Mr. Joseph J. Brindlinger
Manager, Engineering Services
Union Metal Corporation
1022 9th St. S.W.
P.O. Box 9920
Canton, OH 44711

Dear Mr. Brindlinger:

This is in response to your May 18 request for acceptance by the Federal Highway Administration of your company's A2940 cast aluminum base for use on Federal-aid highway projects. Tests were conducted to assess the compliance of the base with Section 7 of the 1975 and 1985 AASHTO specifications. You enclosed for our review two Southwest Research Institute reports (Project No. 06-2128-102), dated May 1988, containing pendulum tests on the base using two different poles.

The tests used an instrumented 1,800-pound pendulum fitted with a 10 stage crushable nose which simulates a 1979 Volkswagen Rabbit. The bolt circle diameter was 14.5 inches and the luminaire mounting height was 50 feet in both tests. The measured and extrapolated results from the tests were as follows:

<table>
<thead>
<tr>
<th>Test No.</th>
<th>Date</th>
<th>Measured change in velocity at 20 m.p.h.</th>
<th>Extrapolated change in velocity at 60 m.p.h.</th>
<th>Stub Height</th>
<th>Pole Wall Thickness</th>
<th>Total Weight of System</th>
<th>Change in Momentum</th>
</tr>
</thead>
<tbody>
<tr>
<td>UMLP 1</td>
<td>3-28-88</td>
<td>14.8 fps</td>
<td>9.7 fps</td>
<td>4.0&quot;</td>
<td>0.188&quot;</td>
<td>331 #</td>
<td>827 lb-sec</td>
</tr>
<tr>
<td>UMLP 3</td>
<td>3-28-88</td>
<td>13.8 fps</td>
<td>10.5 fps</td>
<td>4.0&quot;</td>
<td>0.250&quot;</td>
<td>405 #</td>
<td>453 lb-sec</td>
</tr>
</tbody>
</table>

The above information shows that the actual tests and calculated changes in velocity of the pole-base combinations meet the change in velocity and stub height provisions of Section 7 of the 1985 American Association of State Highway and Transportation Officials (AASHTO) "Standard Specifications for Structural Supports for Highway Signs, Luminaire and Traffic Signals." It is also evident that the test results meet the change in momentum requirements of the 1975 AASHTO specifications.

The Union Metal A2940 base is acceptable for use on Federal-aid projects, within the range of conditions tested, if proposed by a State. The acceptance is limited to breakaway characteristics of the base and does not cover its structural features. Presumably, you will supply potential users with sufficient information on structural design and installation requirements to ensure proper base performance.
We anticipate that the States will require certification from Akron Foundry Company that castings furnished have essentially the same chemistry, mechanical properties, and geometry as the castings used in the tests and that the castings will meet the FHWA change in velocity requirements.

Sincerely yours,

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

3 Enclosures
MATL: CAST ALUM. 356-T6

10" SLEEVE BASE
PATT. NO. APA-2940

CONTROL NO. 17798

SCALE 1:1

DATE 2-10-88

A2940-A1
**Shipping List (for 1 unit)**

<table>
<thead>
<tr>
<th>ITEM</th>
<th>QTY</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
<td>POLE ARM - 46S-1000 X D.004 X 46-1/2&quot;</td>
</tr>
<tr>
<td>2</td>
<td>1</td>
<td>15° ARM ASS'Y.</td>
</tr>
<tr>
<td>3</td>
<td>2</td>
<td>BACK-HALF CLAMP</td>
</tr>
<tr>
<td>4</td>
<td>8</td>
<td>3/8&quot; DIA 4-1/2&quot; HEX BOLT</td>
</tr>
<tr>
<td>5</td>
<td>8</td>
<td>1/4&quot; HEX NUTS S.S.</td>
</tr>
<tr>
<td>6</td>
<td>16</td>
<td>1/2&quot; WASHERS S.S.</td>
</tr>
<tr>
<td>7</td>
<td>4</td>
<td>1&quot;X4&quot; STAINLESS HUB</td>
</tr>
<tr>
<td>8</td>
<td>4</td>
<td>1&quot; BUSHING</td>
</tr>
<tr>
<td>9</td>
<td>4</td>
<td>1&quot; FLAT WASHER</td>
</tr>
</tbody>
</table>

*Total Weight: 324 lbs*

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**Notes:**

- 4" O.D. X .065 WALL THK.
- 15'-0" NOM. 3.3 SQ.FT. 75 LBS.
- 4" 5'-6" 1/2" - 40 ALUM PIPE
- 1/8" X 1/2" EXTRUSION
- 31/2" X 2" ALUM BASE
- SEE DWG. A2540-A1 FOR BASE DETAIL
- (4) 1" DIA. A. BOLTS ON 14 1/2" B.C.
- TORQUE NUT TO 200 FT. LBS.

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**Union Metal Corporation**

**P09-B105**

**ESRA-19**

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**Revisions:**

- **R1:** WAS 46'-6" MORGON HWT.
- **R2:** ADDED BUSHING REF.

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**Drawn by:** O.J. Davis
**Checked by:** J.B. Coad
**Date:** 1/28/86
**Scale:** 1/8" = 1'-0"
**Drawn by:** J.B. Coad
**Checked by:** J.B. Coad
**Date:** 1/28/86