

APPLICATION

THE LED ACORN STYLE LUMINAIRE MAY BE USED FOR:

- 1) NEW INSTALLATION OF ACORN STYLE LUMINAIRES ON NEWLY PLACED POLES WHOSE SPACING HAS BEEN DESIGNED SPECIFICALLY FOR THE LUMINAIRE. STREET LIGHT DESIGNS USING PHOTOMETRIC SOFTWARE ARE REQUIRED FOR EACH LUMINAIRE. THE DESIGNER SHALL COMPLY WITH IESNA RP-08 (latest version).
- 2) REPLACING EXISTING HID LUMINAIRES ON EXISTING POLES WHERE SPACING REMAINS UNCHANGED.

LED REQUIREMENTS

- A. CORRELATED COLOR TEMPERATURE (CCT): 3000K.
- B. COLOR RENDERING INDEX (CRI) MINIMUM 70
- C. AMBIENT OPERATING ENVIRONMENT: -40°C TO +40°C (-40°F TO 104°F)
- D. VOLTAGE: 480 V OR 120 V AS SPECIFIED BY THE CITY OF COLUMBUS
- E. COOLING SYSTEM: PASSIVE HEAT SINK WITH NO FANS, PUMPS, OR LIQUIDS, AND SHALL BE RESISTANT TO DEBRIS BUILD-UP THAT DOES NOT DEGRADE HEAT DISSIPATION PERFORMANCE.

HOUSING

THE HOUSING SHALL BE FLUTED, AND BE CONSTRUCTED OF DIE-CAST OR SAND-CAST ALUMINUM, AND SHALL BE RUST RESISTANT. PAINT FINISH SHALL BE POWDER-COATED BLACK, OR AS DIRECTED BY THE CITY OF COLUMBUS DIVISION OF POWER. THE PAINT FINISH SHALL EXCEED A RATING OF SIX PER ASTM D 1654 AFTER 1000 HOURS OF TESTING PER B117. PAINTED OR FINISHED LUMINAIRE COMPONENTS EXPOSED TO THE ENVIRONMENT SHALL EXHIBIT NO GREATER THAN 30% REDUCTION OF GLOSS PER ASTM D523, AFTER 500 HOURS OF QUV TESTING AT ASTM G154 CYCLE 6. ALL EXTERNAL SCREWS SHALL BE STAINLESS STEEL. NO PARTS SHALL BE CONSTRUCTED OF POLYCARBONATES. THE HOUSING SHALL BE EQUIPPED WITH A TOOL-LESS ENTRY DOOR TO ALLOW ACCESS TO THE ELECTRICAL COMPONENTS INSIDE THE LUMINAIRE.

OPTICAL SYSTEM

THE OPTICAL SYSTEM SHALL BE CONSIST OF A THERMAL RESISTANT BOROSCILLATE GLASS REFRACTOR RESEMBLING A TRADITIONAL ACORN SHAPE.

LED POWER SUPPLY / DRIVER

- A) POWER FACTOR, MINIMUM 0.90
- B) DRIVER OUTPUT CURRENT, mA VARIABLE
- C) DIMMING SIGNAL, CONTROL RANGE, VDC 0 TO 10

D) LED DRIVER SHALL BE MOUNTED INSIDE THE HOUSING, REPLACEABLE, AND SHALL BE PRE-WIRED TO 480V READY FOR INSTALLATION. DRIVER AND LED ARRAYS SHALL BE DESIGNED FOR MULTI-CURRENT INPUT OPERATIONS WITH 0-10V DRIVER ADJUSTABLE OUTPUT. THE LED DRIVER SHALL COMPLY WITH FCC RULES AND REGULATIONS, TITLE 47 CFR PART 15 NON-CONSUMER (CLASS A). LED DRIVER SHALL TOLERATE SUSTAINED OPEN CIRCUIT AND SHORT CIRCUIT OUTPUT CONDITIONS WITHOUT DAMAGE. LED DRIVER SHALL HAVE AN INDEPENDENTLY VERIFIED AND DOCUMENTED FAILURE RATE OF $\leq 0.01\%$ PER 1000 HOURS. WIRING INSIDE THE HOUSING SHALL COMPLY WITH 600V/105°C RATING OR HIGHER. THE LED DRIVER SHALL HAVE A "CLASS A" SOUND RATING. POWER SUPPLY/DRIVER SHALL BE UL RECOGNIZED FOR DRY AND DAMP LOCATIONS. ALL OTHER ELECTRICAL COMPONENTS SHALL BE UL LISTED OR RECOGNIZED FOR WET LOCATIONS. OUTPUT OPERATING FREQUENCY MUST BE $\geq 120\text{HZ}$ AND INPUT OPERATING FREQUENCY OF 60 HZ. THE LED DRIVER SHALL BE RoHS COMPLIANT.

