAP WITH ADDITIONAL THRU ARM END BOLT.
16. ARM PLATE CONNECTING BOLTS HIGH STRENGTH.
17. MAST ARM POLE CONCRETE FOUNDATION IS TO BE POURED IN ONE SINGLE POURING WITH ITS GRADE AND SLOPE OF THE FINISHED SIDEWALK FRESH GRADE SHALL BE LAID OUT AND A FORM INSTALLED IN ORDER TO ACHIEVE THIS FINAL GRADE. SLOPE DISTANCES P1 AND P2 FOR ANCHOR BOLTS SHALL BE STRICTLY ENFORCED. FOUNDATIONS POURED IN NO COMPLIANCE WITH THESE REQUIREMENTS SHALL BE COMPLETELY REMOVED AND POURED AGAIN AT CONTRACTOR'S EXPENSE.
18. WHEN THE POLE CONCRETE FOUNDATION IS POURED WITHIN THE SIDEWALK AREA, THE TOP OF SAID POLE CONCRETE FOUNDATION WILL RECEIVE PROPER SIDEWALK FINISH AND WILL BECOME PART OF IT.
19. IF THE ELEVATION REQUIRED BY THE POLE CONCRETE FOUNDATION IS HIGHER THAN THE ELEVATION OF THE SURROUNDING TERRAIN, OUTSIDE A SIDEWALK AREA, THE POLE CONCRETE FOUNDATION WILL BE EXTENDED VERTICALLY SO AS TO MAINTAIN THE CONCRETE FOOTING DEPTH 12" BELOW THE GROUND EQUAL TO THE AMOUNT OR HEIGHT SPECIFIED IN THE FOUNDATION DATA. TYPICAL STEEL REINFORCEMENT WILL BE ADJUSTED ACCORDINGLY TO THE PROPER CLEARANCES BY INCREASING THE LENGTH OF THE HOOKED BARS. THE MAXIMUM EXTENSION SHALL BE 2'-0" IF MORE THAN 2'-0" ARE REQUIRED, THE FOOTING DEPTH 12" SHALL BE INCREASED BY THAT AMOUNT IN EXCESS OF 2'-0".
20. HIGH STRENGTH BOLTS THAT HAVE BEEN USED BEFORE AND HAVE BEEN SUBJECTED TO LOAD SHALL NOT BE REUSED IN ANY ARM ATTACHMENT OR CONNECTION.
21. ACCEPTABLE POLE LENGTHS ARE 18'-6" FOR TYPE I POLES AND 20'-0" FOR TYPE II POLES. POLE TAPER SHALL BE 0.14" PER FOOT IN ALL CASES.
22. ANY STRUCTURAL DETAIL NOT ADDRESSED OR CONTEMPLATED IN THIS SPECIFICATION SHALL BE RESOLVED BY THE POLE MANUFACTURER WITH AN APPROACH BASED ON COMPLIANCE WITH THE AASHTO CRITERION FOR 100 MPH ISOTACH.
23. PROVISIONS SHALL BE MADE TO HAVE ADEQUATE DRAINAGE CONDITIONS AT THE POLE BASE BETWEEN THE METAL BASE PLATE OF THE POLE AND THE TOP OF THE CONCRETE FOUNDATION. THIS CAN BE ACCOMPLISHED THROUGH THE USE OF GROUTING AND PVC TUBING OR A WIRE MESH SUITABLE TO KEEP AWAY MOST FORMS OF INSECT LIFE.
24. CALCULATIONS USING AASHTO FORMULAS MUST BE INCLUDED WITH SUBMITTAL DATA FOR ALL ARMS AND POLES.

- NOTES:**
1. UPRIGHT POLE AND MAST ARM SIZES ARE BASED UPON STEEL AS DESCRIBED IN SPECIFICATION ABOVE. IF CROSS-SECTION OTHER THAN ROUND IS USED, OR IF STEEL OTHER THAN 55,000 PSIS IS TO BE USED, BENDING STRENGTH AT LEAST EQUIVALENT TO TUBE SIZES SHOWN MUST BE PROVIDED BY ADJUSTING WALL THICKNESS. FOR POLE SHAPES OTHER THAN ROUND, THIS MINIMUM STRENGTH MUST BE PROVIDED THROUGH THE WEAKEST POLE CROSS-SECTION.
 2. INTERCHANGEABILITY ON BASES MUST BE MAINTAINED, AND BOLT CIRCLE DIAMETER AND ANCHOR BOLT SIZES SHOWN MUST REMAIN THE SAME. CAST BASES ARE PREFERRED. ALTERNATE TYPES MUST ALSO PROVIDE METAL NUT COVERS FOR NEAT APPEARANCE.

TYPICAL POLE AND ARM SIZE REQUIREMENTS

DADE COUNTY CLASS NO.	UPRIGHT POLE SIZE			TRAFFIC ARM SIZE REFER TO ITEM C BELOW
	TYPE I REFER TO ITEM B BELOW	TYPE II REFER TO ITEM B BELOW	TYPE III REFER TO ITEM B BELOW	
DS-1				11 GA. 5.0"x 3.60"x 10'-0"
DS-2				11 GA. 5.0"x 3.32"x 12'-0"
DS-3				7 GA. 6.0"x 4.04"x 14'-0"
DS-4				7 GA. 6.0"x 3.76"x 16'-0"
DS-5	3 GA. 11" X TAPER X 18'-6"	3 GA. 11" X TAPER X 28'-6"	3 GA. 11" X TAPER X 20'-0"	7 GA. 6.0"x 3.48"x 18'-0"
DS-6				7 GA. 6.0"x 3.20"x 20'-0"
DS-7				7 GA. 7.0"x 3.92"x 22'-0"
DS-8				7 GA. 7.0"x 3.64"x 24'-0"
DS-9				7 GA. 7.0"x 3.36"x 26'-0"
DS-10				3 GA. 8.0"x 4.08"x 28'-0"
DS-11				3 GA. 8.0"x 3.80"x 30'-0"
DS-12				3 GA. 8.0"x 3.52"x 32'-0"
DS-13				3 GA. 8.0"x 3.24"x 34'-0"
DS-14				3 GA. 9.0"x 3.96"x 36'-0"
DS-15				3 GA. 9.0"x 3.68"x 38'-0"
DS-16	3 GA. 13" X TAPER X 18'-6"	3 GA. 13" X TAPER X 28'-6"	3 GA. 13" X TAPER X 20'-0"	3 GA. 9.0"x 6.83"x 15'-6" } 40'-0" (A)
DS-17				7 GA. 7.44"x 3.80"x 26'-0" } 42'-0" (A)
DS-18				3 GA. 9.0"x 6.83"x 15'-6" } 44'-0" (A)
DS-19				7 GA. 7.44"x 4.24"x 30'-0" } 46'-0" (A)
DS-20				3 GA. 10.0"x 7.79"x 15'-9" } 48'-0" (A)
				7 GA. 8.44"x 3.96"x 32'-0" } 50'-0" (A)
DS-21				3 GA. 10.0"x 6.43"x 25'-6" } 52'-0" (A)
DS-22				7 GA. 9.04"x 5.12"x 28'-0" } 54'-0" (A)
DS-23	3 GA. 15" X TAPER X 18'-6"	3 GA. 15" X TAPER X 28'-6"	3 GA. 15" X TAPER X 20'-0"	3 GA. 12.0"x 8.40"x 25'-9" } 56'-0" (A)
DS-24				7 GA. 9.04"x 4.84"x 30'-0" } 58'-0" (A)
DS-25				3 GA. 12.0"x 8.40"x 25'-9" } 60'-0" (A)
DS-26				7 GA. 9.04"x 4.0"x 36'-0" } 62'-0" (A)
DS-27	0 GA. 15" X TAPER X 18'-6"	0 GA. 15" X TAPER X 28'-6"	0 GA. 15" X TAPER X 20'-0"	3 GA. 13.0"x 8.40"x 25'-9" } 64'-0" (A)
DS-28				7 GA. 9.04"x 3.72"x 38'-0" } 66'-0" (A)
DS-29				3 GA. 13.0"x 8.12"x 27'-9" } 68'-0" (A)
DS-30	0.3125 X 17" X TAPER X 18'-6"	0.3125 X 17" X TAPER X 28'-6"	0.3125 X 17" X TAPER X 20'-6"	3 GA. 8.76"x 3.44"x 38'-0" } 70'-0" (A)
DS-31				3 GA. 13.0"x 8.40"x 25'-9" } 72'-0" (A)
DS-32	0.3125 X 18" X TAPER X 18'-6"	0.3125 X 18" X TAPER X 28'-6"	0.3125 X 18" X TAPER X 20'-6"	3 GA. 10.58"x 5.26"x 38'-0" } 74'-0" (A)
DS-33				3 GA. 10.58"x 4.98"x 38'-0" } 76'-0" (A)
DS-34				3 GA. 10.58"x 4.70"x 38'-0" } 78'-0" (A)
DS-35	0.375 X 18" X TAPER X 18'-6"	0.375 X 18" X TAPER X 28'-6"	0.375 X 18" X TAPER X 20'-6"	3 GA. 15"x 10.28"x 33'-9" } 80'-0" (A)
DS-36				3 GA. 11.8"x 5.58"x 40'-0" } 82'-0" (A)

