



U.S. Department
of Transportation

**Federal Highway
Administration**

400 Seventh St., S.W.
Washington, D.C. 20590

SEP 7 1990

Refer to: HNG-14

John F. Boozer, III, P.E.
Product Development Engineer
Shakespeare Electronics and Fiberglass Division
Route 3, P.O. Box 733
Newberry, South Carolina 29108

Dear Mr. Boozer:

Thank you for your letter of March 26 to Mr. Thomas O. Willett in which you requested Federal Highway Administration (FHWA) acceptance for your company's anchor base fiberglass light poles as breakaway structures. The pole-base series in this request are designated ASW27 through ASW35 and AHW27 through AHW35. In support of this request you submitted reports dated March 1990, of tests conducted at the Federal Outdoor Impact Laboratory, and drawings of the two types of cast aluminum shoe bases used in the tests. Additional information provided on July 31 in response to our request included chemical analyses of the aluminum castings and clarification of hardware details.

Details of the tested hardware are shown in the enclosed drawings of the tested pole-base combinations and fully dimensioned drawings of the anchor bases. The tests used an instrumented 1,850-pound bogie vehicle fitted with a 10 stage crushable nose which simulates a 1979 Volkswagen Rabbit. All test bases were secured with 1-inch diameter bolts torqued to 400 foot-pounds. The bolt circle diameter was 12 inches in each case (the bases can accommodate 11- to 12-inch bolt circle diameters.) The luminaire mounting height was 35 feet. Test results are summarized below.

Test Number	89F039	89F041	89F040	89F042
Pole Catalog Number*	ASW 35-18	ASW 35-18	AHW 35-18	AHW 35-18
Base Casting Number**	37-60-0160-10		37-60-0208-10	
Impact Speed	20.0 mph	59.9 mph	19.9 mph	60.2 mph
Vehicle Velocity Change	6.1 fps	6.4 fps	6.1 fps	6.6 fps
Occupant Velocity Change	6.4 fps	4.7 fps	6.3 fps	6.7 fps
Stub Height	2.7 in.	2.7 in.	2.7 in.	2.7 in.
Weight of Test Article	208 #	208 #	237 #	237 #
Pole Wall Thickness***	0.215 in.	0.215 in.	0.28 in.	0.28 in.

*The letter "W" was added to the designation after the tests were conducted. It identifies a pole whose cast aluminum base has a 0.100-inches deep by 0.060-inches wide annular recess cut into the inside face of the stem of the base 1-inch above the bottom surface of the base.

**Base casting 37-60-0160-10 is used with the ASW series. Base casting 37-60-0208-10 is used with AHW series poles 31 feet and over. For AHW series poles from 27 to 29 feet, the base casting used depends upon the length of mast arms used.

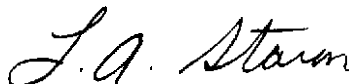
***Pole wall thicknesses are the same for all poles in the 27-foot to 35-foot mounting height range, and vary only between pole series. Some pole-base combinations have a 1/2 inch thick aluminum sleeve welded to the I.D. of the aluminum anchor base. This sleeve is used to size down a base for proper clearance.

The above information shows that the tested pole-base combinations met the change in velocity and stub-height requirements adopted by the FHWA. From these results we are convinced that all the other poles, with single or double mast arms up to 12-feet or post mountings, in the series identified in the enclosed product tables, will also meet the breakaway requirements adopted by the FHWA. Therefore, the poles in the identified series are acceptable for use on the Federal-aid projects when requested by a State.

This acceptance is limited to breakaway characteristics of the bases and does not cover the structural features of the bases nor the poles. Presumably, you will supply potential users with sufficient information on structural design and installation requirements to ensure proper performance. We anticipate that the States will require certification from Shakespeare that the poles and castings furnished have essentially the same chemistry, mechanical properties, and geometry as those used in the tests, and that they will meet the FHWA change in velocity requirements.

Since your company's anchor base light poles are proprietary items, to be used in a Federal-aid highway project they; (a) must be supplied through competitive bidding with equally suitable unpatented items; (b) the State highway agency certifies that they are essential for synchronization with existing highway facilities, or that no equally suitable alternate exists; or (c) they are used for research or for a **distinctive** type of construction on relatively short sections of road for experimental purposes. Our regulations concerning proprietary products are contained in Title 23, Code of Federal Regulations, Section 635.411, a copy of which is enclosed.

Sincerely yours,



L. A. Staron
Chief, Federal-Aid and Design Division

Enclosures

Manufacturer: SHAKESPEARE

Part No: AS 35

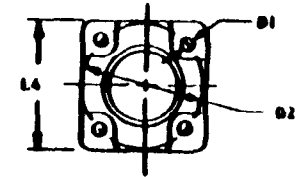
Ref. FOIL Tests: 89F039, 89F041

Completed By: C. HOTT

Date: 12/10/89

WEIGHTS (LBS)

Pole:	140	(W1)
Mast Arm:	16	(W2)
Luminaire:	52	(W3)
Total Assy:	208	(WT)



MEASURED LENGTHS

Mounting Height:	35'	(M1)
Pole Height:	33'2"	(M2)
Pole CG Height:	14'1"	(M0)
Mast CG Height:	33'6"	(M9)
Mast CG Offset:	3'4"	(L2)
Lumin CG Height:	34'10"	(M4)
Lumin CG Offset:	0'	(L1)

ANCHOR BASE PARAMETERS

Access Panel:	Reef
A-Base Height:	8" (M5)
A-Base Width:	8" (M6)
Foundation BC:	12" (D2)
Dia Found Bolt:	1" (D1)
Material:	Aluminum
Base thickness:	0.375

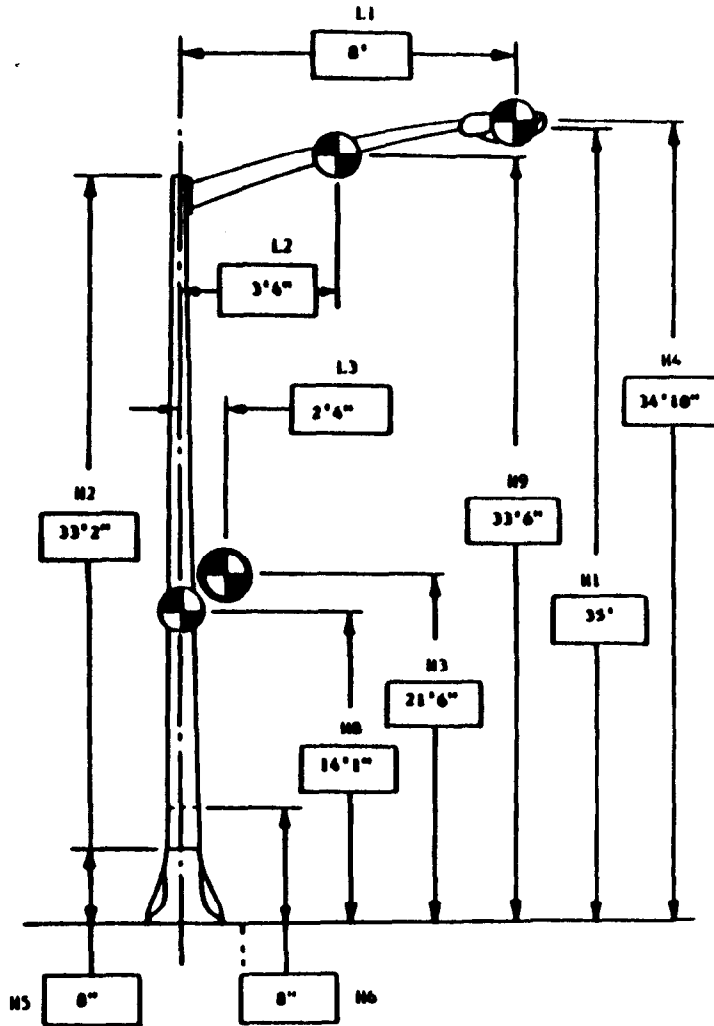
POLE PARAMETERS

Base Dia:	8.5"
Tip Dia:	4.0"