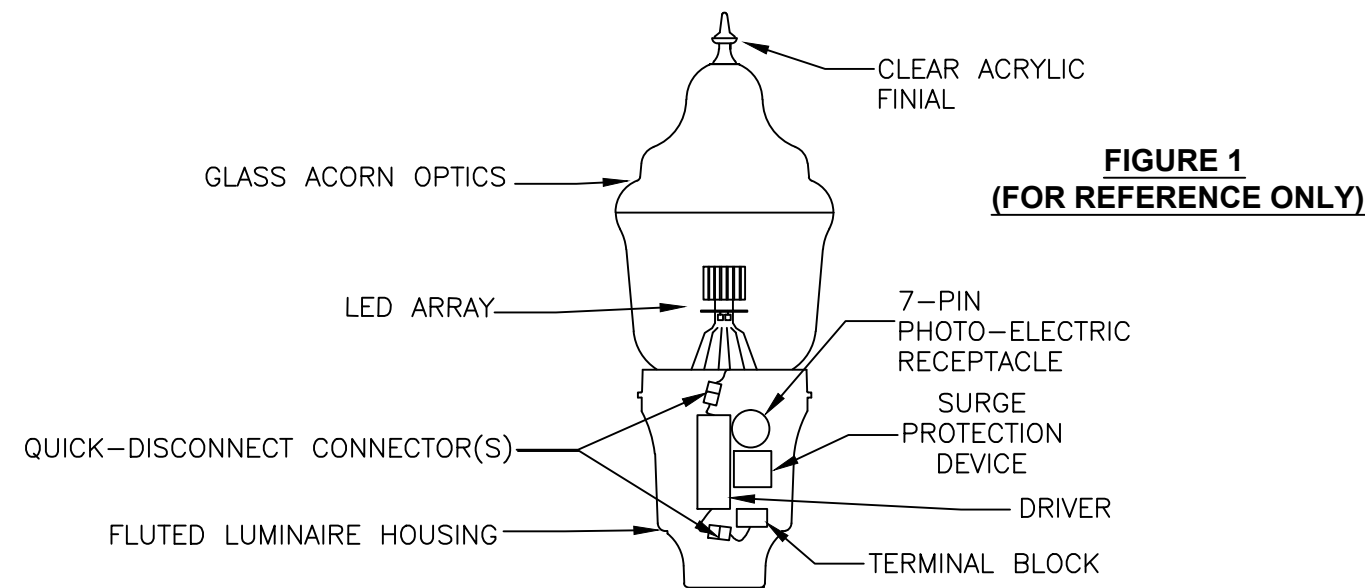
LED SURGE PROTECTION DEVICE

THE SURGE PROTECTION DEVICE SHALL COMPLY WITH ANSI C136.37 AND ANSI/IEEE C62.41.2. EACH SURGE PROTECTION DEVICE SHALL BE INTERNALLY MOUNTED INSIDE HOUSING AND SPECIFIED FOR 480V OR 120V OPERATION WITH A MINIMUM 10 KV/5KA SURGE PROTECTION. THE SURGE PROTECTION DEVICE SHALL BE A UL 1449 4TH EDITION TYPE 4 RECOGNIZED COMPONENT FOR USE IN TYPE 2 LOCATIONS

MIS-802	DEPARTMENT OF PUBLIC UTILITIES - DIVISION OF POWER CITY OF COLUMBUS, OHIO		
	LUMINAIRE, LED, ACORN		
	DRAWN BY: SAW	DATE: 1/1/2018	
	APPROVED:		
SCALE: NONE	SHEET: 1 OF 4	802	

