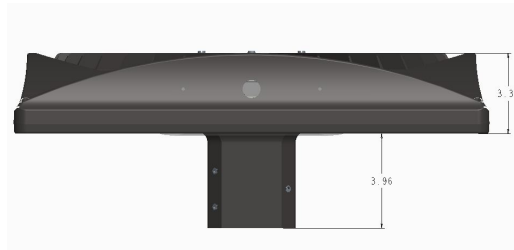


ISOFOOTCANDLE LINES OF HORIZONTAL ILLUMINATION

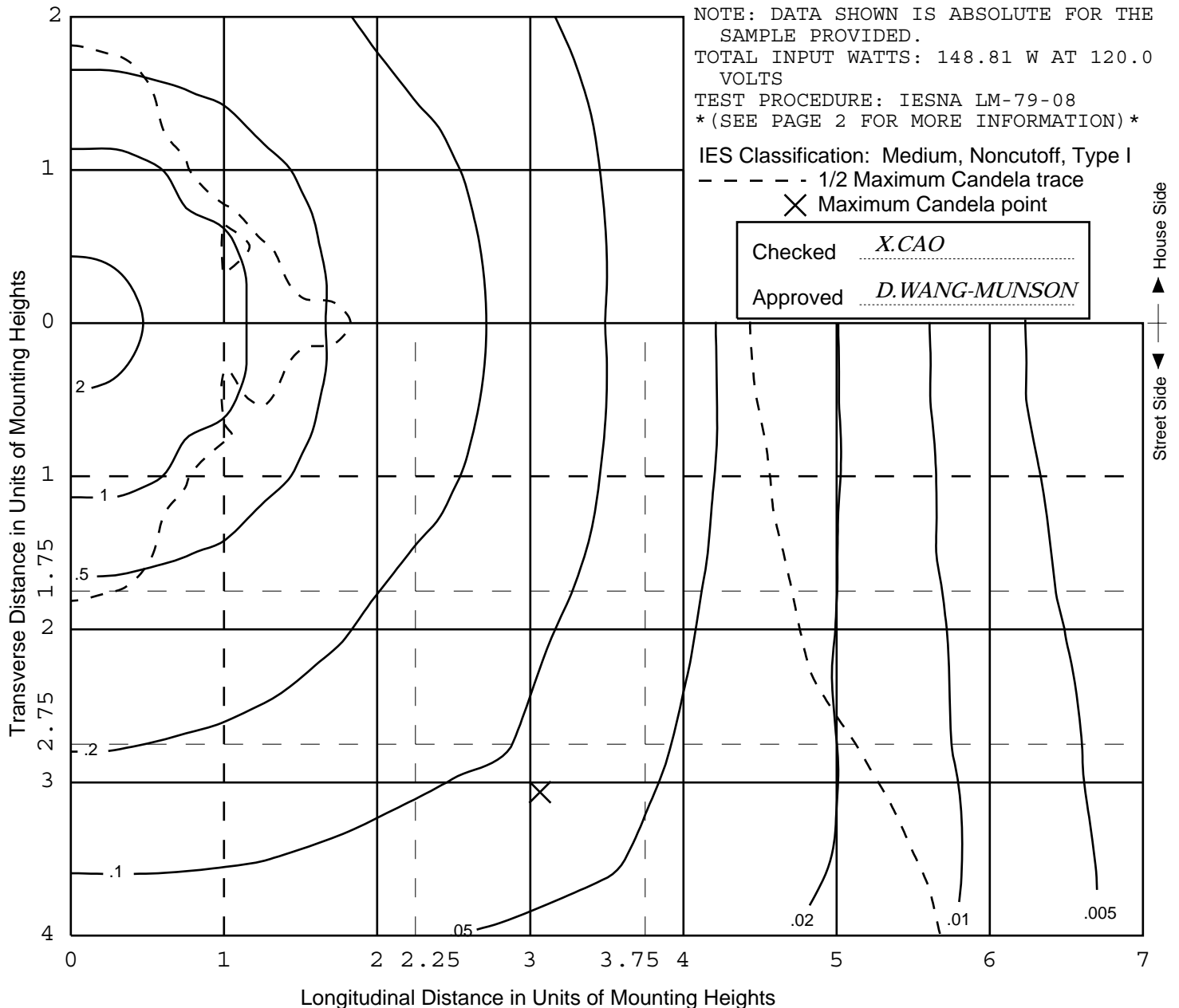
Values based on 25 foot mounting height.



REPORT NUMBER: RAB01418
 ISSUE DATE: 12/15/15 PAGE: 1 OF 9
 DATE SAMPLE TESTED: 12/15/15
 PREPARED FOR: RAB LIGHTING INC.
 CATALOG NUMBER: ALED5S150Y/D10 (TYPE V Square)
 LUMINAIRE: CAST FINNED METAL HOUSING, 4 WHITE CIRCUIT BOARD WITH 11 LEDS, MOLDED 1-PIECE PLASTIC REFLECTOR WITH SPECULAR FINISH, CLEAR POLYCARBONATE LENS IN CAST BRONZE PAINTED METAL FRAME.
 LAMP: FORTY-FOUR WHITE LIGHT EMITTING DIODES (LEDs), TILTED 80-DEGREES FROM VERTICAL BASE-UP POSITION.
 NOTE: DATA SHOWN IS ABSOLUTE FOR THE SAMPLE PROVIDED.
 TOTAL INPUT WATTS: 148.81 W AT 120.0 VOLTS
 TEST PROCEDURE: IESNA LM-79-08
 (SEE PAGE 2 FOR MORE INFORMATION)

IES Classification: Medium, Noncutoff, Type I

--- 1/2 Maximum Candela trace
 X Maximum Candela point



REPORT NUMBER: RAB01418
ISSUE DATE: 12/15/15
PREPARED FOR: RAB LIGHTING INC.

