



U.S. Department  
of Transportation

Federal Highway  
Administration

MAY 14 1990

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

REFER TO:  
HNG-14

C. Richard Briden, P. E.  
Engineering Manager  
P & K Pole Products  
84 Foundry Street  
Newark, New Jersey 07105

Dear Mr. Briden:

This is in response to your three December 13, 1989, letters to Mr. Thomas O. Willett requesting acceptance by the Federal Highway Administration (FHWA) of your company's 7-inch and 8-inch breakaway aluminum shoebase luminaire supports for use on Federal-aid highway projects. Tests were conducted to assess the compliance of these bases with FHWA breakaway requirements, which cite Section 7 of the 1985 American Association of State Highway and Transportation Officials' (AASHTO) Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals. You enclosed for our review three Southwest Research Institute reports (Project No. 06-3116-503), dated November 1989, containing results of pendulum tests on aluminum poles with these base designs. Further information, including a film of the tests, was transmitted with your letters of January 12 to Mr. Nicholas Artimovich and April 25 to Mr. Willett.

The tests used an instrumented 1,800-pound pendulum fitted with a 10 stage crushable nose which simulates the left quarter point of a 1979 Volkswagen Rabbit. Impact speed for each test was 20 m.p.h. Details of the tested hardware and the measured and extrapolated results are summarized below:

Test No.	PK-1	PK-2	PK-3
O.D. and Base No.	7 inch SB-2G	7 inch SB-2G	8 inch SB-2G
Mounting Height	30 feet	30 feet	35 feet
Pole Wall Thickness	0.156 inches	0.188 inches	0.156 inches
Pole, Arm, & Lum. Wt.	193.5 pounds	218.0 pounds	212.0 pounds
20-mph Test Delta V	8.8 f.p.s.	12.2 f.p.s.	9.1 f.p.s.
60-mph Calc. Delta V	5.1 f.p.s.	6.6 f.p.s.	5.8 f.p.s.
Stub Height	2.3 inches	2.3 inches	2.3 inches

This information shows that the tested pole-base combinations will meet the change in velocity and stub-height requirements adopted by the FHWA.

Thus, breakaway shoebases SB-2G for 7-inch and 8-inch outside pole diameters (O.D.), with maximum support and luminaire weights of 250-pounds and maximum pole wall thicknesses of 0.188 inches, as shown on the enclosed drawings, are acceptable for use on Federal-aid highway projects, if proposed by a State. This acceptance is limited to breakaway characteristics of the bases and does not cover their structural features. Presumably, you will supply potential

users with sufficient information on structural design limitations, including resistance to torsion and overturning, and on installation requirements to ensure proper performance. We anticipate that the States will require certification from P & K Pole Products that the bases furnished have essentially the same chemistry, mechanical properties, and geometry as the bases used in the tests, and that supports with those bases will meet the FHWA breakaway requirements.

