



U.S. Department of Transportation
Federal Highway Administration

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

APR 26 1993

Refer to: HNG-14

Ray C. Minor, P.E.
Manager of Engineering
Hapco Division
P.O. Box 547
Abingdon, Virginia 24210

Dear Mr. Minor:

Thank you for your March 17 letter to Lawrence A. Staron requesting Federal Highway Administration's (FHWA) acceptance of your company's aluminum extrusion breakaway bases. Your letter was accompanied by the test report dated March 12, 1993, film and video documentation, and confidential information regarding material specifications and additional tests performed. Additional information and drawings were submitted with your letter of April 16. The pendulum testing was conducted to assess the breakaway performance of the base with various Hapco aluminum poles. The tests were witnessed by Mr. Nicholas Artimovich of this office. Requirements for breakaway supports are found in the 1985 American Association of State Highway and Transportation Officials (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 breakaway bases, which are shown in the enclosed drawings, are essentially slip bases. The bending capacity of the bases comes from the breakaway caps that hold the flanges on the ribs attached to the poles to the mating flanges on the base lugs. Breakaway comes from an impact force breaking the bolts that hold the breakaway caps in place. A friction-reducing tape on the clamp faces of the breakaway caps aids in activation of the breakaway mechanism.

Test Number	3385	3386	3387
Support Type	8" Aluminum	10" Aluminum	10" Aluminum
Wall Thickness, mm (in)	4.78 (.188)	4.78 (.188)	6.35 (.250)
Base Designation	A73089	A73088	A73088
Bolt Circle Diam., mm (in)	280 (11)	380 (15)	380 (15)
Test Article Mass, kg (weight, lbs)	91 (200)	182 (400)	250 (550)
Mounting Height, m (ft)	9.15 (30)	11.8 (38.75)	16.8 (55)
Pendulum Mass, kg (wt, lbs)	818 (1800)	818 (1800)	818 (1800)
Impact Speed, km/hr (mph)	32.2 (20)	32.2 (20)	32.2 (20)
Velocity Change, m/s (fps)	2.5 (8.3)	2.3 (7.5)	3.3 (10.7)
Calculated 60-mph (97-km/h)			
Velocity Change, m/s (fps)	1.8 (5.8)	2.3 (7.4)	3.6 (11.7)
Stub Height, mm (in)	75 (3)	75 (3)	75 (3)

The results of the tests summarized above meet the change in velocity and stub height requirements adopted by AASHTO and FHWA. Therefore, the tested extruded aluminum breakaway bases A73089 and A73088, described above, for 203-mm (8-inch) and 254-mm (10-inch) butt diameter aluminum luminaire supports, respectively, with wall thicknesses from 4.77 mm to 6.35 mm are acceptable for use on Federal-aid highway projects, within the range of conditions tested, if proposed by a State. This acceptance also applies to intermediate base sizes, provided appropriate stiffening is included at the base ends of the pole shafts.

Our acceptance is limited to the breakaway characteristics of the bases and does not cover their structural features. Presumably, you will supply potential users with sufficient information on structural design and installation requirements to ensure proper performance. We recommend that installation instructions stress the need for a plane surface for mounting these breakaway bases. Additionally, the material specifications for the bolts that hold the breakaway caps in place must ensure that the bolt strengths do not exceed that need for proper release. We anticipate that the States will require certification from Hapco Division that the hardware furnished has essentially the same chemistry, mechanical properties, and geometry as that used in the tests and that it will meet the FHWA change in velocity requirements.

Because the Hapco breakaway extruded aluminum bases are proprietary to be used in Federal-aid highway projects: (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 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, a copy of which is enclosed.

