APPLICATION

THE LED LOW MAST LUMINAIRE MAY BE USED FOR:

A. NEW INSTALLATION OF LOW MAST LUMINAIRES ON NEWLY PLACED POLES AS PER PLAN.

B. REPLACING EXISTING HID LUMINAIRES ON EXISTING POLES WHERE SPACING REMAINS UNCHANGED.

NOTE: THE LOW MAST LUMINAIRE IS ONLY TO BE INSTALLED ON THE MIS-306 ALUMINUM LOW MAST POLE (ADJUSTABLE 39' TO 43')

LED LOW MAST LUMINAIRE GENERAL REQUIREMENTS

A. LUMINAIRE SHALL NOT WEIGH MORE THAN 70 POUNDS.

B, LUMINAIRE SHALL NOT HAVE AN EFFECTIVE PROJECTED AREA (EPA) OF MORE THAN 1.3 SQ. FT.

C. CORRELATED COLOR TEMPERATURE (CCT): 3000K. WITH A COLOR RENDERING IDEX (CRI) OF 70

D. AMBIENT OPERATING ENVIRONMENT: -40°C TO +40°C (-40°F TO 104°F)

E. VOLTAGE : 480V, 120V, OR AS SPECIFIED BY THE CITY OF COLUMBUS.

F. COOLING SYSTEM: PASSIVE HEAT SINK WITH NO FANS, PUMPS, OR LIQUIDS. THE LUMINAIRE SHALL BE RESISTANT TO DEBRIS BUILD-UP THAT MAY DEGRADE HEAT DISSIPATION PERFORMANCE.

HOUSING / ELECTRICAL ASSEMBLY

A. THE LUMINAIRE HOUSING SHALL BE CONSTRUCTED OF DIE-CAST ALUMINUM, AND BE RUST RESISTANT. NO PARTS SHALL BE CONSTRUCTED OF POLYCARBONATES.

B. THE LUMINAIRE HOUSING SHALL INCLUDE A SECURE MAST ARM MOUNT SLIP- FITTER TO ATTACH THE LUMINAIRE TO A 2" IPS BRACKET. THE SLIP-FITTER SHALL ALLOW FOR TILT ADJUSTMENTS 5° ABOVE AND BELOW HORIZONTAL, AND SHALL BE TOTALLY ENCLOSED IN THE LUMINAIRE HOUSING.

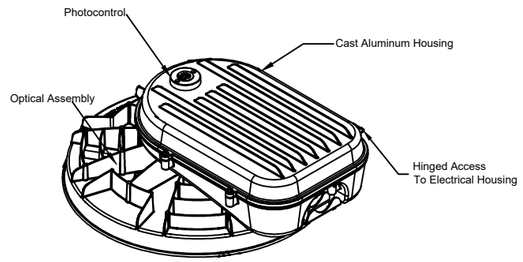
C. THE LUMINAIRE HOUSING SHALL BE HINGED AND ALLOW EASE OF ACCESS TO LED DRIVERS AND ELECTRICAL COMPONENTS. ALL SCREWS SHALL BE STAINLESS STEEL.

OPTICAL ASSEMBLY

A. THE LUMINAIRE OPTICAL ASSEMBLY SHALL BE SECURELY ATTACHED

B. THE LUMINAIRE OPTICAL ASSEMBLY SHALL BE GLASS, AND ROTATABLE FOR ALLIGNMENT TO THE ROADWAY.

C. THE LUMINAIRE OPTICAL SHALL SHIP COMPLETE WITH THE ELECTRICAL ASSEMBLY IN A SINGLE CARTON.



PAINT FINISH

A. THE PAINT FINISH SHALL BE POLYESTER POWDER COATED WITH A 5-STAGE PRE-TREATMENT PROCESS. THE FINISH COLOR SHALL BE GRAY, OR AS DIRECTED BY THE CITY OF COLUMBUS DIVISION OF POWER.

B. THE PAINT FINISH SHALL ACHIEVE A SCRIBE CREEPAGE RATING OF (10) PER ASTM D 1654 AFTER 5000 HOURS OF SALT / FOG TESTING PER ASTM B117.

C. PAINTED OR FINISHED COMPONENTS EXPOSED TO THE ENVIRONMENT SHALL EXHIBIT NO GREATER THAN 30% REDUCTION OF GLOSS PER ASTM D523, AFTER 500 HOURS OF UV TESTING PER ASTM G154 CYCLE 6.

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. GENERAL REQUIREMENTS

1. THE LED DRIVER SHALL BE MOUNTED INSIDE THE LUMINAIRE HOUSING, REPLACEABLE, PRE-WIRED TO 480V, 120V, OR AS SPECIFIED AND READY FOR INSTALLATION.