Wall Thickness:	0.25"
Material:	FIBERGLASS

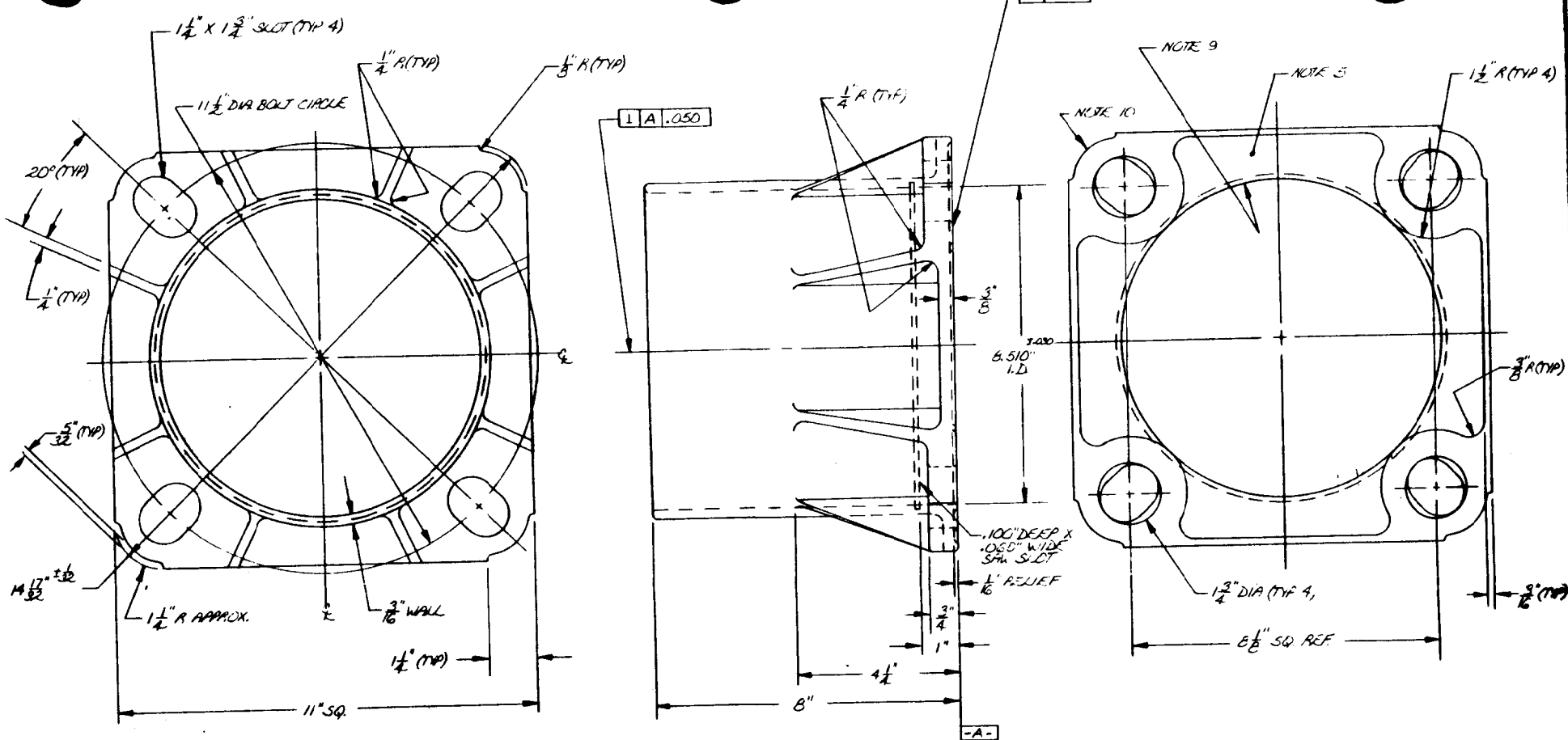
Total Assy CG Height: 21'6" (M3)

Total Assy CG Offset: 2'4" (L3)



Typical test installation

Figure 4. Luminaire support measurements.



- NOTES:**
- 1- MATERIAL: FRAME A-356-T6 AL ALY WITH THE FOLLOWING MIN. PROPERTIES
 OBTAINED FROM SEPARATELY CAST TEST BARS: **UNT. TENSILE STRENGTH 36,000 PSI**
MIN. YIELD STRENGTH 24,000 PSI
ELONGATION IN 2" 3.5%
 - 2- IN DESIGNING CASTING EQUIP, NOM. DIM'S SPECIFIED SHALL BE TARGET DIM'S
 - 3- ADD MIN. DRAFT
 - 4- ALL FILLS & RD'S $1/32"$ R UNLESS NOTED
 - 5- "SHAKESPEARE" TO APPEAR ON THIS SURFACE
 - 6- ALL 4 CORNERS & ASSOCIATED PAIRS OF RIBS MUST BE IDENTICAL SO THAT OUR PART NO. WILL FIT.
 - 7- THIS PART TO BE MADE USING SAME MATCH PLATE AS OUR PART NO. 37-60-0147-10 & 37-60-0154-10. USE $8.500"$ DIA. CORE TO ALN THIS PART.
 - 8- FLANGE MUST PASS THROUGH GAGE #69-162 SUPPLIED BY SHAKESPEARE.
 - 9- PART NO. TO APPEAR ON THIS SURFACE.
 - 10- 4° MINIMUM DRAFT AT CORNER NOTCHES.

ITEM	PART NUMBER		DESCRIPTION	MATERIAL
LET	WAS	BY	DATE	

ASSEMBLY NUMBER

DESCRIPTION

100" DEEP X .085" WIDE SQ. SLOT

1/16" RELIEF

3/4"

1"

4 1/2"

8"

1.000"

6.510" I.D.

0.015"

1/4" R (TYP)

NOTE 9

NOTE 3

1 1/2" R (TYP 4)

3/8" R (TYP)

1 3/4" DIA (TYP 4,

8 5/8" SQ REF

2" (TYP)

NOTE 10

NOTE 5

MATERIAL

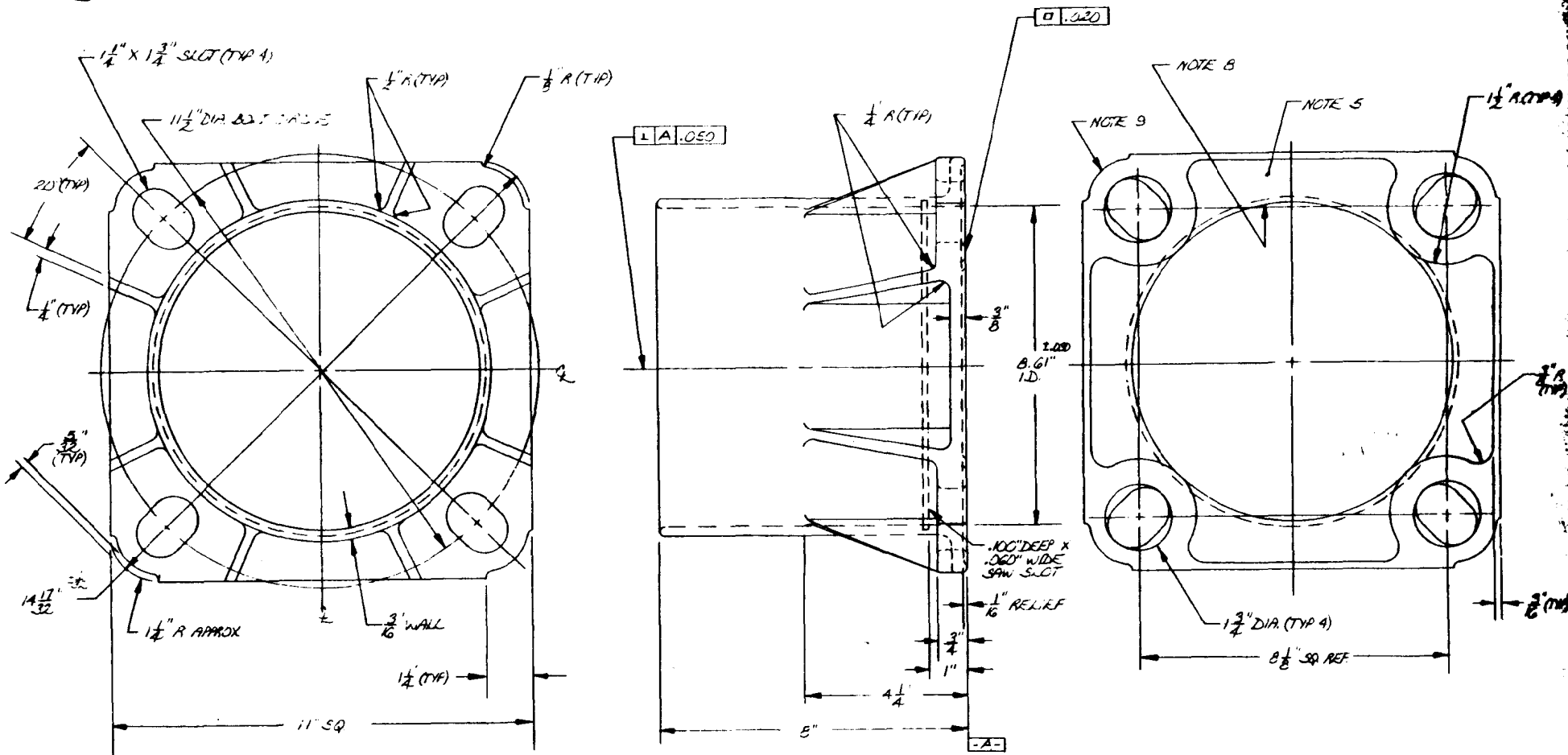
Shakespeare Electronics and Fiberglass Division
 Modesto, S. C. 29208

ANCHOR BASE

DATE: 3-30-80

PC. NO. 37-60-0160-39

X-3613



NOTES:

- 1. MAT'L: PRIME ASSG-T6 AL ALY WITH THE FOLLOWING MIN. PROPERTIES OBTAINED FROM SEPARATELY CAST TEST BARS:
 - ULT. TENSILE STRENGTH 36,000 PSI
 - MIN. YIELD STRENGTH 28,000 PSI
 - ELONGATION IN 2" 3.5%
- 2. IN DESIGNING CASTING EQUIP. NOM. DIMS SPECIFIED SHALL BE TARGET DIMS
- 3. ADD MIN. DRAFT
- 4. ALL FILLS AND RD'S $\frac{1}{4}$ " R UNLESS NOTED
- 5. "SHAKESPEARE" TO APPEAR ON THIS SURFACE
- 6. ALL 4 CORNERS & ASSOCIATED PAIRS OF RIBS MUST BE IDENTICAL SO THAT OUR PART NO. WILL FIT.
- 7. FLANGE MUST PASS THROUGH GAGE #5A-162 SUPPLIED BY SHAKESPEARE
- 8. PART NO. TO APPEAR ON THIS SURFACE
- 9. .4° MIN DRAFT AT CORNER NOTCHES.