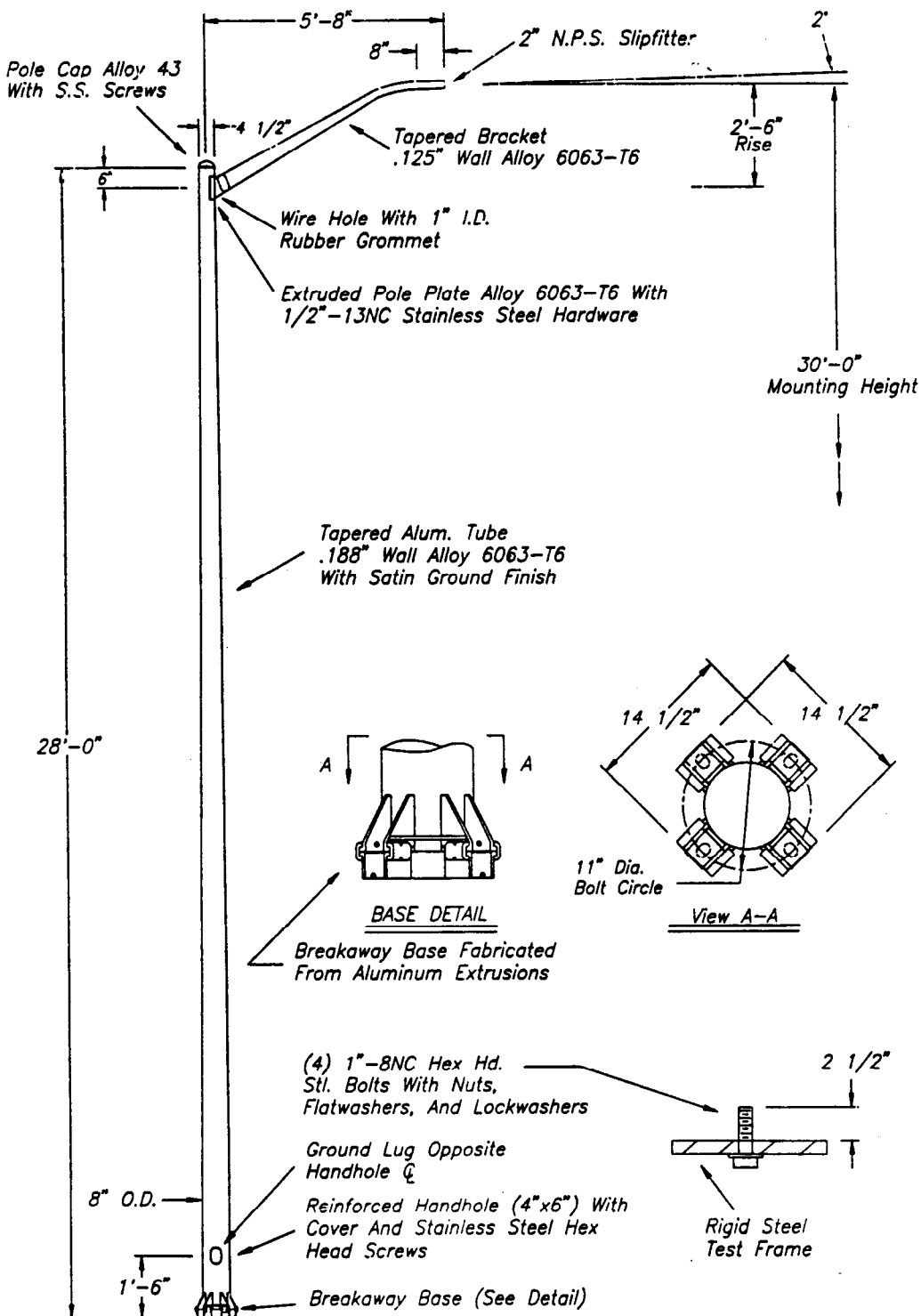
Sincerely yours,



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

5 Enclosures

Figure (3)
Hapco Drawing No. B73071,
30' Lighting Pole



B73071

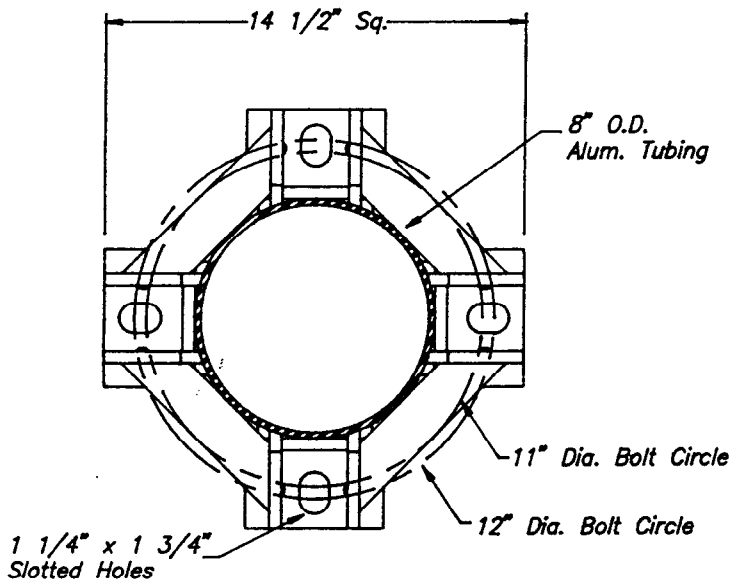
NO.	REVISIONS	DATE

WARNING: Do Not Install Lighting Poles without Luminaires

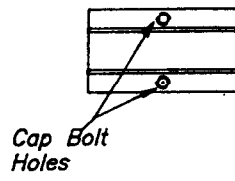
hapco

COMPANY OFFICE OF P.O. BOX 57 HANCOCK, MASSACHUSETTS, U.S.A. 01930