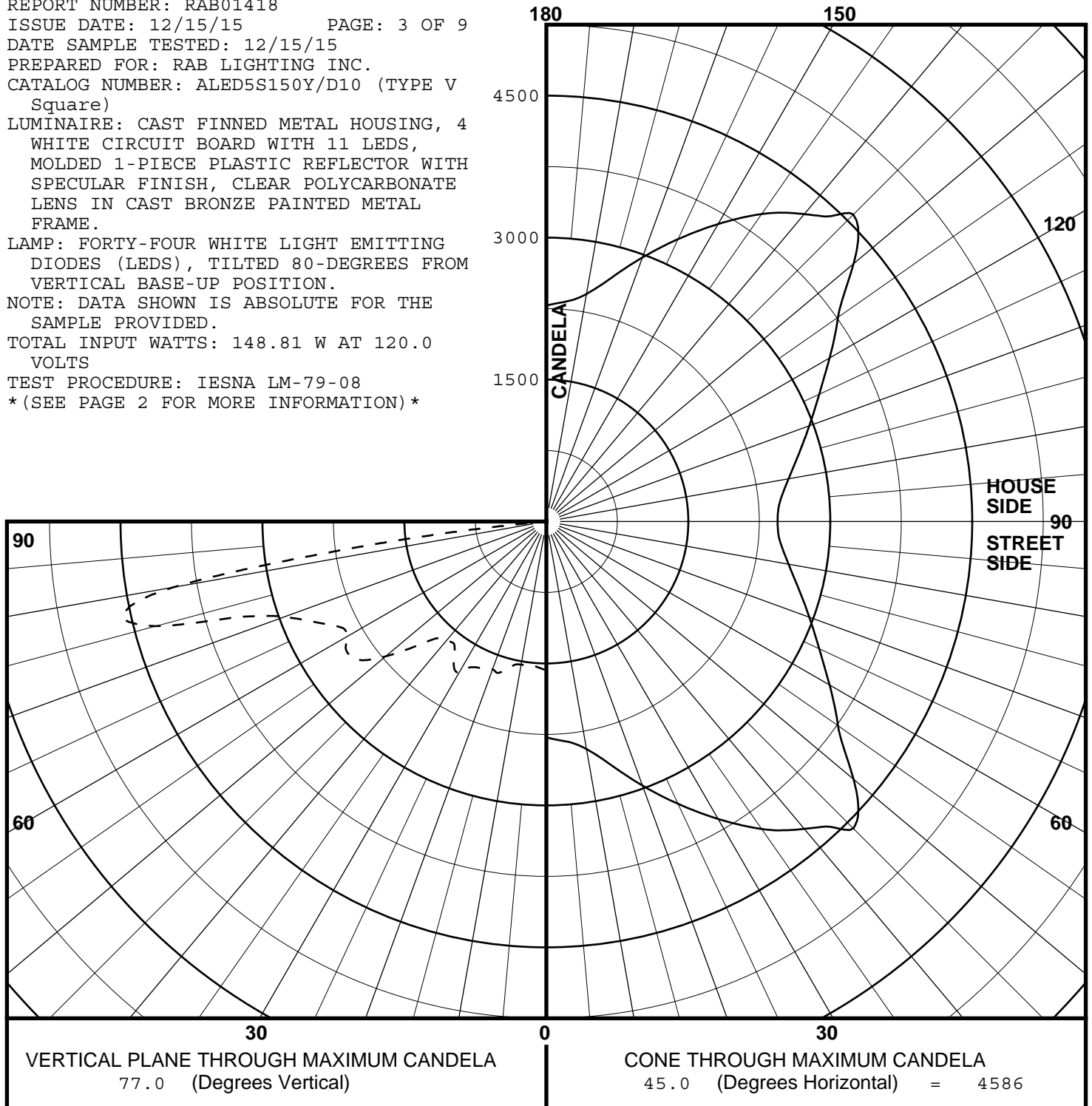
PAGE: 2 OF 9
DATE SAMPLE TESTED: 12/15/15

