

Attachment A

On-Line Guide to Luminaire Supports

Interim Report
May 24, 2010

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On-Line Guide to Luminaire Supports

Task Force 13 Meeting
Yountville, CA
May 20, 2010

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Status

- ▶ Draft version of the Guide is on-line at:
 - <http://guides.RoadSafeLLC.com/>
- ▶ The Luminaire Support Guide database currently includes data for all luminaire systems contained within the FHWA Approval Letters LS-23, LS-27, LS-29, LS-32, LS-35, LS-64, LS-65 and LS-66.
- ▶ Encompasses more than 8,000 different combinations of bases, poles and arms, where each combination represents an FHWA approved luminaire support system.

Status

- ▶ **The database provides specific information for each system including**
 - ▶ Manufacturer,
 - ▶ FHWA Approval Letter,
 - ▶ Material type,
 - ▶ Test specification (e.g., Report 350),
 - ▶ Mounting height,
 - ▶ Base type,
 - ▶ Pole type,
 - ▶ Pole length,
 - ▶ Pole base dia.,
 - ▶ Pole top dia.,
 - ▶ Pole wall thickness
 - ▶ Type of arm,
 - ▶ Arm length,
 - ▶ Number of arms
 - ▶ Maximum fixture weight,
 - ▶ Maximum wind speed,
 - ▶ ~~Wind speed/EPA~~

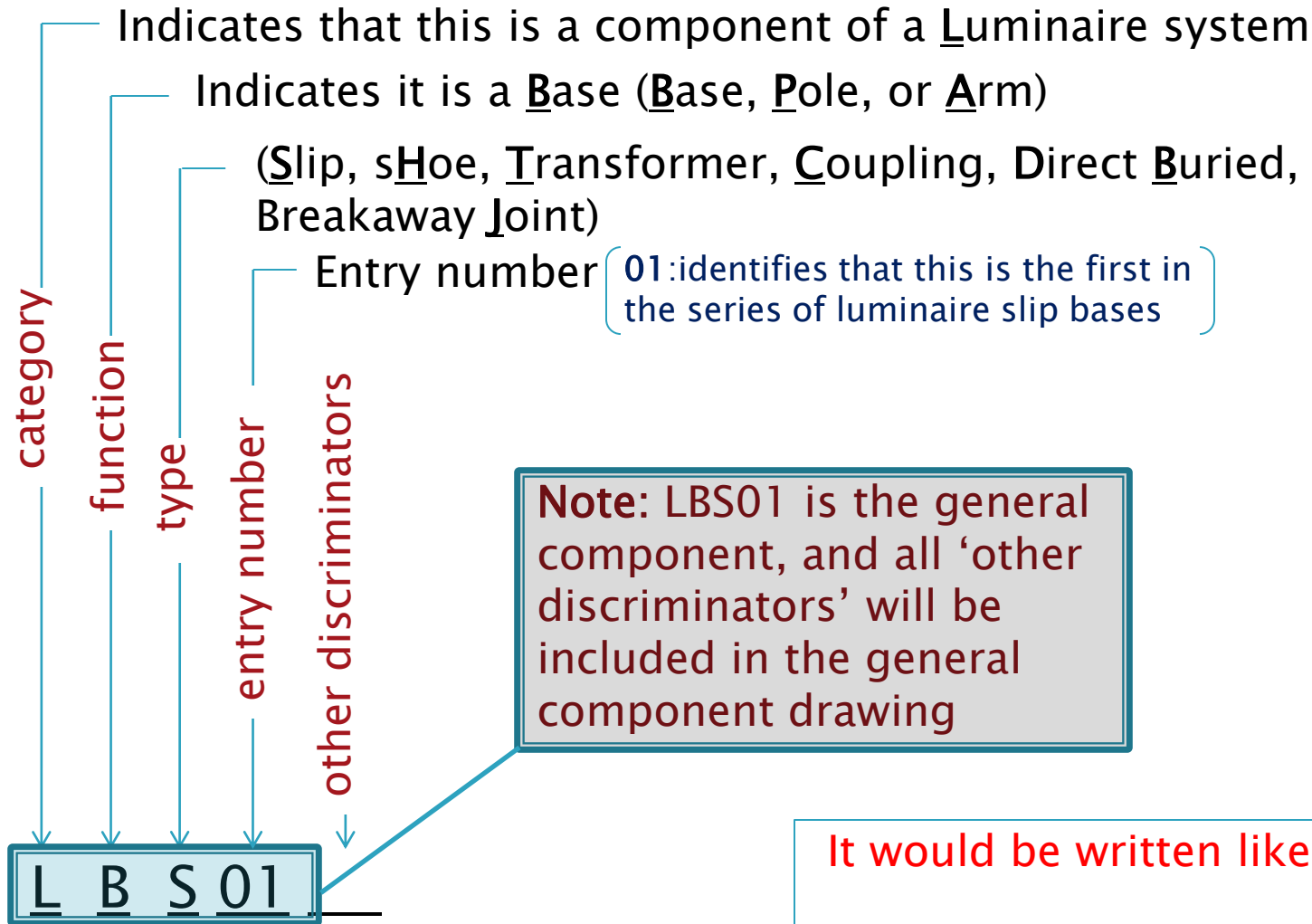
Component Nomenclature

- ▶ Components are named according to category, function and type.
- ▶ The nomenclature consists of:
 - Three upper-case letters (**LAM01b**),
 - Two digits (**LAM01b**)
 - and optional alphanumeric characters to further describe the component, (**LAM01b**)
- ▶ This nomenclature is consistent with the style used in the other guides
 - Easily integrates into the existing on-line component guide

Proposed nomenclature for naming luminaire components

Category	Function	Type
<u>L</u> uminaire (L)	<u>P</u> ole (P)	<u>A</u> luminum (A) <u>S</u> teel (S) <u>P</u> lastic (P) <u>C</u> omposite(C) <u>O</u> ther (O)
	<u>B</u> ase (B)	breakaway <u>J</u> oint (J) <u>s</u> Hoe base (H) <u>S</u> lip base (S) <u>T</u> ransformer (T) direct <u>B</u> uried (B) <u>C</u> oupling (C)
	<u>A</u> rm (A)	<u>D</u> avitt (D) <u>M</u> ast (M) <u>T</u> russ (T) <u>C</u> ross (C) <u>t</u> e <u>N</u> on (N)