- ITEMS**
- (A) DENOTES 2 PIECE ARM (SEE TELESCOPIC SPLICE DETAIL).
 - (B) FOR TAPER REFER TO NO. 21 IN THE MATERIAL SPECIFICATIONS.
 - (C) THE POLE MANUFACTURER SHALL PROVIDE POLE AND FOUNDATION SPECIFICATIONS FOR MAST ARMS OVER 64 FEET IN LENGTH OR WHEN MORE THAN ONE TRAFFIC MAST ARM IS USED.
 - (D) THE POLE MANUFACTURER SHALL ADJUST THE DIAMETER OF THE OUTBOARD SECTION OF THE 2 PIECE ARMS, TO OBTAIN THE PROPER OVERLAP OF 18" - 21".
 - (E) FOR POLES DS-29 AND LARGER, THE POLE MANUFACTURER MAY MOVE THE LOCATION OF THE TELESCOPIC MAST ARM JOINT BY 2.5m (MAXIMUM) IN THE OUTBOARD DIRECTION. DS-16 THRU DS-21 MAY HAVE A 1-PIECE MAST ARM. THE INBOARD SECTION MAY BE 8.0m FOR DS-16 THROUGH DS-19 AND DS-28



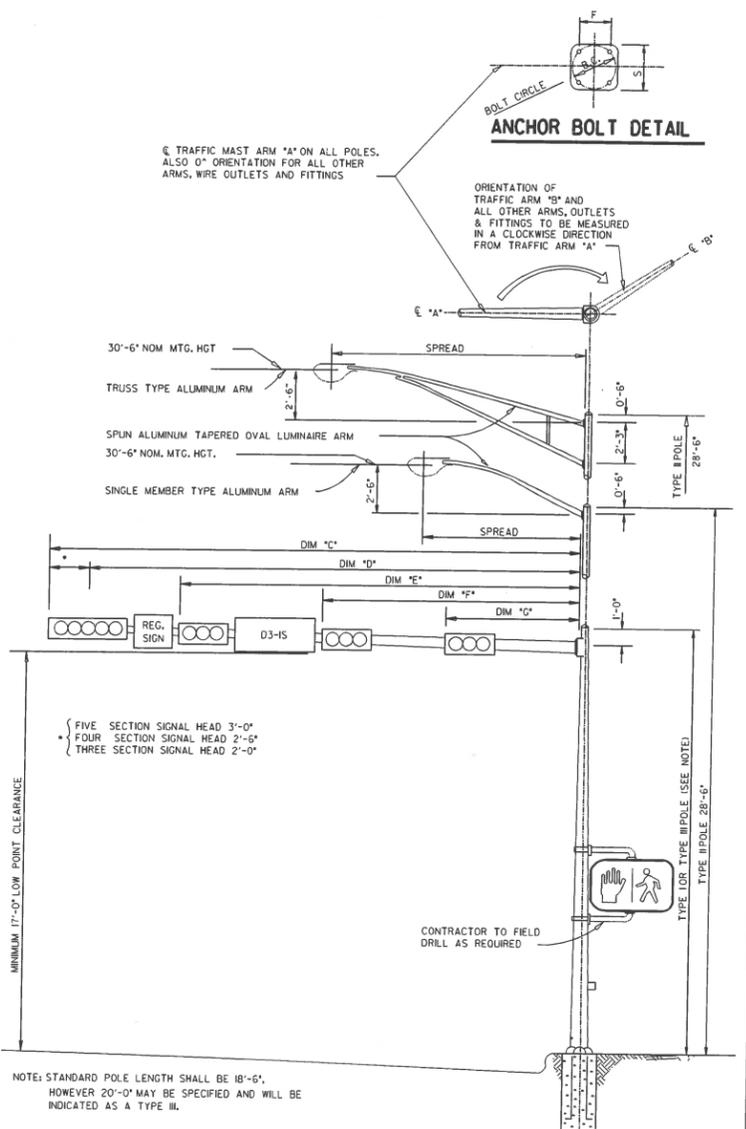
MAST ARM VARIABLE

ARM DIAMETER	W	L	T1	T2	TOTAL NO. OF BOLTS	A	R	Y	Z
5\"/>									

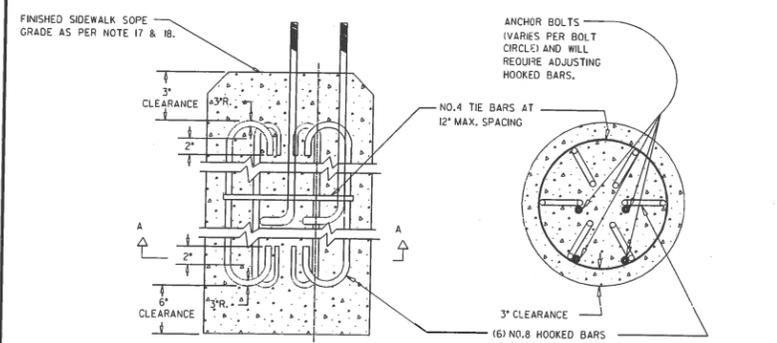
DESIGNED BY	NAME	DATE	DRAWN BY	NAME	DATE
CHECKED BY			CHECKED BY		
SUPERVISED BY	PEDRO G. HERNANDEZ				

APPROVED BY: METROPOLITAN DADE COUNTY PUBLIC WORKS DEPARTMENT

ANCHOR BOLT DETAIL

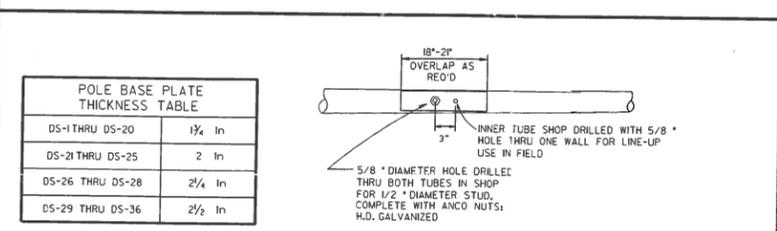


TRAFFIC MAST ARM & ORIENTATION DETAIL



POLE CONCRETE FOUNDATION TO BE POURED IN ONE SINGLE POUR ACCORDING TO SECTION 346 AND B455 PLACING CONCRETE OF THE FLORIDA DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR ROADS AND BRIDGES, DATED 1996 AND SUPPLEMENT THERETO.

TYPICAL STEEL REINFORCING



POLE BASE PLATE THICKNESS TABLE

POLE SIZE	THICKNESS
DS-1 THRU DS-20	1 1/4\"/>

TELESCOPIC SPLICE DETAIL FOR ARM LENGTHS OVER 38 FEET

BASE PLATE AND FOUNDATION DATA

POLE SIZE	BOLT CIRCLE	ANCHOR BOLT				* CONC. FOOTING	
		F	S	P1	P2	DIAMETER	DEPTH
3 GA. 11.0"	15"	10 3/8"	15 3/8"	3 3/4"	6 3/4"	1 3/4"	9'-9"
13.0"	18"	12 3/8"	18 1/2"	4 1/4"	7"	1 3/4"	11'-0"
15.0"	22"	15 1/2"	23"	5"	8"	2"	11'-0"
0 GA. 15.0"	22"	15 1/2"	23"	5"	8"	2"	12'-0"
0.3125X17"	25"	17 1/2"	25 3/8"	5"	11"	2"	14'-0"
0.3575X18"	26"	18 3/8"	26 3/8"	5"	11"	2"	14'-0"
0.375X18"	27"	19 1/2"	27 3/8"	5"	11"	2"	17'-0"
0.375X18"	26"	18 3/8"	26 3/8"	5"	11"	2"	17'-0"

1. ANCHOR BOLT LENGTH INCLUDES HOOK
2. FOUNDATION TO BE CONCRETE CLASS IV (DRILL SHAFT) - 4000 p.s.i. MINIMUM STRENGTH IN 28 DAYS.