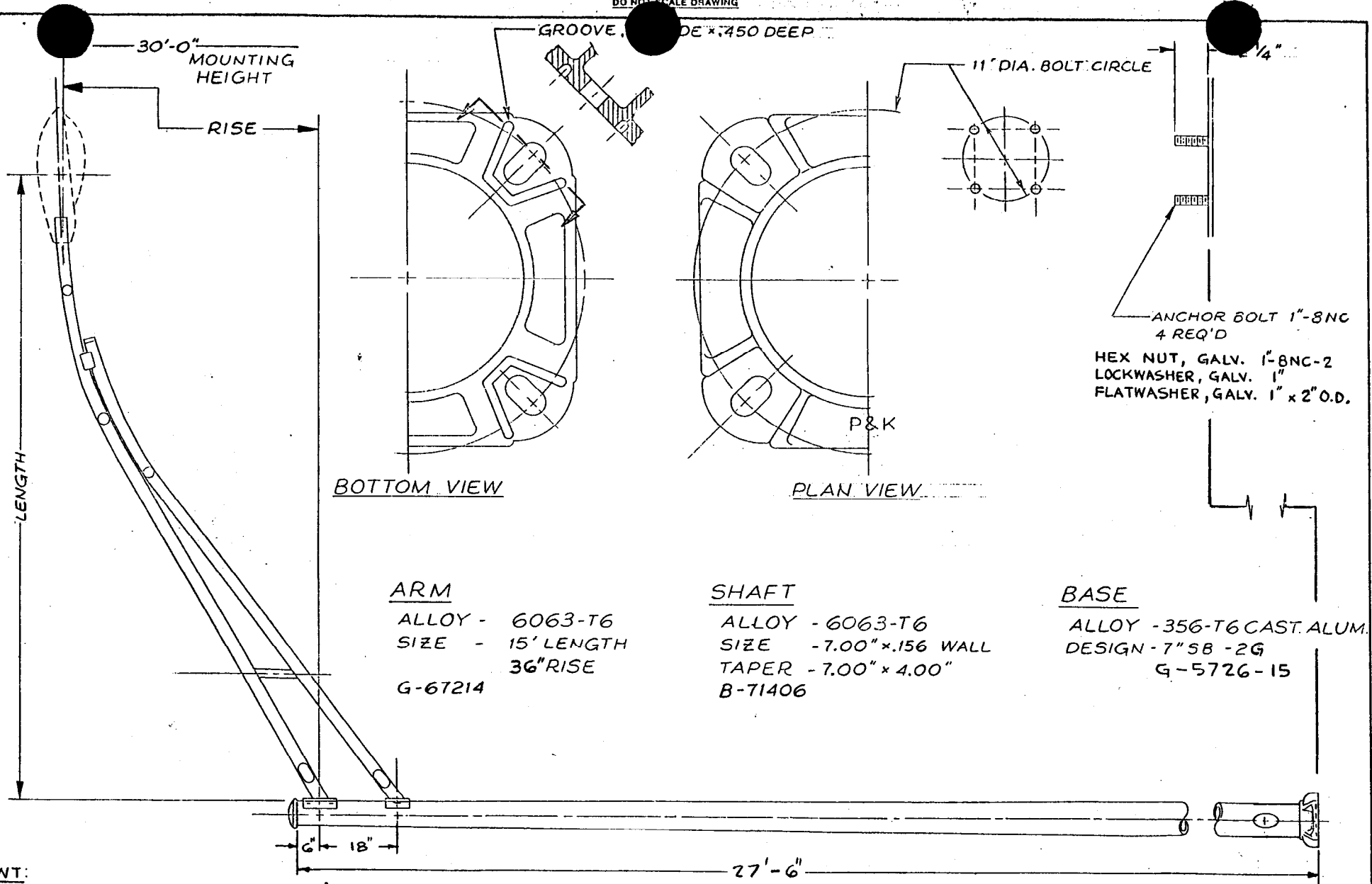
Since your company's breakaway shoebases are proprietary items, to be used in a Federal-aid highway project, they; (a) must be supplied through competitive bidding with equally suitable unpatented items; (b) the specifying State highway agency must certify that they are essential for synchronization with existing highway facilities, or that no equally suitable alternate exists; or (c) they must be 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 for your information.

Sincerely yours,



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

Enclosures



ANCHOR BOLT 1"-8NC  
4 REQ'D  
HEX NUT, GALV. 1"-8NC-2  
LOCKWASHER, GALV. 1"  
FLATWASHER, GALV. 1" x 2" O.D.