Base Nomenclature

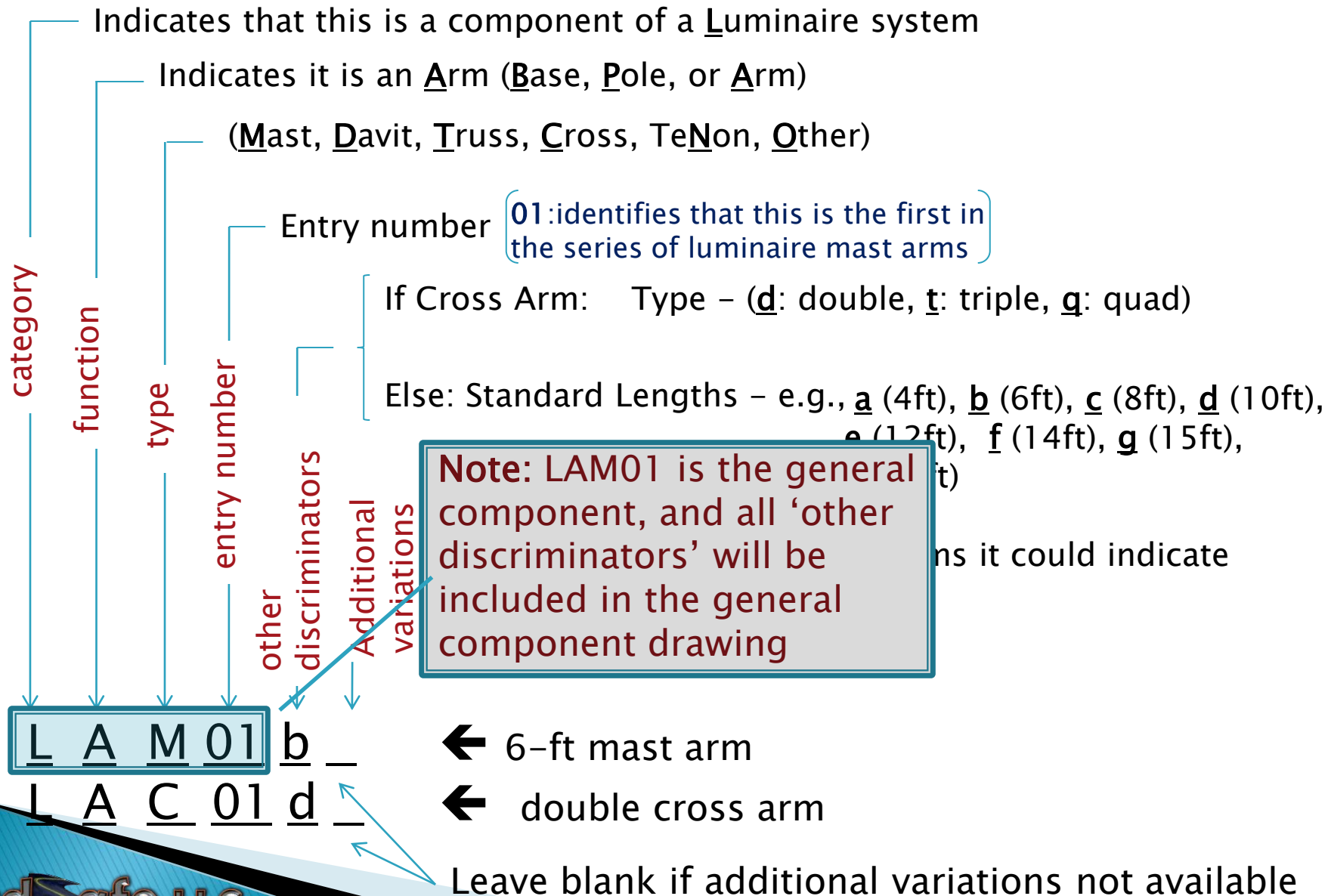


Note: LBS01 is the general component, and all 'other discriminators' will be included in the general component drawing

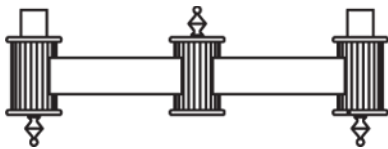
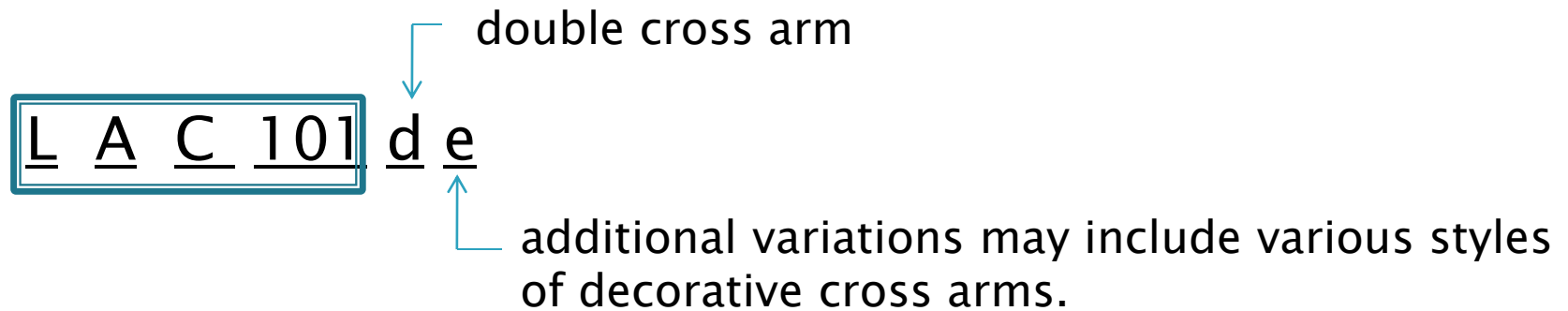
It would be written like this:

LBS01

Arm Nomenclature



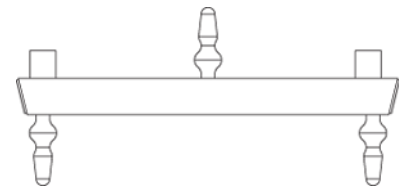
Additional Nomenclature for Arm Components



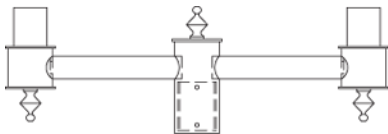
(a)



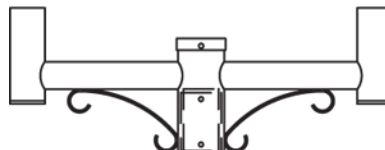
(b)



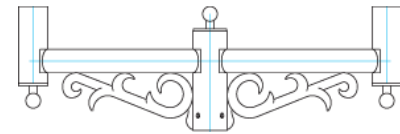
(c)



(d)