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION
10-94	JDL	TYPICAL STEEL REINFORCING	6-95	JAR DPA	MIN. POLE & ARM SIZE FOR DS-29 THRU DS-35						

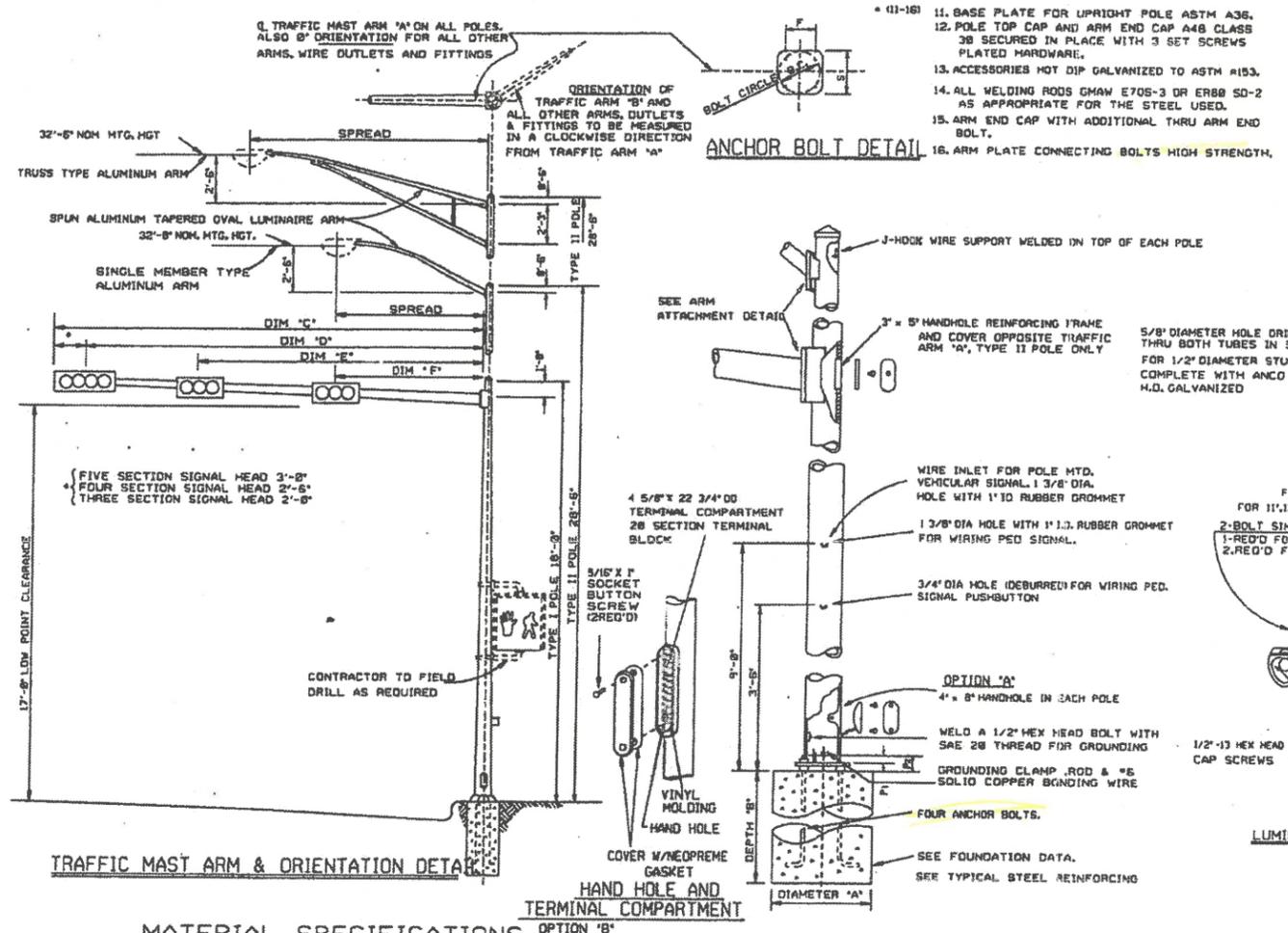
dpa DAVID PLUMMER & ASSOCIATES, INC.
TRANSPORTATION • CIVIL • STRUCTURAL • ENVIRONMENTAL
CORAL GABLES FORT MYERS WEST PALM BEACH
1750 PONCE DE LEON BLVD., CORAL GABLES FL 33134 TELEPHONE (305) 447-0900 FAX (305) 444-4986

REVISIONS: ISSUING DATE: 04-20-98 PROJECT: MIAMI BEACH 16TH STREET DEVELOPMENT TITLE: STEEL MAST ARM DETAILS

DATE: 04/20/98 PROJECT NO.: 96147
DRAWN: SHEET NO.: 6 OF 7
CHECKED: APPROVED: 7

95156.MASTARM.DGN

STATE PROJ. NO.	SHEET NO.
87240-3522	T-3

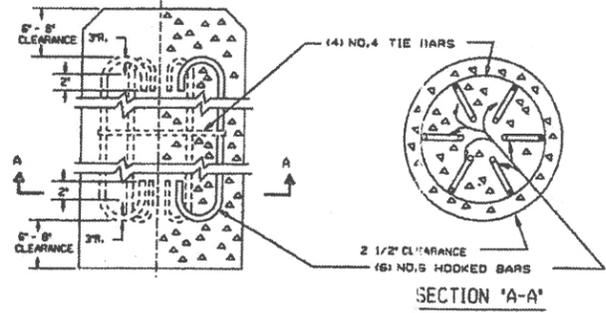


TYPICAL POLE AND ARM SIZE REQUIREMENTS

DADE COUNTY CLASS NO.	UPRIGHT POLE SIZE		TRAFFIC ARM SIZE
	TYPE I	TYPE II	
DS-1			11 GA 5.87X 3.68X 18'-0"
DS-2	7 GA 8.87X 4.78X 18'-0"	7 GA 8.87X 4.81X 28'-0"	11 GA 5.87X 3.32X 12'-0"
DS-3			7 GA 6.87X 4.84X 14'-0"
DS-4	7 GA 9.87X 5.78X 18'-0"	7 GA 9.87X 5.01X 28'-0"	7 GA 6.87X 3.76X 16'-0"
DS-5			7 GA 6.87X 3.48X 18'-0"
DS-6			7 GA 6.87X 3.28X 28'-0"
DS-7			7 GA 7.07X 3.92X 22'-0"
DS-8	7 GA 10.07X 6.78X 18'-0"	7 GA 10.07X 6.01X 28'-0"	7 GA 7.07X 3.64X 24'-0"
DS-9			7 GA 7.07X 3.36X 26'-0"
DS-14			3 GA 8.87X 4.88X 28'-0"
DS-15	3 GA 11.87X 7.78X 18'-0"	3 GA 11.87X 7.81X 28'-0"	3 GA 8.87X 3.88X 38'-0"
DS-16			3 GA 8.87X 3.52X 32'-0"
DS-17			3 GA 8.87X 3.24X 34'-0"
DS-28	3 GA 12.87X 8.78X 18'-0"	3 GA 12.87X 8.81X 28'-0"	3 GA 9.87X 3.96X 36'-0"
DS-21			3 GA 9.87X 3.68X 38'-0"
DS-22	3 GA 12.87X 8.78X 18'-0"	3 GA 12.87X 8.81X 28'-0"	7 GA 9.87X 5.83X 15'-0"
			7 GA 7.44X 3.87X 28'-0"
DS-23	3 GA 12.87X 8.78X 18'-0"	3 GA 12.87X 8.81X 28'-0"	7 GA 9.87X 6.83X 15'-0"
			7 GA 7.44X 3.87X 28'-0"
DS-24	3 GA 13.87X 9.78X 18'-0"	3 GA 13.87X 9.81X 28'-0"	3 GA 10.87X 7.79X 15'-0"
			7 GA 8.44X 4.24X 38'-0"
DS-25	3 GA 13.87X 9.78X 18'-0"	3 GA 13.87X 9.81X 28'-0"	3 GA 10.87X 7.79X 15'-0"
			7 GA 8.44X 3.98X 32'-0"
DS-26	3 GA 13.87X 9.78X 18'-0"	3 GA 13.87X 9.87X 28'-0"	3 GA 10.87X 6.43X 25'-0"
			7 GA 7.84X 3.68X 24'-0"
DS-27	3 GA 13.87X 9.78X 18'-0"	3 GA 13.87X 9.81X 28'-0"	3 GA 10.87X 6.43X 25'-0"
			7 GA 7.84X 3.48X 28'-0"
DS-28	3 GA 15.87X 11.78X 18'-0"	3 GA 15.87X 11.81X 28'-0"	3 GA 12.87X 8.48X 25'-0"
			7 GA 9.87X 5.12X 28'-0"
DS-29	3 GA 15.87X 11.78X 18'-0"	3 GA 15.87X 11.81X 28'-0"	3 GA 12.87X 8.48X 25'-0"
			7 GA 9.87X 4.18X 33'-0"
DS-30	3 GA 15.87X 11.78X 18'-0"	3 GA 15.87X 11.81X 28'-0"	3 GA 12.87X 8.48X 25'-0"
			7 GA 9.87X 4.58X 32'-0"
DS-31	3 GA 15.87X 11.78X 18'-0"	3 GA 15.87X 11.81X 28'-0"	3 GA 12.87X 8.48X 25'-0"
			7 GA 9.87X 4.28X 34'-0"
DS-32	3 GA 15.87X 11.78X 18'-0"	3 GA 15.87X 11.81X 28'-0"	3 GA 12.87X 8.48X 25'-0"
			7 GA 9.87X 4.87X 28'-0"
DS-33	8 GA 15.87X 11.78X 18'-0"	8 GA 15.87X 11.81X 28'-0"	8 GA 12.87X 8.48X 25'-0"
			7 GA 9.87X 3.72X 28'-0"
DS-34	8 GA 15.87X 11.78X 18'-0"	8 GA 15.87X 11.81X 28'-0"	8 GA 12.87X 8.48X 25'-0"
			7 GA 8.76X 3.44X 28'-0"