ADDITIONAL INFORMATION

TEST DISTANCE: 28.25 FEET
LED DRIVER: 2 x RDD-U85-A2100
ACCREDITED LABORATORY CODE 201085-0

MAXIMUM PLANE AND MAXIMUM CONE PLOTS OF CANDELA

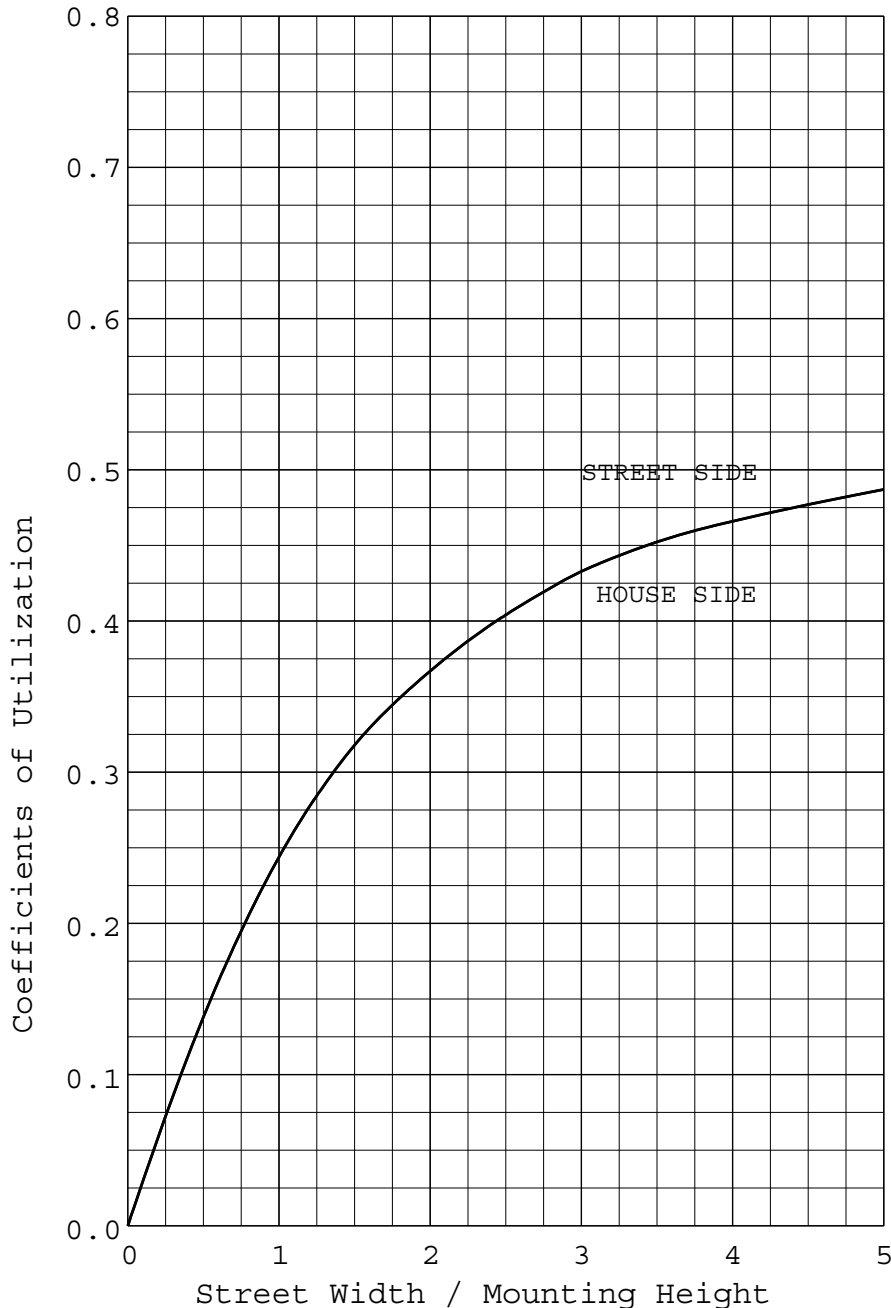
REPORT NUMBER: RAB01418
 ISSUE DATE: 12/15/15 PAGE: 3 OF 9
 DATE SAMPLE TESTED: 12/15/15
 PREPARED FOR: RAB LIGHTING INC.
 CATALOG NUMBER: ALED5S150Y/D10 (TYPE V Square)
 LUMINAIRE: CAST FINNED METAL HOUSING, 4 WHITE CIRCUIT BOARD WITH 11 LEDS, MOLDED 1-PIECE PLASTIC REFLECTOR WITH SPECULAR FINISH, CLEAR POLYCARBONATE LENS IN CAST BRONZE PAINTED METAL FRAME.
 LAMP: FORTY-FOUR WHITE LIGHT EMITTING DIODES (LEDS), TILTED 80-DEGREES FROM VERTICAL BASE-UP POSITION.
 NOTE: DATA SHOWN IS ABSOLUTE FOR THE SAMPLE PROVIDED.
 TOTAL INPUT WATTS: 148.81 W AT 120.0 VOLTS
 TEST PROCEDURE: IESNA LM-79-08
 (SEE PAGE 2 FOR MORE INFORMATION)



REPORT NUMBER: RAB01418
ISSUE DATE: 12/15/15
PREPARED FOR: RAB LIGHTING INC.

PAGE: 4 OF 9
DATE SAMPLE TESTED: 12/15/15

COEFFICIENTS OF UTILIZATION AND FLUX DISTRIBUTION



	LUMENS	PERCENT OF FIXTURE
DOWNWARD STREET SIDE	6372.	50.0
DOWNWARD HOUSE SIDE	6372.	50.0
DOWNWARD TOTAL	12745.	99.9
UPWARD STREET SIDE	6.	0.0
UPWARD HOUSE SIDE	6.	0.0
UPWARD TOTAL	12.	0.1
TOTAL FLUX	12757.	100.0
TOTAL INPUT WATTS = 148.8		
EFFICACY = 85.7 Lm/W		

ALL CANDELA AND LUMENS IN THIS REPORT ARE BASED ON ABSOLUTE PHOTOMETRY.
THE COEFFICIENT OF UTILIZATION VALUES ARE BASED ON THE TOTAL ABSOLUTE
LUMEN OUTPUT OF THIS LUMINAIRE SAMPLE.