LED MODULE / ARRAY REQUIREMENTS

LED MODULE(S)/ARRAY(S) SHALL DELIVER A MINIMUM OF 70% OF INITIAL LUMENS WHEN INSTALLED FOR 100,000 HOURS AND MEET L70 STANDARDS. LIGHTING DISTRIBUTION SHALL BE IN ACCORDANCE WITH "IESNA LIGHTING DISTRIBUTIONS". LAMP LUMEN DEPRECIATION FACTOR SHALL BE SUPPORTED BY TM-21 DATA @ 25 °C FOR 50,000 HOURS. LUMINAIRE DIRT DEPRECIATION(LDD) SHALL BE 0.90 FOR GLASS OPTICS. IT IS THE RESPONSIBILITY OF EACH MANUFACTURER TO PROVIDE A CALCULATION OF LAMP LUMEN DEPRECIATION(LLD). LIGHT LOSS FACTOR USED IN PHOTOMETRIC LAYOUT CALCULATIONS SHALL BE THE PRODUCT OF LDD AND THE MANUFACTURER'S PROJECTED LAMP LUMEN DEPRECIATION AT 100,000 HOURS AT 25°C AMBIENT TEMPERATURE. LUMEN MAINTENANCE SHALL BE A MINIMUM OF 70% OVER 100,000 HOURS OF LIFE WHEN OPERATING AT TEMPERATURES OF 40°C (104°F) OR LESS. THE LUMINAIRE SHALL CONTINUE TO OPERATE AND MAINTAIN THE MINIMUM OPTICAL PERFORMANCE CRITERIA FOR THE PARTICULAR APPLICATION IN WHICH IT IS INSTALLED. OPTICAL SYSTEM COMPONENTS SHALL BE RATED AT IP66 TO PROTECT AGAINST WATER, DIRT, AND INSECT INFILTRATION, AND BE RoHS COMPLIANT. LUMINAIRE CIRCUITRY SHALL INCLUDE QUICK CONNECT/DISCONNECT FOR EASY SEPARATION. SEE FIGURE 1.



THE MINIMUM OPTICAL PERFORMANCE IS DEFINED BY THE APPLICATION INSTALLATION IN CONJUNCTION WITH THE "CITY OF COLUMBUS, DIVISION OF POWER GUIDELINES FOR STREET LIGHTING CIRCUIT LAYOUT".

7-PIN PHOTO-ELECTRIC RECEPTACLE

THE LUMINAIRE SHALL BE FURNISHED WITH A 7-PIN PHOTO-ELECTRIC RECEPTACLE INSTALLED IN THE LUMINAIRE HOUSING. THE RECEPTACLE SHALL BE TWIST LOCK TYPE, AND HAVE THE CAPABILITY TO BE DIRECTIONALLY ADJUSTED. THE 7-PIN PHOTO -ELECTRIC RECEPTACLE SHALL BE SUITABLE FOR OPERATION WITH LED LUMINAIRES, AND CONFORM TO ANSI DESIGN STANDARD C136.10. THE PHOTO-ELECTRIC SOCKET SHALL ACCOMMODATE DIMMING AND/OR AUTOMATION INTEGRATION.

7-PIN LONG LIFE PHOTO CONTROL (AS REQUIRED BY THE ENGINEER)

THE LUMINAIRE SHALL BE SUPPLIED WITH A "LONG LIFE" PHOTO CONTROL THAT SHALL BE SOLID STATE, AND SUITABLE FOR OPERATION WITH 7-PIN PHOTO CONTROL RECEPTACLES AND LED LUMINAIRES. THE PHOTO CONTROL SHALL HAVE A MINIMUM DESIGN LIFE OF 20 YEARS.

SHORTING CAP FOR 7-PIN LED PHOTO-ELECTRIC RECEPTACLE (480 V LUMINAIRE ONLY)

THE LUMINAIRE SHALL BE SUPPLIED WITH A SHORTING CAP SUITABLE FOR OPERATION WITH A 7-PIN LED PHOTO ELECTRIC RECEPTACLE. THE SHORTING CAP SHALL CONTAIN A GASKET AROUND THE OUTER PERIMETER OF THE CAP FOR PROPER SEALING AGAINST DEBRIS. THE SHORTING CAP SHALL MEET OR EXCEED ANSI DESIGN STANDARD ANSI C136.10.

