



U.S. Department  
of Transportation  
**Federal Highway  
Administration**

JUL 20 1992

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

Refer to: **HNG-14**

T. M. Fawley, II, P. E.  
Hapco Division  
P. D. Box 547  
Abingdon, Virginia 24210

Dear Mr. Fawley:

Thank you for your letter of June 19 requesting the Federal Highway Administration's (FHWA) acceptance of your company's cast aluminum anchor (shoe) base for luminaire supports, your drawing number **BJ2785**. Accompanying your letter was a report of a single pendulum test conducted at your facility on an aluminum pole mounted on the anchor base. The report was attested to by Jeffery A. Bloom, an independent consultant who performed the velocity calculations. The tests were conducted to assess the breakaway performance of thin-walled aluminum luminaire supports with this base. Requirements for breakaway supports are found in the 1985 AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals. These specifications have been adopted, with minor modifications, by the FHWA.

The test results are summarized here:

Pole Type	6063-T6 Aluminum Hapco Pole, Drawing 21-855
Pole Wall Thickness, mm (in)	4.77 (0.188)
Base Type	356-T5 Alum. Shoe Base, Dwg. <b>B72785, 11" BC</b>
Mast Arm Mass, Kg (weight, lbs.)	5.5 (12)
Dummy Luminaire Mass, kg (wt., lbs.)	22.7 (50)
Test Article Mass, kg (wt., lbs.)	84.7 (186.3)
Mounting Height, m (ft)	10.7 (35)
Pendulum Mass, kg (wt., lbs.)	818 (1800)
Impact Speed, km/hr (mph)	33.6 (20.9)
Velocity Change, m/s (fps)	4.2 (14.0)
Calculated High Speed Velocity Change, m/s (fps)	2.2 (7.1)
Stub Height, mm (in)	75 (3)

The results of this test meet the change in velocity and stub height requirements adopted by AASHTO and the FHWA. Therefore, your company's breakaway shoe base described above is acceptable for use on Federal-aid highway projects, within the range of conditions tested, if proposed by a State. This acceptance extends to the following three applications detailed in your letter:

1. 7" x O.D. x .188" wall shaft, 10" - 11" bolt circle, maximum mounting height 35 feet, 4" x 6" nominal handhole.
2. 7" O.D. x .156" wall shaft, 10" - 11" bolt circle, maximum mounting height 30 feet, 4" x 6" nominal handhole.
3. 7" O.D. x .156" wall shaft, 10" - 11" bolt circle, maximum mounting height 30 feet, no handhole.

Our acceptance is limited to breakaway characteristics of the system 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 performance. We anticipate that the States will require certification from HAPCO that the hardware furnished has essentially the same chemistry, mechanical properties, and geometry as that used in the test, and that it will meet the FHWA change in velocity requirements.

The design of the HAPCO base is proprietary. For proprietary products to be used in a Federal-aid highway project: (a) they must be supplied through competitive bidding with equally suitable unpatented items; (b) the 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.

Sincerely yours,



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

Enclosure