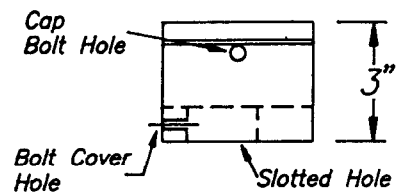
TITLE 30' LIGHTING POLE	
CUSTOMER Test No. 3385	
SCALE 32.00	DATE 03/08/93
BY PL	DWG. NO. B73071
CHK'D	



Top View

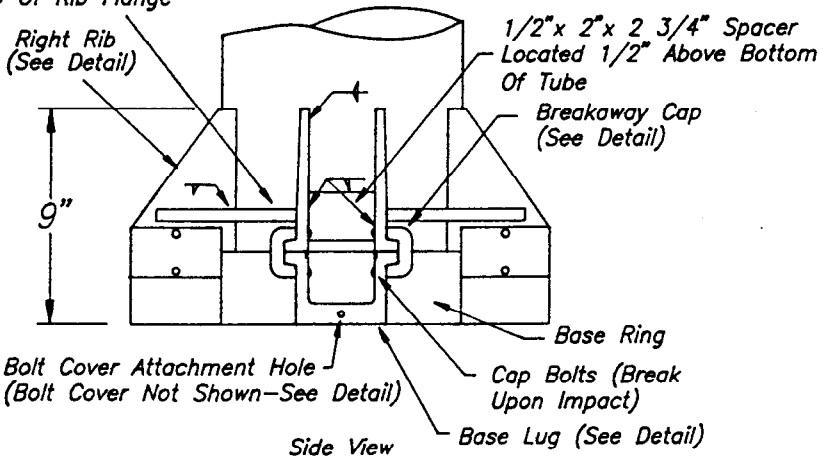


BREAKAWAY CAP

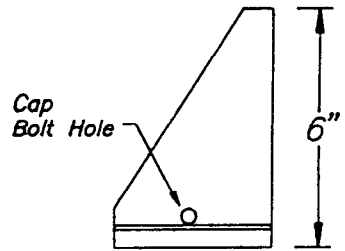


BASE LUG

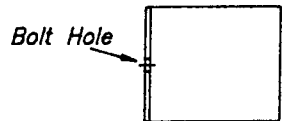
3/8" x 2" x 6 3/4" Rib
Spacer Located 3/4" Above
Top Of Rib Flange