ITEM	PART NUMBER	DESCRIPTION	MATERIAL
LET	WAS	BY DATE	Anchor Base Electronics and Fiberglass Division Rockwell, L. C. DIV.
		SAMPLE MUST BE APPROVED AS SHOWN BELOW BEFORE PROCEEDING WITH FABRICATION. QUAL. APPROVAL: YES <input type="checkbox"/> NO <input type="checkbox"/> DES. APPROVAL: YES <input type="checkbox"/> NO <input type="checkbox"/> ALL DIMENSIONS AND SPECIFIED FOR ARE FOR FINISHED PARTS AND MUST BE MET AFTER FINISH IS APPLIED. HOLDING OTHERWISE SPECIFIED TOLERANCES ARE IN UNLESS TOLERANCES SPECIFIED IN THIS DRAWING & UNLESS OTHERWISE SPECIFIED IN THE GENERAL TOLERANCES APPLY FOR DIMENSIONS AND SURF. FINISH.	ANCHOR BASE USED ON: <u>2D</u> <u>WAS</u> <u>N</u> <u>3-22-62</u> PG. No. <u>37-60-0208-39</u> X-9613

SHAKESPEARE BREAKAWAY ANCHOR BASE LIGHT POLES
CONSTRUCTION DETAILS

RESIN

The resins used in the manufacture of Shakespeare FRP light poles are thermosetting polyester. Typical mechanical properties of these resins in unfilled, unreinforced castings are:

Ultimate Flexural Strength	13,000 to 14,000 psi
Flexural Modulus	640,000 to 680,000 psi
Ultimate Tensile Strength	9,000 to 9,500 psi
Percent Elongation	1.8 to 1.9%
Water Absorption 24hrs.	.11 to .20%

GLASS REINFORCEMENT

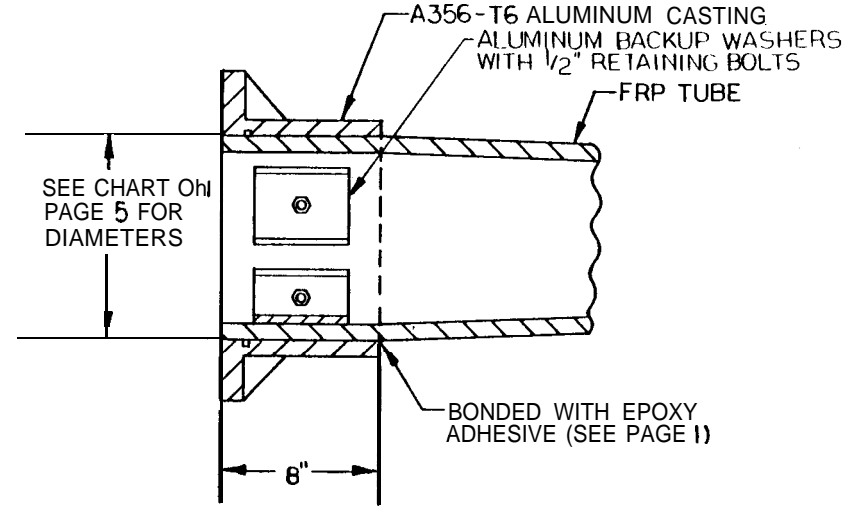
The glass reinforcement used in the manufacture of Shakespeare FRP light poles is industry standard "E" glass in the form of continuous roving. The typical properties of this glass as reported in "Handbook of Fiberglass and Advanced Plastics Composites", George Lubin, ED., Library of Congress Catalog Card Number 7598348, are:

Specific Gravity	2.54
Virgin tensile strength at 72° F	500,000 psi
Modulus of Elasticity at 72° F	10,500,000 psi
Elastic Elongation at 72° F	4.8%
Coefficient of thermal expansion	2.8 X 10 $\frac{\text{in}}{\text{in}^{\circ}\text{F}}$

EPOXY ADHESIVE

The adhesive used in the manufacture of Shakespeare light poles is an epoxy resin cured with polyamide resin. The viscosity of this adhesive is modified with an organic filler so that it will remain in place until cured. Typical properties for this adhesive are:

Compressive yield per ASTM-D695	10,000 psi
Tensile ultimate per ASTM-D638	8,000 psi
Percent elongation per ASTM-D638	8%
Flexural modulus per ASTM-D790	3.1 X 10 ⁸ psi
Aluminum to Aluminum Bond	4,560 psi



POLE/BASE CASTING DETAIL

Shakespeare anchor bases are telescopically fitted to the outside of the fiberglass tube and are bonded with the epoxy adhesive described on page 1. The ID of the base casting is larger than the OD of the tube by 1/8" to 1/4". All base castings are A356-T6 aluminum. The Shakespeare part numbers for the base castings are listed below.

PART NUMBER	POLE USED ON
37-60-0160-10	ASW
37-60-0208-10	AHW

If required, an aluminum sleeve is welded to the ID of the base to size it down for proper clearance.

FILAMENT ORIENTATION AND AMOUNT

Shakespeare light poles are manufactured using a filament winding process. Two winding angles are used for all poles. These angles are nominally 15 degrees for the majority of the fibers and 75 to 135 degrees for the remainder. The relative proportions of these two angles vary with pole length and series (standard, heavy duty, etc.). For the pole tested August, 1989 by Southwest Research Institute, these proportions are:

	75° - 85°	15°
ASW35	11%	89%
AHW35	8.5%	91.5%

For all poles greater than 25ft., two layers of 75 to 85 windings are on the inside surface and extend from the butt of the pole toward the tip to the dimensions shown below. Roving spacing in number of rovings per inch per layer is 5.5. Each individual resin impregnated roving has a net cross-sectional area of .0022 square inches.

Distance from tip to end of spiral

ASW	10 ft.
AHW	10 ft.

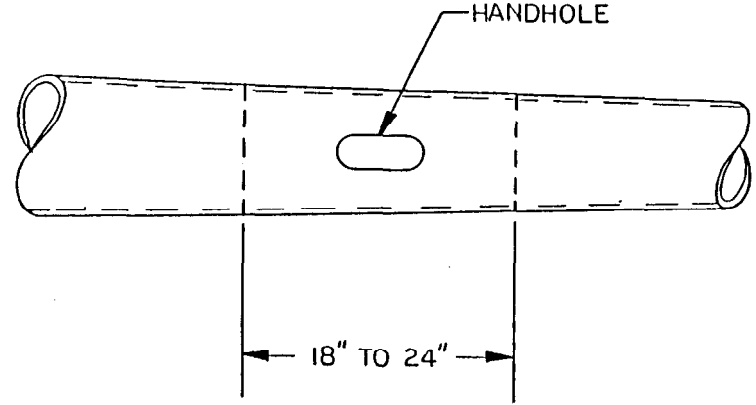
The number of layers of 15° windings is:

	No. of 15° layers	Total number of rovings in cross section
ASW	6	1,752
AHW	8	2,336

Note: When sliced at 15° to its axis, each individual resin impregnated roving yields a net cross-sectional area of .00228 square inches.

POLE TAPER

The ID of Shakespeare poles tapers at the rate of .140 inches/foot. Due to the nature of filament winding this yields a taper rate on the D.D. of .130 to .138 inches/foot. Many longer poles have an essentially straight section on the butt end. This was done to minimize inventory for our cast aluminum anchor bases. Measuring from the tip of the pole, the maximum taper length is 27 ft.



ASW and AHW 27 thru 35 foot poles have 10 yards of 12" wide 8 oz/yd glass cloth at the handhole area as shown above. 5 yards are applied to the bare mandrel in a spiral pattern and the other 5 yards are applied over the spiral windings before the helical windings are applied.

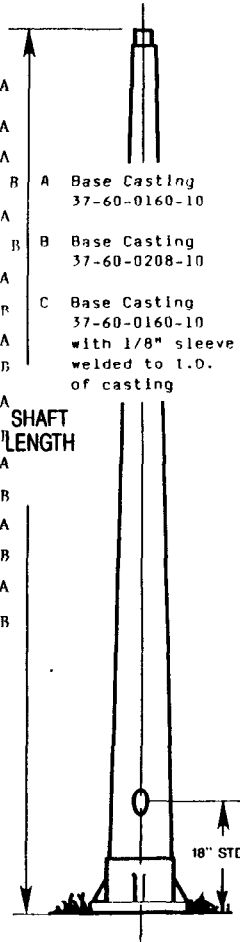
Shakespeare® POST TOP Fiberglass ANCHOR BASE LIGHT POLES

Series AHW and ASW

INSIDE AND OUTSIDE DIAMETERS OF ANCHOR
BASE POLES OFF 35 FT MANDREL.
(MANDREL NUMBER T-5147)

DISTANCE FROM POLE TIP (ft.)	ASW SERIES OD(in.)	AHW SERIES OD(in.)	ID (in)
Tip	4.70	4.90	4.13
1	4.83	5.04	4.21
2	4.97	5.17	4.35
3	5.10	5.30	4.49
4	5.23	5.43	4.63
5	5.36	5.56	4.77
6	5.50	5.69	4.91
7	5.63	5.82	5.05
8	5.76	5.95	5.19
9	5.90	6.08	5.33
10	6.03	6.21	5.47
11	6.16	6.34	5.61
12	6.30	6.47	5.75
13	6.43	6.60	5.90
14	6.56	6.73	6.04
15	6.69	6.86	6.18
16	6.83	6.99	6.32
17	6.96	7.12	6.46
18	7.09	7.25	6.60
19	7.23	7.38	6.74
20	7.36	7.51	6.88
21	7.49	7.64	7.02
22	7.63	7.77	7.16
23	7.76	7.90	7.30
24	7.89	8.03	7.44
25	8.02	8.16	7.58
26	8.16	8.29	7.72
27	8.29	8.42	7.86
28	8.34	8.47	7.91
29	8.35	8.48	7.92
30	8.36	8.49	7.93
31	8.36	8.49	7.93
32	8.37	8.50	7.94
33	8.38	8.51	7.95
34	8.39	8.52	7.96
35	8.40	8.53	7.97