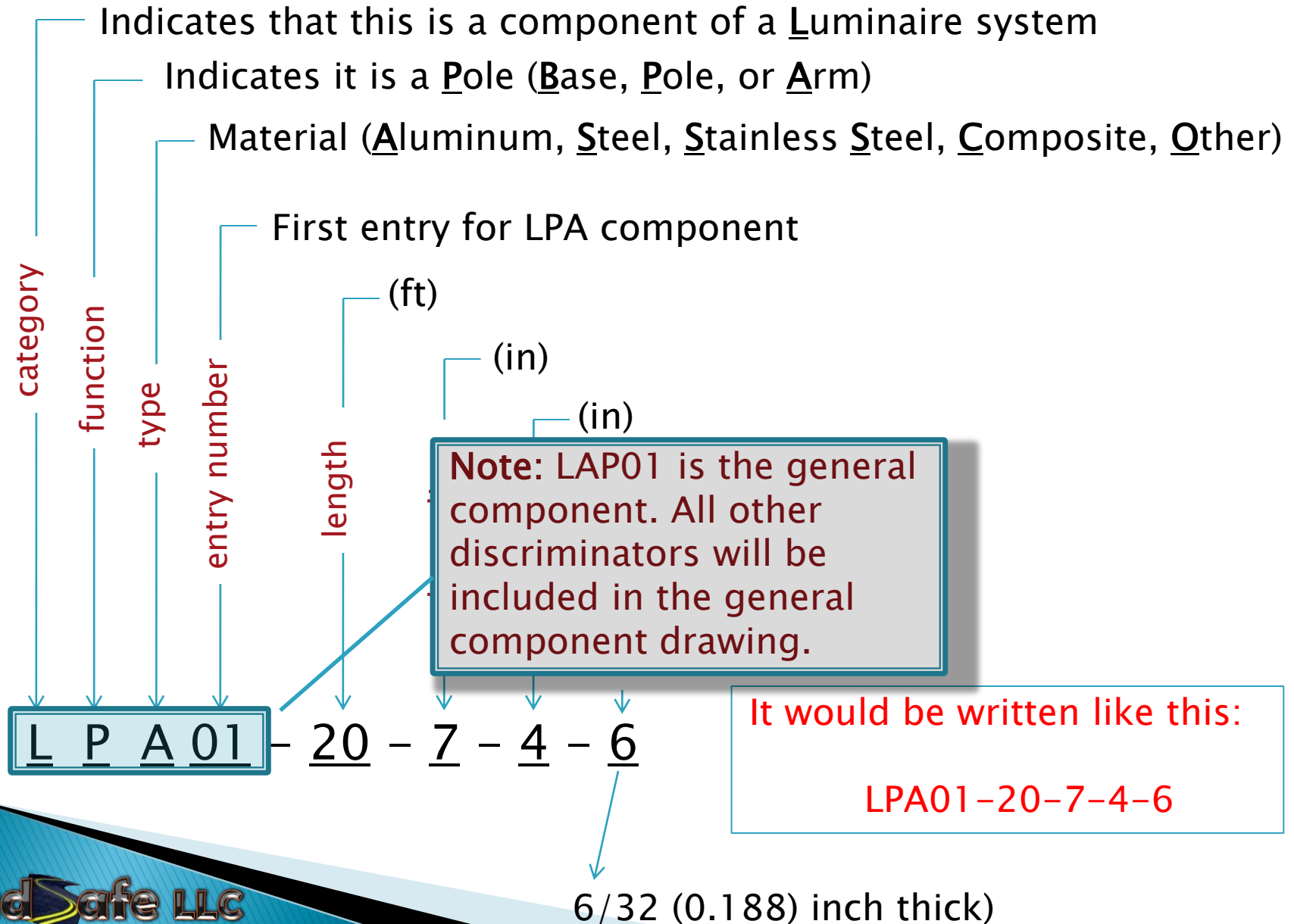


(e)



(f)

Pole Nomenclature





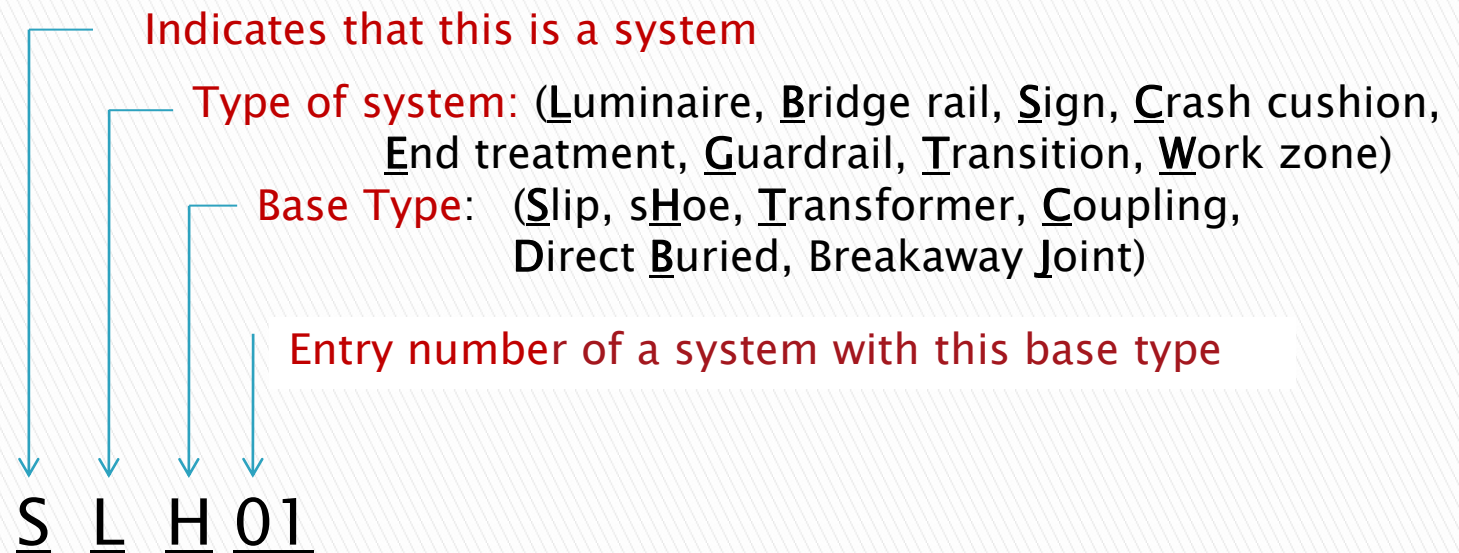
Pole Component Nomenclature

- ▶ Note that the currently proposed designator for *diameter only uses the integer part of the dimension*.
- ▶ For example, LPA01-20-7-4-5 is:
 - an aluminum pole that is
 - 20 ft length,
 - with a base diameter of 7 inches,
 - a top diameter of 4.5 inches, and
 - a wall thickness of 5/32 inch (0.156 inch).
- ▶ This conforms to the way the manufacturers have tended to specify their pole products.