Side View



RIGHT RIB



BOLT COVER

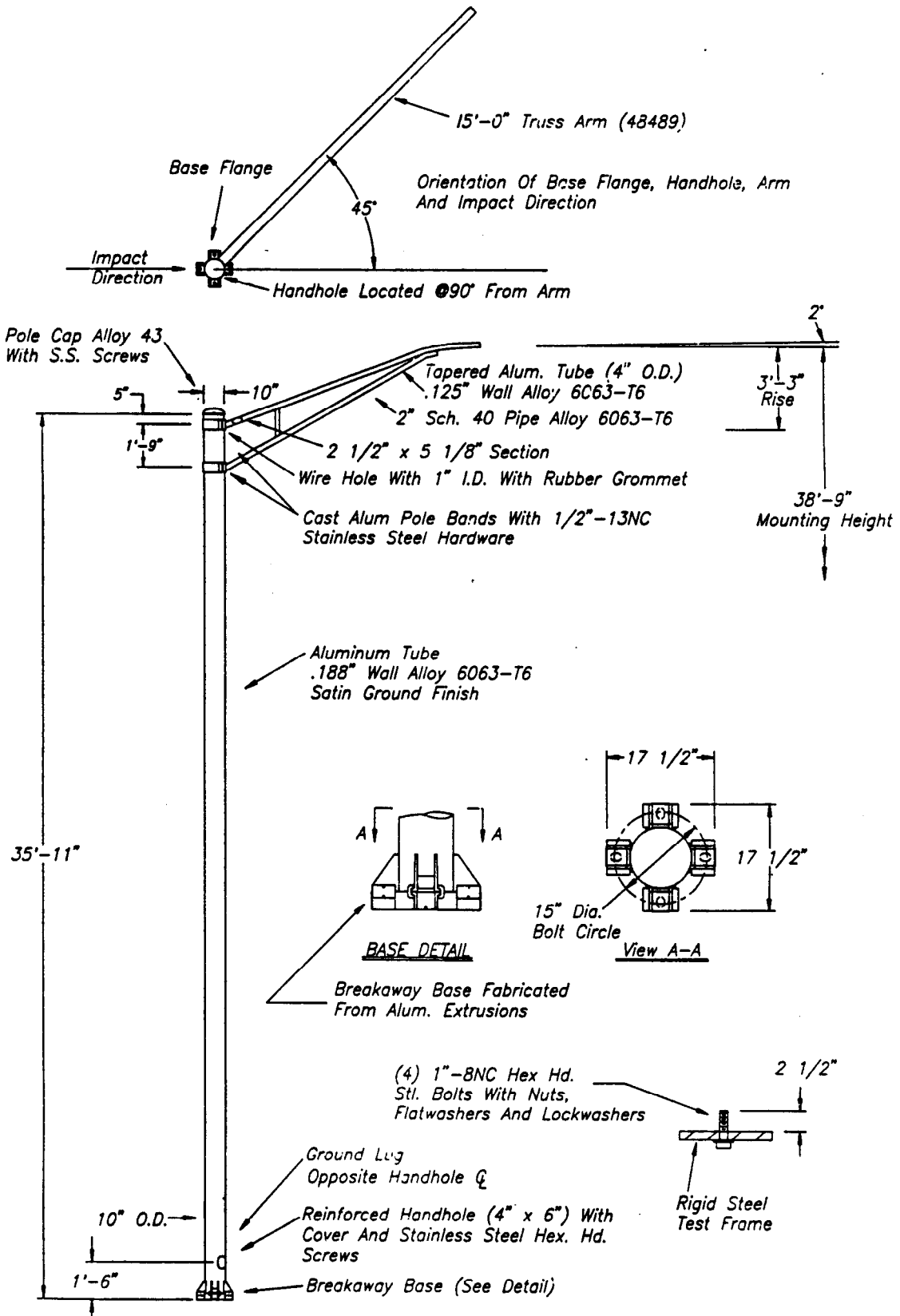
Oca Bric 9489 Form 9873

NO.	REVISIONS	DATE
1	Stiffener Details Added	4/93

COMPANY DIVISION OF ELABNEY-NATIONAL, INC. P. O. BOX 147 ARLINGTON, VA. 22216

TITLE 8" EXTRUSION BASE	
CUSTOMER	
SCALE	DATE 04/16/93
BY PL	DWG. NO. A73089
CHK'D	

Figure (15)
 Hapco Drawing No. B73075
 38'-9" Lighting Pole



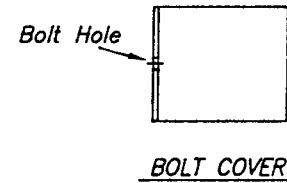
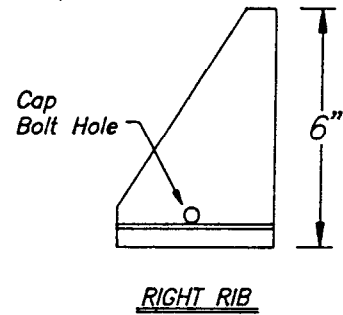
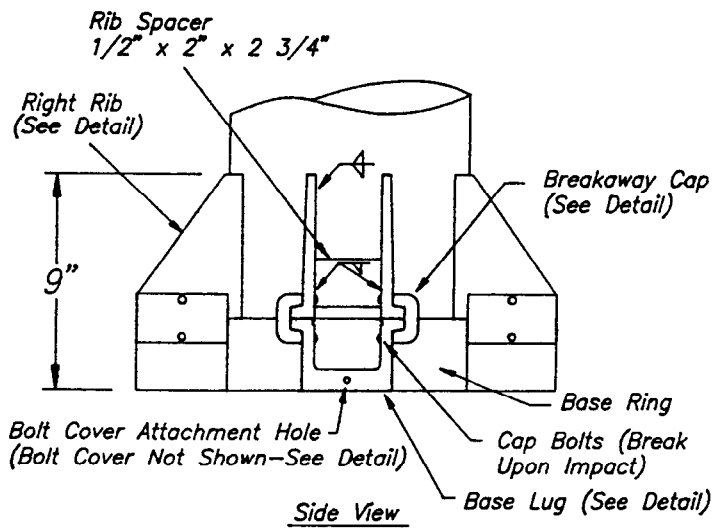
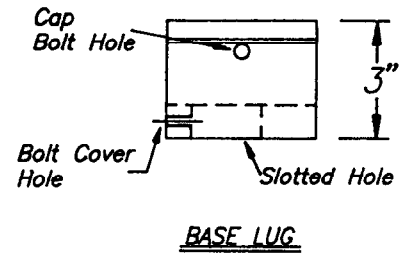