- MATERIAL SPECIFICATIONS**
- TAPERED UPRIGHT POLES AND MAST ARMS SHALL BE ROUND OR POLYGONAL (ON 12 SIDES) IN CROSS-SECTION, FABRICATED FROM SAE 1020 STEEL PROCESSED TO ACHIEVE A MINIMUM YIELD STRESS OF 55,000 PSI AND CONFORMING TO THE REQUIREMENTS OF ASTM A 575 (GRADE A) SEE NOTE 1 (LINEAR TAPER 1/4 IN/FT) FOR POLES OF 18' TO 13' AND A572 (GRADE 50) FOR 15' POLES.
 - CAST ANCHOR BASE AND HANDHOLE FRAME - ASTM A27 GRADE 65 35 SEE NOTE 2.
 - HANDHOLE COVER PLATE - 11 GAUGE STEEL SAE 1015
 - CAST ALUMINUM POLE TOP ALUMINUM ALLOY #43
 - ANCHOR BOLTS TO BE HIGH STRENGTH STEEL HAVING 95,000 PSI MINIMUM YIELD STRESS 95,000 PSI ULTIMATE CONFORMING TO ASTM A 376 SEE NOTE 2
 - ALL NUTS AND BOLTS LESS THAN 5/8" DIAMETER TO BE PASSIVATED STAINLESS STEEL A193-309 SERIES, COMMERCIAL GRADE
 - ALL OTHER NUTS AND BOLTS 5/8" DIAMETER AND OVER SHALL CONFORM TO ASTM A 307 AND BE GALVANIZED IN ACCORDANCE WITH ASTM A 153 SPECIFICATION.
 - WELDING ROD ASTM A 232-CLASS E 60 XX OR E 70 XX (SEE NOTE 14)
 - GALVANIZING OF ALL STEEL COMPONENTS SHALL CONFORM TO ASTM A 123 SPECIFICATION SPECIAL ATTENTION SHOULD BE GIVEN TO PARAGRAPH 94 WHICH COVERS APPEARANCE OF THE GALVANIZED SURFACE. SURFACE MUST HAVE A REASONABLE UNIFORMITY OF APPEARANCE, WITH NO EXCESSIVE BUILDUP OF DROSS OR FLUX, AND NO UNCOATED OR BLACK SPOTS. FAILURES TO COMPLY WITH THESE REQUIREMENTS WILL BE CAUSE FOR REJECTION
 - STEEL PLATE FOR TRAFFIC ARM CONNECTION TO UPRIGHT POLE - ASTM A 36.
 - 11 THRU 16 (CONT'D) ON TOP OF SHEET

- NOTES:**
- UPRIGHT POLE AND MAST ARM SIZES ARE BASED UPON STEEL AS DESCRIBED IN SPECIFICATION ABOVE. IF CROSS-SECTION OTHER THAN ROUND IS USED, OR IF STEEL OTHER THAN 55,000 PSI IS TO BE USED, BENDING STRENGTH AT LEAST EQUIVALENT TO TUBE SIZES SHOWN MUST BE PROVIDED BY ADJUSTING WALL THICKNESS. FOR POLE SHAPES OTHER THAN ROUND, THIS MINIMUM STRENGTH MUST BE PROVIDED THROUGH THE WEAKEST POLE CROSS-SECTION.
 - INTERCHANGEABILITY ON BASES MUST BE MAINTAINED, AND BOLT CIRCLE DIAMETER AND ANCHOR BOLT SIZES SHOWN MUST REMAIN THE SAME. CAST BASES ARE PREFERRED. ALTERNATE TYPES MUST PROVIDE NUT COVERS FOR NEAT APPEARANCE.
 - ALL MAST ARM INSTALLATION SHALL USE A UNIVERSAL SWIVEL BETWEEN THE DISCONNECT AND MAST ARM.



BASE PLATE AND FOUNDATION DATA

POLE SIZE	BOLT CIRCLE	F	S	P ₁	P ₂	ANCHOR BOLT		CONC. FOOTING	
						DIAMETER	LENGTH	DIAMETER	DEPTH
7 GA 8.8"	11"	7 3/4"	11 1/2"	2 5/8"	5 1/4"	1 1/4"	48"	27"	8'-3"
9.8"	12 1/2"	8 7/8"	12 3/4"	3"	5 1/4"	1 1/4"	48"	27"	8'-9"
11.8"	13 1/2"	9 9/16"	14 1/8"	3 3/8"	5 7/8"	1 1/2"	68"	27"	7'-3"
13.8"	15"	10 5/8"	15 5/8"	3 5/8"	6 1/4"	1 1/2"	68"	38"	7'-6"
15.8"	16"	11 5/16"	17"	3 5/8"	6 1/2"	1 1/2"	68"	38"	8'-0"
3 GA 11.8"	15"	8 9/8"	15 5/8"	3 5/8"	6 3/4"	1 3/4"	98"	36"	4'-9"
13.8"	18"	11 5/16"	17"	4"	8 3/4"	1 3/4"	98"	36"	18'-3"
15.8"	18"	12 3/4"	18 1/2"	4 1/4"	7"	1 3/4"	98"	36"	11'-8"
	22"	15 1/2"	23"	5"	8"	2"	98"	36"	11'-8"
8 GA 15.8"	22"	15 1/2"	23"	5"	8"	2"	98"	36"	12'-0"

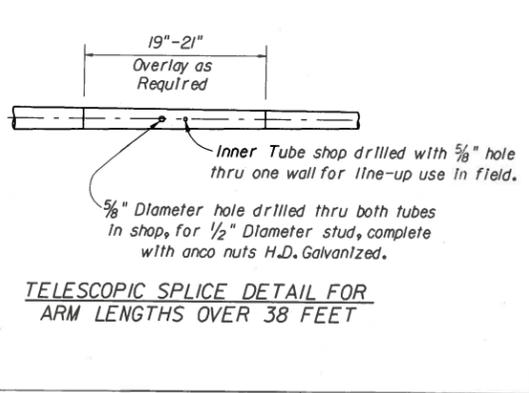
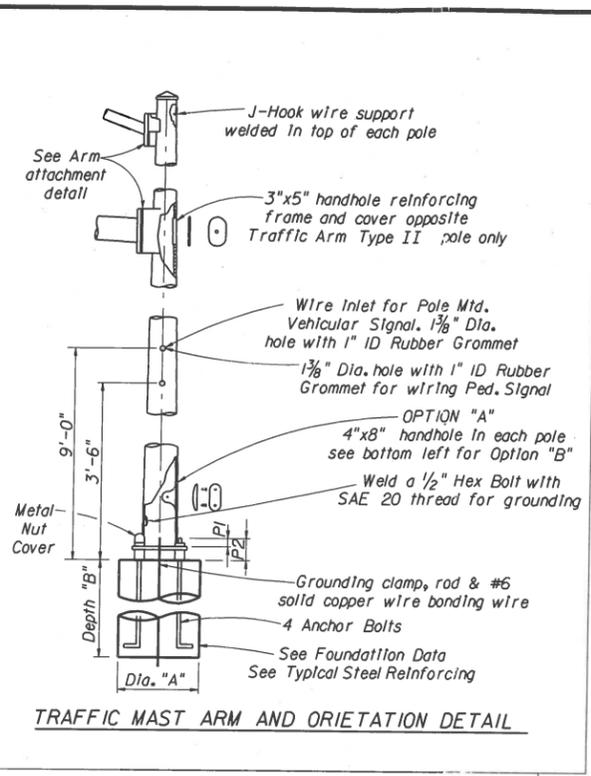
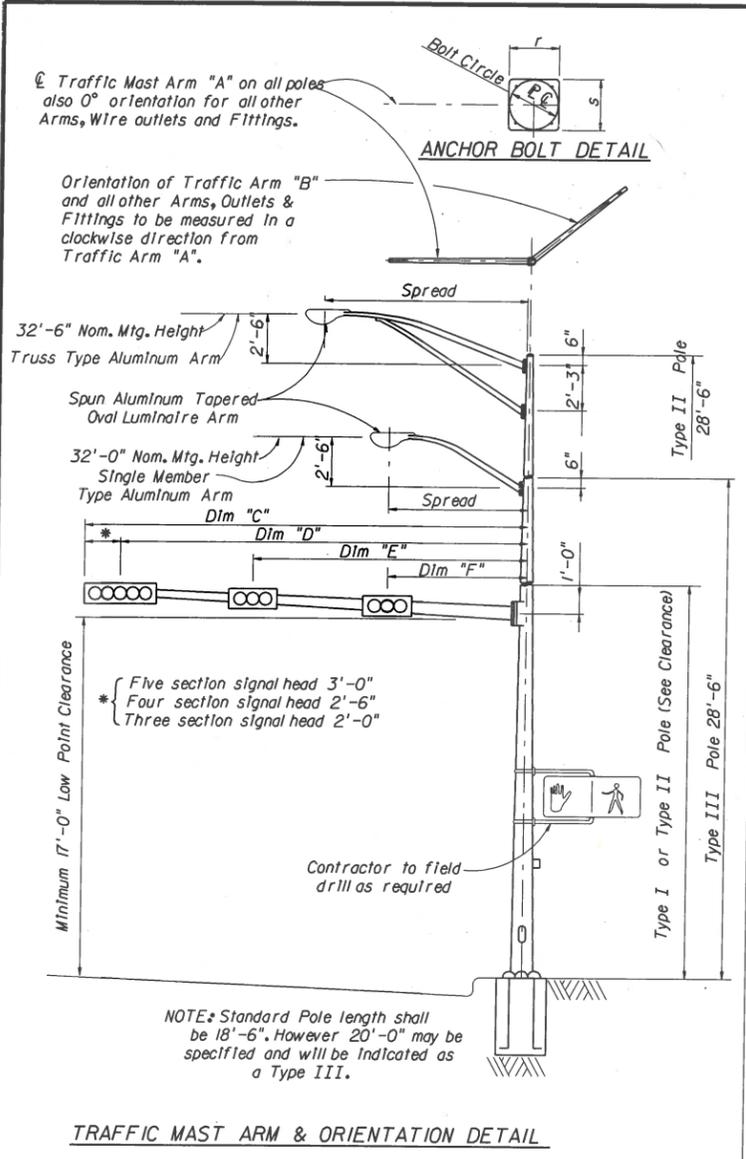
• FOUNDATION TO BE CONCRETE - 4,888 P.S.I. STRENGTH MINIMUM IN 28 DAYS