Web-Page Format

- ▶ There are two ways to search for luminaire systems in the On-Line Guide:
 - Navigation List *Browse Option*:
 - Lists all General Luminaire Systems
 - Selecting a system from this page will direct the user to a page with information about the *General System*
 - The General System page also includes a search option to find various configurations of the *general system* that meet desired criteria.
 - Navigation List *Search Option*:
 - Allows the user to search through the entire database for all luminaire systems that meet desired criteria
 - Selecting a system from this page will direct the user to a page with information about the *Specific System*

General System Nomenclature



Browse for Luminaires

Online Guide To Luminaires

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Browse Generalized Luminaires

Click on a column heading to arrange the list in order of that luminaire characteristic.

Name	BaseComponent	Manufacturer	Material	FHWAAcceptanceLetter
SLC01 413 configuration(s).	LBC01 Coupling (C)	HAPCO	Aluminum	LS-23pdf
SLH01 95 configuration(s).	LBH01 Shoebase (H)	HAPCO	Aluminum	LS-27pdf
SLH02 61 configuration(s).	LBH02 Shoebase (H)	HAPCO	Aluminum	LS-32pdf
SLH03 75 configuration(s).	LBH03 Shoebase (H)	HAPCO	Aluminum	LS-32pdf
SLJ01 78 configuration(s).	LBJ01 Breakaway Joint (J)	HAPCO	Aluminum	LS-65pdf
SLS01 325 configuration(s).	LBS01 Slip Base (S)	HAPCO	Aluminum	LS-29pdf
SLT01 1343 configuration(s).	LBT01 Transformer (T)	HAPCO	Aluminum	LS-66pdf
SLT03 738 configuration(s).	LBT03 Transformer (T)	HAPCO	Aluminum	LS-64pdf
SLT04 2046 configuration(s).	LBT04 Transformer (T)	HAPCO	Aluminum	LS-64pdf

Browse for Luminaires

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Name	BaseComponent	Manufacturer	Material	FHWAAcceptanceLetter
SLC01 413 configuration(s).	LBC01 Coupling (C)	HAPCO	Aluminum	LS-23pdf
SLH01 95 configuration(s).	LBH01 Shoebase (H)	HAPCO	Aluminum	LS-27pdf
SLH02 61 configuration(s).	LBH02 Shoebase (H)	HAPCO	Aluminum	LS-32pdf
SLH03 75 configuration(s).	LBH03 Shoebase (H)	HAPCO	Aluminum	LS-32pdf
SLJ01 78 configuration(s).	LBJ01 Breakaway Joint (J)	HAPCO	Aluminum	LS-65pdf
SLS01 325 configuration(s).	LBS01 Slip Base (S)	HAPCO	Aluminum	LS-29pdf
SLT01 1343 configuration(s).	LBT01 Transformer (T)	HAPCO	Aluminum	LS-66pdf
SLT03 738 configuration(s).	LBT03 Transformer (T)	HAPCO	Aluminum	LS-64pdf
SLT04 2046 configuration(s).	LBT04 Transformer (T)	HAPCO	Aluminum	LS-64pdf

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SLH01: General System

This page provides only general information about this system. To view the specific configurations of this system, use the search criteria at the bottom of this page. To search through specific configurations of all systems, please use the [Search Luminaires](#) page.

Specific Configurations:	95 specific systems
Acceptance:	Submitted
FHWA Acceptance Letters:	LS-27.pdf
Test Specification:	Report 350
Manufacturer:	HAPCO
Base Type:	Shoebase (H)
Base Component:	LBH01
Arm Type:	Tenon (N) Davitt (D) Cross (C) Mast (M) Truss (T)
Num. of Arms:	0, 1, 2, 3, 4 (arms)
Mounting Height:	20, 25, 30 (feet)
Fixture Weight:	25 to 100 (lbs)
Maximum Wind Speed:	70 to 110 (mph)
Contact:	Mr. Joe Bowman (Click for details)



Drawings	Other Documents	Images
<ul style="list-style-type: none">• SLH01-pg1of2.pdf• SLH01-pg2of2.pdf	<ul style="list-style-type: none">• FHWA-Acceptance-Letter_LS-27.pdf• Test Report 72785 July 1 1992.pdf• 3-Second Gust Wind Map.pdf	<ul style="list-style-type: none">• Thumbnail Gallery

Search Specific Configurations of SLH01

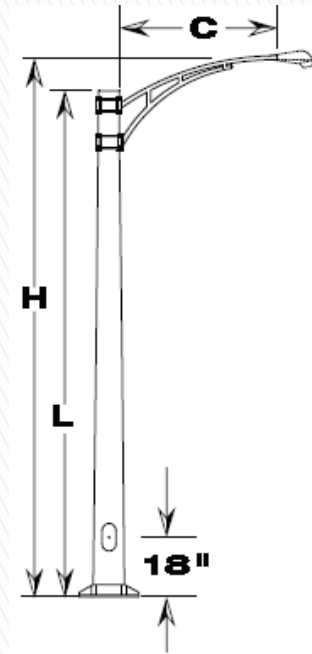
Pole/Mounting Height	<input type="text" value="Minimum"/>	to	<input type="text" value="Maximum"/>	ft
Fixture Weight	<input type="text" value="Minimum"/>	to	<input type="text" value="Maximum"/>	lbs
Number of Arms	<input type="text" value="Any"/>			
Arm Type	<input type="text" value="Any Arm Type"/>			
Wind Speed Above	<input type="text" value="0"/>	mph		
<input type="button" value="Search"/>				

Search Option from the General System Pages

Search Specific Configurations of SLH01

Pole/Mounting Height	<input type="text" value="20"/>	to	<input type="text" value="20"/>	ft
Fixture Weight	<input type="text" value="Minimum"/>	to	<input type="text" value="100"/>	lbs
Number of Arms	<input type="text" value="2"/>			
Arm Type	<input type="text" value="Mast (M)"/>			
Wind Speed Above	<input type="text" value="80"/>			mph
<input type="button" value="Search"/>				

Specific System Nomenclature



Indicates that this is a system

Type of system (Luminaire, Guardrail, Bridge rail, etc.)