NOMINAL MOUNTING HEIGHT (FT)	SHAFT LENGTH (FT)	WEIGHT (LBS)	POLE DIAMETER		STANDARD HANDHOLE LOCATION FROM BASE (IN)	RECOMMENDED TOTAL LOADING				BOLT HOLE CIRCLE (IN.)	CATALOG NUMBER	
			SHAFT TOP (IN)	SHAFT BASE (IN)		WEIGHT (LBS)	80 MPH EPA* (SQ FT)	90 MPH EPA* (SQ FT)	100 MPH EPA* (SQ FT)			120 MPH EPA* (SQ FT)
27	27	114	4.7	8.3	18	100	14.3	11.0	8.7	5.7	1 1/2	ASW27
27	27	147	4.9	8.4	18	200	18.9	14.7	11.7	7.7	1 1/2	AHW27
28	28	118	4.7	8.4	18	100	13.4	10.3	8.1	5.3	1 1/2	ASW28
28	28	152	4.9	8.5	18	200	17.9	13.9	11.0	7.3	1 1/2	AHW28
29	29	122	4.7	8.4	18	100	12.6	9.7	7.6	4.9	1 1/2	ASW29
29	29	157	4.9	8.5	18	200	16.9	13.1	10.4	6.8	1 1/2	AHW29
30	30	125	4.7	8.4	18	100	11.9	9.1	7.1	4.6	1 1/2	ASW30
30	30	163	4.9	8.5	18	200	16.0	12.3	9.8	6.3	1 1/2	AHW30
31	31	130	4.7	8.4	18	100	10.1	7.7	6.0	3.8	1 1/2	ASW31
31	31	168	4.9	8.5	18	200	13.7	10.6	8.3	5.4	1 1/2	AHW31
32	32	133	4.7	8.4	18	100	9.5	7.2	5.6	3.5	1 1/2	ASW32
32	32	173	4.9	8.5	18	200	13.0	10.0	7.8	5.0	1 1/2	AHW32
33	33	137	4.7	8.4	18	100	8.9	6.7	5.2	3.2	1 1/2	ASW33
33	33	178	4.9	8.5	18	200	12.3	9.4	7.4	4.6	1 1/2	AHW33
34	34	141	4.7	8.4	18	100	7.1	5.2	3.9	2.2	1 1/2	ASW34
34	34	183	4.9	8.5	18	200	10.4	7.8	6.0	3.6	1 1/2	AHW34
35	35	145	4.7	8.4	18	100	5.5	3.8	2.7	1.3	1 1/2	ASW35
35	35	188	4.9	8.5	18	200	9.7	7.2	5.5	3.2	1 1/2	AHW35



JB/hf

**Do Not Use For Side Mount Applications — See AO Series
**Do Not Use With Tenon Mounted Arms — See AO Series

HANDHOLE: Standard 2 1/2" x 5"
Optional 2 1/2" Round, or 4" x 6" on Some Models
TENONS: 2 1/2", 3", or 4" on Some Models
All poles are individually wrapped. Anchor bolts standard.
Bolt covers and base shrouds optional. see accessories.

Shakespeare

4 ft. MAST ARM ANCHOR BASE FIBERGLASS LIGHT POLES

Series
AHW
and
ASW

CATALOG SHEET MA-2

NOMINAL MOUNTING HEIGHT (FT)	SHAFT LENGTH (FT)	WEIGHT (LBS) INCLUDES ARMS(S)	POLE DIAMETER		STANDARD HANDHOLE LOCATION FROM BASE (IN)	RECOMMENDED MAX SIZE OF EACH LUMINAIRE				BOLT HOLE CIRCLE (IN)	CATALOG NUMBER
			SHAFT TOP (IN)	SHAFT BASE (IN)		WEIGHT (LBS) PER LUM	80 MPH EPA* (SQ FT)	90 MPH EPA* (SQ FT)	100 MPH EPA* (SQ FT)		

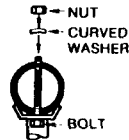
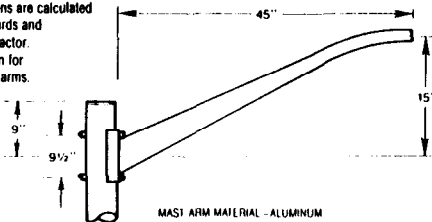
LIGHT POLE WITH ONE MAST ARM

27	26'6"	116	4.7	8.3	18	75	3.2	3.2	3.2	11 1/2	ASW27-14	A
27	26'6"	143	4.9	8.4	18	75	3.2	3.2	3.2	11 1/2	AHW27-14	A
28	27'6"	120	4.7	8.4	18	75	3.2	3.2	3.2	11 1/2	ASW28-14	A
28	27'6"	148	4.9	8.5	18	75	3.2	3.2	3.2	11 1/2	AHW28-14	B
29	28'6"	124	4.7	8.4	18	75	3.2	3.2	3.2	11 1/2	ASW29-14	A
29	28'6"	153	4.9	8.5	18	75	3.2	3.2	3.2	11 1/2	AHW29-14	B
30	29'6"	128	4.7	8.4	18	75	3.2	3.2	3.2	11 1/2	ASW30-14	A
30	29'6"	158	4.9	8.5	18	75	3.2	3.2	3.2	11 1/2	AHW30-14	B
31	30'6"	132	4.7	8.4	18	75	3.2	3.2	3.2	11 1/2	ASW31-14	A
31	30'6"	163	4.9	8.5	18	75	3.2	3.2	3.2	11 1/2	AHW31-14	B
32	31'6"	137	4.7	8.4	18	75	3.2	3.2	3.2	11 1/2	ASW32-14	A
32	31'6"	167	4.9	8.5	18	75	3.2	3.2	3.2	11 1/2	AHW32-14	B
33	32'6"	141	4.7	8.4	18	75	3.2	3.2	3.2	11 1/2	ASW33-14	A
33	32'6"	172	4.9	8.5	18	75	3.2	3.2	3.2	11 1/2	AHW33-14	B
34	33'6"	146	4.7	8.4	18	75	3.2	3.2	3.2	11 1/2	ASW34-14	A
34	33'6"	177	4.9	8.5	18	75	3.2	3.2	3.2	11 1/2	AHW34-14	B
35	34'6"	150	4.7	8.4	18	75	3.2	3.2	2.8	11 1/2	ASW35-14	A
35	34'6"	182	4.9	8.5	18	75	3.2	3.2	3.2	11 1/2	AHW35-14	B

All poles are individually wrapped. Aluminum cap, 2 1/4" x 5" handhole, and anchor bolts standard. Bolt covers (on some models) and base shrouds (for all models) are optional. . . . see accessories. Optional, 4" x 6" handholes available on all but AO Models.

*Poles are not rated above 3.2 EPA as the mast arms are not rated for luminaires greater than 3.2 EPA.

EPA recommendations are calculated per AASHTO Standards and include a 30% gust factor. See Post Top section for EPA ratings without arms.



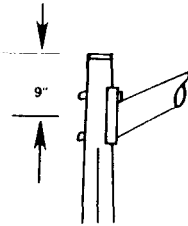
For Anchor Base Dimensions See Catalog Sheet GI-4

See TEST DATA & ACCESSORIES Section for Mast Arm and attachment hardware part numbers.

NOMINAL MOUNTING HEIGHT (FT)	SHAFT LENGTH (FT)	WEIGHT (LBS) INCLUDES ARMS(S)	POLE DIAMETER		STANDARD HANDHOLE LOCATION FROM BASE (IN)	RECOMMENDED MAX SIZE OF EACH LUMINAIRE				BOLT HOLE CIRCLE (IN)	CATALOG NUMBER
			SHAFT TOP (IN)	SHAFT BASE (IN)		WEIGHT (LBS) PER LUM	80 MPH EPA* (SQ FT)	90 MPH EPA* (SQ FT)	100 MPH EPA* (SQ FT)		

LIGHT POLE WITH TWO MAST ARMS

27	26'6"	122	4.7	8.3	18	75	3.2	3.2	3.2	11 1/2	ASW27-24	A
27	26'6"	149	4.9	8.4	18	75	3.2	3.2	3.2	11 1/2	AHW27-24	A
28	27'6"	126	4.7	8.4	18	75	3.2	3.2	3.2	11 1/2	ASW28-24	A
28	27'6"	154	4.9	8.5	18	75	3.2	3.2	3.2	11 1/2	AHW28-24	B
29	28'6"	130	4.7	8.4	18	75	3.2	3.2	2.9	11 1/2	ASW29-24	A
29	28'6"	159	4.9	8.5	18	75	3.2	3.2	3.2	11 1/2	AHW29-24	B
30	29'6"	134	4.7	8.4	18	75	3.2	3.2	2.6	11 1/2	ASW30-24	A
30	29'6"	164	4.9	8.5	18	75	3.2	3.2	3.2	11 1/2	AHW30-24	B
31	30'6"	138	4.7	8.4	18	75	3.2	2.9	2.1	11 1/2	ASW31-24	A
31	30'6"	169	4.9	8.5	18	75	3.2	3.2	3.2	11 1/2	AHW31-24	B
32	31'6"	143	4.7	8.4	18	75	3.2	2.7	1.9	11 1/2	ASW32-24	A
32	31'6"	173	4.9	8.5	18	75	3.2	3.2	3.2	11 1/2	AHW32-24	B
33	32'6"	147	4.7	8.4	18	75	3.2	2.4	1.7	11 1/2	ASW33-24	A
33	32'6"	178	4.9	8.5	18	75	3.2	3.2	2.9	11 1/2	AHW33-24	B
34	33'6"	152	4.7	8.4	18	75	2.6	1.7	1.1	11 1/2	ASW34-24	A
34	33'6"	183	4.9	8.5	18	75	3.2	3.2	2.3	11 1/2	AHW34-24	B
35	34'6"	156	4.7	8.4	18	75	2.3	1.5	0.9	11 1/2	ASW35-24	A
35	34'6"	188	4.9	8.5	18	75	3.2	2.9	2.0	11 1/2	AHW35-24	B