REVISIONS										APPROVED BY				DATE	
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	NAME	DATE	NAME	DATE	DATE

FLORIDA DEPARTMENT OF TRANSPORTATION
 APPROVED BY: [Signature]
 DATE CO. PUBLIC WORKS
 DATE: 11-91

STEEL MAST ARM DETAIL

OLDEST
Before 1991

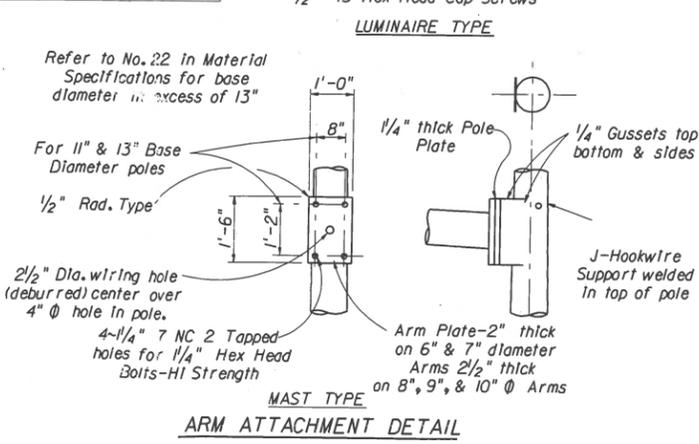
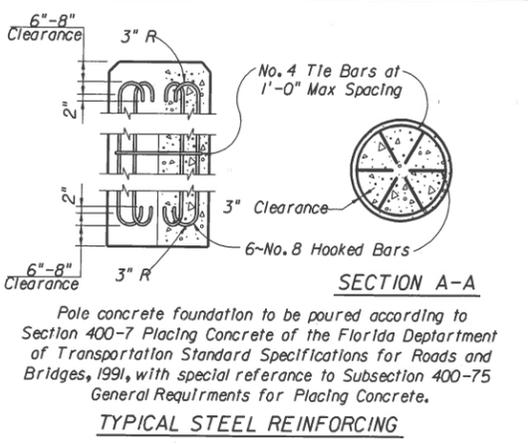
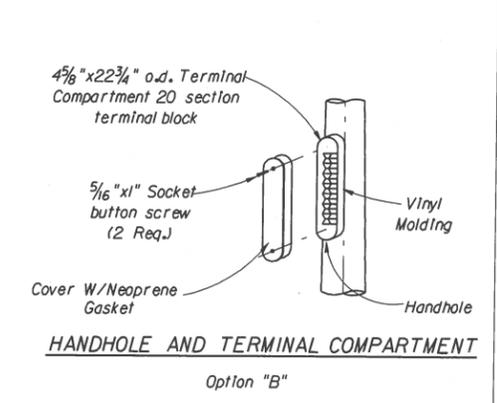


- MATERIAL SPECIFICATIONS
1. Tapered upright poles and mast arms shall be round or polygonal (min 12 sides) in cross-section. Fabricated from SAE 1020 steel processed to achieve a minimum yield stress of 55,000 psi and conforming to the requirements of ASTM A 595 (grade A) for poles of up to 13' and A572 (grade 60) for 15' poles.
 2. Cast anchor base and handhole frame - ASTM A27 grade 65-35. (See note 2).
 3. Handhole cover plate - 11 gauge steel SAE 1015.
 4. Cast aluminum pole top - Aluminum Alloy #43.
 5. Anchor bolts to be high strength steel having 55,000 PSI minimum yield stress 95,000 PSI ultimate conforming to ASTM A 576. (See note 2).
 6. All nuts and bolts less than 5/8" diameter to be passivated stainless steel AISI-300 series, commercial grade.
 7. All other nuts and bolts 5/8" diameter and over shall conform to SSTM A 307 and be galvanized in accordance with ASTM A 153 Specification.
 8. Welding rod ASTM A 233-Class E 60 xx or E 70 xx (See no. 14).
 9. Galvanizing of all steel components shall conform to ASTM A 123 Specification. Special attention should be given to paragraph 9A which covers appearance of the galvanized surface. Surface must have a reasonable uniformity of appearance, with no excessive buildup of dross or flux, and no uncoated or black spots failure to comply with these requirements will be cause for rejection.
 10. Steel plate for traffic arm connection to upright pole - ASTM A 36.
 11. Base plate for upright pole ASTM A36.
 12. Pole top cap and arm end cap A4H class 30 secured in place with 3 set screws plated hardware.
 13. Accessories hot dip galvanized to ASTM A153.
 14. All welding rods GMAW E705-3 or ER80 SD-2 as appropriate for the steel used.
 15. Arm end cap with additional thru arm end bolt.
 16. Arm plate connecting bolts high strength.
 17. If the pole is to be located within the sidewalk area, the top of solid pole concrete foundation will be poured at sidewalk elevation.
 18. When the pole concrete foundation is poured within the sidewalk area, the top of solid pole concrete foundation will receive proper sidewalk finish and will become part of it.
 19. If the elevation required by the pole concrete foundation is higher than the elevation of the surrounding terrain, outside a sidewalk area, the pole concrete foundation will be extended so as to maintain the concrete footing depth "B" (below the ground) equal to the amount or height specified in the foundation data typical steel reinforcement will be adjusted accordingly to the proper clearances by increasing the length of the hooked bars. The maximum extension shall be 2'-0" if more than 2'-0" are required, the footing depth "B" shall be increased by that amount in excess of 2'-0".
 20. High strength bolts that have been used before and have been

20. High strength bolts that have been used before and have been subjected to load shall not be reused in any arm attachment or connection.
21. Acceptable pole lengths are 18'-6" for Type I poles and 20'-0" for Type III poles. Pole taper shall be 0.4" per foot in all cases.
22. Any structural detail not addressed or contemplated in this specification shall be resolved by the pole manufacturer with an approach based on compliance with the AASHTO criterion for 100 MPH ISOTACH.
23. Provisions shall be made to have adequate drainage conditions at the pole base between the metal base plate of the pole and the top of the concrete foundation. This can be accomplished through the use of grouting and PVC tubing or a wire mesh suitable to keep away most forms of insect life.

- NOTES:
1. Upright pole and mast arm sizes are based upon steel as described in specification above. If cross-section other than round is used, or if steel other than 55,000 PSI is to be used, bending strength at least equivalent to tube sizes shown must be provided by adjusting wall thickness. For pole shapes other than round, this minimum strength must be provided through the weakest pole cross-section.
 2. Interchangeability on bases must be maintained, and bolt circle diameter and anchor bolt sizes shown must remain the same cast bases are preferred alternate types must also provide metal nut covers for neat appearance.