2. THE DRIVER AND LED ARRAYS SHALL BE DESIGNED FOR MULTI-CURRENT INPUT OPERATIONS WITH 0-10V DRIVER ADJUSTABLE OUTPUT.

3. OUTPUT OPERATING FREQUENCY MUST BE ≥ 120HZ, AND INPUT OPERATING FREQUENCY MUST BE 60 HZ.

4. THE LED DRIVER SHALL TOLERATE SUSTAINED OPEN CIRCUIT AND SHORT CIRCUIT OUTPUT CONDITIONS WITHOUT DAMAGE. THE LED DRIVER SHALL HAVE AN INDEPENDENTLY VERIFIED AND DOCUMENTED FAILURE RATE OF ≤ 0.01% PER 1000 HOURS.

5. ANY WIRING INSIDE THE DRIVER HOUSING SHALL HAVE A 600V/105°C RATING OR HIGHER.

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6. THE LED DRIVER SHALL BE UL CERTIFIED FOR DRY AND DAMP LOCATIONS. ALL OTHER ELECTRICAL COMPONENTS SHALL BE UL LISTED FOR WET LOCATIONS.

7. THE LED DRIVER SHALL COMPLY WITH FCC RULES AND REGULATIONS, TITLE 47 CFR PART 15 NON-CONSUMER, AND HAVE A CLASS "A" SOUND RATING.

LED SURGE PROTECTION DEVICE

A. THE SURGE PROTECTION DEVICE SHALL COMPLY WITH ANSI C136.37, AND ANSI/IEEE C62.41.2.

B. EACH SURGE PROTECTION DEVICE SHALL BE INTERNALLY MOUNTED INSIDE THE LUMINAIRE HOUSING, AND BE SPECIFIED FOR 480V, 120V OR AS SPECIFIED BY THE CITY OF COLUMBUS.

C. THE SURGE PROTECTION DEVICE SHALL HAVE A MINIMUM 10 KV / 5KA SURGE PROTECTION.

D. THE SURGE PROTECTION DEVICE SHALL BE A UL 1449 TYPE 4 RECOGNIZED COMPONENT FOR TYPE 2 LOCATIONS.

LED MODULE / ARRAY REQUIREMENTS

A. THE LED MODULE(S) / ARRAY(S) SHALL DELIVER A MINIMUM OF 70% OF INITIAL LUMENS WHEN INSTALLED FOR 100,000 HOURS OPERATING AT TEMPERATURES OF 40°C (104°F) OR LESS. AND MEET L70 STANDARDS. LESS THAN THIS VALUE WILL BE CONSIDERED A LUMINAIRE FAILURE, AND SUBJECT TO REPLACEMENT UNDER THE 10 YEAR MANUFACTURER'S WARRANTY.

B. THE LED MODULE(S) / ARRAY(S) SHALL PRODUCE LIGHTING DISTRIBUTION TYPES IN ACCORDANCE WITH IESNA LIGHTING DISTRIBUTION TYPES AS RECOMMENDED BY RP-08 (latest version)

C. LLD, LDD AND LLF CALCULATIONS

1. THE LAMP LUMEN DEPRECIATION FACTOR (LLD) SHALL BE SUPPORTED BY TM-21 DATA @ 25 °C FOR 50,000 HOURS. IT IS THE RESPONSIBILITY OF EACH MANUFACTURER TO PROVIDE A CALCULATION OF LAMP LUMEN DEPRECIATION (LLD).

2. THE LUMINAIRE DIRT DEPRECIATION FACTOR (LDD) SHALL BE 0.85 FOR UV STABILIZED ACRYLIC OPTICS, AND 0.90 FOR GLASS OPTICS.

3. THE LIGHT LOSS FACTOR (LLF) 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.

D. OPTICAL SYSTEM COMPONENTS SHALL BE IP66 RATED TO PROTECT AGAINST WATER, DIRT, AND INSECT INFILTRATION, AND BE RoHS COMPLIANT.

E. LUMINAIRE CIRCUITRY SHALL INCLUDE QUICK CONNECT / DISCONNECT FOR EASY SEPARATION.

D. THE MINIMUM OPTICAL PERFORMANCE FROM A LUMINAIRE AND IT'S COMPONENTS FOR A GIVEN APPLICATION OR PROJECT IS DEFINED BY THE *"CITY OF COLUMBUS, DIVISION OF POWER STREET LIGHTING* DESIGN GUIDE", IN CONJUNCTION WITH THE RECOMMENDED PRACTICES OF IESNA RP-08.