A Base Casting 37-60-0160-10

B Base Casting 37-60-0208-10

C Base Casting 37-60-0160-10 with 1/8" sleeve welded to I.D. of casting

A Base Casting 37-60-0160-10

B Base Casting 37-60-0208-10

C Base Casting 37-60-0160-10 with 1/8" sleeve welded to I.D. of casting

Shakespeare

6 ft. MAST ARM ANCHOR BASE FIBERGLASS LIGHT POLES

Series
AHW
and
ASW

CATALOG SHEET MA-4

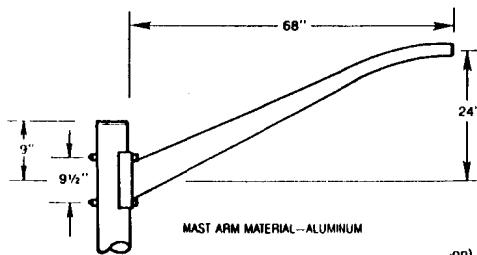
NOMINAL MOUNTING HEIGHT (FT)	SHAFT LENGTH (FT)	WEIGHT (LBS) INCLUDES ARMS	POLE DIAMETER		STANDARD HANDHOLE LOCATION FROM BASE (IN)	RECOMMENDED MAX SIZE OF EACH LUMINAIRE			BOLT HOLE CIRCLE (IN)	CATALOG NUMBER
			SHAFT TOP (IN)	SHAFT BASE (IN)		WEIGHT (LBS) PER LUM	80 MPH EPA* (SQ FT)	90 MPH EPA* (SQ FT)		

LIGHT POLE WITH ONE MAST ARM

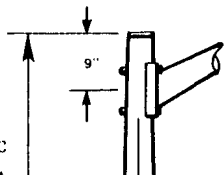
27	25'9"	119	4.7	8.3	18	75	3.2	3.2	3.2	1 1/2	ASW27-16	C
27	25'9"	156	4.9	8.4	18	75	3.2	3.2	3.2	1 1/2	AHW27-16	A
28	26'9"	123	4.7	8.4	18	75	3.2	3.2	3.2	1 1/2	ASW28-16	A
28	26'9"	161	4.9	8.5	18	75	3.2	3.2	3.2	1 1/2	AHW28-16	A
29	27'9"	128	4.7	8.4	18	75	3.2	3.2	3.2	1 1/2	ASW29-16	A
29	27'9"	166	4.9	8.5	18	75	3.2	3.2	3.2	1 1/2	AHW29-16	B
30	28'9"	132	4.7	8.4	18	75	3.2	3.2	3.2	1 1/2	ASW30-16	A
30	28'9"	171	4.9	8.5	18	75	3.2	3.2	3.2	1 1/2	AHW30-16	B
31	29'9"	136	4.7	8.4	18	75	3.2	3.2	3.2	1 1/2	ASW31-16	A
31	29'9"	176	4.9	8.5	18	75	3.2	3.2	3.2	1 1/2	AHW31-16	B
32	30'9"	141	4.7	8.4	18	75	3.2	3.2	3.2	1 1/2	ASW32-16	A
32	30'9"	181	4.9	8.5	18	75	3.2	3.2	3.2	1 1/2	AHW32-16	B
33	31'9"	145	4.7	8.4	18	75	3.2	3.2	3.2	1 1/2	ASW33-16	A
33	31'9"	186	4.9	8.5	18	75	3.2	3.2	3.2	1 1/2	AHW33-16	B
34	32'9"	150	4.7	8.4	18	75	3.2	3.2	3.2	1 1/2	ASW34-16	A
34	32'9"	191	4.9	8.5	18	75	3.2	3.2	3.2	1 1/2	AHW34-16	B
35	33'9"	154	4.7	8.4	18	75	3.2	3.2	2.3	1 1/2	ASW35-16	A
35	33'9"	196	4.9	8.5	18	75	3.2	3.2	3.2	1 1/2	AHW35-16	B

All poles are individually wrapped. Aluminum cap, 2 1/4" x 5" handhole, and anchor bolts standard. Bolt covers (on some models) and base shrouds (for all models) are optional. See accessories. Optional 4" x 6" handholes available on all but AO Models.

*Poles are not rated above 3.2 EPA as the mast arms are not rated for luminaires greater than 3.2 EPA. EPA recommendations are calculated per AASHTO Standards and include a 30% gust factor. See Post Top section for EPA ratings without arms.



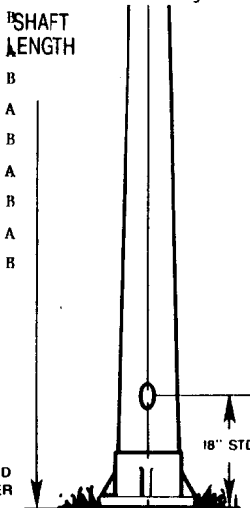
MAST ARM MATERIAL—ALUMINUM



A Base Casting 37-60-0160-10

B Base Casting 37-60-0208-10

C Base Casting 37-60-0160-10 with 1/8" sleeve welded to I.D. of casting



For Anchor Base Dimensions See Catalog Sheet GI-4

See TEST DATA & ACCESSORIES Section for Mast Arm and attachment hardware part numbers

NOMINAL MOUNTING HEIGHT (FT)	SHAFT LENGTH (FT)	WEIGHT (LBS) INCLUDES ARMS	POLE DIAMETER		STANDARD HANDHOLE LOCATION FROM BASE (IN)	RECOMMENDED MAX SIZE OF EACH LUMINAIRE			BOLT HOLE CIRCLE (IN)	CATALOG NUMBER
			SHAFT TOP (IN)	SHAFT BASE (IN)		WEIGHT (LBS) PER LUM	80 MPH EPA* (SQ FT)	90 MPH EPA* (SQ FT)		

LIGHT POLE WITH TWO MAST ARMS

27	25'9"	129	4.7	8.3	18	75	3.2	3.2	3.2	1 1/2	ASW27-26	C
27	25'9"	166	4.9	8.4	18	75	3.2	3.2	3.2	1 1/2	AHW27-26	A
28	26'9"	133	4.7	8.4	18	75	3.2	3.2	2.5	1 1/2	ASW28-26	A
28	26'9"	171	4.9	8.5	18	75	3.2	3.2	3.2	1 1/2	AHW28-26	A
29	27'9"	138	4.7	8.4	18	75	3.2	3.2	2.3	1 1/2	ASW29-26	A
29	27'9"	176	4.9	8.5	18	75	3.2	3.2	3.2	1 1/2	AHW29-26	B
30	28'9"	142	4.7	8.4	18	75	3.2	3.0	2.0	1 1/2	ASW30-26	A
30	28'9"	181	4.9	8.5	18	75	3.2	3.2	3.2	1 1/2	AHW30-26	B
31	29'9"	146	4.7	8.4	18	75	3.2	2.5	1.6	1 1/2	ASW31-26	A
31	29'9"	186	4.9	8.5	18	75	3.2	3.2	3.0	1 1/2	AHW31-26	B
32	30'9"	151	4.7	8.4	18	75	3.2	2.1	1.3	1 1/2	ASW32-26	A
32	30'9"	191	4.9	8.5	18	75	3.2	3.2	2.6	1 1/2	AHW32-26	B
33	31'9"	155	4.7	8.4	18	75	2.9	1.8	1.1	1 1/2	ASW33-26	A
33	31'9"	196	4.9	8.5	18	75	3.2	3.2	2.3	1 1/2	AHW33-26	B
34	32'9"	160	4.7	8.4	18	75	2.6	1.6	0.9	1 1/2	ASW34-26	A
34	32'9"	201	4.9	8.5	18	75	3.2	3.1	2.1	1 1/2	AHW34-26	B
35	33'9"	164	4.7	8.4	18	75	1.8	0.9	0.3	1 1/2	ASW35-26	A
35	33'9"	206	4.9	8.5	18	75	3.2	2.3	1.4	1 1/2	AHW35-26	B