BOTTOM VIEW

PLAN VIEW

ARM  
ALLOY - 6063-T6  
SIZE - 15' LENGTH  
36" RISE  
G-67214

SHAFT  
ALLOY - 6063-T6  
SIZE - 7.00" x .156 WALL  
TAPER - 7.00" x 4.00"  
B-71406

BASE  
ALLOY - 356-T6 CAST. ALUM.  
DESIGN - 7" SB - 2G  
G-5726-15

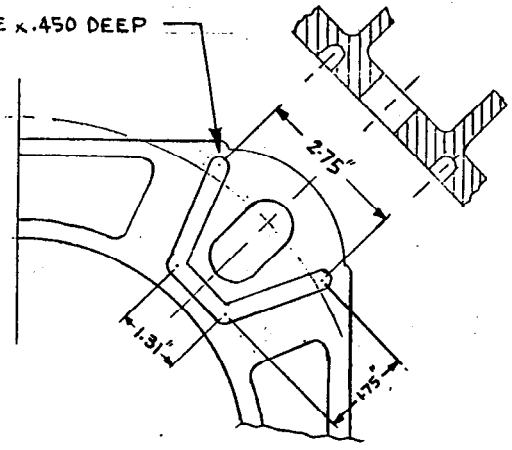
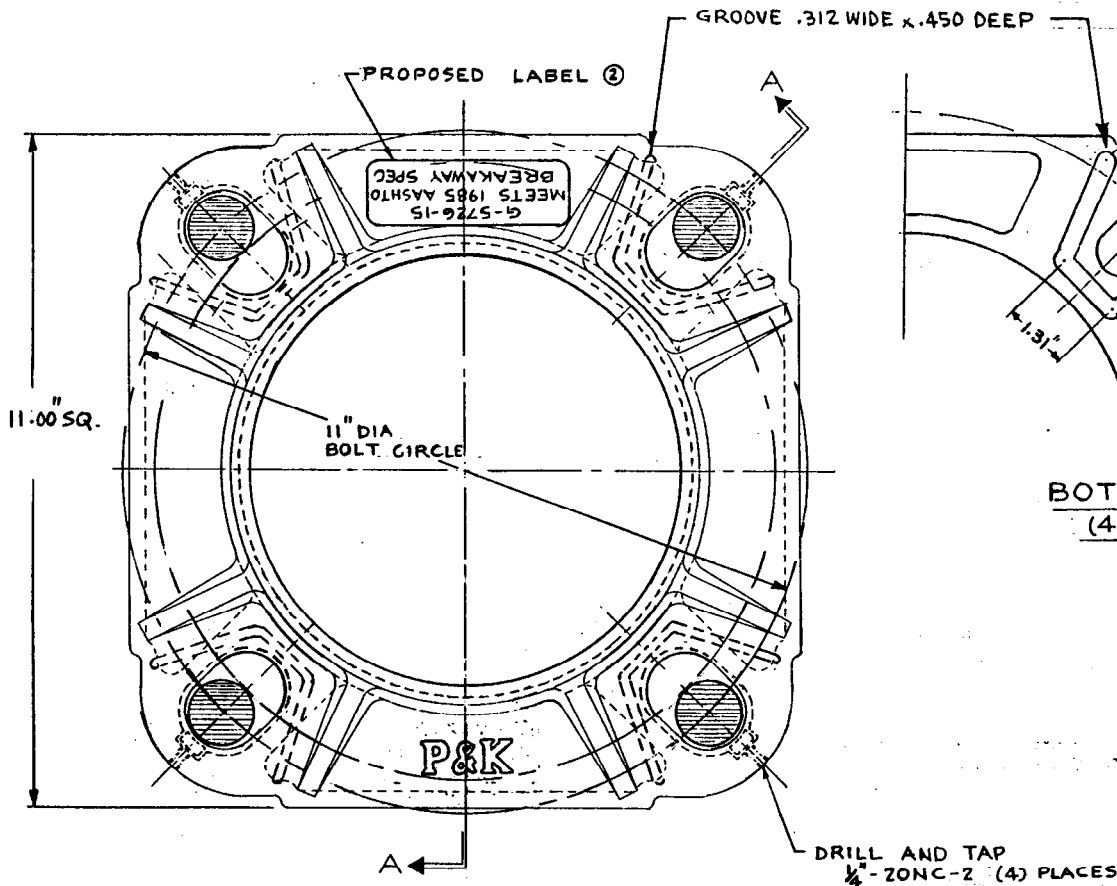
WT:

POLE	97 #
ARM	46 #
LUM.	50 #
<u>TOTAL</u>	<u>193 #</u>

PK1

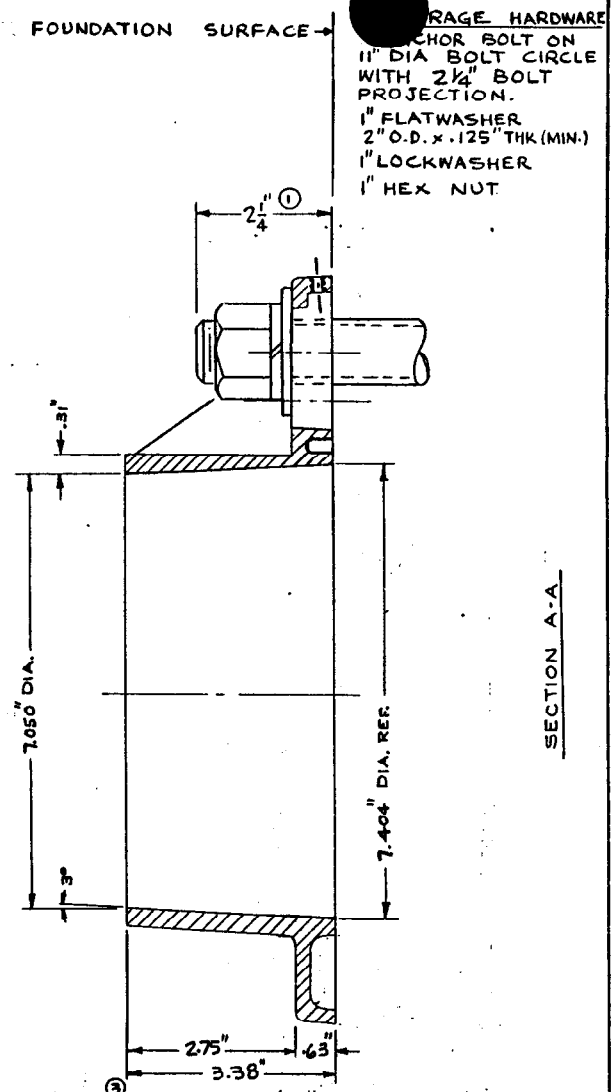
ALTERATIONS					MATERIAL	P&K POLE PRODUCTS 84 Foundry St., Newark, N.J.
ALT.	DESCRIPTION	DATE	BY	CHK		
					STOCK SIZE	TITLE RTA7L30AAT15802
					FINISH OR TEMPER	DR. D.C.R. 1/25/90 DWG. NO. C-96351
					UNLESS OTHERWISE SPECIFIED TOLERANCES SHALL BE: DECIMALS ± FRACTIONS ± ANGLES ±	CH. DATE APP. SCALE: NONE
					CUSTOMER	