7-PIN PHOTO-ELECTRIC RECEPTACLE

A. THE LUMINARE SHALL BE FURNISHED WITH A 7-PIN PHOTO-ELECTRIC RECEPTACLE INSTALLED IN THE TOP OF THE LUMINAIRE HOUSING. THE RECEPTACLE SHALL BE TWIST LOCK TYPE, AND HAVE THE CAPABILITY TO BE DIRECTIONALLY ADJUSTED.

B. THE 7-PIN PHOTO -ELECTRIC RECEPTACLE SHALL BE SUITABLE FOR OPERATION WITH LED LUMINAIRES, AND CONFORM TO ANSI DESIGN STANDARD C136.10.

C. THE PHOTO-ELECTRIC RECEPTACLE SHALL ACCOMMODATE DIMMING AND / OR AUTOMATION INTEGRATION WITH THE INSTALLATION OF NODES OR EXTERNAL EQUIPMENT AS REQUIRED.

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

A. THE LUMINAIRE SHALL BE SUPPLIED WITH A "LONG LIFE" PHOTO CONTROL THAT SHALL BE SOLID STATE, & SUITABLE FOR USE WITH 7-PIN PHOTO CONTROL RECEPTACLES AND LED LUMINAIRES.

B. THE PHOTO CONTROL SHALL HAVE A MINIMUM DESIGN LIFE OF 20 YEARS.

SHORTING CAP FOR 7-PIN LED PHOTO-ELECTRIC RECEPTACLE

A. 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.

B. THE SHORTING CAP SHALL MEET OR EXCEED ANSI DESIGN STANDARD ANSI C136.10.

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DEPARTMENT OF PUBLIC UTILITIES - DIVISION OF POWER
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LUMINAIRE, LED,
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INTERNAL LABELING

A. A VISIBLE LABEL SHALL BE ATTACHED TO THE INSIDE SURFACE OF THE LUMINAIRE HOUSING.THAT MEETS THE REQUIREMENTS OF ANSI C 136.22. THE LABEL SHALL INCLUDE THE FOLLOWING:

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

EXTERNAL NEMA LABELING

A. AN EXTERNAL NEMA LABEL SHALL BE INSTALLED ON THE OUTSIDE OF THE LUMINAIRE, AND BE ORIENTED SO THAT IT CAN BE CLEARLY IDENTIFIED FROM GROUND LEVEL.

B. THE LABEL SHALL BE PER ANSI C136.15-2011, AND INDICATE THE WATTAGE OF THE LUMINAIRE

C. THE LUMINAIRE SHALL BE INSTALLED ON A 2-3/8" O.D. BRACKET AS SHOWN ON THE PLANS AND MIS SPECIFICATIONS.

INSTALLATION

A. ORIENTATION AND LEVELING OF THE UNITS SHALL BE SO AS TO PROVIDE FOR UNIFORM APPEARANCE, MAXIMUM LIGHTING EFFICIENCY AND EASE OF MAINTENANCE..

WARRANTY

A. THE WARRANTY SHALL PROVIDE FOR THE FULL REPLACEMENT OF THE ENTIRE LUMINAIRE ASSEMBLY. THIS 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 BY THE DIVISION OF POWER.

B. NEGLIGIBLE LIGHT OUTPUT FROM MORE THAN 10 PERCENT OF THE LED PACKAGE CONSTITUTES LUMINAIRE FAILURE. THE LUMINAIRE WILL BE REPLACED UNDER THE MANUFACTURER'S 10 YEAR WARRANTY.

TESTING / CERTIFICATION / STANDARDS / RECOMMENDED PRACTICES

THE LUMINAIRE SHALL COMPLY WITH THE LATEST VERSIONS OF THE FOLLOWING STANDARDS:

A. ANSI C136:31 FOR 100,000 CYCLES AT 3G ACCELERATION FOR NORMAL ROAD AND BRIDGE APPLICATIONS.

B. UL/CUL LISTED, SUITABLE FOR WET LOCATIONS PER UL 1598 OR CSA C22.2 NUMBER 250.

D. LUMINAIRE COMPONENTS AND APPLIED FINISHES SHALL COMPLY WITH THE 1000 HOUR SALT / FO 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. THE LUMINAIRE SHALL BE CERTIFIED WITH A BUG RATING (BACKLIGHT, UPLIGHT, GLARE)

G. IESNA LM-79 H. IESNA LM-80 I. TM-15 J. TM-21 K. ANSI C78.377 L. ANSI C136.10

M. ANSI C136.22. N. ANSI C136.37 O. ANSI C136.41 P. ASTM D1654 Q. IEEE C62.41.2

R. IEC 60529 S. UL 1449 (Surge Protection Devices) T. RoHS

DELIVERY, STORAGE, AND HANDLING

A. DELIVERY

1. THE LED LUMINAIRES SHALL BE DELIVERED TO THE JOB SITE IN A MANNER AS TO NOT CAUSE DAMAGE OR REQUIRE REPAIRS.

2. LUMINAIRE SHALL BE 100% FACTORY TESTED PRIOR TO SHIPMENT BY THE MANUFACTURER 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 MANUFACTURER'S RECOMMENDATIONS.

