U.S. Department of Transportation
Federal Highway Administration

1200 New Jersey Avenue, SE
Washington, D.C. 20590

October 29, 2009

In Reply Refer To: HSSD/LS-69

Mr. Greg Mercier
Director of Design Engineering
Hapco
26252 Hillman Highway
Abingdon, VA 24210

Dear Mr. Mercier,

This letter is in response to your request for Federal Highway Administration (FHWA) acceptance of a roadside safety device for use on the National Highway System (NHS).

Name of device: Hapco decorative pole B15366 (casting 79419)
Type of device: Luminaire Support
Test Level: Test Level 3 (TL-3)
Testing conducted by: Texas Transportation Institute (TTI)
Date of request: September 16, 2009
Date of follow-up: October 21, 2009

You requested that we find this device acceptable for use on the NHS under the provisions of National Cooperative Highway Research Program (NCHRP) Report 350 "Recommended Procedures for the Safety Performance Evaluation of Highway Features."

Requirements
Roadside safety devices should meet the guidelines contained in the NCHRP Report 350, "Recommended Procedures for the Safety Performance Evaluation of Highway Features". FHWA Memorandum "**ACTION:** Identifying Acceptable Highway Safety Features" of July 25, 1997, provides further guidance on crash testing requirements of luminaire supports.

Description
The Hapco decorative pole B15366 (casting 79419) luminaire support was tested at the TTI outdoor pendulum testing facility. The base of the lighting pole was cast aluminum (alloy 356-T6) with a round base tapered to a height of 29 ¼ inches. A 6-inch outside diameter tapering to a 3-inch outside diameter aluminum tube (alloy 6063-T6) with ¼ inch wall thickness and 17 foot 7 inch long was screwed and welded to the tapered shape, giving a total height of 20 feet. A cast aluminum adapter ring was placed on top of the pole to accommodate the round light. The weight of the pole with base was 173 pounds and the round light was 17 pounds, totaling a

weight of 190 pounds. The base was welded to a 10-inch diameter and 6-foot long aluminum tube with wall thickness of 0.156 inches. Drawings of the Hapco decorative pole B15366 (casting 79419) luminaire support are enclosed.

Crash Testing

Your company's decorative lighting pole was tested at TTI's outdoor pendulum testing facility, as a surrogate for full-scale crash testing. The pendulum bogie was built according to the specifications of the Federal Outdoor Impact Laboratory's (FOIL) pendulum, and the frontal crush of the aluminum honeycomb nose of the bogie simulated the crush of an actual vehicle. Tests with pendulums are acceptable for most breakaway supports, exceptions being base bending or yielding supports.

A low speed pendulum test was conducted on your company's decorative lighting supports. A summary of the test results are enclosed. The decorative lighting pole met the NCHRP Report 350 occupant risk criteria. In addition, TTI extrapolated the high-speed performance of the lighting pole installation from the low speed pendulum test. I agree that the test article appears to perform appropriately to make such high-speed extrapolations. All high speed extrapolations yield lower change in velocity values than the paired low speed pendulum test.

In the test with the Hapco decorative pole B15366 (casting 79419), the base fractured at ground level and at the connection to the tapered aluminum pole. The base fracturing at ground level satisfies the FHWA limit of maximum 3.9-inch stub height remaining after a support breaks away.

Findings

In summary, the Hapco decorative pole B15366 (casting 79419) 20 foot decorative lighting pole as described above, meets the appropriate evaluation criteria for a NCHRP 350 TL-3 device and may be used at all appropriate locations on the NHS when selected by the contracting authority. The Hapco decorative pole B15366 (casting 79419) is accepted with luminaire heights up to 20 feet, shafts up to ¼ inch wall thickness with diameters up to 6 inches, and embedment lengths not less than 6 feet.

Standard provisions

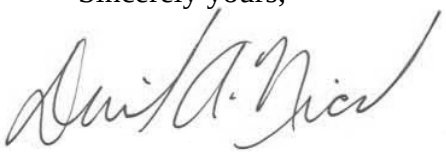
Please note the following standard provisions that apply to FHWA letters of acceptance:

- This acceptance is limited to the crashworthiness characteristics of the device and does not cover their structural features, nor conformity with the Manual on Uniform Traffic Control Devices.
- Any changes that may adversely influence the crashworthiness of the device will require a new acceptance letter.
- Should the FHWA discover that the qualification testing was flawed, that in-service performance reveals unacceptable safety problems, or that the device being marketed is significantly different from the version that was crash tested, we reserve the right to modify or revoke our acceptance.
- You will be expected to supply potential users with sufficient information on design and installation requirements to ensure proper performance.
- You will be expected to certify to potential users that the hardware furnished has essentially the same chemistry, mechanical properties, and geometry as that submitted for

acceptance, and that it will meet the crashworthiness requirements of the FHWA and the NCHRP Report 350.