TESTING / CERTIFICATION / STANDARDS / RECOMMENDED PRACTICES

THE LUMINAIRE SHALL COMPLY WITH THE FOLLOWING STANDARDS :

- A) ANSI C136:31 2010 (or latest) FOR 100,000 CYCLES AT 1.5G ACCELERATION FOR NORMAL ROAD APPLICATIONS.
- B) UL/CUL LISTED, SUITABLE FOR WET LOCATIONS PER UL 1598 OR CSA C22.2 NUMBER 250.
- C) THE LED OPTICAL ASSEMBLY AND DRIVER SHALL BE IP66 RATED PER IEC60529.
- D) LUMINAIRE COMPONENTS AND APPLIED FINISHES SHALL COMPLY WITH THE 1000 HOUR SALT/FOG TEST PER ASTM B117 STANDARD.
- E) LM-79 OPTICAL PERFORMANCE TESTS SHALL BE CONDUCTED IN ACCORDANCE WITH IESNA STANDARD PRACTICES FOR SOLID STATE LIGHTING
- F) LUMINAIRE SHALL BE CERTIFIED WITH A BUG RATING (BACKLIGHT, UPLIGHT, GLARE)
- G) IESNA LM-80-15 (or latest)
- H) ANSI C136.41-2013 (or latest)
- I) ANSI C136.37 2011 (or latest)
- J) ANSI C136.22 -2004 (or latest)
- K) IEC 60529 (or latest)
- L) IEEE C62.41.2-2002 (or latest)
- M) IESNA TM-15-11 (or latest)
- N) RoHS
- O) ANSI C136.10-2010 (or latest)
- P) ANSI C78.377-2008 (or latest)
- Q) TM-21-11 (or latest)
- R) ASTM D1654-08 (or latest)
- S) IES LM-79-08 (or latest)
- T) UL 1449 (Surge Protection Devices)

MIS-802

DEPARTMENT OF PUBLIC UTILITIES - DIVISION OF POWER CITY OF COLUMBUS, OHIO		
LUMINAIRE, LED, ACORN		
DRAWN BY: SAW	DATE: 1/1/2018	
APPROVED:		
SCALE: NONE	SHEET: 2 OF 4	802

WARRANTY

THE WARRANTY SHALL PROVIDE FOR THE FULL REPLACEMENT OF THE ENTIRE LUMINAIRE ASSEMBLY, WHICH INCLUDES THE POWER SUPPLIES/DRIVER, DEFECTIVE ELECTRICAL AND NON- ELECTRICAL PARTS, AND LIGHT SOURCE FOR A PERIOD OF TEN (10) YEARS FROM DATE OF ACCEPTANCE. NEGLIGIBLE LIGHT OUTPUT FROM MORE THAN 10 PERCENT OF THE LED PACKAGES CONSTITUTES LUMINAIRE FAILURE. LONG-LIFE PHOTOCONTROL SHALL BE COVERED FOR FULL REPLACEMENT FOR A PERIOD OF TEN (10) YEARS FROM THE DATE OF ACCEPTANCE FOR ANY FAILURE AND/OR DEFECT IN WORKMANSHIP.

WEIGHT

LUMINAIRE SHALL NOT WEIGH MORE THAN 60 POUNDS.

EFFECTIVE PROJECTED AREA (EPA)

LUMINAIRE SHALL NOT HAVE AN EPA MORE THAN 2.25 SQ. FT.

DELIVERY, STORAGE AND HANDLING

A) DELIVERY

- 1. LED LUMINAIRES SHALL BE DELIVERED TO THE JOB SITE AS TO NOT CAUSE DAMAGE OR REQUIRED REPAIRS. LUMINAIRE SHALL BE 100% FACTORY TESTED PRIOR TO SHIPMENT.
- 2. DELIVERY OF MATERIAL SHALL BE COORDINATED WITH OTHER TRADES TO AVOID DELAYS.