C. HANDLING

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

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LUMINAIRE, LED
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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		
	Luminaire **E**ffective **P**rojected **A**rea (EPA)		
	Luminaire Housing Finish Color		
MOUNTING METHOD	☐ Post-Top ☐ Side-Arm		
	Tenon Nominal Pipe Size (NPS)		
LENS:	☐ Flat ☐ Sag / Drop ☐ Teardrop ☐ Prismatic Acorn/Traditional		
IES FORWARD DISTRIBUTION TYPE	☐ I ☐ II ☐ III ☐ IV ☐ V ☐ VS		
IES LATERAL DISTRIBUTION TYPE	☐ Very Short ☐ Short ☐ Medium ☐ Long ☐ Very Long		
DRIVER	Variable Output: (Specify Current Output Setting in mA)		
	Minimum Available Output		
	Maximum Available Output		
	Dimmable (0-10 Volts Required)		YES / NO
ELECTRICAL IMMUNITY	Surge Suppression Installed (Minimum 10 KV / 5 KA)		
PHOTOCONTROL	Photo-control Receptacle Style	7-PIN	☐ YES
		TWIST-LOCK	☐ YES
	Long Life Photo-control	7-PIN Compatible	☐ YES ☐ NO
	Shorting Cap Included		☐ YES ☐ NO
WARRANTY	Minimum 10 Year All–Inclusive (Full Replacement) Warranty		☐ YES ☐ NO
PERFORMANCE CRITERIA: LED LUMINAIRE			
NOMINAL CCT	Rated **C**orrelated **C**olor **T**emperature (3000K)		☐ YES ☐ NO
LIGHT LOSS FACTOR	(LDD + Projected Lumen Depreciation @ 100,000 HRS in 25°C Ambient Temperature)		
PHOTOPIC² DOWNWARD LUMINAIRE OUTPUT	***Initial*** Lumen Output Below Horizontal		
	Maintained Lumen Output Below Horizontal (From LM-79 Test)		
	Minimum ***maintained*** Luminaire Output Below Horizontal		
BUG RATING:	**B**acklight-**U**p light-**G**lare Rating		
ANSI VIBRATION TEST LEVEL	Level 1 (Normal) Level 2 (Bridge/Overpass)		
THERMAL ENVIRONMENT	Minimum Ambient Operating Temperature		
	Maximum Ambient Operating Temperature		

SUBMITTALS

A. THE FOLLOWING ITEMS SHALL BE INCLUDED IN THE SUBMITTAL PACKAGE:

1. LUMINAIRE SUBMITTAL FORM
2. LUMINAIRE CUT SHEET
3. LED DRIVER CUT SHEET
4. LM-79 TEST REPORT
5. TM-21 TEST REPORT
6. LUMINAIRE THERMAL TEST REPORT
7, MANUFACTURER'S TEN (10) YEAR WARRANTY DOCUMENTATION

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

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

SUGGESTED MANUFACTURERS

A. THE FOLLOWING LUMINAIRES ARE SUGGESTED LED LOW MAST LUMINAIRES FOR USE IN THE CITY OF COLUMBUS.

1. HOLOPHANE (HMLED4 SERIES)
2. GE EVOLVE (ERHM SERIES)

B. A SUGGESTED LUMINAIRE HAS BEEN PREVIOUSLY USED BY THE CITY OF COLUMBUS, AND SHALL BE USED AS THE BASIS OF DESIGN FOR THE PROJECT IN WHICH THIS SPECIFICATION IS APPLICABLE.

C. 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 MEET AND COMPLY WITH ALL ITEMS IN THIS SPECIFICATION.

BASIS OF PAYMENT

ITEM	UNIT	DESCRIPTION
MIS-806	EACH	LUMINAIRE, LED, LOW MAST

DEPARTMENT OF PUBLIC UTILITIES - DIVISION OF POWER
CITY OF COLUMBUS, OHIO

MIS-806

LUMINAIRE, LED
LOW MAST

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