LIGHT POLE WITH FOUR MAST ARMS

27	25'9"	149	4.7	8.3	18	75	3.2	3.0	2.2	1 1/2	ASW27-46	C
27	25'9"	186	4.9	8.4	18	75	3.2	3.2	3.2	1 1/2	AHW27-46	A
28	26'9"	153	4.7	8.4	18	75	3.2	2.9	2.0	1 1/2	ASW28-46	A
28	26'9"	191	4.9	8.5	18	75	3.2	3.2	3.2	1 1/2	AHW28-46	A
29	27'9"	158	4.7	8.4	18	75	3.2	2.7	1.8	1 1/2	ASW29-46	A
29	27'9"	196	4.9	8.5	18	75	3.2	3.2	3.1	1 1/2	AHW29-46	B
30	28'9"	162	4.7	8.4	18	75	3.2	2.4	1.6	1 1/2	ASW30-46	A
30	28'9"	201	4.9	8.5	18	75	3.2	3.2	2.8	1 1/2	AHW30-46	B
31	29'9"	166	4.7	8.4	18	75	2.9	2.0	1.3	1 1/2	ASW31-46	A
31	29'9"	206	4.9	8.5	18	75	3.2	3.2	2.4	1 1/2	AHW31-46	B
32	30'9"	171	4.7	8.4	18	75	2.6	1.7	1.0	1 1/2	ASW32-46	A
32	30'9"	211	4.9	8.5	18	75	3.2	2.9	2.0	1 1/2	AHW32-46	B
33	31'9"	175	4.7	8.4	18	75	2.3	1.5	0.9	1 1/2	ASW33-46	A
33	31'9"	216	4.9	8.5	18	75	3.2	2.7	1.8	1 1/2	AHW33-46	B
34	32'9"	180	4.7	8.4	18	75	2.1	1.3	0.7	1 1/2	ASW34-46	A
34	32'9"	221	4.9	8.5	18	75	3.2	2.5	1.7	1 1/2	AHW34-46	B
35	33'9"	184	4.7	8.4	18	75	1.4	0.7	0.2	1 1/2	ASW35-46	A
35	33'9"	226	4.9	8.5	18	75	2.9	1.9	1.2	1 1/2	AHW35-46	B

C Base Casting 37-60-0160-10 with 1/8" sleeve welded to I.D. of casting

A Base Casting 37-60-0160-10
B Base Casting 37-60-0208-10

Shakespeare

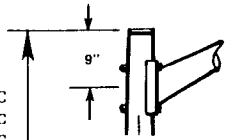
8 ft. MAST ARM ANCHOR BASE FIBERGLASS LIGHT POLES

Series AHW and ASW

CATALOG SHEET MA-6

NOMINAL MOUNTING HEIGHT (FT)	SHAFT LENGTH (FT)	WEIGHT (LBS) INCLUDES ARMS	POLE DIAMETER		STANDARD HANDHOLE LOCATION FROM BASE (IN)	RECOMMENDED MAX SIZE OF EACH LUMINAIRE				BOLT HOLE CIRCLE (IN)	CATALOG NUMBER
			SHAFT TOP (IN)	SHAFT BASE (IN)		WEIGHT (LBS) PER LUM	80 MPH EPA* (SQ FT)	90 MPH EPA* (SQ FT)	100 MPH EPA* (SQ FT)		

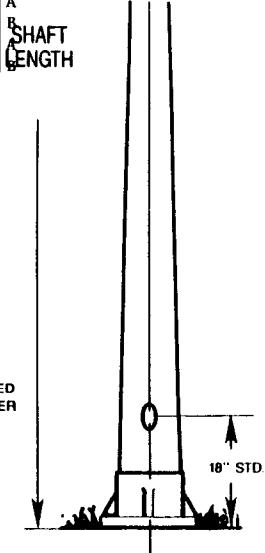
LIGHT POLE WITH ONE MAST ARM												
27	25	120	4.7	8.2	18	75	3.2	3.2	3.2	1 1/2	ASW27-18	C
27	25	155	4.9	8.3	18	75	3.2	3.2	3.2	1 1/2	AHW27-18	C
28	26	125	4.7	8.3	18	75	3.2	3.2	3.2	1 1/2	ASW28-18	C
28	26	160	4.9	8.4	18	75	3.2	3.2	3.2	1 1/2	AHW28-18	A
29	27	129	4.7	8.4	18	75	3.2	3.2	3.2	1 1/2	ASW29-18	A
29	27	165	4.9	8.5	18	75	3.2	3.2	3.2	1 1/2	AHW29-18	A
30	28	133	4.7	8.4	18	75	3.2	3.2	3.2	1 1/2	ASW30-18	B
30	28	170	4.9	8.5	18	75	3.2	3.2	3.2	1 1/2	AHW30-18	B
31	29	137	4.7	8.4	18	75	3.2	3.2	3.2	1 1/2	ASW31-18	A
31	29	175	4.9	8.5	18	75	3.2	3.2	3.2	1 1/2	AHW31-18	A
32	30	141	4.7	8.4	18	75	3.2	3.2	3.2	1 1/2	ASW32-18	A
32	30	180	4.9	8.5	18	75	3.2	3.2	3.2	1 1/2	AHW32-18	B
33	31	146	4.7	8.4	18	75	3.2	3.2	3.2	1 1/2	ASW33-18	A
33	31	185	4.9	8.5	18	75	3.2	3.2	3.2	1 1/2	AHW33-18	B
34	32	150	4.7	8.4	18	75	3.2	3.2	3.0	1 1/2	ASW34-18	A
34	32	190	4.9	8.5	18	75	3.2	3.2	3.2	1 1/2	AHW34-18	B
35	33	154	4.7	8.4	18	75	3.2	3.2	2.6	1 1/2	ASW35-18	A
35	33	195	4.9	8.5	18	75	3.2	3.2	3.2	1 1/2	AHW35-18	B



A Base Casting 37-60-0160-10

B Base Casting 37-60-0208-10

C Base Casting 37-60-0160-10 with 1/8" sleeve welded to I.D. of casting



NOMINAL MOUNTING HEIGHT (FT)	SHAFT LENGTH (FT)	WEIGHT (LBS) INCLUDES ARMS	POLE DIAMETER		STANDARD HANDHOLE LOCATION FROM BASE (IN)	RECOMMENDED MAX SIZE OF EACH LUMINAIRE				BOLT HOLE CIRCLE (IN)	CATALOG NUMBER
			SHAFT TOP (IN)	SHAFT BASE (IN)		WEIGHT (LBS) PER LUM	80 MPH EPA* (SQ FT)	90 MPH EPA* (SQ FT)	100 MPH EPA* (SQ FT)		

LIGHT POLE WITH TWO MAST ARMS												
27	25	133	4.7	8.2	18	75	3.2	3.1	2.0	1 1/2	ASW27-28	C
27	25	168	4.9	8.3	18	75	3.2	3.2	3.2	1 1/2	AHW27-28	C
28	26	138	4.7	8.3	18	75	3.2	2.9	1.8	1 1/2	ASW28-28	C
28	26	173	4.9	8.4	18	75	3.2	3.2	3.2	1 1/2	AHW28-28	A
29	27	142	4.7	8.4	18	75	3.2	2.7	1.7	1 1/2	ASW29-28	A
29	27	178	4.9	8.5	18	75	3.2	3.2	3.2	1 1/2	AHW29-28	A
30	28	146	4.7	8.4	18	75	3.2	2.4	1.4	1 1/2	ASW30-28	A
30	28	183	4.9	8.5	18	75	3.2	3.2	2.9	1 1/2	AHW30-28	B
31	29	150	4.7	8.4	18	75	3.1	1.9	1.0	1 1/2	ASW31-28	A
31	29	188	4.9	8.5	18	75	3.2	3.2	2.4	1 1/2	AHW31-28	A
32	30	154	4.7	8.4	18	75	2.6	1.4	0.6	1 1/2	ASW32-28	B
32	30	193	4.9	8.5	18	75	3.2	3.0	1.9	1 1/2	AHW32-28	B
33	31	159	4.7	8.4	18	75	2.3	1.2	0.4	1 1/2	ASW33-28	A
33	31	198	4.9	8.5	18	75	3.2	2.7	1.7	1 1/2	AHW33-28	B
34	32	163	4.7	8.4	18	75	2.0	0.9	0.2	1 1/2	ASW34-28	A
34	32	203	4.9	8.5	18	75	3.2	2.4	1.4	1 1/2	AHW34-28	A
35	33	167	4.7	8.4	18	75	1.7	0.7	-	1 1/2	ASW35-28	B
35	33	208	4.9	8.5	18	75	3.2	2.2	1.2	1 1/2	AHW35-28	B

LIGHT POLE WITH FOUR MAST ARMS												
27	25	159	4.7	8.2	18	75	3.2	2.5	1.6	1 1/2	ASW27-48	C
27	25	194	4.9	8.3	18	75	3.2	3.2	2.9	1 1/2	AHW27-48	C
28	26	164	4.7	8.3	18	75	3.2	2.3	1.5	1 1/2	ASW28-48	C
28	26	199	4.9	8.4	18	75	3.2	3.2	2.7	1 1/2	AHW28-48	C
29	27	168	4.7	8.4	18	75	3.2	2.2	1.3	1 1/2	ASW29-48	A
29	27	204	4.9	8.5	18	75	3.2	3.2	2.6	1 1/2	AHW29-48	A
30	28	172	4.7	8.4	18	75	3.0	1.9	1.1	1 1/2	ASW30-48	A
30	28	209	4.9	8.5	18	75	3.2	3.2	2.3	1 1/2	AHW30-48	B
31	29	176	4.7	8.4	18	75	2.5	1.5	0.8	1 1/2	ASW31-48	A
31	29	214	4.9	8.5	18	75	3.2	2.8	1.9	1 1/2	AHW31-48	A
32	30	180	4.7	8.4	18	75	2.1	1.2	0.5	1 1/2	ASW32-48	B
32	30	219	4.9	8.5	18	75	3.2	2.4	1.5	1 1/2	AHW32-48	B
33	31	185	4.7	8.4	18	75	1.8	0.9	0.3	1 1/2	ASW33-48	A
33	31	224	4.9	8.5	18	75	3.2	2.2	1.3	1 1/2	AHW33-48	A
34	32	189	4.7	8.4	18	75	1.6	0.8	0.1	1 1/2	ASW34-48	A
34	32	229	4.9	8.5	18	75	3.1	1.9	1.1	1 1/2	AHW34-48	A
35	33	193	4.7	8.4	18	75	1.4	0.6	-	1 1/2	ASW35-48	B
35	33	234	4.9	8.5	18	75	2.8	1.7	1.0	1 1/2	AHW35-48	B

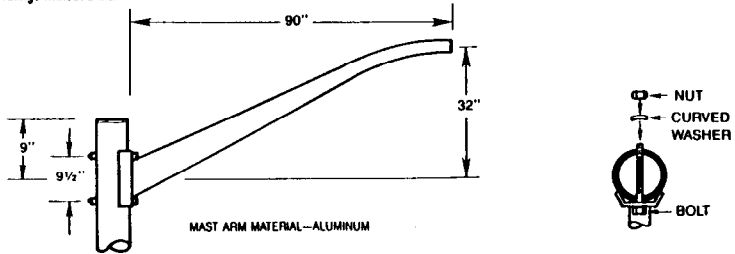
A Base Casting 37-60-0160-10

B Base Casting 37-60-0208-10

C Base Casting 37-60-0160-10 with 1/8" sleeve welded to I.D. of casting

All poles are individually wrapped. Aluminum cap, 2 1/2" x 5" handhole, and anchor bolts standard. Bolt covers (on some models) and base shrouds (for all models) are optional - see accessories. Optional: 4" x 6" handholes available on all but AO Models.