DADE COUNTY CLASS NO.	UPRIGHT POLE SIZE			
	TYPE I REFER TO ITEM B BELOW	TYPE II REFER TO ITEM B BELOW	TYPE III REFER TO ITEM B BELOW	
DS-1				11 Ga. 5.0"x3.60"x10'-0"
DS-2				11 Ga. 5.0"x3.32"x12'-0"
DS-3				7 Ga. 6.0"x4.04"x14'-0"
DS-4				7 Ga. 6.0"x3.76"x16'-0"
DS-5				7 Ga. 6.0"x3.48"x18'-0"
DS-6				7 Ga. 6.0"x3.20"x20'-0"
DS-7	3 Ga. 11" x Taper x 18'-6"	3 Ga. 11" x Taper x 28'-6"	3 Ga. 11" x Taper x 20'-0"	7 Ga. 7.0"x3.92"x22'-0"
DS-8				7 Ga. 7.0"x3.64"x24'-0"
DS-9				7 Ga. 6.0"x3.36"x26'-0"
DS-10				3 Ga. 8.0"x4.08"x28'-0"
DS-11				3 Ga. 8.0"x3.80"x30'-0"
DS-12				3 Ga. 8.0"x3.52"x32'-0"
DS-13				3 Ga. 8.0"x3.24"x34'-0"
DS-14				3 Ga. 9.0"x3.96"x36'-0"
DS-15				3 Ga. 9.0"x3.68"x38'-0"
DS-16	3 Ga. 13" x Taper x 18'-6"	3 Ga. 13" x Taper x 28'-6"	3 Ga. 13" x Taper x 20'-0"	3 Ga. 9.0"x6.83"x15'-6"
DS-17				7 Ga. 7.44"x3.80"x26'-0"
DS-18				7 Ga. 7.44"x3.52"x28'-0"
DS-19				7 Ga. 8.44"x4.24"x30'-0"
DS-20				7 Ga. 8.44"x3.96"x32'-0"
DS-21				7 Ga. 10.0"x7.79"x15'-9"
DS-22				7 Ga. 10.0"x7.79"x15'-9"
DS-23	3 Ga. 15" x Taper x 18'-6"	3 Ga. 15" x Taper x 28'-6"	3 Ga. 15" x Taper x 20'-0"	3 Ga. 10.0"x7.79"x15'-9"
DS-24				7 Ga. 9.04"x4.84"x30'-0"
DS-25				7 Ga. 9.04"x4.56"x32'-0"
DS-26				7 Ga. 12.0"x8.40"x25'-9"
DS-27	0 Ga. 15" x Taper x 18'-6"	0 Ga. 15" x Taper x 28'-6"	0 Ga. 15" x Taper x 20'-0"	7 Ga. 9.04"x4.28"x34'-0"
DS-28				7 Ga. 12.0"x8.40"x25'-9"
				7 Ga. 9.04"x4.0"x36'-0"
				7 Ga. 13.0"x8.40"x25'-9"
				7 Ga. 9.04"x3.72"x38'-0"
				3 Ga. 13.0"x8.12"x27'-9"
				7 Ga. 8.76"x3.44"x38'-0"



BASE PLATE AND FOUNDATION DATA

POLE SIZE	BOLT CIRCLE	F	S	A	P ₂	ANCHOR BOLT DIA.	CONC. FOOTING LENGTH DIA. "A" DIA. "B"
3 GA. 11.0'	15"	10 3/8"	15 5/8"	3 3/4"	6 3/4"	1 3/4"	90" 36" 9'-9"
13.0'	18"	12 3/4"	18 1/2"	4 1/4"	7"	1 3/4"	90" 36" 11'-0"
15.0'	22"	15 1/2"	23"	5"	8"	2"	90" 36" 11'-0"
0 GA. 15.0'	22"	15 1/2"	23"	5"	8"	2"	90" 36" 12'-0"

* Foundation to be Concrete - 4,000 p.s.i. strength minimum in 28 days.

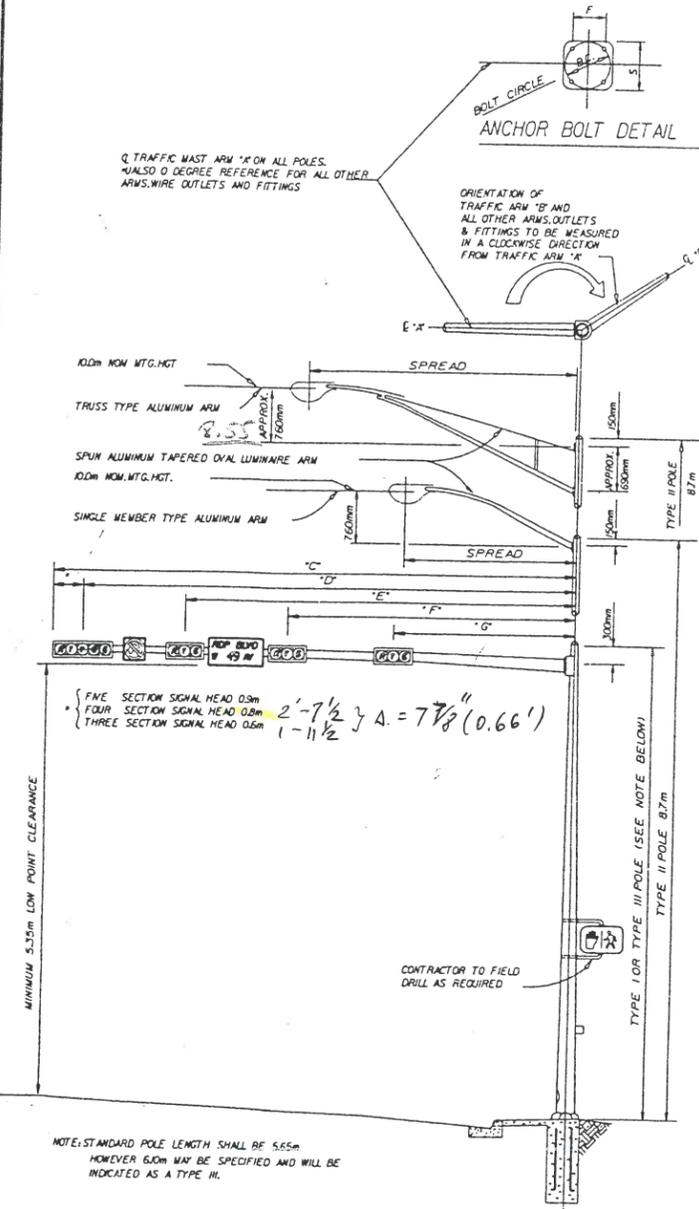
REVISIONS

DATE	BY	DESCRIPTION									

FLORIDA DEPARTMENT OF TRANSPORTATION

STEEL MAST ARM DETAIL

POLE CASE PLATE THICKNES TABLE 3 MOUNT

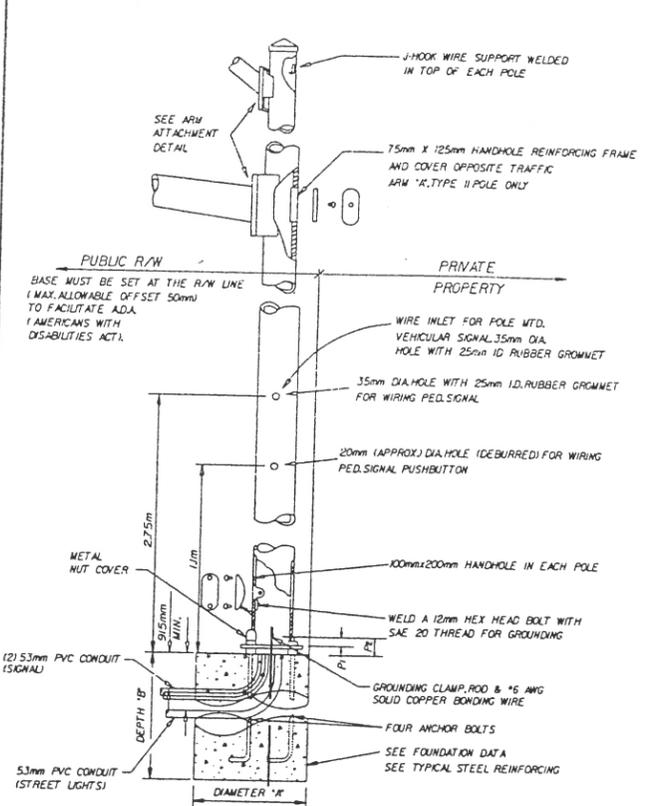


TRAFFIC MAST ARM & ORIENTATION DETAIL

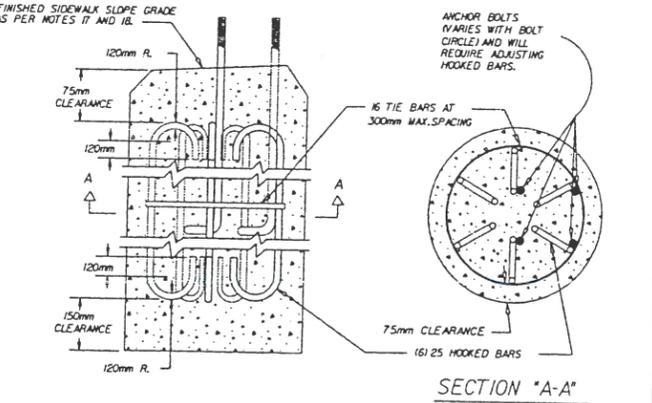
BASE PLATE AND FOUNDATION DATA

POLE SIZE	BOLT CIRCLE	F	S	P ₁	P ₂	ANCHOR BOLT ¹	CONC. FOOTING ²
						MIN. DIA. LENGTH	DIAMETER A DEPTH B
T8 x 275mm	38mm	270mm	395mm	90mm	170mm	44mm 2250mm	915mm 3100mm
T8 x 330mm	45mm	320mm	470mm	100mm	180mm	44mm 2250mm	915mm 3400mm
T8 x 380mm	55mm	395mm	585mm	125mm	205mm	50mm 2250mm	915mm 3400mm
T6 x 380mm	55mm	395mm	585mm	125mm	205mm	50mm 2250mm	915mm 3700mm
T4 x 430mm	630mm	445mm	645mm	125mm	268mm	50mm 2250mm	1200mm 4250mm
T4 x 455mm	655mm	465mm	660mm	125mm	275mm	50mm 2250mm	1200mm 4250mm
T4 x 500mm	700mm	495mm	695mm	125mm	275mm	50mm 2250mm	1200mm 5200mm
T2 x 455mm	655mm	465mm	660mm	125mm	275mm	50mm 2250mm	1200mm 5200mm

