APPLICATION

THE LED UNDERPASS STYLE LUMINAIRE MAY BE USED FOR:

1) NEW INSTALLATION OF UNDERPASS STYLE LUMINAIRES ON NEWLY CONSTRUCTED SUPPORTS 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 UNDERPASS LUMINAIRES ON EXISTING SUPPORTS 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 / DOOR ASSEMBLY

THE HOUSING SHALL BE CONSTRUCTED OF SAND-CAST OR DIE-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. TWO HOUSING MOUNTING METHODS SHALL BE ALLOWED:

1. FLUSH-MOUNT THE HOUSING DIRECTLY ONTO THE VERTICAL SURFACE.
2. USE FIXED WALL-MOUNT BRACKETS. A MINIMUM OF FOUR HEX HEAD STAINLESS STEEL BOLTS SHALL BE USED TO MOUNT THE HOUSING TO THE WALL OR SUPPORT STRUCTURE.

THE LUMINAIRE SHALL NOT EXTEND MORE THAN 12" FROM THE WALL/SUPPORT. THE HOUSING SHALL BE EQUIPPED WITH A 3/4-NPT TOP ENTRY SO THE LUMINAIRE CAN BE INDIVIDUALLY MOUNTED OR THE HOUSING SHALL BE EQUIPPED WITH TWO 3/4-NPT SIDE ENTRIES SO THE LUMINAIRE CAN BE MOUNTED IN A CONTINUOUS ROW AND ACCOMMODATE THROUGH-WIRING. THE HOUSING SHALL HAVE A MAXIMUM SIZE OF 24" WIDE BY 18" OF HEIGHT. A HINGED DOOR SHALL ALLOW ACCESS TO THE ELECTRICAL COMPONENTS AND BE SECURELY CLOSED WITH STAINLESS STEEL BOLTS.

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 < 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 > 120HZ 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, 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/SKA SURGE PROTECTION. THE SURGE PROTECTION DEVICE SHALL BE A UL 1449 4TH EDITION TYPE 4 RECOGNIZED COMPONENT FOR USE IN TYPE 2 LOCATIONS.
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 AT 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(LDD). 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.

FIGURE 1
(FOR REFERENCE ONLY)

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".

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 3.0G ACCELERATION FOR NORMAL ROAD AND BRIDGE 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 Device)
U) IEC 61000 - ELECTROMAGNETIC COMPATIBILITY TEST (EMC)
V) ANSI C82.77-02 (or latest) HARMONIC DISTORTION

DEPARTMENT OF PUBLIC UTILITIES - DIVISION OF POWER
CITY OF COLUMBUS, OHIO
MIS-804 LUMINAIRE, LED, UNDERPASS
DRAWN: [Signature] DATE: 1/1/2018
APPROVED: [Signature] SHEET 2 OF 4 804
SCALE: NONE
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. NEGLIGENCE 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 1.30 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 HOUSING. 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

EXTERNAL NEMA LABELING
AN EXTERNAL NEMA LABEL SHALL BE INSTALLED ON THE LUMINAIRE, AND BE ORIENTED SO THAT IT CAN BE CLEARLY IDENTIFIED FROM GROUND LEVEL. THE LABEL SHALL BE PER ANSI C136.15-2011 (OR LATEST) AND INDICATE THE EXACT WATTAGE OF THE LUMINAIRE.

INSTALLATION
THE LUMINAIRE SHALL BE INSTALLED AS SHOWN ON THE CONTRACT DRAWINGS AND MIS SPECIFICATIONS. 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.

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

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

1. HOLOPHANE LIGHTING (TUNNELPASS 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

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<td>EACH</td>
<td>LUMINAIRE, LED, UNDERPASS</td>
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