S. O. NO.



BOTTOM VIEW  
(4) PLACES

DRILL AND TAP  
1/4" ZONC-2 (4) PLACES



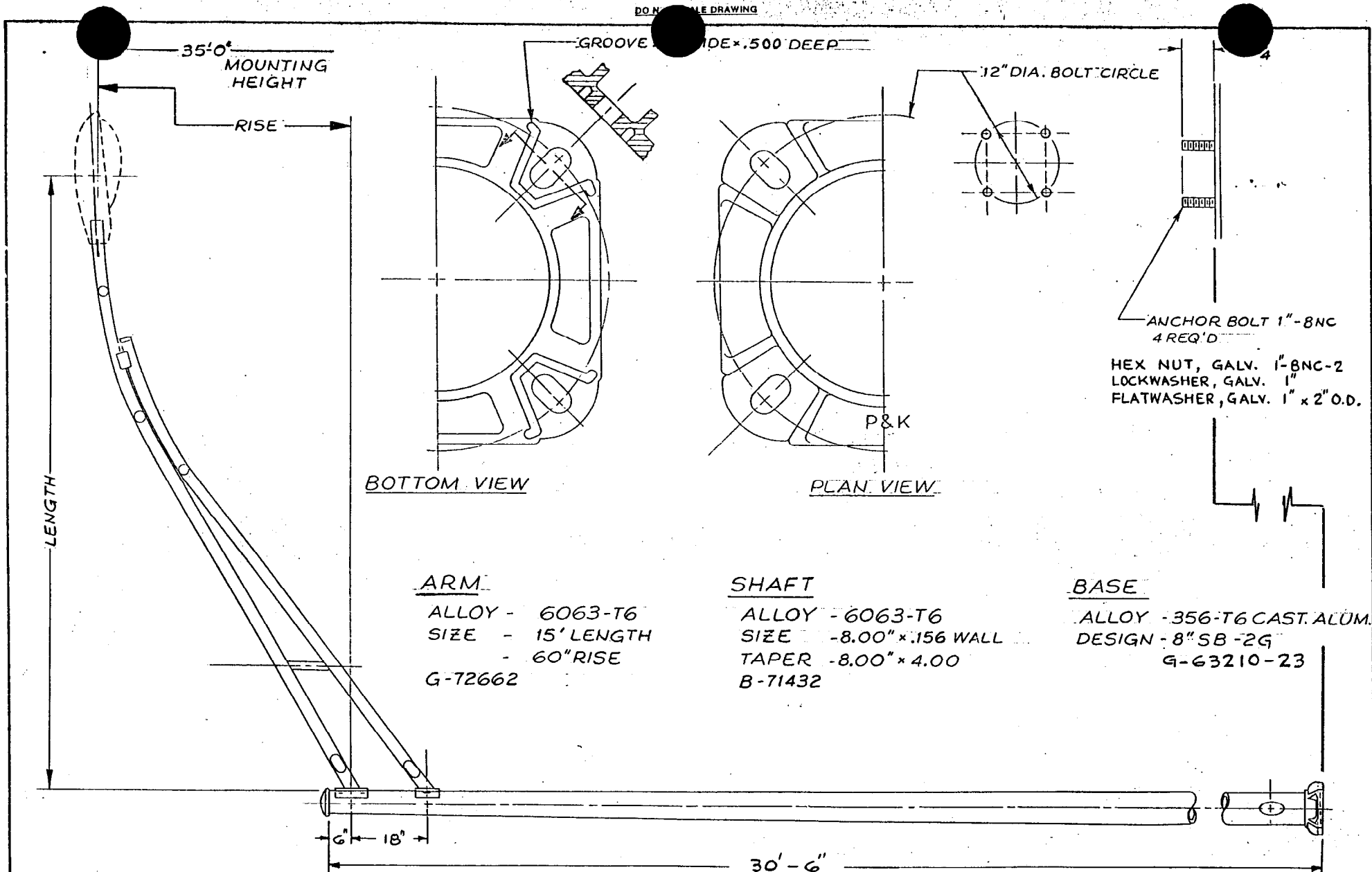
NOTE  
FOR OPTIMUM PERFORMANCE, MOUNT POLEBASE ON A FLAT AND LEVEL FOUNDATION SURFACE. IF GAPS ARE PRESENT, THOROUGHLY FILL VOIDS WITH NON-SHRINK GROUT.