Mounting height [H] (ft)

Base Type: (Slip, sHoe, Transformer, Coupling, Direct Buried, Breakaway Joint)

Material: (Aluminum, Steel, Composite, Other)

Bottom pole dia. (in)

Top pole dia. (in)

Pole thickness (/32 in)

Arm type (Davit, Mast, Truss, Cross, TeNon)

Entry number

Arm discriminators (e.g., length, cross arm type)

#of Arms

S L 30 / H01 / A01-7-4-5 / M01b1

Mounting
Height

Base

Pole (shaft)

Arm

It would be written like this:

SL30/H01/A01-7-4-5/M01b1

Search Example from the Navigation List

Online Guide To Luminaires

Find systems that exactly match the search criteria used in the previous example

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Search Luminaires

Acceptance

Any Type

Test Specification

Any Type

Manufacturer

Any Manufacturer

Material

Any Material

Base Type

Any Base Type

Pole/Mounting Height

Minimum

to

Maximum

ft

Fixture Weight

Minimum

to

Maximum

lbs

Number of Arms

Any

Arm Type

Any ArmType

Wind Speed Above

0

mph

Search

Search Example from the Navigation List

Online Guide To Luminaires

Find systems that exactly match the search criteria used in the previous example

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Search Luminaires

Acceptance

Submitted

Test Specification

Report 350

Manufacturer

HAPCO

Material

Aluminum

Base Type

Shoebase (H)

Pole/Mounting Height

20

to

20

ft

Fixture Weight

Minimum

to

100

lbs

Number of Arms

2

Arm Type

Mast (M)

Wind Speed Above

80

mph

Search

Search from the Navigation List

- ▶ The Guide will return a list of all the specific luminaire configurations that meet those criteria.

Subset of
systems
identified in
previous
example using
the General
Page search

Name/Designator	Pole Component	Arm Component	Base Component	Acceptance Letter	Manufacturer
SL20/H01/A01-7-4-5/M01b2 HAPCO Aluminum Shoe Base with 20 ft Mtg. Ht. and 2 Mast Arms	LPA01-x-7-4-5	LAM01b	LBH01	LS-27.pdf	HAPCO
SL20/H01/A01-7-4-5/M01c2 HAPCO Aluminum Shoe Base with 20 ft Mtg. Ht. and 2 Mast Arms	LPA01-x-7-4-5	LAM01c	LBH01	LS-27.pdf	HAPCO
SL20/H01/A01-7-4-6/M01b2 HAPCO Aluminum Shoe Base with 20 ft Mtg. Ht. and 2 Mast Arms	LPA01-x-7-4-6	LAM01b	LBH01	LS-27.pdf	HAPCO
SL20/H01/A01-7-4-6/M01c2 HAPCO Aluminum Shoe Base with 20 ft Mtg. Ht. and 2 Mast Arms	LPA01-x-7-4-6	LAM01c	LBH01	LS-27.pdf	HAPCO
SL20/H03/A12-6-4-5/M01a2 HAPCO Aluminum Shoe Base with 20 ft Mtg. Ht. and 2 Mast Arms	LPA12-x-6-4-5	LAM01a	LBH03	LS-32.pdf	HAPCO
SL20/H03/A12-6-4-5/M01b2 HAPCO Aluminum Shoe Base with 20 ft Mtg. Ht. and 2 Mast Arms	LPA12-x-6-4-5	LAM01b	LBH03	LS-32.pdf	HAPCO
SL20/H03/A12-6-4-5/M01c2 HAPCO Aluminum Shoe Base with 20 ft Mtg. Ht. and 2 Mast Arms	LPA12-x-6-4-5	LAM01c	LBH03	LS-32.pdf	HAPCO
SL20/H03/A12-6-4-6/M01a2 HAPCO Aluminum Shoe Base with 20 ft Mtg. Ht. and 2 Mast Arms	LPA12-x-6-4-6	LAM01a	LBH03	LS-32.pdf	HAPCO
SL20/H03/A12-6-4-6/M01b2 HAPCO Aluminum Shoe Base with 20 ft Mtg. Ht. and 2 Mast Arms	LPA12-x-6-4-6	LAM01b	LBH03	LS-32.pdf	HAPCO
SL20/H03/A12-6-4-6/M01c2 HAPCO Aluminum Shoe Base with 20 ft Mtg. Ht. and 2 Mast Arms	LPA12-x-6-4-6	LAM01c	LBH03	LS-32.pdf	HAPCO

Specific System Pages:

- ▶ Selecting a system from the search results page will direct the user to a page that provides a detailed description of the system
- ▶ This page will also echo the search criteria.

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SL20/H01/A01-7-4-5/M01c2 (SLH01)

HAPCO Aluminum Shoe Base with 20 ft Mtg. Ht. and 2 Mast Arms

		Search criteria:
Acceptance:	Submitted	Submitted
Test Specification:	Report 350	Report 350
Manufacturer:	HAPCO	HAPCO
Base Type:	Shoebase (H)	Shoebase (H)
Arm Type:	Mast (M)	Mast (M)
Arm Length:	8' 0" (feet)	
Num. of Arms:	2 (arms)	2
Mounting Height:	20 (feet)	20 < x < 20
Pole Base Diameter:	7.00 (inches)	
Pole Top Diameter:	4.50 (inches)	
Pole Length:	N/A	
Wall Thickness of Pole:	0.156 (inches)	
Max. Fixture Weight:	37 (lbs)	
Maximum Wind Speed:	110 (mph)	80
Contact:	Mr. Joe Bowman	
Last Updated:	April 24, 2010	
FHWA Acceptance Letters:	Letter LS-27	

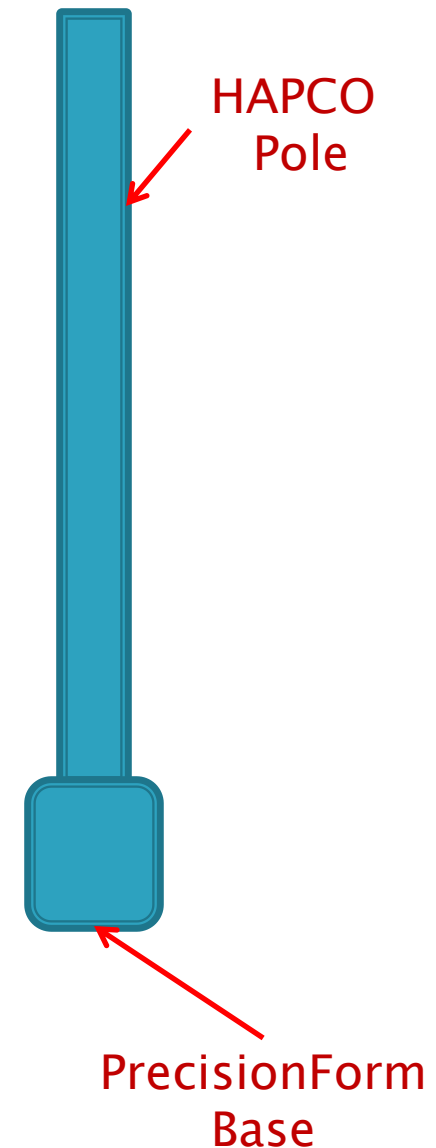
Arm Component:	LAM01c
Pole Component:	LPA01-x-7-4-5
Base Component:	LBH01
General System:	SLH01

No photograph available.

