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:

<table>
<thead>
<tr>
<th>Test No.</th>
<th>PK-1</th>
<th>PK-2</th>
<th>PK-3</th>
</tr>
</thead>
<tbody>
<tr>
<td>O.D. and Base No.</td>
<td>7 inch SB-2G</td>
<td>7 inch SB-2G</td>
<td>8 inch SB-2G</td>
</tr>
<tr>
<td>Mounting Height</td>
<td>30 feet</td>
<td>30 feet</td>
<td>35 feet</td>
</tr>
<tr>
<td>Pole Wall Thickness</td>
<td>0.156 inches</td>
<td>0.188 inches</td>
<td>0.156 inches</td>
</tr>
<tr>
<td>Pole, Arm, &amp; Lum. Wt.</td>
<td>193.5 pounds</td>
<td>218.0 pounds</td>
<td>212.0 pounds</td>
</tr>
<tr>
<td>60-mph Calc. Delta V</td>
<td>5.1 f.p.s.</td>
<td>6.6 f.p.s.</td>
<td>5.8 f.p.s.</td>
</tr>
<tr>
<td>Stub Height</td>
<td>2.3 inches</td>
<td>2.3 inches</td>
<td>2.3 inches</td>
</tr>
</tbody>
</table>

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
FOUNDATION SURFACE

ANCHOR BOLT ON
11" DIA. BOLT CIRCLE
WITH 2¾" BOLT
PROJECTION.

1" FLAT WASHER
3" O.D. x .125" THK.
1" LOCK WASHER
1" HEX NUT

PROPOSED LABEL

GROOVE .312 WIDE x .450 DEEP

11" DIA.
BOLT CIRCLE

BOTTOM VIEW
(4) PLACES

DRILL AND TAP
\( \frac{8}{8} \) ZINC-C-2

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

REFERENCE:

P&K CAST ALLOY
1. PERMANENT MOLD
2. ZINC-C-2

BASE TYPE SB-26

SECTION A-A

NOTE
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
Q-63210-23

WT:
Pole  114#
Arm  48#
Lum.  50#
Total 212#

P&K POLE PRODUCTS
84 Foundry St., Newark, N.J.
For optimum performance, mount polebase on a flat and level foundation surface. If gaps are present, thoroughly fill voids with non-shrink grout.
RISE: 35'-0" MOUNTING HEIGHT

GROOVE: SIDE=.500 DEEP

12" DIA. BOLT CIRCLE

ANCHOR BOLT 1"-8NC 4 REQ'D
HEX NUT, GALV. 1"-8NC-2
LOCK WASHER, GALV. 1"-2.0 D.
FLAT WASHER, GALV. 1" x 2.0 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-11432

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

WT:
Pole 1144 lbs
Arm 48 lbs
Lum. 50 lbs
Total 212 lbs

P&K POLE PRODUCTS
84 Foundry St., Newark, N.J.

C-96353
ANCHORAGE HARDWARE

1" ANCHOR BOLT ON 1 1/4" BOLT CIRCLE
WITH 2 1/4" BOLT PROJECTION.
1" FLAT WASHER 2 0.D. X .125 THK (MIN)
1" LOCK WASHER
1" HEX NUT

FOOTING SURFACE

GROOVE ON BOTTOM SIDE

PROPOSED LABEL 2

DRILL & TAP 5/8-11 UNC-2
(4) PLACES

GROOVE .312" WIDE
X .500" DEEP

SECTION A-A

BOTTOM VIEW
(4) PLACES

12" DIA BOLT CIRCLE

GROOVE .312" WIDE
X .500" DEEP

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

P&K