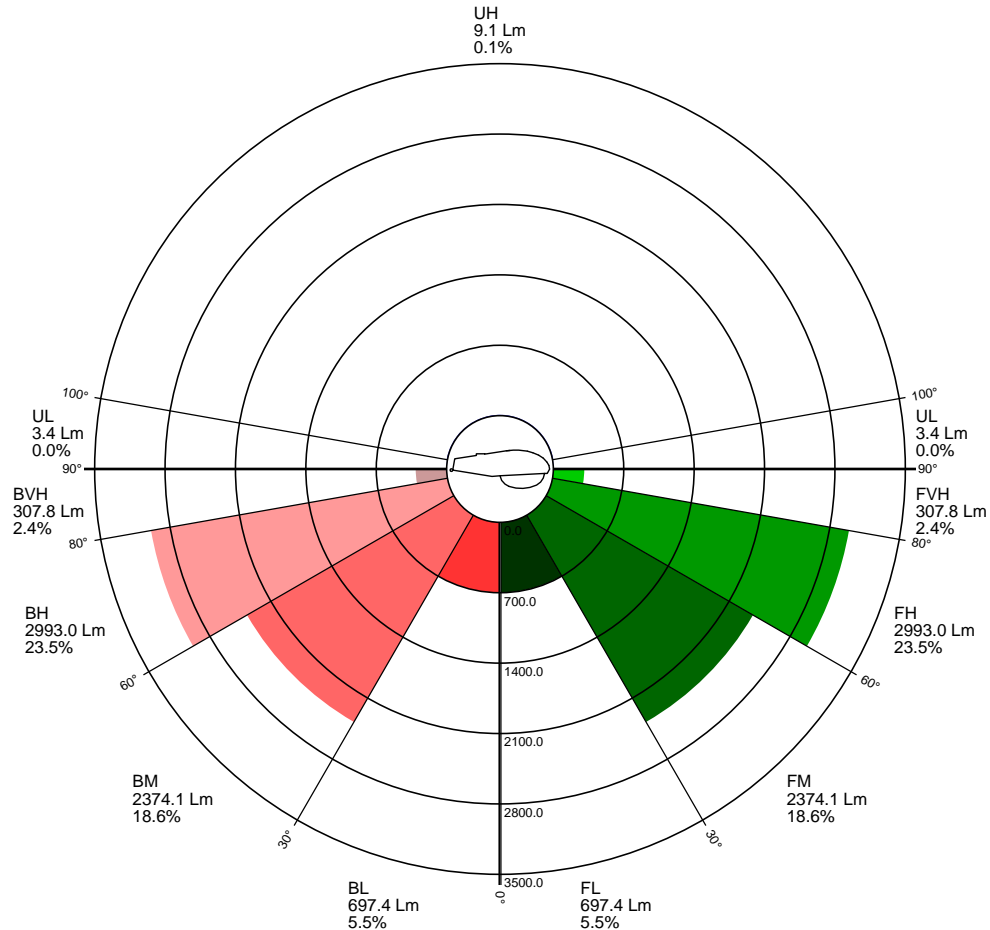
REPORT NUMBER: RAB01418
 ISSUE DATE: 12/15/15
 PREPARED FOR: RAB LIGHTING INC.

PAGE: 5 OF 9
 DATE SAMPLE TESTED: 12/15/15

BUG Rating:				B4 U1 G3		
Zonal Summary				Zone Ratings		
		Lumens	% of Fixture	B	U	G
Forward						
FL	(0° - 30°)	697.4	5.5			
FM	(30° - 60°)	2374.1	18.6			
FH	(60° - 80°)	2993.0	23.5			G2
FVH	(80° - 90°)	307.8	2.4			G3
Backward						
BL	(0° - 30°)	697.4	5.5	B2		
BM	(30° - 60°)	2374.1	18.6	B2		
BH	(60° - 80°)	2993.0	23.5	B4		G2
BVH	(80° - 90°)	307.8	2.4			G3
Upward						
UL	(90° - 100°)	3.4	0.0		U1	
UH	(100° - 180°)	9.1	0.1		U1	
Trapped Light						
Total Flux						
		12757	100.0			

Zonal Lumen Summary

(Linear scale)



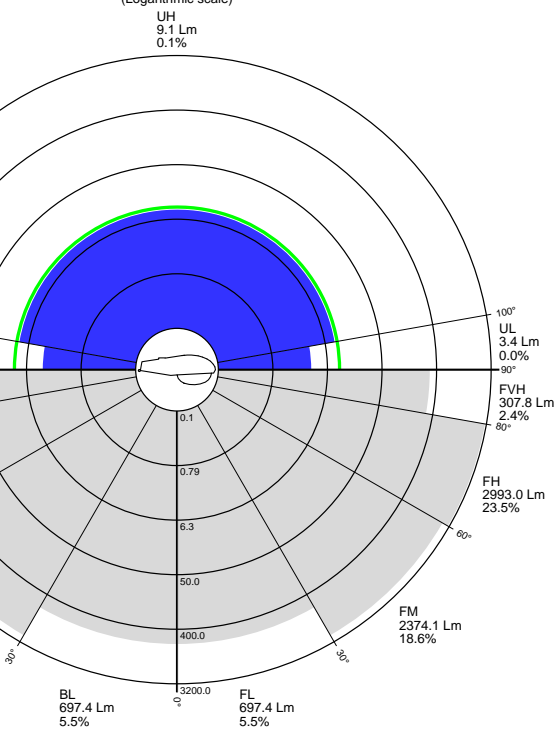
(Logarithmic scale)