ALTERATIONS		MATERIAL		TITLE	
NO.	DESCRIPTION	DATE	BY	DESCRIPTION	DATE
①	ADDED			356-T6 CAST AL-ALLOY	
②	ADDED			L.P. PERMANENT MOLD	
③	ADDED				

356-T6 CAST AL-ALLOY		P&K POLE PRODUCTS 84 Foundry St., Newark, N.J.	
L.P. PERMANENT MOLD		TITLE	
		BASE TYPE SB-26	
		7" DIA	
DESIGN ENGINEER		DATE	
APPROVED TECHNICIAN		DATE	
DRILL NO.		DATE	
APP.		DATE	
CHECKED		DATE	
		G-5726	
		-15	

G-5726-15



BOTTOM VIEW

PLAN VIEW

ARM  
 ALLOY - 6063-T6  
 SIZE - 15' LENGTH  
 - 60" RISE  
 G-72662

SHAFT  
 ALLOY - 6063-T6  
 SIZE - 8.00" x .156 WALL  
 TAPER - 8.00" x 4.00  
 B-71432

BASE  
 ALLOY - 356-T6 CAST. ALUM.  
 DESIGN - 8" SB-2G  
 G-63210-23

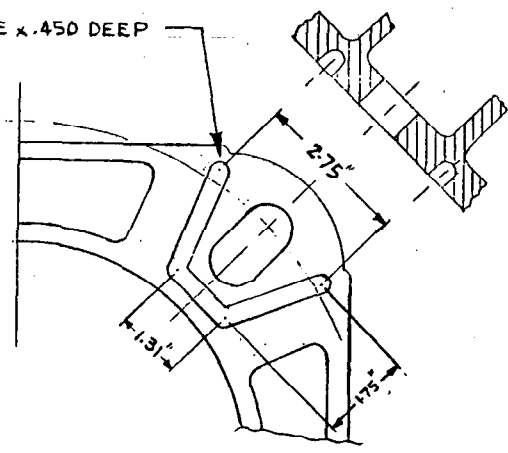
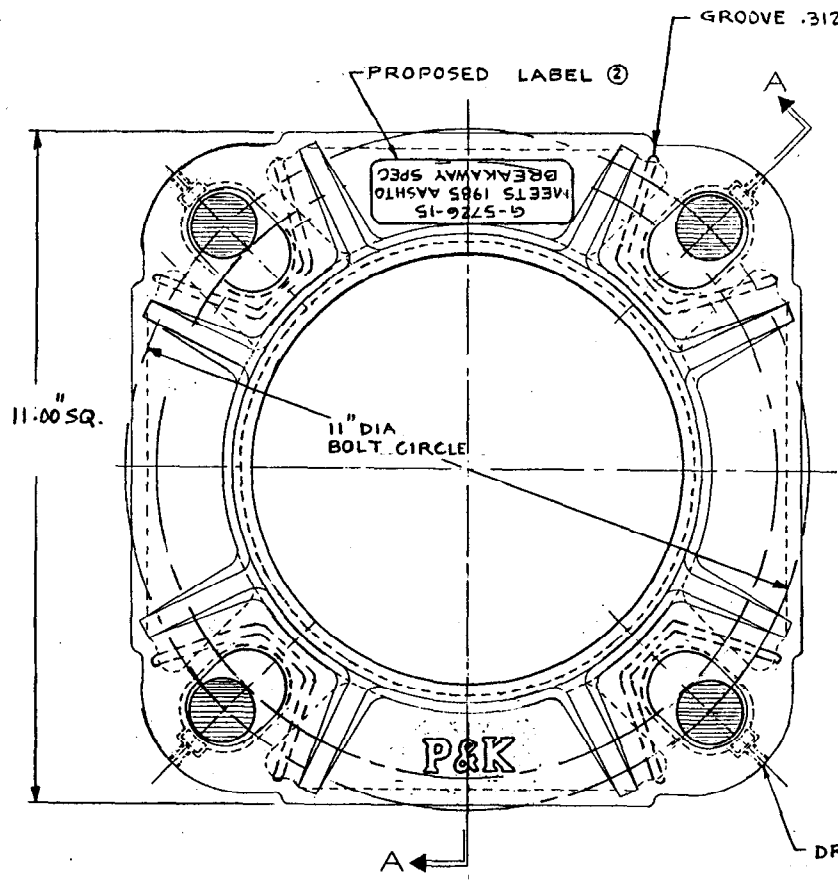
ANCHOR BOLT 1"-8NC  
 4 REQ'D  
 HEX NUT, GALV. 1"-8NC-2  
 LOCKWASHER, GALV. 1"  
 FLATWASHER, GALV. 1" x 2" O.D.