Drawings	Other Documents	Images
<ul style="list-style-type: none"> SLH01.pdf 	<ul style="list-style-type: none"> LS-27.pdf Wind Map.pdf 	<ul style="list-style-type: none"> Thumbnail Gallery

General Comments

- ▶ For cases where a system includes components from multiple manufacturers,
 - such as luminaire system SLC01 which uses HAPCO pole and arms with a PrecisionForm four-bolt coupling base,
- ▶ The General and Specific System pages will list the manufacturer that markets the complete system – in this case, HAPCO.
- ▶ The Component page will include all pertinent information about the component, including manufacture of that particular component.



General Comments

- ▶ One particular challenge in the development of the Guide has been the conversion of the existing catalogs of luminaire systems into a format that is more consistent with the FHWA acceptance letter process.
- ▶ For example, FHWA letter LS-27 for the HAPCO four-bolt shoe base luminaire encompasses subsets of several different HAPCO luminaire systems.
- ▶ It would be a very difficult task for the research team, without the manufacturer's help, to 'sift' through the many possible configurations and identify those that correspond to each specific approval letter.

FHWA Letter Approval Wording: LS-27 [1992]

▶ Aluminum Shoe base

- Three tests, two different poles
 - Test 1 35 ft x 7 in O.D. x 0.188 in thick
 - Test 2 30 ft x 7 in O.D. x 0.156 in thick
 - Test 3 30 ft x 7 in O.D. x 0.156 in thick
- ▶ Test info included pole type, pole thickness, base type, arm weight, system weight, mounting height, bolt circle, pole diameter
- ▶ The letter states that the breakaway 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.

FHWA Letter Approval Wording: LS-67(1) [2008]

- ▶ The Dynamic Lighting pole base 26706B (surface mount and embedded ground stub FDBE36) is accepted with luminaire:
 - The Dynamic Lighting pole base 26706A is accepted with
 - Pole mounting heights up to 13 feet 10 inches (4.22 m),
 - Shaft wall thickness up to 0.188 inch (4.78 mm), and
 - Shaft diameters up to 4 inches (101.6 mm).
 - The ground stub FDBE36 must have a 0.188 inch (4.78 mm) wall thickness and embedment length of at least 36 inches (0.91 m) in NCHRP standard soil.

Data from Manufactures

- ▶ We are requesting that manufactures provide the research team with a list of luminaire systems that correspond to the FHWA acceptance letter with specific information that accurately defines each system.

Per Manufacturers Catalog																	
Base Component Name	Catalog Number	Letter No.	Material	Base Type	Crash Test Level	Test Specs	Mounting Height (ft)	Shaft Length (ft)	Maximum Fixture Weight (lb)	Arm Type	Arm Length (ft)	Num. of Arms	Butt Diameter (in)	Top Diameter (in)	Wall Thickness (in)	Max Wind Speed (mph)	EPA
4 Bolt Base (51 Series)	<u>RTA 20 C 7 B 4</u>	LS-27	Aluminum	Shoe	3	Report 350	20	20	100	-	-	-	7	4.5	0.156	110	7.2
4 Bolt Base (51 Series)	<u>RTA 20 C 7 B 4 M 2 6</u>	LS-27	Aluminum	Shoe	3	Report 350	20	17	69	Mast	6	2	7	4.5	0.156	110	1.4
4 Bolt Base (51 Series)	<u>RTA 20 C 7 B 4 M 1 8</u>	LS-27	Aluminum	Shoe	3	Report 350	20	16	37	Mast	8	1	7	4.5	0.156	110	1
4 Bolt Base (51 Series)	<u>RTA 20 C 7 B 4 D 1 4</u>	LS-27	Aluminum	Shoe	3	Report 350	20	15	75	Davit	4	1	7	4.5	0.156	110	1.9
4 Bolt Base (51 Series)	<u>RTA 20 C 7 B 4 D 1 6</u>	LS-27	Aluminum	Shoe	3	Report 350	20	14	75	Davit	6	1	7	4.5	0.156	110	1.4
4 Bolt Base (51 Series)	<u>RTA 20 C 7 B 4 D 1 8</u>	LS-27	Aluminum	Shoe	3	Report 350	20	13	75	Davit	8	1	7	4.5	0.156	110	1.1

Wind-Speed and EPA

- ▶ In general, most luminaire manufacturers have adopted, or are moving to adopt, the current AASHTO specifications for wind speed design based on 3-second gust wind speed.
 - *Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals, 5th Edition*, American Association of State and Highway Transportation Officials, 2001– 2009
- ▶ Some manufacturers, however, are still using the old AASHTO procedures to compute maximum wind speed based on fastest mile wind, which may lead to confusion for buyers comparing luminaire products from different manufacturers.
 - *Standard Specifications for Structural Supports for Highway Signs, Luminaires & Traffic Signals*, American Association of State and Highway Transportation Officials, 1994
- ▶ For consistency within the TF13 On-Line Guide, all wind speed data and EPA calculations should conform to the latest AASHTO specifications.

Wind-Speed and EPA

- ▶ The EPA ratings for a HAPCO luminaire system (HAPCO catalog number RTA20B6B4) based on the fastest-mile wind speed and three-second gust, respectively,
 - which clearly illustrates the difference in EPA calculations between the two methods.

EPA calculations for HAPCO pole RTA20B6B4 using fastest-mile wind speed

Fastest-Mile Wind Speed	70	80	90	100	110	120	130	140	150
Maximum EPA	9.8	6.7	4.9	3.8	3.0				

EPA calculations for HAPCO pole RTA20B6B4 using 3-second gust wind speed

Max 3-second Wind Gust	70	80	90	100	110	120	130	140	150
Maximum EPA			8.1	6.0	4.7	3.8	3	2.5	2

Data from Manufactures

- ▶ The Mock-up Guide does not currently include EPA data for any wind speeds other than the max wind speed.
- ▶ We can include EPA vs. Wind Speed if the subcommittee wants that information included.