(Logarithmic scale)



(Logarithmic scale)



PAGE: 7 OF 9
DATE SAMPLE TESTED: 12/15/15

STREET	CANDLER REGULATION	SIDE	LATERAL ANGLE								
			0.0	5.0	15.0	25.0	35.0	45.0	55.0	65.0	75.0
	180.0		1.	1.	1.	1.	1.	1.	1.	1.	1.
	175.0		2.	2.	1.	1.	0.	0.	0.	1.	1.
	165.0		2.	1.	1.	1.	0.	0.	0.	1.	1.
	155.0		1.	1.	1.	1.	0.	0.	0.	1.	1.
	145.0		1.	1.	1.	1.	0.	0.	0.	1.	1.
	135.0		2.	2.	1.	1.	0.	0.	0.	1.	1.
	125.0		2.	2.	1.	1.	1.	1.	1.	1.	1.
	115.0		3.	2.	2.	2.	2.	2.	2.	2.	2.
	105.0		4.	4.	4.	4.	4.	4.	4.	4.	4.
	95.0		2.	2.	3.	3.	4.	4.	3.	3.	2.
	90.0		2.	2.	2.	3.	4.	4.	4.	4.	3.
	87.5		8.	8.	9.	13.	20.	23.	21.	13.	9.
	85.0		24.	31.	82.	253.	345.	192.	372.	290.	104.
	82.5		104.	152.	390.	963.	1854.	1814.	1943.	1145.	622.
V	80.0		1054.	1094.	1285.	1774.	2937.	4004.	3227.	1987.	1389.
E	77.5		2010.	2056.	2374.	3055.	3990.	4580.	3806.	3112.	2575.
R	77.0<<		2281.	2332.	2669.	3292.	3967.	4586.	3762.	3181.	2762.
T	75.0		3207.	3261.	3515.	3727.	3839.	4271.	3697.	3501.	3179.
I	72.5		3312.	3363.	3466.	3621.	3560.	3338.	3383.	3450.	3290.
C	70.0		3258.	3275.	3205.	3207.	3122.	2945.	2918.	3089.	3063.
A	67.5		2899.	2931.	2865.	2893.	2799.	2733.	2731.	2830.	2766.
L	65.0		2616.	2617.	2608.	2646.	2639.	2567.	2668.	2653.	2564.
	62.5		2351.	2367.	2384.	2471.	2571.	2432.	2630.	2537.	2429.
A	60.0		2227.	2269.	2253.	2421.	2489.	2433.	2542.	2513.	2315.
N	57.5		2267.	2278.	2289.	2245.	2436.	2511.	2460.	2348.	2351.
G	55.0		2122.	2134.	2218.	2221.	2428.	2502.	2437.	2254.	2321.
L	52.5		2114.	2142.	2249.	2277.	2304.	2406.	2297.	2276.	2281.
E	50.0		2155.	2159.	2283.	2344.	2190.	2218.	2215.	2344.	2264.
	47.5		2153.	2179.	2305.	2288.	2016.	2005.	2051.	2378.	2312.
	45.0		2128.	2149.	2219.	2174.	1895.	1805.	1877.	2190.	2280.
	42.5		2013.	2010.	2036.	1953.	1789.	1672.	1763.	1962.	2077.
	40.0		1848.	1858.	1863.	1809.	1730.	1640.	1710.	1823.	1844.
	37.5		1785.	1785.	1787.	1721.	1728.	1617.	1721.	1685.	1755.
	35.0		1688.	1685.	1694.	1689.	1706.	1690.	1732.	1654.	1652.
	30.0		1673.	1678.	1654.	1651.	1731.	1844.	1734.	1662.	1644.
	25.0		1674.	1688.	1734.	1802.	1733.	1704.	1695.	1728.	1705.
	20.0		1649.	1647.	1665.	1675.	1683.	1663.	1696.	1644.	1642.
	15.0		1597.	1594.	1604.	1627.	1645.	1617.	1604.	1602.	1608.
	10.0		1536.	1534.	1529.	1553.	1520.	1536.	1556.	1589.	1588.
	5.0		1512.	1517.	1551.	1518.	1518.	1529.	1549.	1565.	1623.
	0.0		1571.	1571.	1571.	1571.	1571.	1571.	1571.	1571.	1571.

PLANE OF MAXIMUM CANDELA

CONE OF MAXIMUM CANDELA

REPORT NUMBER: RAB01418
 ISSUE DATE: 12/15/15
 PREPARED FOR: RAB LIGHTING INC.