WT:

POLE	114 #
ARM	48 #
LUM.	50 #
<u>TOTAL</u>	<u>212 #</u>

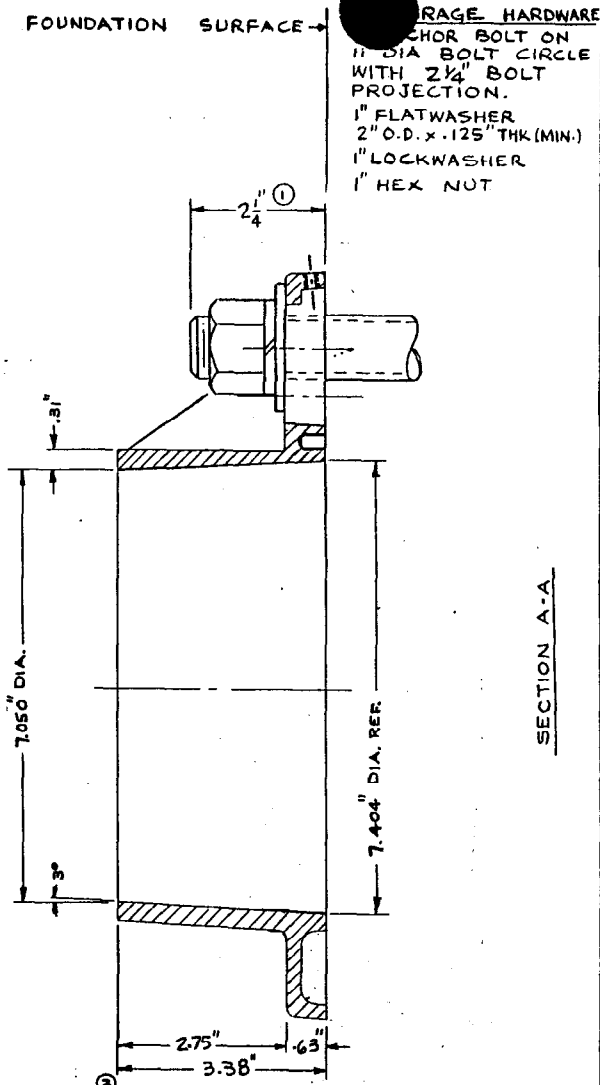
PK 3

ALTERATIONS					MATERIAL		P&K POLE PRODUCTS 84 Foundry St., Newark, N.J.	
ALT.	DESCRIPTION	DATE	BY	CH	STOCK SIZE	TITLE		
						RTA8L35AAT15802		
					FINISH OR TEMPER	DR. D.C.R. 7/25/88		
					UNLESS OTHERWISE SPECIFIED TOLERANCES SHALL BE:	DECIMALS ±	DWG. NO.	
					FRACTIONS ±	CH.	C-96353	
					ANGLES ±	APP.		
					CUSTOMER	SCALE:	NONE	