*Poles are not rated above 32 EPA as the mast arms are not rated for luminaires greater than 32 EPA. EPA recommendations are calculated per AASHTO Standards and include a 30% gust factor. See Post Top section for EPA ratings without arms.



*Poles are not rated above 32 EPA as the mast arms are not rated for luminaires greater than 32 EPA. EPA recommendations are calculated per AASHTO Standards and include a 30% gust factor. See Post Top section for EPA ratings without arms.

For Anchor Base Dimensions See Catalog Sheet GI-4

See TEST DATA & ACCESSORIES Section for Mast Arm and attachment hardware part numbers.

Shakespeare

10 ft. MAST ARM ANCHOR BASE FIBERGLASS LIGHT POLES

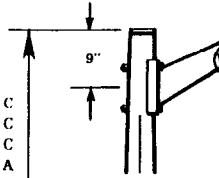
Series
AHW
and
ASW

CATALOG SHEET MA-8

NOMINAL MOUNTING HEIGHT (FT)	SHAFT LENGTH (FT)	WEIGHT (LBS) INCLUDES ARMS	POLE DIAMETER		STANDARD HANDHOLE LOCATION FROM BASE (IN)	RECOMMENDED MAX. SIZE OF EACH LUMINAIRE				BOLT HOLE CIRCLE (IN.)	CATALOG NUMBER
			SHAFT TOP (IN)	SHAFT BASE (IN)		WEIGHT (LBS) PER LUM	80 MPH EPA* (SQ FT)	90 MPH EPA* (SQ FT)	100 MPH EPA* (SQ FT)		

LIGHT POLE WITH ONE MAST ARM

27	24'6"	120	4.7	8.1	18	75	3.2	3.2	3.2	1 1/2	ASW27-11	C
27	24'6"	156	4.9	8.2	18	75	3.2	3.2	3.2	1 1/2	AHW27-11	C
28	25'6"	125	4.7	8.2	18	75	3.2	3.2	3.2	1 1/2	ASW28-11	C
28	25'6"	161	4.9	8.3	18	75	3.2	3.2	3.2	1 1/2	AHW28-11	C
29	26'6"	129	4.7	8.3	18	75	3.2	3.2	3.2	1 1/2	ASW29-11	A
29	26'6"	166	4.9	8.4	18	75	3.2	3.2	3.2	1 1/2	AHW29-11	A
30	27'6"	133	4.7	8.4	18	75	3.2	3.2	3.2	1 1/2	ASW30-11	A
30	27'6"	171	4.9	8.5	18	75	3.2	3.2	3.2	1 1/2	AHW30-11	A
31	28'6"	137	4.7	8.4	18	75	3.2	3.2	3.2	1 1/2	ASW31-11	A
31	28'6"	176	4.9	8.5	18	75	3.2	3.2	3.2	1 1/2	AHW31-11	A
32	29'6"	141	4.7	8.4	18	75	3.2	3.2	3.1	1 1/2	ASW32-11	B
32	29'6"	181	4.9	8.5	18	75	3.2	3.2	3.2	1 1/2	AHW32-11	B
33	30'6"	145	4.7	8.4	18	75	3.2	3.2	2.7	1 1/2	ASW33-11	A
33	30'6"	186	4.9	8.5	18	75	3.2	3.2	3.2	1 1/2	AHW33-11	A
34	31'6"	150	4.7	8.4	18	75	3.2	3.2	2.3	1 1/2	ASW34-11	A
34	31'6"	191	4.9	8.5	18	75	3.2	3.2	3.2	1 1/2	AHW34-11	A
35	32'6"	154	4.7	8.4	18	75	3.2	3.2	1.9	1 1/2	ASW35-11	A
35	32'6"	196	4.9	8.5	18	75	3.2	3.2	3.2	1 1/2	AHW35-11	A



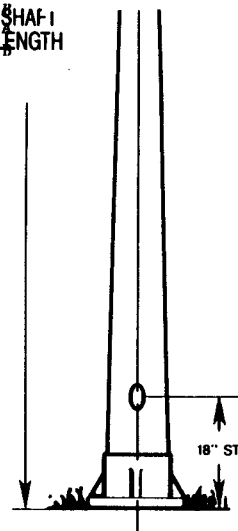
A Base Casting
37-60-0160-10

B Base Casting
37-60-0208-10

C Base Casting
37-60-0160-10

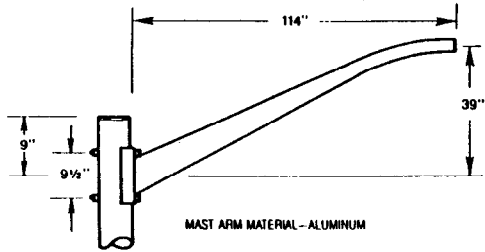
with 1/8" sleeve welded to I.O. of casting

SHAFT LENGTH

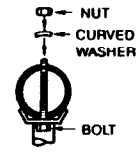


For Anchor Base Dimensions
See Catalog Sheet GI-4

All poles are individually wrapped. Aluminum cap, 2 1/2" x 5" handhole, and anchor bolts standard. Bolt covers and base shrouds are optional. see accessories. Optional: 4" x 6" handholes.



MAST ARM MATERIAL - ALUMINUM



NUT
CURVED WASHER
BOLT

* Poles are not rated above 3.2 EPA as the mast arms are not rated for luminaires greater than 3.2 EPA. EPA recommendations are calculated per AASHTO Standards and include a 30% gust factor. See Post Top section for EPA ratings without arms.

See TEST DATA & ACCESSORIES Section for Mast Arm and attachment hardware part numbers.

NOMINAL MOUNTING HEIGHT (FT)	SHAFT LENGTH (FT)	WEIGHT (LBS) INCLUDES ARMS	POLE DIAMETER		STANDARD HANDHOLE LOCATION FROM BASE (IN)	RECOMMENDED MAX. SIZE OF EACH LUMINAIRE			BOLT HOLE CIRCLE (IN.)	CATALOG NUMBER
			SHAFT TOP (IN)	SHAFT BASE (IN)		WEIGHT (LBS) PER LUM	80 MPH EPA* (SQ FT)	90 MPH EPA* (SQ FT)		

LIGHT POLE WITH TWO MAST ARMS

27	24'6"	137	4.7	8.1	18	75	3.2	2.3	1.2	1 1/2	ASW27-21	C
27	24'6"	173	4.9	8.2	18	75	3.2	3.2	2.8	1 1/2	AHW27-21	C
28	25'6"	142	4.7	8.2	18	75	3.2	2.1	1.0	1 1/2	ASW28-21	C
28	25'6"	178	4.9	8.3	18	75	3.2	3.2	2.6	1 1/2	AHW28-21	C
29	26'6"	146	4.7	8.3	18	75	3.2	1.9	0.8	1 1/2	ASW29-21	A
29	26'6"	183	4.9	8.4	18	75	3.2	3.2	2.4	1 1/2	AHW29-21	A
30	27'6"	150	4.7	8.4	18	75	3.1	1.6	0.6	1 1/2	ASW30-21	A
30	27'6"	188	4.9	8.5	18	75	3.2	3.2	2.1	1 1/2	AHW30-21	A
31	28'6"	154	4.7	8.4	18	75	2.4	1.2	0.4	1 1/2	ASW31-21	A
31	28'6"	193	4.9	8.5	18	75	3.2	2.9	1.7	1 1/2	AHW31-21	B
32	29'6"	158	4.7	8.4	18	75	1.8	0.7	-	1 1/2	ASW32-21	A
32	29'6"	198	4.9	8.5	18	75	3.2	2.3	1.1	1 1/2	AHW32-21	A
33	30'6"	162	4.7	8.4	18	75	1.5	0.4	-	1 1/2	ASW33-21	A
33	30'6"	203	4.9	8.5	18	75	3.2	2.0	0.9	1 1/2	AHW33-21	B
34	31'6"	167	4.7	8.4	18	75	1.2	0.2	-	1 1/2	ASW34-21	A
34	31'6"	208	4.9	8.5	18	75	3.1	1.7	0.7	1 1/2	AHW34-21	B
35	32'6"	171	4.7	8.4	18	75	1.0	-	-	1 1/2	ASW35-21	A
35	32'6"	213	4.9	8.5	18	75	2.8	1.4	0.4	1 1/2	AHW35-21	B