- To prevent misunderstanding by others, this letter of acceptance is designated as number LS-69 and shall not be reproduced except in full. This letter and the test documentation upon which it is based are public information. All such letters and documentation may be reviewed at our office upon request.
- The HAPCO decorative luminaire supports are patented products and considered proprietary. If proprietary devices are specified by a highway agency for use on Federal-aid projects, except exempt, non-NHS projects, they: (a) must be supplied through competitive bidding with equally suitable unpatented items; (b) the highway agency must certify that they are essential for synchronization with the existing highway facilities or that no equally suitable alternative 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.
- This acceptance letter shall not be construed as authorization or consent by the FHWA to use, manufacture, or sell any patented device for which the applicant is not the patent holder. The acceptance letter is limited to the crashworthiness characteristics of the candidate device, and the FHWA is neither prepared nor required to become involved in issues concerning patent law. Patent issues, if any, are to be resolved by the applicant.

Sincerely yours,



David A. Nicol, P.E.
Director, Office of Safety Design
Office of Safety

Enclosures

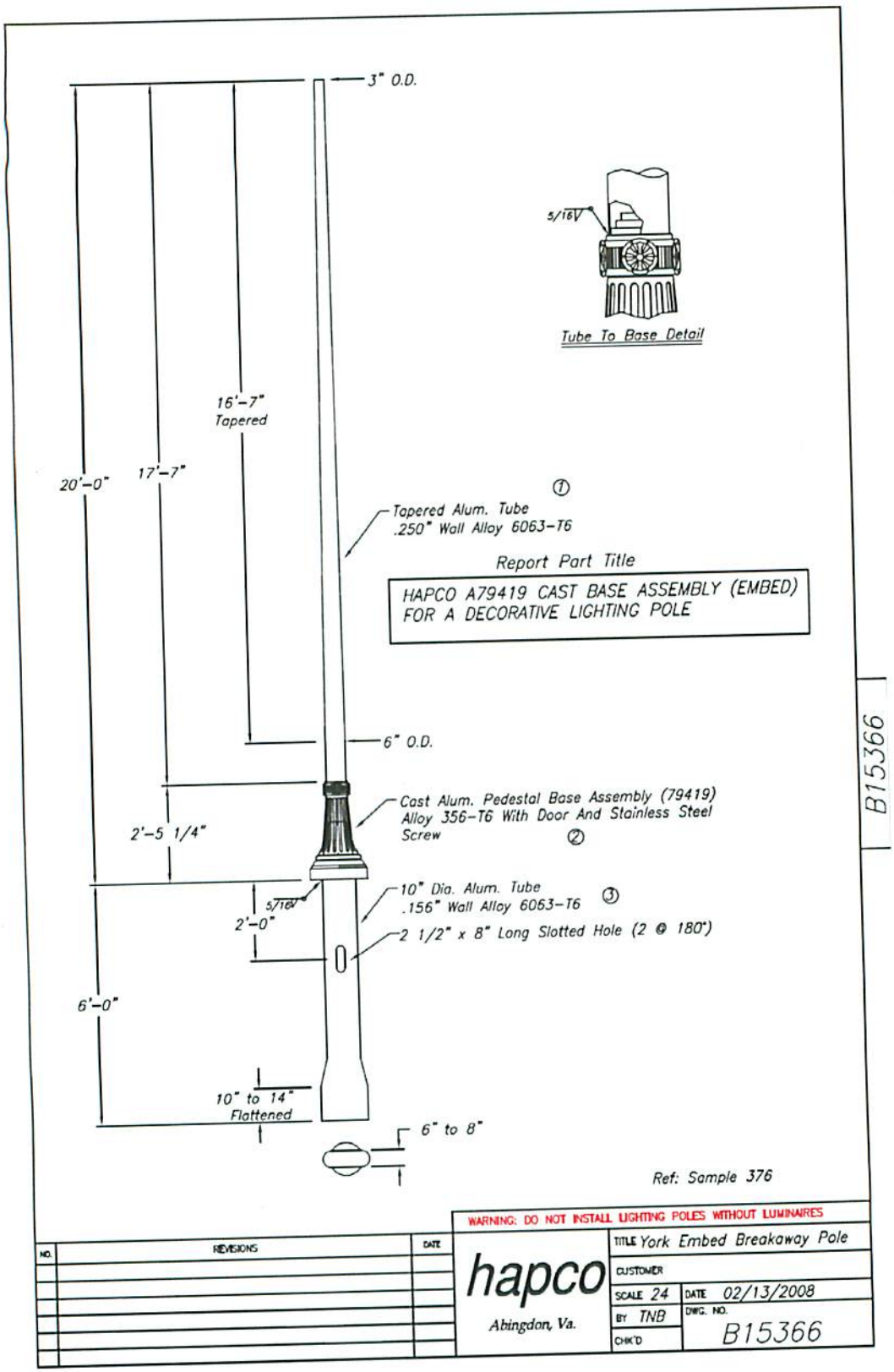

3" O.D.
5/16V
Tube To Base Detail
16'-7" Tapered
20'-0"
17'-7"
①
Tapered Alum. Tube .250" Wall Alloy 6063-T6
Report Part Title
HAPCO A79419 CAST BASE ASSEMBLY (EMBED) FOR A DECORATIVE LIGHTING POLE