**BOTTOM VIEW**  
(4) PLACES

DRILL AND TAP  
1/4"-20NC-2 (4) PLACES



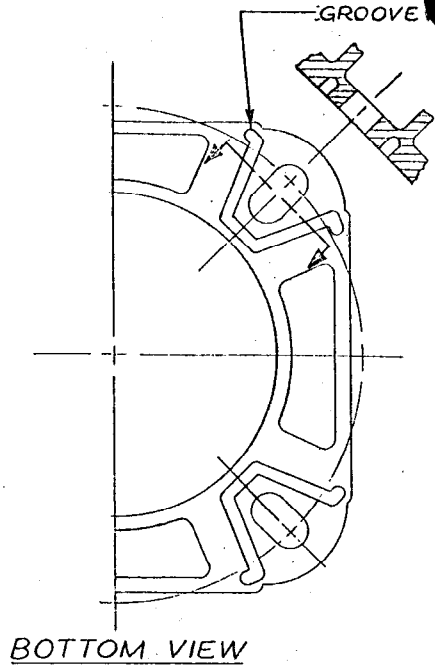
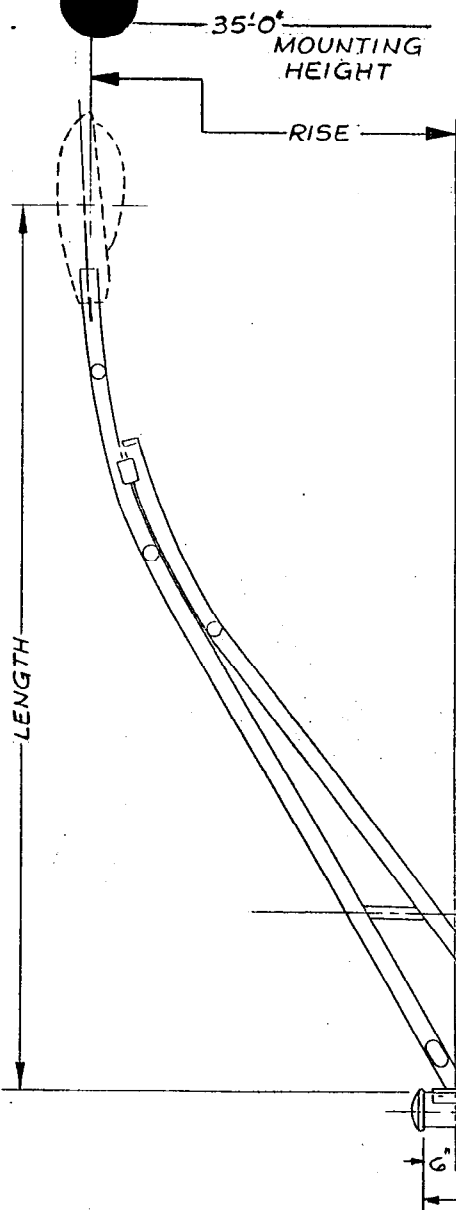
**MOUNTING HARDWARE**  
ANCHOR BOLT ON  
11" DIA BOLT CIRCLE  
WITH 2 1/4" BOLT  
PROJECTION.  
1" FLATWASHER  
2" O.D. x .125" THK (MIN.)  
1" LOCKWASHER  
1" HEX NUT

**SECTION A-A**

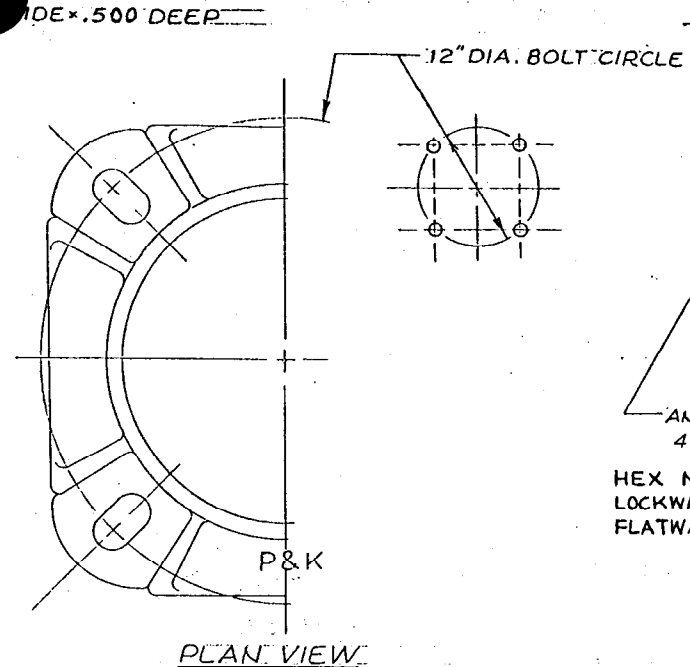
**NOTE**  
FOR OPTIMUM PERFORMANCE, MOUNT  
POLEBASE ON A FLAT AND LEVEL  
FOUNDATION SURFACE. IF GAPS ARE  
PRESENT, THOROUGHLY FILL VOIDS WITH  
NON-SHRINK GROUT.