ANCHOR BOLT LENGTH INCLUDES HOOK
 FOUNDATION TO BE CONCRETE CLASS II (DRILL SHAFT) - 28 MPa MINIMUM STRENGTH IN 28 DAYS

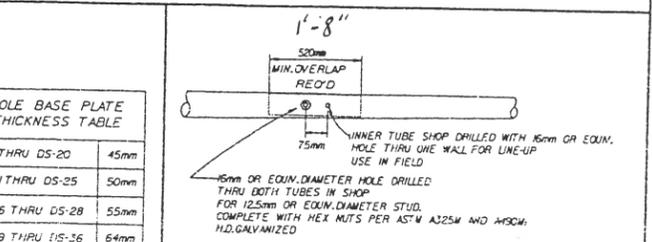


TRAFFIC MAST ARM & ORIENTATION DETAIL



SECTION "A-A"

POLE CONCRETE FOUNDATION TO BE POURED IN ONE SINGLE POUR AND ACCORDING TO SECTION 346 AND 455 PLACING CONCRETE OF THE FLORIDA DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR ROADS AND BRIDGES, DATED 1999 AND SUPPLEMENT THERETO.



TYPICAL STEEL REINFORCING

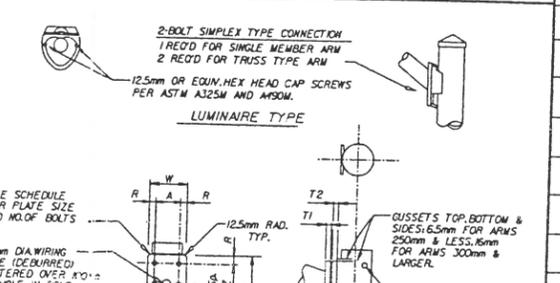
TELESCOPIC SPLICE DETAIL FOR ARM LENGTHS 12 METERS OR GREATER

MATERIAL SPECIFICATIONS

1. TAPERED UPRIGHT POLES AND MAST ARMS SHALL BE ROUND OR POLYGONAL (MIN. 12 SIDES) IN CROSS-SECTION FABRICATED FROM SAE 1020 STEEL PROCESSED TO ACHIEVE A MINIMUM YIELD STRESS OF 380 MPa AND CONFORMING TO THE REQUIREMENTS OF ASTM A555 GRADE A FOR POLES UP TO 330mm AND A595 GRADE B, 400 MPa YIELD FOR POLES 380mm AND OVER.
2. ANCHOR BOLT AND HANDHOLE FRAME: ROOM GRADE 250 (SEE NOTE 2 BELOW).
3. HANDHOLE OVER PLATE: T12 GAUGE STEEL SAE 1015.
4. POLE TOP CAP SHALL BE HOT-DIP GALVANIZED STEEL PER ASTM A513 ALUMINUM ALLOY OF ZINC DIE CAST, SET IN PLACE WITH 3 SET SCREWS PLATED HARDWARE.
5. ANCHOR BOLTS TO BE HIGH STRENGTH STEEL HAVING 380 MPa MINIMUM YIELD STRESS AND 655 MPa ULTIMATE YIELD STRESS CONFORMING TO AASHTO M31-90 GRADE (SEE NOTE 2 BELOW).
6. ALL NUTS AND BOLTS LESS THAN 16mm (OR EQUIV.) DIAMETER TO BE PASSIVATED STAINLESS STEEL A316-304 SERIES COMMERCIAL GRADE.
7. ALL OTHER NUTS AND BOLTS 16mm (OR EQUIV.) DIAMETER AND OVER SHALL CONFORM TO ASTM F568 (CLASS 4B) AND BE GALVANIZED IN ACCORDANCE WITH ASTM A53. GALVANIZING OF ALL STEEL COMPONENTS SHALL CONFORM TO PARAGRAPH 9A WHICH COVERS APPEARANCE OF THE GALVANIZED SURFACE. SURFACE MUST HAVE A REASONABLE UNIFORMITY OF APPEARANCE WITH NO EXCESSIVE BUILDUP OF DROSS OR FLUX AND NO UNDATED OR BLACK SPOTS. FAILURE TO COMPLY WITH THESE REQUIREMENTS WILL BE CAUSE FOR REJECTION.
8. STEEL PLATE FOR TRAFFIC ARM CONNECTION TO UPRIGHT POLE: ROOM GRADE 250.
9. BASE PLATE FOR UPRIGHT POLE: ASTM A503M GRADE 250.
10. ALL WELDING JOINTS SHALL BE HOT-DIP GALVANIZED STEEL PER ASTM A553 ALUMINUM ALLOY OF ZINC DIE CAST, SECURED IN PLACE WITH 3 SET SCREWS PLATED HARDWARE.
11. ACCESSORIES: HOT-DIP GALVANIZED TO ASTM A53.
12. ALL WELDING JOINTS SHALL BE HOT-DIP GALVANIZED STEEL PER ASTM A553 ALUMINUM ALLOY OF ZINC DIE CAST, SECURED IN PLACE WITH 3 SET SCREWS PLATED HARDWARE.
13. ARM END CAP WITH ADDITIONAL THRU ARM END BOLT.
14. ARM PLATE CONNECTING BOLTS: HIGH STRENGTH.
15. WALKWAY HOLES: CONCRETE FOUNDATIONS TO BE POURED IN ONE SINGLE POURING WITH ITS GRADE AND SLOPE OF THE FINISHED SIDEWALK. SIDEWALK FINISH GRADE SHALL BE LAID OUT AND A FORM INSTALLED IN ORDER TO ACHIEVE THIS FINAL GRADE. SLOPE DISTANCES P1 AND P2 FOR ANCHOR BOLTS SHALL BE STRICTLY ENFORCED. FOUNDATIONS POURED IN NO COMPLIANCE WITH THESE REQUIREMENTS SHALL BE COMPLETELY REMOVED AND POURED AGAIN AT CONTRACTOR'S EXPENSE.
16. WHEN THE POLE CONCRETE FOUNDATION IS POURED WITHIN THE SIDEWALK AREA, THE TOP OF SAID POLE CONCRETE FOUNDATION WILL RECEIVE PROPER SIDEWALK FINISH AND WILL BECOME PART OF IT.
17. IF THE ELEVATION REQUIRED BY THE POLE CONCRETE FOUNDATION IS HIGHER THAN THE ELEVATION OF THE SURROUNDING TERRAIN, OUTSIDE A SIDEWALK AREA, THE POLE CONCRETE FOUNDATION WILL BE EXTENDED VERTICALLY SO AS TO MAINTAIN THE CONCRETE FOOTING DEPTH "B" (BELOW THE GROUND) EQUAL TO THE AMOUNT OR HEIGHT SPECIFIED IN THE FOUNDATION DATA. TYPICAL STEEL REINFORCEMENT WILL BE ADJUSTED ACCORDING TO THE PROPER CLEARANCES BY INCREASING THE LENGTH OF THE LOADED BARS. THE MAXIMUM VERTICAL EXTENSION SHALL BE 60mm. IF MORE THAN 60mm ARE REQUIRED, THE DEPTH "B" SHALL BE INCREASED BY THAT AMOUNT IN EXCESS OF 60mm.
18. HIGH STRENGTH BOLTS THAT HAVE BEEN USED BEFORE AND HAVE BEEN SUBJECT TO LOAD SHALL NOT BE REUSED IN ANY ARM ATTACHMENT OR CONNECTION.
19. ACCEPTABLE POLE LENGTHS ARE 5.65m FOR TYPE I POLES AND 6.0m FOR TYPE II POLES. POLE TAPER SHALL BE SUCH THAT THE DIAMETER WILL REDUCE BY 35mm FOR EACH 3m OF POLE LENGTH.
20. ANY STRUCTURAL DETAIL NOT ADDRESSED OR CONTEMPLATED IN THIS SPECIFICATION SHALL BE RESOLVED BY THE POLE MANUFACTURER WITH AN APPROACH BASED ON COMPLIANCE WITH THE AASHTO CRITERION FOR 10% ISOTACH.
21. PROVISIONS SHALL BE MADE TO HAVE ADEQUATE DRAINAGE CONDITIONS AT THE TOP OF THE CONCRETE FOUNDATION. THIS CAN BE ACCOMPLISHED THROUGH THE USE OF GROUTING AND PVC TUBING OR A WIRE MESH SUITABLE TO KEEP AWAY MOST FORMS OF INSECT LIFE.
22. CALCULATIONS USING AASHTO FORMULAS MUST BE INCLUDED WITH SUBMITTAL DATA FOR ALL ARMS AND POLES.