6" O.D.
Cast Alum. Pedestal Base Assembly (79419) Alloy 356-T6 With Door And Stainless Steel Screw
②
2'-5 1/4"
10" Dia. Alum. Tube .156" Wall Alloy 6063-T6
③
5/16V
2'-0"
2 1/2" x 8" Long Slotted Hole (2 @ 180°)
6'-0"
10" to 14" Flattened
6" to 8"
Ref: Sample 376
B15366
WARNING: DO NOT INSTALL LIGHTING POLES WITHOUT LUMINAIRES
NO.
REVISIONS
DATE
hapco
Abingdon, Va.
TITLE York Embed Breakaway Pole
CUSTOMER
SCALE 24
DATE 02/13/2008
BY TNB
CHK'D
DWG. NO.
B15366

Table D2. Summary of results for pendulum test 400001-HAP P14.

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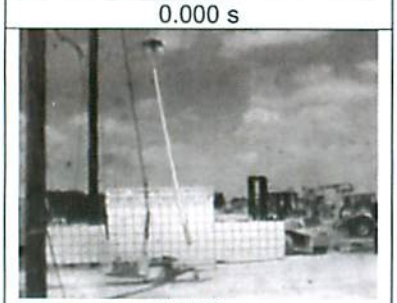

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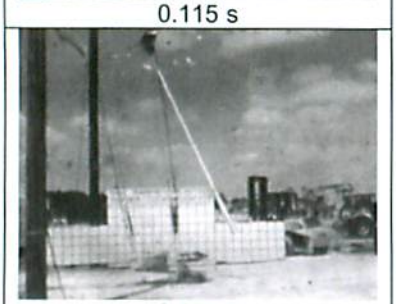

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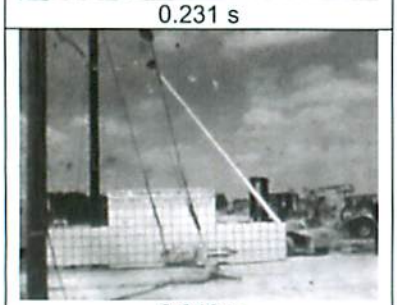

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General Information
Test Agency ..... Texas Transportation Institute
Test No. 400001-HAP P14
Date 2008-08-01

Test Article
Type ..... Breakaway Luminaire
Name ..... York (B15366) Breakaway Lighting Support
Installation Height ..... 20 ft
Material of Key Element ..... Cast aluminum

Soil Type ..... Standard Soil

Test Vehicle
Type ..... Bogie
Designation ..... Pendulum
Test Inertia Mass ..... 1848 lb

Impact Conditions
Speed ..... 21.4 mi/h
Angle ..... 90 deg

Occupant Risk Values
Impact Velocity
Longitudinal direction ..... 3.4 m/s
Ridedown Accelerations
Longitudinal direction ..... -1.1 g's

Maximum Change in Velocity ..... 10.4 ft/s (3.2 m/s)
Predicted High-Speed Change in Velocity .. 7.3 ft/s (2.2 m/s)