Per Manufacturers Catalog																									
Base Component Name	Catalog Number	Letter No.	Material	Base Type	Crash Test Level	Test Specs	Mounting Height (ft)	Shaft Length (ft)	Maximum Fixture Weight (lb)	Arm Type	Arm Length (ft)	Num. of Arms	Butt Diameter (in)	Top Diameter (in)	Wall Thickness (in)	Wind Speed (mph)	EPA	Wind Speed (mph)	EPA	Wind Speed (mph)	EPA	Wind Speed (mph)	EPA	Wind Speed (mph)	EPA
4 Bolt Base (51 Series)	RTA 20 C 7 B 4	LS-27	Aluminum	Shoe	3	Report 350	20	20	100	-	-	-	7	4.5	0.156	110	7.2	100	8.9	90	11.2	80	14.6	70	20
4 Bolt Base (51 Series)	RTA 20 C 7 B 4 M 2 6	LS-27	Aluminum	Shoe	3	Report 350	20	17	69	Mast	6	2	7	4.5	0.156	110	1.4	100	2.2	90	3.3	80	4.8	70	7.2
4 Bolt Base (51 Series)	RTA 20 C 7 B 4 M 1 8	LS-27	Aluminum	Shoe	3	Report 350	20	16	37	Mast	8	2	7	4.5	0.156	110	1	100	1.7	90	2.7	80	3.5	70	6.5
4 Bolt Base (51 Series)	RTA 20 C 7 B 4 D 1 4	LS-27	Aluminum	Shoe	3	Report 350	20	15	75	Davit	4	2	7	4.5	0.156	110	1.9	100	2.6	90	3.4	80	5.5	70	7.6
4 Bolt Base (51 Series)	RTA 20 C 7 B 4 D 1 6	LS-27	Aluminum	Shoe	3	Report 350	20	14	75	Davit	6	2	7	4.5	0.156	110	1.4	100	1.9	90	2.7	80	4.7	70	6.6
4 Bolt Base (51 Series)	RTA 20 C 7 B 4 D 1 8	LS-27	Aluminum	Shoe	3	Report 350	20	13	75	Davit	8	2	7	4.5	0.156	110	1.1	100	1.5	90	2.2	80	4.1	70	5.9

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Wind Speed (mph)	EPA	Wind Speed (mph)	EPA	Wind Speed (mph)	EPA	Wind Speed (mph)	EPA	Wind Speed (mph)	EPA
110	7.2	100	8.9	90	11.2	80	14.6	70	20
110	1.4	100	2.2	90	3.3	80	4.8	70	7.2
110	1	100	1.7	90	2.7	80	3.5	70	6.5
110	1.9	100	2.6	90	3.4	80	5.5	70	7.6
110	1.4	100	1.9	90	2.7	80	4.7	70	6.6
110	1.1	100	1.5	90	2.2	80	4.1	70	5.9

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Per Manufacturers Catalog

Base Component Name	Catalog Number	Letter No.	Material	Base Type	Crash Test Level	Test Specs	Mounting Height (ft)	Shaft Length (ft)	Maximum Fixture Weight (lb)	Arm Type	Arm Length (ft)	Num. of Arms	Butt Diameter (in)	Top Diameter (in)	Wall Thickness (in)	Wind Speed (mph)	EPA	Wind Speed (mph)	EPA	Wind Speed (mph)	EPA	Wind Speed (mph)	EPA	Wind Speed (mph)	EPA
4 Bolt Base (51 Series)	RTA 20 C 7 B 4	LS-27	Aluminum	Shoe	3	Report 350	20	20	100	-	-	-	7	4.5	0.156	110	7.2	100	8.9	90	11.2	80	14.6	70	20
4 Bolt Base (51 Series)	RTA 20 C 7 B 4 M 2 6	LS-27	Aluminum	Shoe	3	Report 350	20	17	69	Mast	6	2	7	4.5	0.156	110	1.4	100	2.2	90	3.3	80	4.8	70	7.2
4 Bolt Base (51 Series)	RTA 20 C 7 B 4 M 1 8	LS-27	Aluminum	Shoe	3	Report 350	20	16	37	Mast	8	2	7	4.5	0.156	110	1	100	1.7	90	2.7	80	3.5	70	6.5
4 Bolt Base (51 Series)	RTA 20 C 7 B 4 D 1 4	LS-27	Aluminum	Shoe	3	Report 350	20	15	75	Davit	4	2	7	4.5	0.156	110	1.9	100	2.6	90	3.4	80	5.5	70	7.6
4 Bolt Base (51 Series)	RTA 20 C 7 B 4 D 1 6	LS-27	Aluminum	Shoe	3	Report 350	20	14	75	Davit	6	2	7	4.5	0.156	110	1.4	100	1.9	90	2.7	80	4.7	70	6.6
4 Bolt Base (51 Series)	RTA 20 C 7 B 4 D 1 8	LS-27	Aluminum	Shoe	3	Report 350	20	13	75	Davit	8	2	7	4.5	0.156	110	1.1	100	1.5	90	2.2	80	4.1	70	5.9

Online Guide To Luminaires

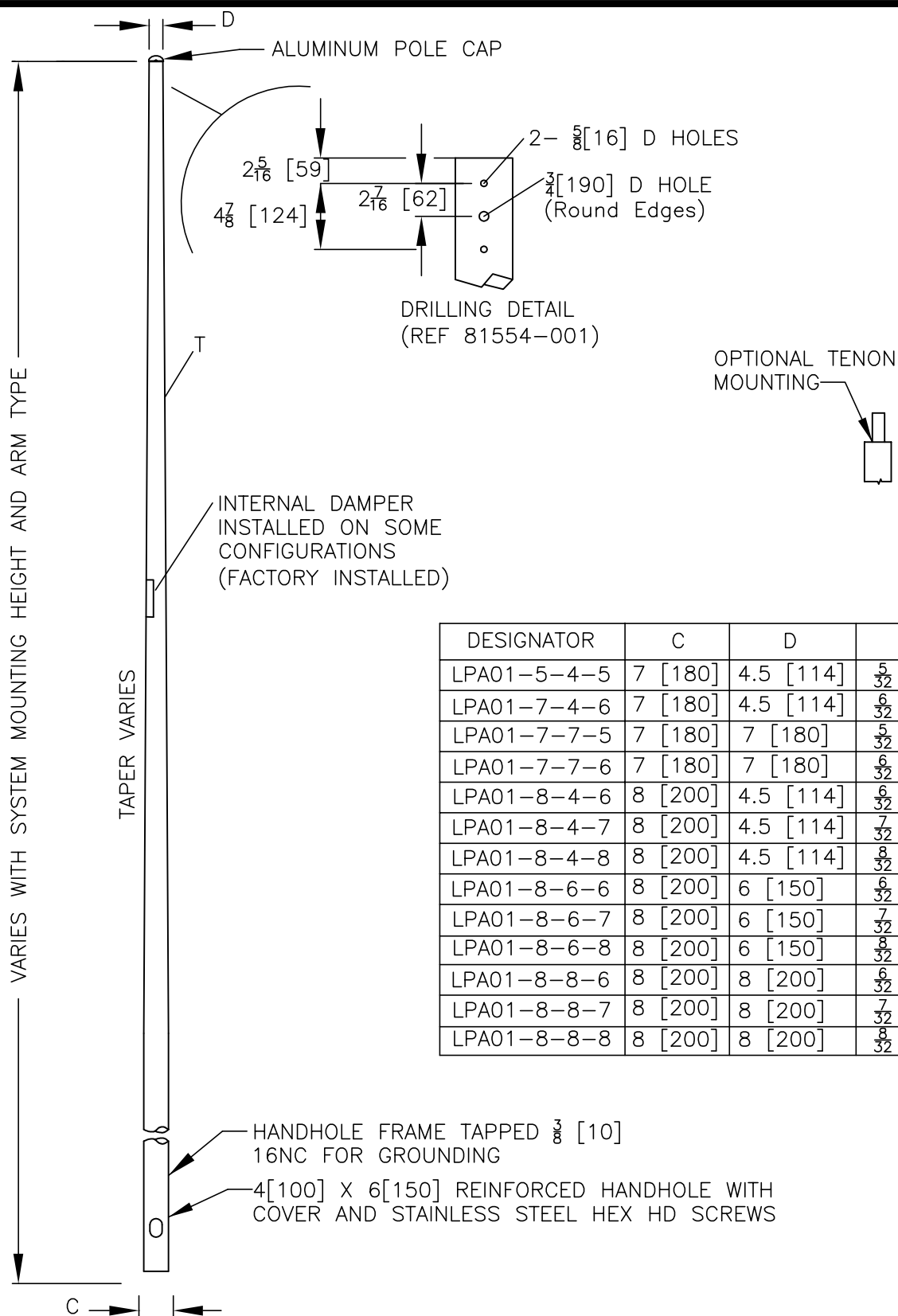
4 Bolt Base (51 Series)	RTA 20C7B4M26	LS-27	Aluminum	Shoe	3	Report 350	20	17	69	Mast	6	2	7	4.5	0.156	110	1.4	100	2.2	90	3.3	80	4.8	70	7.2
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Components