B) STORAGE OF MATERIALS

- 1. MATERIAL SHALL BE STORED IN STRICT COMPLIANCE WITH MANUFACTURE'S RECOMMENDATIONS.

C) HANDLING

- 1. HANDLE ALL PRODUCTS WITH CARE. ONLY SOUND, UNDAMAGED PRODUCTS SHALL BE ACCEPTED.

INTERNAL LABELING

A VISIBLE LABEL SHALL BE ATTACHED TO THE INSIDE SURFACE OF EACH LUMINAIRE H. THE INTERNAL LABEL SHALL MEET THE REQUIREMENTS OF ANSI C 136.22 (LATEST VERSION). THE LABEL SHALL INCLUDE THE FOLLOWING:

- MANUFACTURER'S NAME - LUMINAIRE TYPE, AND CATALOG NUMBER
- MONTH AND YEAR OF MANUFACTURE
- LINE INPUT VOLTAGE AND WATTAGE
- FREQUENCY IF OVER 60 HERTZ
- DESCRIPTIVE WIRING DIAGRAM SHOWING INPUT TERMINALS, DRIVER, PHOTO-CONTROL RECEPTACLE AND LED ARRAY.

INSTALLATION

THE LUMINAIRE SHALL SLIP FIT OVER A 2-7/8" TO 3-1/8" POST TOP TENONAS SHOWN IN THE CONTRACT DOCUMENTS AND MIS SPECIFICATIONS. THE LUMINAIRE SHALL BE SECURED TO THE POLE TENON BY A MINIMUM OF FOUR HEX HEAD STAINLESS STEEL SET SCREWS. THE POLE TENON SHALL BE TOTALLY ENCLOSED IN THE LUMINAIRE HOUSING. ORIENTATION AND LEVELING OF THE UNITS SHALL BE SO AS TO PROVIDE FOR UNIFORM APPEARANCE, MAXIMUM LIGHTING EFFICIENCY AND EASE OF MAINTENANCE.

SUBMITTALS

A) THE FOLLOWING SUBMITTALS SHALL BE SUPPLIED WITH THE BID:

- 1) LUMINAIRE SUBMITTAL FORM (SEE SHEET 4)
- 2) LUMINAIRE CUT SHEET
- 3) LED DRIVER CUT SHEET
- 4) LM-79 TEST REPORT
- 5) TM-21 TEST REPORT
- 6) LUMINAIRE THERMAL TEST REPORT

LM -79 DATA AND TM-21 TEST REPORTS MUST REFLECT THE EXACT CCT & WATTAGE OF THE LUMINAIRE TO BE SUPPLIED. NO PRO-RATED TEST REPORTS WILL BE ACCEPTED.

THE LUMINAIRE THERMAL TEST REPORT MUST REFLECT THE EXACT WATTAGE AND VOLTAGE TO BE SUPPLIED. NO PRO-RATED TEST REPORTS WILL BE ACCEPTED.

B) THE CONTRACTOR SHALL PROVIDE THE MANUFACTURER'S TEN (10) YEAR WARRANTY DOCUMENTATION WITH THE SUBMITTAL PACKAGE .

MIS-802	DEPARTMENT OF PUBLIC UTILITIES - DIVISION OF POWER CITY OF COLUMBUS, OHIO		
	LUMINAIRE, LED, ACORN		
	DRAWN BY: SAW	DATE: 1/1/2018	
	APPROVED:		
SCALE: NONE	SHEET: 3 OF 4	802	