ALTERATIONS		DATE		BY		MATERIAL		DRAWN	
1	ADDED					356-T6 CAST AL. ALLOY		P&K POLE PRODUCTS	
2	ADDED					L.P. PERMANENT MOLD		84 Foundry St, Newark, N.J.	
3	ADDED							TITLE	
								BASE TYPE SB-26	
								7" DIA	
								DR. M775	CHK. J.111
								SCALE	NONE
								G-5726	
								-15	

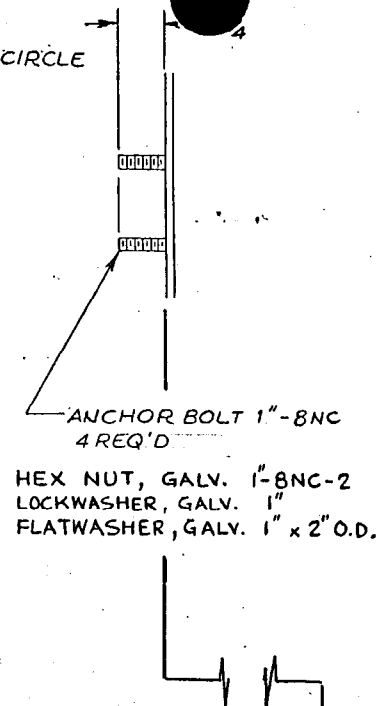
**G-5726-15**



BOTTOM VIEW



PLAN VIEW



ANCHOR BOLT 1"-8NC  
4 REQ'D  
HEX NUT, GALV. 1"-8NC-2  
LOCKWASHER, GALV. 1"  
FLATWASHER, GALV. 1" x 2" O.D.

ARM  
ALLOY - 6063-T6  
SIZE - 15' LENGTH  
- 60" RISE  
G-72662

SHAFT  
ALLOY - 6063-T6  
SIZE - 8.00" x .156 WALL  
TAPER - 8.00" x 4.00  
B-71432

BASE  
ALLOY - 356-T6 CAST. ALUM.  
DESIGN - 8" SB-2G  
G-63210-23

WT :  
POLE 114#  
ARM 48#  
LUM. 50#  
TOTAL 212#

PK 3

ALTERATIONS					MATERIAL		P&K POLE PRODUCTS 84 Foundry St., Newark, N.J.	
ALT.	DESCRIPTION	DATE	BY	CH	STOCK SIZE	TITLE	DR. D.C.R.	DWG. NO.
					FINISH OR TEMPER	RTA 8L35AAT15802	DATE	C-96353
					UNLESS OTHERWISE SPECIFIED TOLERANCES SHALL BE: DECIMALS ± FRACTIONS ± ANGLES ±	APP.	SCALE: NONE	
					CUSTOMER			

**ANCHORAGE HARDWARE**

FOUNDATION SURFACE

- 1" ANCHOR BOLT ON 12" DIA BOLT CIRCLE WITH 2 1/4" BOLT PROJECTION.
- 1" FLATWASHER 2" O.D. x .125" THK (MIN.)
- 1" LOCKWASHER
- 1" HEX NUT

GROOVE ON BOTTOM SIDE

PROPOSED LABEL ②

DRILL & TAP 1/4"-20NC-2 (4)-PLACES

G-63210-23  
MEETS 1985 AASHTO  
BREAKAWAY SPEC.

12" DIA BOLT CIRCLE

P&K

12.00 SQ

8.063" DIA.

2 1/4" ①

SECTION "A-A"

GROOVE .312" WIDE x .500" DEEP

BOTTOM VIEW (4) PLACES

2.78" .72"  
3.50"

**NOTE ③**

FOR OPTIMUM PERFORMANCE, MOUNT POLEBASE ON A FLAT AND LEVEL FOUNDATION SURFACE. IF GAPS ARE PRESENT, THOROUGHLY FILL VOIDS WITH NON-SHRINK GROUT.

ALTERATIONS		MATERIAL	STOCK SIZE	FINISH OR TOLERANCE
①	ADDED	356-T6 CAST AL. ALLOY	PERMANENT MOLD	
②	ADDED			
③	ADDED			

REV	DATE	BY	CHKD	APP'D
1	2-23-89			
DRAWN BY		CHECKED BY		DATE
G-63210		G-63210		11-1-89
SCALE		NONE		

G-63210-23