Minimum EPA	4
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Component and System Drawings

- ▶ The manufacturers will also be asked to provide basic drawings of the 'general systems' and for each primary component of the system (e.g., base, pole, and arm).
- ▶ The drawings should be in TF13 format. A template of the TF13 format can be found at <http://aashtotf13.tamu.edu/Guide/standards.html>.
- ▶ For proprietary systems, the drawings will be generic in nature but provide sufficient information to describe the component to a potential buyer.



DESIGNATOR	C	D	T
LPA01-5-4-5	7 [180]	4.5 [114]	$\frac{5}{32}$ [4.0]
LPA01-7-4-6	7 [180]	4.5 [114]	$\frac{6}{32}$ [4.8]
LPA01-7-7-5	7 [180]	7 [180]	$\frac{5}{32}$ [4.0]
LPA01-7-7-6	7 [180]	7 [180]	$\frac{6}{32}$ [4.8]
LPA01-8-4-6	8 [200]	4.5 [114]	$\frac{6}{32}$ [4.8]
LPA01-8-4-7	8 [200]	4.5 [114]	$\frac{7}{32}$ [5.6]
LPA01-8-4-8	8 [200]	4.5 [114]	$\frac{8}{32}$ [6.4]
LPA01-8-6-6	8 [200]	6 [150]	$\frac{6}{32}$ [4.8]
LPA01-8-6-7	8 [200]	6 [150]	$\frac{7}{32}$ [5.6]
LPA01-8-6-8	8 [200]	6 [150]	$\frac{8}{32}$ [6.4]
LPA01-8-8-6	8 [200]	8 [200]	$\frac{6}{32}$ [4.8]
LPA01-8-8-7	8 [200]	8 [200]	$\frac{7}{32}$ [5.6]
LPA01-8-8-8	8 [200]	8 [200]	$\frac{8}{32}$ [6.4]

HAPCO ALUMINUM POLE FOR LUMINAIRE

hapco

Abingdon, Va.

LPA01

SHEET NO.

1 OF 2

DATE:

2010

SPECIFICATIONS

The pole (shaft) shall be constructed of extruded tube of 6063 aluminum alloy per ASTM B221 and shall be full-length heat treated after welding on the base flange to T-6 temper. Pole (shaft) shall be free of longitudinal welds. Pole (shaft) cap, when required, shall be of cast aluminum of 443 or 356F aluminum alloy and attached utilizing stainless steel hardware.

Dimensional tolerances not shown or implied are intended to be those consistent with the proper functioning of the part, including its appearance and accepted manufacturing practices.

INTENDED USE

Pole is designed for use with breakaway shoe base component LBH01 in Luminaire Support System SLH01.

HAPCO ALUMINUM POLE FOR LUMINAIRE

LPA01

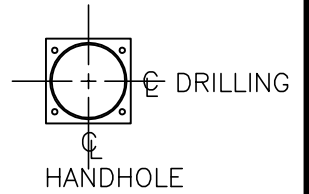
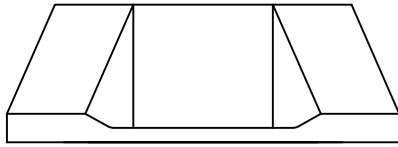
SHEET NO.

DATE

2 of 2

2010

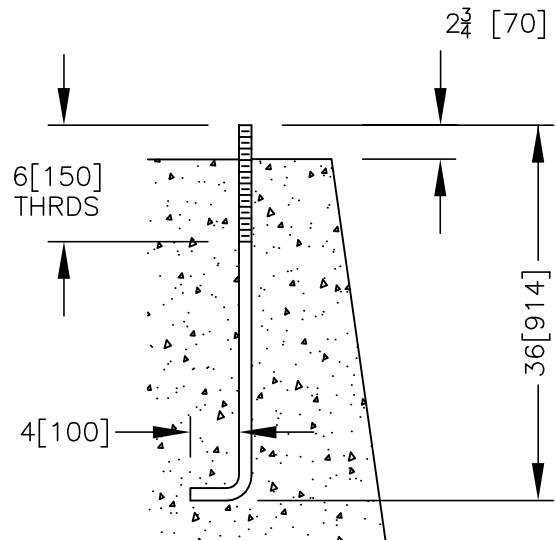
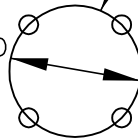




DRILLING ORIENTATION
(REF 81554-001)

4-1[25]-8NC GALV STL ANCHOR BOLTS
AASHTO M314-90 GRADE 55
10[250] THREADED END GALV PER ASTM A153
4-1[25]-8NC GALV STL HEX NUTS
4-1[25] GALV STL LOCKWASHERS
4-1[25] GALV STL FLATWASHERS

10[250] TO 11[280] D
BOLT CIRCLE



HAPCO 4-BOLT SHOE BASE FOR LUMINAIRE

hapco

Abingdon, Va.

LBH01

SHEET NO.

DATE:

1 OF 2

2010

SPECIFICATIONS

Dimensional tolerances not shown or implied are intended to be those consistent with the proper functioning of the part, including its appearance and accepted manufacturing practices.

INTENDED USE

For use with pole component(s) LPA01.

HAPCO 4-BOLT SHOE BASE FOR LUMINAIRE

LBH01

SHEET NO.

DATE

2 of 2

2010