PAGE: 8 OF 9
 DATE SAMPLE TESTED: 12/15/15

CANDELA TABULATION

HOUSE SIDE

LATERAL ANGLE

	90.0	95.0	105.0	115.0	125.0	135.0	145.0	155.0	165.0	175.0	180.0
180.0	1.	1.	1.	1.	1.	1.	1.	1.	1.	1.	1.
175.0	2.	2.	1.	1.	0.	0.	0.	1.	1.	2.	2.
165.0	1.	1.	1.	1.	0.	0.	0.	1.	1.	1.	2.
155.0	2.	1.	1.	1.	0.	0.	0.	1.	1.	1.	1.
145.0	2.	2.	1.	1.	0.	0.	0.	1.	1.	1.	1.
135.0	2.	1.	1.	1.	0.	0.	0.	1.	1.	2.	2.
125.0	2.	1.	1.	1.	1.	1.	1.	1.	1.	2.	2.
115.0	2.	2.	2.	2.	2.	2.	2.	2.	2.	2.	3.
105.0	4.	4.	4.	4.	4.	4.	4.	4.	4.	4.	4.
95.0	2.	2.	2.	3.	3.	4.	4.	3.	3.	2.	2.
90.0	3.	2.	3.	4.	4.	4.	4.	3.	2.	2.	2.
87.5	9.	8.	9.	13.	21.	23.	20.	13.	9.	8.	8.
85.0	25.	37.	104.	290.	372.	192.	345.	253.	82.	31.	24.
82.5	226.	238.	622.	1145.	1943.	1814.	1854.	963.	390.	152.	104.
V 80.0	1090.	1123.	1389.	1987.	3227.	4004.	2937.	1774.	1285.	1094.	1054.
E 77.5	2208.	2244.	2575.	3112.	3806.	4580.	3990.	3055.	2374.	2056.	2010.
R 77.0<<	2444.	2480.	2762.	3181.	3762.	4586.	3967.	3292.	2669.	2332.	2281.
T 75.0	2877.	2952.	3179.	3501.	3697.	4271.	3839.	3727.	3515.	3261.	3207.
I 72.5	3142.	3215.	3290.	3450.	3383.	3338.	3560.	3621.	3466.	3363.	3312.
C 70.0	3038.	3040.	3063.	3089.	2918.	2945.	3122.	3207.	3205.	3275.	3258.
A 67.5	2788.	2791.	2766.	2830.	2731.	2733.	2799.	2893.	2865.	2931.	2899.
L 65.0	2477.	2507.	2564.	2653.	2668.	2567.	2639.	2646.	2608.	2617.	2616.
62.5	2309.	2363.	2429.	2537.	2630.	2432.	2571.	2471.	2384.	2367.	2351.
A 60.0	2252.	2327.	2315.	2513.	2542.	2433.	2489.	2421.	2253.	2269.	2227.
N 57.5	2291.	2328.	2351.	2348.	2460.	2511.	2436.	2245.	2289.	2278.	2267.
G 55.0	2181.	2236.	2321.	2254.	2437.	2502.	2428.	2221.	2218.	2134.	2122.
L 52.5	2117.	2153.	2281.	2276.	2297.	2406.	2304.	2277.	2249.	2142.	2114.
E 50.0	2151.	2163.	2264.	2344.	2215.	2218.	2190.	2344.	2283.	2159.	2155.
47.5	2157.	2175.	2312.	2378.	2051.	2005.	2016.	2288.	2305.	2179.	2153.
45.0	2190.	2190.	2280.	2190.	1877.	1805.	1895.	2174.	2219.	2149.	2128.
42.5	2060.	2050.	2077.	1962.	1763.	1672.	1789.	1953.	2036.	2010.	2013.
40.0	1815.	1809.	1844.	1823.	1710.	1640.	1730.	1809.	1863.	1858.	1848.
37.5	1773.	1770.	1755.	1685.	1721.	1617.	1728.	1721.	1787.	1785.	1785.
35.0	1710.	1704.	1652.	1654.	1732.	1690.	1706.	1689.	1694.	1685.	1688.
30.0	1681.	1665.	1644.	1662.	1734.	1844.	1731.	1651.	1654.	1678.	1673.
25.0	1740.	1734.	1705.	1728.	1695.	1704.	1733.	1802.	1734.	1688.	1674.
20.0	1689.	1676.	1642.	1644.	1696.	1663.	1683.	1675.	1665.	1647.	1649.
15.0	1631.	1623.	1608.	1602.	1604.	1617.	1645.	1627.	1604.	1594.	1597.
10.0	1599.	1601.	1588.	1589.	1556.	1536.	1520.	1553.	1529.	1534.	1536.
5.0	1573.	1576.	1623.	1565.	1549.	1529.	1518.	1518.	1551.	1517.	1512.
0.0	1571.	1571.	1571.	1571.	1571.	1571.	1571.	1571.	1571.	1571.	1571.

CONE OF MAXIMUM CANDELA

REPORT NUMBER: RAB01418
 ISSUE DATE: 12/15/15
 PREPARED FOR: RAB LIGHTING INC.