**CITY OF COLUMBUS: DIVISION OF POWER
LED LUMINAIRE SUBMITTAL FORM
MATERIAL SPECIFICATION**

Luminaire Catalog Number: _____ Manufacturer: _____

Project: _____ Drawing Number: _____

GENERAL CRITERIA: LED LUMINAIRE		
LUMINAIRE	Wattage of Luminaire	
	Voltage of Luminaire	
	Weight of Luminaire (Not To Exceed 60 lbs.)	
	Luminaire Effective Projected Area (EPA)	
	Luminaire Housing Finish Color (Gray, Black, Bronze)	
MOUNTING METHOD	<input type="checkbox"/> Post-Top <input type="checkbox"/> Side-Arm <input type="checkbox"/> Swivel-Tenon	
	Tenon Nominal Pipe Size (NPS)	
LENS:	<input type="checkbox"/> Flat <input type="checkbox"/> Sag / Drop <input type="checkbox"/> Teardrop <input type="checkbox"/> Prismatic Acorn/Traditional	
IES FORWARD DISTRIBUTION TYPE	<input type="checkbox"/> I <input type="checkbox"/> II <input type="checkbox"/> III <input type="checkbox"/> IV <input type="checkbox"/> V <input type="checkbox"/> VS	
IES LATERAL DISTRIBUTION TYPE	<input type="checkbox"/> Very Short <input type="checkbox"/> Short <input type="checkbox"/> Medium <input type="checkbox"/> Long <input type="checkbox"/> Very Long	
DRIVER	Variable Output: (Specify Current Output Setting in mA)	
	Minimum Available Output	
	Maximum Available Output	
	Dimmable	0-10 Volts
ELECTRICAL IMMUNITY	Minimum Requirements For Surge Suppression	10 KV / 5 KA
PHOTOCONTROL	Photocontrol Receptacle Style	7--PIN <input type="checkbox"/> YES
		TWIST-LOCK <input type="checkbox"/> YES
	Long Life Photocontrol	7-PIN Compatible <input type="checkbox"/> YES
	Shorting Cap Included (480 Volt Luminaires Only)	<input type="checkbox"/> YES <input type="checkbox"/> NO
WARRANTY	Minimum Warranty Requirement	10 Years
PERFORMANCE CRITERIA: LED LUMINAIRE		
NOMINAL CCT	Rated Correlated Color Temperature (3000K)	
LIGHT LOSS FACTOR	(LDD + Projected Lumen Depreciation @ 100,000 HRS in 25°C Ambient Temperature)	
PHOTOPIC² DOWNWARD LUMINAIRE OUTPUT	<i>Initial</i> Luminaire Output Below Horizontal	
	Minimum <i>maintained</i> Luminaire Output Below Horizontal	
BUG RATING:	Max. Nominal Backlight-Up light-Glare ratings	
ANSI VIBRATION TEST LEVEL	Level 1 (Normal) Level 2 (Bridge/Overpass)	
THERMAL ENVIRONMENT	Minimum Ambient Operating Temperature	
	Maximum Ambient Operating Temperature	

RECOMMENDED MANUFACTURERS

THE FOLLOWING MANUFACTURERS ARE RECOMMENDED TO PROVIDE LED ACORN STYLE LUMINAIRES OR APPROVED EQUAL.

1. HOLOPHANE LIGHTING (GRANVILLE SERIES)
2. KING LUMINAIRE (K804 SERIES)
3. STERNBERG LIGHTING (HOMETOWN SERIES)

A RECOMMENDED MANUFACTURER SHALL BE USED AS THE BASIS OF DESIGN FOR THE PROJECT IN WHICH THIS SPECIFICATION IS APPLICABLE. SHOULD THE CONTRACTOR CHOOSE TO SUBSTITUTE THE BASIS OF DESIGN, THE CHOSEN LUMINAIRE MUST MEET ALL TARGET ILLUMINATION CRITERIA AS SPECIFIED BY THE PROJECT. NO MORE THAN A 10% INCREASE IN THE ACTUAL WATTAGE OF THE LUMINAIRE USED AS THE BASIS OF DESIGN WILL BE ALLOWED. THE SUBSTITUTED LUMINAIRE MUST ADHERE TO ALL ITEMS IN THIS SPECIFICATION.

BASIS OF PAYMENT

ITEM	UNIT	DESCRIPTION
MIS-802	EACH	LUMINAIRE, LED, ACORN

MIS-802	DEPARTMENT OF PUBLIC UTILITIES - DIVISION OF POWER CITY OF COLUMBUS, OHIO		
	LUMINAIRE, LED, ACORN		
	DRAWN BY: SAW	DATE: 1/1/2018	
	APPROVED:		
SCALE: NONE	SHEET: 4 OF 4	802	