LIGHT POLE WITH FOUR MAST ARMS

27	24'6"	171	4.7	8.1	18	75	3.1	1.8	0.9	1 1/2	ASW27-41	C
27	24'6"	207	4.9	8.2	18	75	3.2	3.2	2.2	1 1/2	AHW27-41	C
28	25'6"	176	4.7	8.2	18	75	2.9	1.7	0.8	1 1/2	ASW28-41	C
28	25'6"	212	4.9	8.3	18	75	3.2	3.2	2.1	1 1/2	AHW28-41	A
29	26'6"	180	4.7	8.3	18	75	2.7	1.5	0.7	1 1/2	ASW29-41	A
29	26'6"	217	4.9	8.4	18	75	3.2	3.0	1.9	1 1/2	AHW29-41	A
30	27'6"	184	4.7	8.4	18	75	2.4	1.3	0.5	1 1/2	ASW30-41	A
30	27'6"	222	4.9	8.5	18	75	3.2	2.8	1.7	1 1/2	AHW30-41	B
31	28'6"	188	4.7	8.4	18	75	2.0	1.0	0.3	1 1/2	ASW31-41	A
31	28'6"	227	4.9	8.5	18	75	3.2	2.3	1.3	1 1/2	AHW31-41	B
32	29'6"	192	4.7	8.4	18	75	1.5	0.5	-	1 1/2	ASW32-41	A
32	29'6"	232	4.9	8.5	18	75	3.1	1.8	0.9	1 1/2	AHW32-41	B
33	30'6"	196	4.7	8.4	18	75	1.2	0.3	-	1 1/2	ASW33-41	A
33	30'6"	237	4.9	8.5	18	75	2.8	1.6	0.7	1 1/2	AHW33-41	B
34	31'6"	201	4.7	8.4	18	75	0.9	-	-	1 1/2	ASW34-41	A
34	31'6"	242	4.9	8.5	18	75	2.5	1.4	0.6	1 1/2	AHW34-41	B
35	32'6"	205	4.7	8.4	18	75	0.8	-	-	1 1/2	ASW35-41	A
35	32'6"	247	4.9	8.5	18	75	2.2	1.1	0.3	1 1/2	AHW35-41	B

A Base Casting
37-60-0160-10

B Base Casting
37-60-0208-10

C Base Casting
37-60-0160-10
with 1/8" sleeve welded to I.O. of casting

Shakespeare

12 ft. MAST ARM ANCHOR BASE FIBERGLASS LIGHT POLES

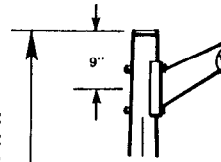
Series
AHW
and
ASW

CATALOG SHEET MA-10

NOMINAL MOUNTING HEIGHT (FT)	SHAFT LENGTH (FT)	WEIGHT (LBS) INCLUDES ARMS	POLE DIAMETER		STANDARD HANDHOLE LOCATION FROM BASE (IN)	RECOMMENDED MAX. SIZE OF EACH LUMINAIRE				BOLT HOLE CIRCLE (IN)	CATALOG NUMBER
			SHAFT TOP (IN)	SHAFT BASE (IN)		WEIGHT (LBS) PER LUM	80 MPH EPA* (SQ FT)	90 MPH EPA* (SQ FT)	100 MPH EPA* (SQ FT)		

LIGHT POLE WITH ONE MAST ARM

27	24	122	4.7	8.1	18	75	3.2	3.2	3.2	1 1/2	ASW27-12
27	24	157	4.9	8.2	18	75	3.2	3.2	3.2	1 1/2	AHW27-12
28	25	126	4.7	8.2	18	75	3.2	3.2	3.2	1 1/2	ASW28-12
28	25	162	4.9	8.3	18	75	3.2	3.2	3.2	1 1/2	AHW28-12
29	26	130	4.7	8.3	18	75	3.2	3.2	3.2	1 1/2	ASW29-12
29	26	167	4.9	8.4	18	75	3.2	3.2	3.2	1 1/2	AHW29-12
30	27	134	4.7	8.4	18	75	3.2	3.2	3.2	1 1/2	ASW30-12
30	27	172	4.9	8.5	18	75	3.2	3.2	3.2	1 1/2	AHW30-12
31	28	138	4.7	8.4	18	75	3.2	3.2	3.2	1 1/2	AHW31-12
31	28	177	4.9	8.5	18	75	3.2	3.2	3.2	1 1/2	ASW31-12
32	29	142	4.7	8.4	18	75	3.2	3.2	2.9	1 1/2	AHW32-12
32	29	182	4.9	8.5	18	75	3.2	3.2	3.2	1 1/2	ASW32-12
33	30	147	4.7	8.4	18	75	3.2	3.2	2.2	1 1/2	ASW33-12
33	30	187	4.9	8.5	18	75	3.2	3.2	3.2	1 1/2	AHW33-12
34	31	151	4.7	8.4	18	75	3.2	3.2	1.8	1 1/2	ASW34-12
34	31	192	4.9	8.5	18	75	3.2	3.2	3.2	1 1/2	AHW34-12
35	32	155	4.7	8.4	18	75	3.2	2.9	1.4	1 1/2	ASW35-12
35	32	196	4.9	8.5	18	75	3.2	3.2	3.2	1 1/2	AHW35-12

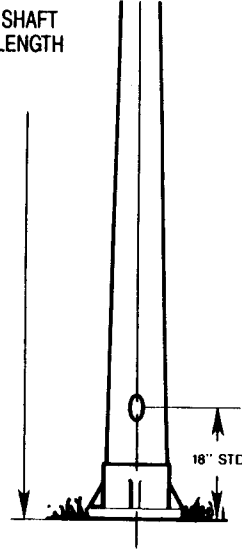


A Base Casting 37-60-0160-10

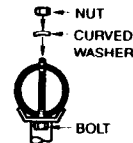
B Base Casting 37-60-0208-10

C Base Casting 37-60-0160-10 with 1/8" sleeve welded to I.D. of casting

SHAFT LENGTH



For Anchor Base Dimensions See Catalog Sheet GI-4



See TEST DATA & ACCESSORIES Section for Mast Arm and attachment hardware part numbers.

NOMINAL MOUNTING HEIGHT (FT)	SHAFT LENGTH (FT)	WEIGHT (LBS) INCLUDES ARMS	POLE DIAMETER		STANDARD HANDHOLE LOCATION FROM BASE (IN)	RECOMMENDED MAX. SIZE OF EACH LUMINAIRE				BOLT HOLE CIRCLE (IN)	CATALOG NUMBER
			SHAFT TOP (IN)	SHAFT BASE (IN)		WEIGHT (LBS) PER LUM	80 MPH EPA* (SQ FT)	90 MPH EPA* (SQ FT)	100 MPH EPA* (SQ FT)		

LIGHT POLE WITH TWO MAST ARMS

27	24	142	4.7	8.1	18	75	3.2	1.6	0.5	1 1/2	ASW27-22
27	24	177	4.9	8.2	18	75	3.2	3.2	2.1	1 1/2	AHW27-22
28	25	146	4.7	8.2	18	75	2.9	1.4	0.4	1 1/2	ASW28-22
28	25	182	4.9	8.3	18	75	3.2	3.2	1.9	1 1/2	AHW28-22
29	26	150	4.7	8.3	18	75	2.7	1.3	0.2	1 1/2	ASW29-22
29	26	187	4.9	8.4	18	75	3.2	3.1	1.7	1 1/2	AHW29-22
30	27	154	4.7	8.4	18	75	2.5	1.1	-	1 1/2	ASW30-22
30	27	192	4.9	8.5	18	75	3.2	2.9	1.6	1 1/2	AHW30-22
31	28	158	4.7	8.4	18	75	1.9	0.7	-	1 1/2	ASW31-22
31	28	197	4.9	8.5	18	75	3.2	2.3	1.2	1 1/2	AHW31-22
32	29	162	4.7	8.4	18	75	1.6	0.5	-	1 1/2	ASW32-22
32	29	202	4.9	8.5	18	75	3.2	2.0	0.9	1 1/2	AHW32-22
33	30	167	4.7	8.4	18	75	1.0	-	-	1 1/2	ASW33-22
33	30	207	4.9	8.5	18	75	2.9	1.4	0.3	1 1/2	AHW33-22
34	31	171	4.7	8.4	18	75	0.7	-	-	1 1/2	ASW34-22
34	31	212	4.9	8.5	18	75	2.6	1.1	-	1 1/2	AHW34-22
35	32	175	4.7	8.4	18	75	-	-	-	1 1/2	ASW35-22
35	32	216	4.9	8.5	18	75	2.2	0.8	-	1 1/2	AHW35-22

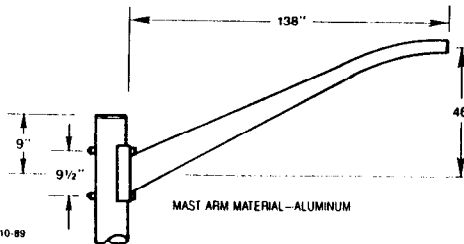
A Base Casting 37-60-0160-10

B Base Casting 37-60-0208-10

C Base Casting 37-60-0160-10 with 1/8" sleeve welded to I.D. of casting

All poles are individually wrapped. Aluminum cap, 2 1/2" x 5" handhole, and anchor bolts standard. Bolt covers and base shrouds are optional see accessories. Optional: 4" x 6" handhole

*Poles are not rated above 32 EPA as the mast arms are not rated for luminaires greater than 32 EPA. EPA recommendations are calculated per AASHTO Standards and include a 30% gust factor. See Post Top section for EPA ratings without arms.



MAST ARM MATERIAL—ALUMINUM