PAGE: 9 OF 9
 DATE SAMPLE TESTED: 12/15/15

5-DEGREE ZONAL LUMEN SUMMARY

0- 5	37
5- 10	111
10- 15	189
15- 20	271
20- 25	356
25- 30	432
30- 35	498
35- 40	579
40- 45	715
45- 50	880
50- 55	987
55- 60	1089
60- 65	1207
65- 70	1438
70- 75	1757
75- 80	1584
80- 85	586
85- 90	30
90- 95	2
95-100	2
100-105	2
105-110	2
110-115	1
115-120	1
120-125	1
125-130	0
130-135	0
135-140	0
140-145	0
145-150	0
150-155	0
155-160	0
160-165	0
165-170	0
170-175	0
175-180	0

10-DEGREE ZONAL LUMEN SUMMARY

0- 10	148
0- 20	607
0- 30	1395
0- 40	2472
0- 50	4067
0- 60	6143
0- 70	8788
0- 80	12129
0- 90	12745
0-100	12748
0-110	12752
0-120	12754
0-130	12755
0-140	12756
0-150	12756
0-160	12757
0-170	12757
0-180	12757

REPORT NUMBER: RAB01524
DATE: 12/15/2015
PREPARED FOR: RAB LIGHTING INC.
CATALOG NUMBER: ALED5S150Y/D10 (TYPE V Square)

ADDRESS: 170 LUDLOW AVE, NORTHVALE, NJ 07647

LUMINAIRE: CAST FINNED METAL HOUSING, 4 WHITE CIRCUIT BOARD WITH 11 LEDS, MOLDED 1-PIECE PLASTIC REFLECTOR WITH SPECULAR FINISH, CLEAR POLYCARBONATE LENS IN CAST BRONZE PAINTED METAL FRAME.

LAMP: FORTY-FOUR WHITE LIGHT EMITTING DIODES (LEDs), TILTED 80-DEGREES FROM VERTICAL BASE-UP POSITION.

DRIVER: 2 X RDD-U85-A2100

OBJECT OF TEST: DATA SHOWN IS ABSOLUTE FOR THE SAMPLE PROVIDED AT THE RATED INPUT VOLTAGES (120.0 AND 277.0 VAC, 60Hz) TO THE TEST SAMPLE.

INSTRUMENTS:	CHROMA PROGRAMMABLE AC POWER SOURCE MODEL 61602	Calibration Due: N/A
	CHROMA PROGRAMMABLE DIGITAL POWER METER MODEL 66202	3/9/16
	OCEAN OPTICS QE65PRO Spectroradiometer	11/10/16
	RAB 2.0 meter Diameter Integrating Sphere, 4PI Geometry	11/10/16

OBJECT OF TEST: Measure the Absolute Flux in lumens*, Total Radiant Flux*, Spectral Power Distribution (SPD), Correlated Color Temperature (CCT), Color Rendering Indices (CRIa,1-14), Chromaticity Coordinates (x,y; u'v'), ANSI C78.377 Duv, and electrical data including ANSI C82.77-2002 Power Factor (PF), and Total Harmonic Distortion (THD) to the test sample. Measure electrical data including Total Harmonic Distortion (THD) at maximum nominal rated input voltage. Report Off-State Power.

PROCEDURE: The test sample was mounted inside the integrating sphere, energized, and allowed to stabilize. After stabilization occurred, measurements were taken. In order to measure mean performance, multiple data sets were recorded and averaged. Readings were taken with the test sample operating at 60 HZ input in a 25 +/-1 degree Celsius free air ambient and in accordance with IESNA LM-79-08. Electrical data was also recorded at maximum nominal rated input voltage (277.0 VAC). All data are traceable to the National Institute of Standards and Technology. Off-State Power was reported with no voltage applied to the sample.

*NOTE: Proper calibration of integrating spheres for measuring total flux output of non-directional samples will produce reliable, repeatable results within the calibration tolerances of the equipment used. However, measurement of test samples with significant self absorption and/or directional output, even when these effects are compensated for, are likely to have a greater variation in results compared to the flux output calculated from a goniophotometric exploration since these artifacts do not affect the goniophotometric results.

RESULTS: (continued subsequent pages)

Checked X.CAO

Approved D.WANG-MUNSON
Lighting Engineer

REPORT NUMBER: RAB01524
 DATE: 12/15/2015
 PREPARED FOR: RAB LIGHTING INC.
 CATALOG NUMBER: ALED5S150Y/D10 (TYPE V Square)

Page 2 of 4

RESULTS:

PHOTOMETRIC	
Total Integrated Flux (lumens)	12757 *
SPECTRORADIOMETRIC	
Observer	CIE 1931 2 degree
Chromaticity Ordinate x	0.4302
Chromaticity Ordinate y	0.4082
Observer	CIE 1976 2 degree
Chromaticity Ordinate u'	0.2445
Chromaticity Ordinate v'	0.5220
Correlated Color Temp CCT (K)	3150
ANSI C78.377-2008 Duv	0.003
Total Radiant Flux (milliWatts)	36802 *
ELECTRICAL	
Input Voltage (Volts AC)	120.0
Input Current (Amps AC)	1.24
Input Power (Watts)	148.8
Input Power Factor (%)	99.6
Input Current THD (%)	7.1
Input Voltage THD (%)	0.2
EFFICACY (Lumens/Watt)	
	85.7
ELECTRICAL AT MAX NONIMAL INPUT	
Input Voltage (Volts AC)	277.0
Input Current (Amps AC)	0.569
Input Power (Watts)	146.4
Input Power Factor (%)	92.9
Input Current THD (%)	14.2
Input Voltage THD (%)	0.2
Off-State Power (Watts)	0.0