NOTES:

1. UPRIGHT POLE AND MAST ARM SIZES ARE BASED UPON STEEL AS DESCRIBED. SPECIFICATION ABOVE IF CROSS-SECTION OTHER THAN ROUND IS USED OR IF STEEL OTHER THAN 380 MPa IS TO BE USED, BENDING STRENGTH AT LEAST EQUIVALENT TO TUBE SIZES SHOWN MUST BE PROVIDED BY ADJUSTING WALL THICKNESS FOR POLE SHAPES OTHER THAN ROUND. THIS MINIMUM STRENGTH MUST BE PROVIDED THROUGH THE WEAKEST POLE CROSS-SECTION.
2. INTERCHANGEABILITY ON BASES SHOULD BE MAINTAINED. BOLT CIRCLE DIAMETERS AND ANCHOR BOLT SIZES SHOWN MUST REMAIN THE SAME, UNLESS LARGER SIZES ARE REQUIRED FOR STRUCTURAL REASONS. ALTERNATE TYPES MUST ALSO PROVIDE METAL NUT COVERS FOR NEAT APPEARANCE.



LUMINAIRE TYPE

FOR ARMS 250mm AND SMALLER: 32 mm OR EQUIV. DRILLED HOLES FOR 32mm HEX HEAD BOLTS (115% STRENGTH) PER ASTM A325M AND A590M

FOR ARMS 300mm AND LARGER: 35 mm OR EQUIV. TAPPED HOLES FOR 35mm HEX HEAD BOLTS (115% STRENGTH) PER ASTM A325M AND A590M OR 38mm DIA. HOLES FOR 35mm HEX HEAD BOLTS, NUTS & WASHERS (115% STRENGTH) PER ASTM A325M AND A590M

MAST TYPE ARM ATTACHMENT DETAIL

ARM DIAMETER	MAST ARM VARIABLES							
	W	L	T1	T2	TOTAL NO. OF BOLTS	A	R	Y Z
125, 75	305	455	51	32	4	205	50	1 335
200, 225, 250	305	455	65	32	4	205	51	1 335
300, 330, 350	710	484	67	32	6	205	51	1 335
360	710	474	70	32	6	205	51	1 335
430, 450	725	554	73	32	6	205	51	1 335

NOTE: ALL DIMENSIONS ARE IN mm

MINIMUM POLE AND ARM SIZE REQUIREMENTS

DADE COUNTY CLASS NO.	UPRIGHT POLE SIZE			TRAFFIC ARM SIZE REFER TO ITEMS BELOW	TOTAL LENGTH 2-PIECE ARM (D)
	TYPE I REFER TO ITEM (B) BELOW	TYPE II REFER TO ITEM (B) BELOW	TYPE III REFER TO ITEM (B) BELOW		
DS-1				T12 x 125mm x TAPER x 3.00m	
DS-2				T12 x 125mm x TAPER x 3.50m	
DS-3				T10 x 150mm x TAPER x 4.25m	
DS-4				T10 x 150mm x TAPER x 4.75m	
DS-5				T10 x 150mm x TAPER x 5.25m	
DS-6				T10 x 150mm x TAPER x 6.00m	
DS-7				T10 x 175mm x TAPER x 6.50m	
DS-8				T10 x 175mm x TAPER x 7.25m	
DS-9				T10 x 175mm x TAPER x 7.50m	
DS-10				T8 x 200mm x TAPER x 8.50m	
DS-11				T8 x 200mm x TAPER x 9.00m	
DS-12				T8 x 200mm x TAPER x 9.75m	
DS-13				T8 x 200mm x TAPER x 10.25m	
DS-14				T8 x 225mm x TAPER x 10.75m	
DS-15				T8 x 225mm x TAPER x 11.50m	
DS-16 (E)	T8 x 330mm x TAPER x 5.65m	T8 x 330mm x TAPER x 8.70m	T8 x 330mm x TAPER x 6.00m	T8 x 225mm x TAPER x 5.0m	12.00m (AU)
DS-17 (E)				T8 x 225mm x TAPER x 5.0m	12.75m (AU)
DS-18 (E)				T8 x 185mm x TAPER x LENGTH	13.25m (AU)
DS-19 (E)				T8 x 250mm x TAPER x 5.0m	14.00m (AU)
DS-20				T8 x 214mm x TAPER x LENGTH	14.50m (AU)
DS-21				T8 x 250mm x TAPER x 8.0m	15.00m (AU)
DS-22				T8 x 179mm x TAPER x LENGTH	15.75m (AU)
DS-23	T8 x 380mm x TAPER x 5.65m	T8 x 380mm x TAPER x 8.70m	T8 x 380mm x TAPER x 6.00m	T8 x 300mm x TAPER x 8.0m	16.25m (AU)
DS-24				T8 x 300mm x TAPER x 8.0m	16.75m (AU)
DS-25				T8 x 300mm x TAPER x 8.0m	17.00m (AU)
DS-26				T8 x 300mm x TAPER x 8.0m	17.50m (AU)
DS-27	T6 x 380mm x TAPER x 5.65m	T6 x 380mm x TAPER x 8.70m	T6 x 380mm x TAPER x 6.00m	T8 x 300mm x TAPER x 8.0m	18.25m (AU)
DS-28 (E)				T8 x 230mm x TAPER x LENGTH	18.75m (AU)
DS-29 (E)				T8 x 330mm x TAPER x 8.5m	19.50m (AU)
DS-30 (E)	T4 x 430mm x TAPER x 5.65m	T4 x 430mm x TAPER x 8.70m	T4 x 430mm x TAPER x 6.00m	T4 x 350mm x TAPER x 9.5m	20.00m (AU)
DS-31 (E)				T8 x 268mm x TAPER x LENGTH	20.50m (AU)
DS-32 (E)	T4 x 455mm x TAPER x 5.65m	T4 x 455mm x TAPER x 8.70m	T4 x 455mm x TAPER x 6.00m	T4 x 350mm x TAPER x 10.5m	21.00m (AU)
DS-33 (E)				T8 x 255mm x TAPER x LENGTH	21.50m (AU)
DS-34 (E)	T4 x 500mm x TAPER x 5.65m	T4 x 500mm x TAPER x 8.70m	T4 x 500mm x TAPER x 6.00m	T4 x 380mm x TAPER x 10.5m	22.50m (AU)
DS-35 (E)				T8 x 280mm x TAPER x LENGTH	23.00m (AU)
DS-36 (E)	T2 x 455mm x TAPER x 5.65m	T2 x 455mm x TAPER x 8.70m	T2 x 455mm x TAPER x 6.00m	T4 x 400mm x TAPER x 12.0m	23.50m (AU)
				T8 x 291mm x TAPER x LENGTH	24.00m (AU)

* APPROXIMATE DIAMETER TO COMPLY WITH ITEM (D) BELOW

- (A) DENOTES 2-PIECE ARM (SEE TELESCOPIC SPLICE DETAIL)
- (B) TAPER IS SUCH THAT THE DIAMETER REDUCES BY 35mm FOR EACH 3m LENGTH OF POLE OR MAST ARM.
- (C) THIS STANDARD APPLIES TO ARM LENGTHS, NUMBER OF SIGNALS AND SIGNS AS SHOWN ON THIS DRAWING. WHEN THIS ITEMS DIFFER FROM THE STANDARD, OR THE STRUCTURE CONSISTS OF MORE THAN ONE ARM, PLANS AND CALCULATIONS FOR THE MAST ARM STRUCTURE AND FOUNDATION SHALL BE SUBMITTED FOR APPROVAL BY THE PLANS AND CALCULATIONS SHALL BE SIGNED AND SEALED BY A PROFESSIONAL ENGINEER REGISTERED BY THE STATE OF FLORIDA.
- (D) THE POLE MANUFACTURER SHALL ADJUST THE DIAMETER OF THE LARGE END OF THE OUTBOARD SECTION OF THE 2-PIECE ARMS TO GUARANTEE THE SPECIFIED OVERLAP (1520mm MINIMUM)
- (E) FOR POLES DS-29 AND LARGER, THE POLE MANUFACTURER MAY MOVE THE LOCATION OF THE TELESCOPIC MAST ARM JOINT BY 25mm (MAXIMUM) IN THE OUTBOARD DIRECTION. DS-16 THROUGH DS-28 HAVE A ONE-PIECE MAST ARM. THE INWARD SECTION MAY BE 80mm FOR DS-16 THROUGH DS-19 AND DS-28.

TABLE OF THICKNESSES

ITEM	THICKNESS (mm)
T12	1.037
T10	4.554
T8	6.023
T6	7.213
T4	7.937
T2	9.525