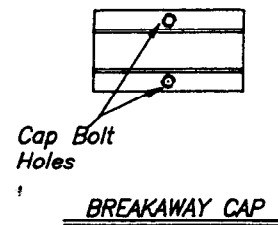
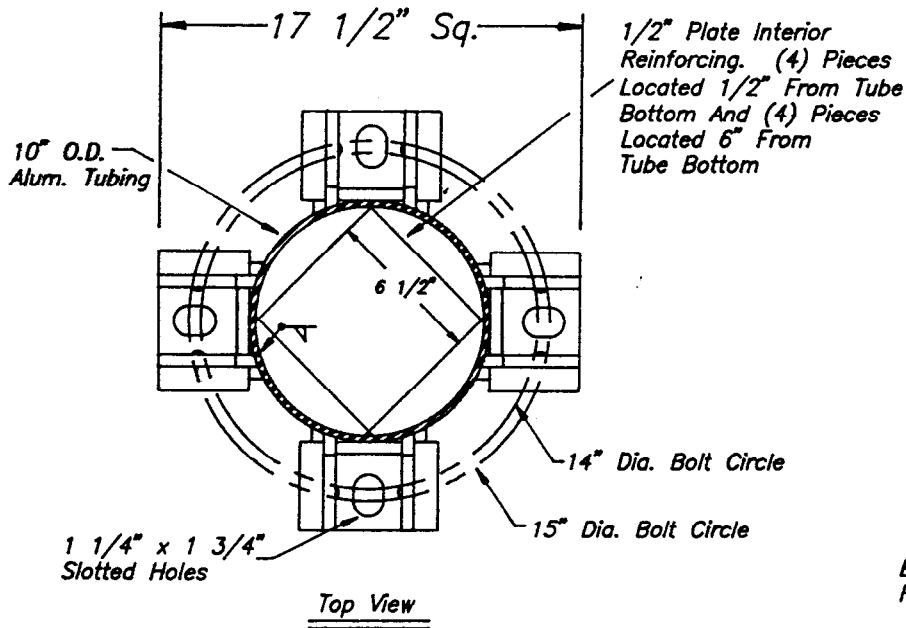
B73075

NO.	REVISIONS	DATE

WARNING: Do Not Install Lighting Poles without Luminaires

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COMPANY
 700 17th St
 JEFFERSON, VA 24645

TITLE 38'-9" LIGHTING POLE	
CUSTOMER Test No. 3386	
SCALE 48.00	DATE 03/11/93
BY PL	DWG. NO. B73075
CHK'D	



NO.	REVISIONS	DATE
1	Stiffener Details Added	4/93

hapco

COMPANY DIVISION OF KEARNEY-NATIONAL, INC. WASHINGTON, VA. 22216

TITLE 10" EXTRUSION BASE

CUSTOMER

SCALE

DATE 04/16/93

BY PL

DWG. NO.

CHK'D

A73088