COLOR RENDERING INDICES	CRI
Ra (Average 1-8)	73
R1 Light greyish red	69
R2 Dark greyish yellow	80
R3 Strong yellowish green	89
R4 Moderate yellowish green	72
R5 Light bluish green	69
R6 Light blue	72
R7 Light violet	80
R8 Light reddish purple	49
R9 Strong red	-25
R10 Strong yellow	53
R11 Strong green	68
R12 Strong blue	49
R13 Light yellowish pink (skin)	70
R14 Moderate olive green (leaf)	94

*NOTE:

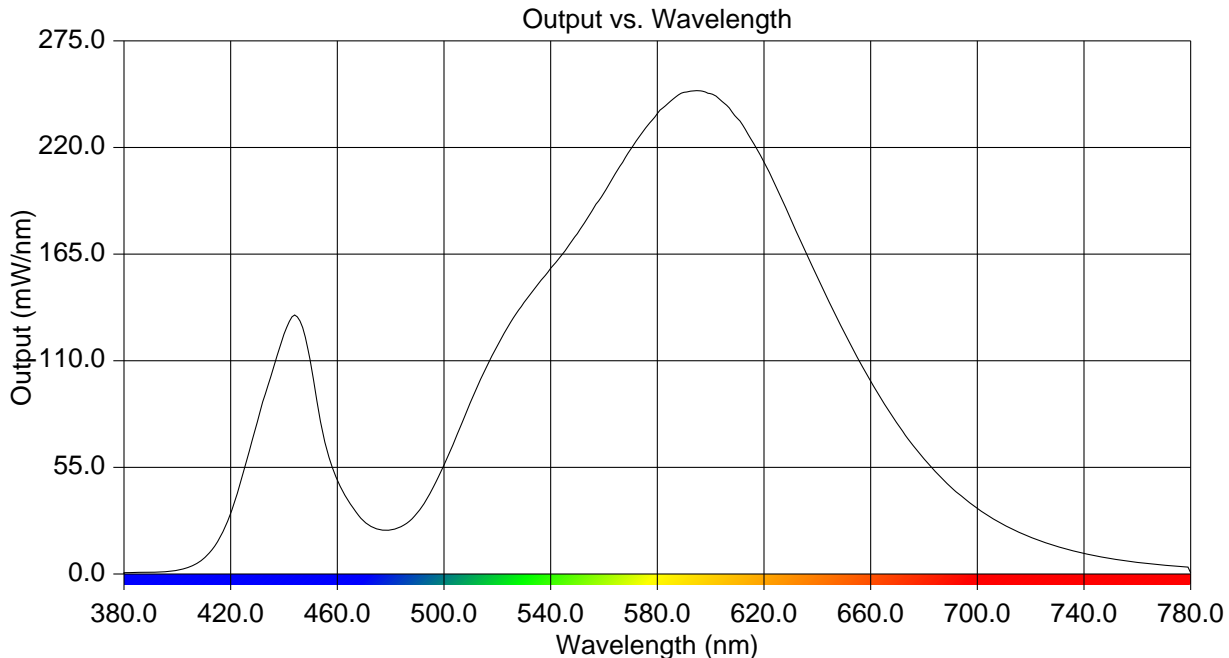
Proper calibration of integrating spheres for measuring total flux output of non-directional samples will produce reliable, repeatable results within the calibration tolerances of the equipment used. However, measurement of test samples with significant self absorption and/or directional output, even when these effects are compensated for, are likely to have a greater variation in results compared to the flux output calculated from a goniophotometric exploration since these artifacts do not affect the goniophotometric results.

REPORT NUMBER: RAB01524
 DATE: 12/15/2015
 PREPARED FOR: RAB LIGHTING INC.
 CATALOG NUMBER: ALED5S150Y/D10 (TYPE V Square)

Page 3 of 4

RESULTS:

Wavelength	mW per nm	Wavelength	mW per nm	Wavelength	mW per nm
380	0.648	515	104.296	650	124.862
385	0.746	520	117.951	655	111.647
390	0.864	525	129.836	660	99.468
395	1.190	530	139.997	665	87.995
400	1.971	535	148.969	670	77.741
405	3.824	540	157.669	675	67.924
410	8.145	545	165.981	680	59.426
415	16.379	550	175.455	685	51.738
420	31.216	555	186.082	690	44.985
425	53.511	560	196.443	695	39.128
430	78.390	565	208.175	700	33.836
435	101.537	570	218.999	705	29.254
440	123.688	575	228.857	710	25.315
445	132.583	580	237.388	715	21.907
450	108.157	585	243.850	720	18.983
455	70.206	590	248.371	725	16.396
460	48.364	595	249.144	730	14.184
465	35.892	600	247.599	735	12.236
470	27.186	605	242.778	740	10.596
475	23.193	610	234.964	745	9.193
480	22.747	615	224.499	750	7.945
485	25.264	620	212.314	755	6.914
490	31.581	625	198.421	760	6.003
495	42.215	630	183.118	765	5.237
500	56.249	635	167.770	770	4.555
505	72.200	640	153.072	775	3.985
510	88.818	645	138.646	780	0.605



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Page 4 of 4

CIE Chromaticity Diagram

