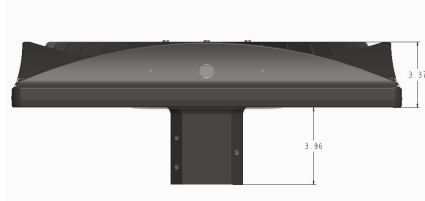


ISOFOOTCANDLE LINES OF HORIZONTAL ILLUMINATION

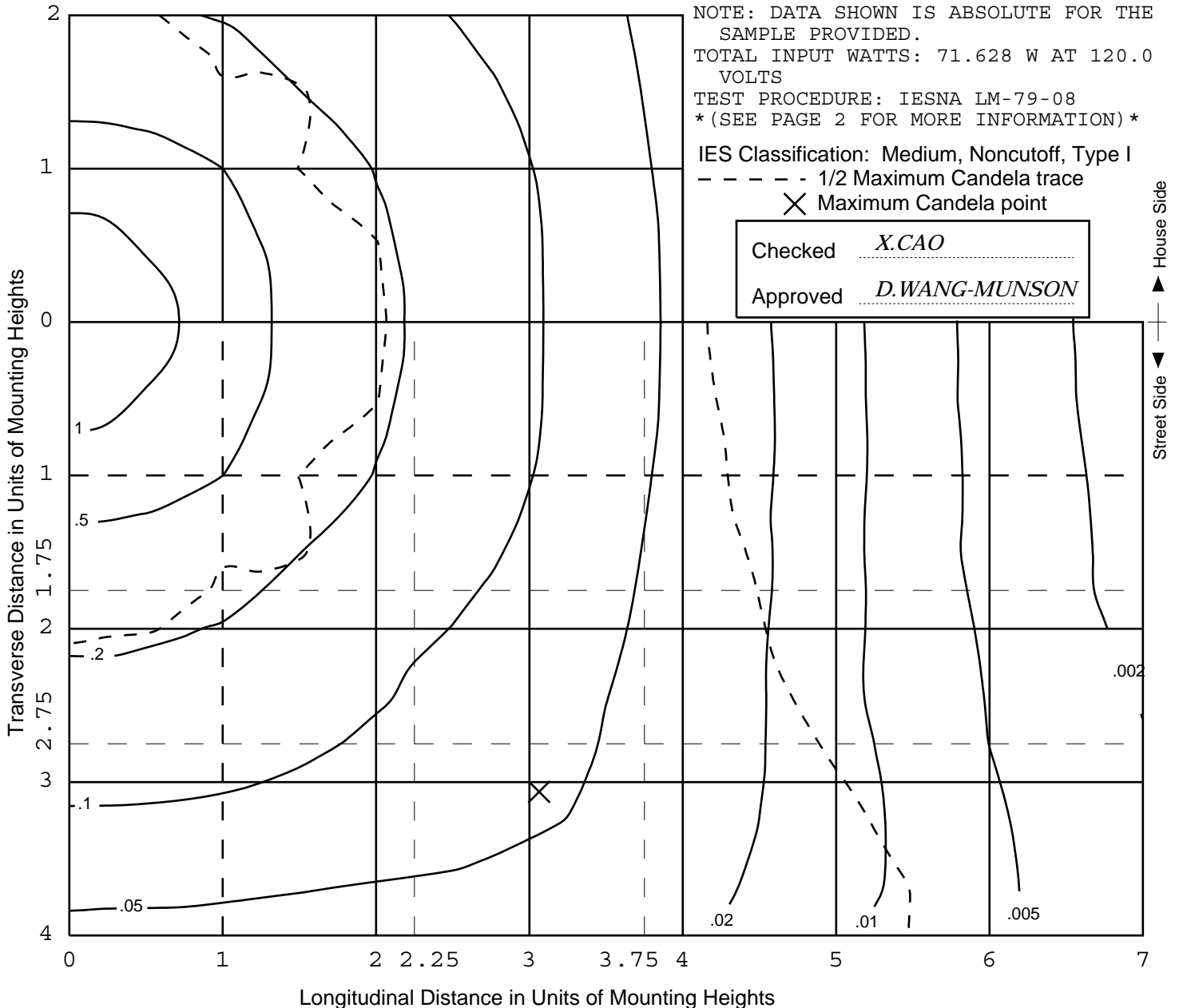
Values based on 25 foot mounting height.



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 DATE SAMPLE TESTED: 12/15/15
 PREPARED FOR: RAB LIGHTING INC.
 CATALOG NUMBER: ALED5S78/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: 71.628 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: RAB01404
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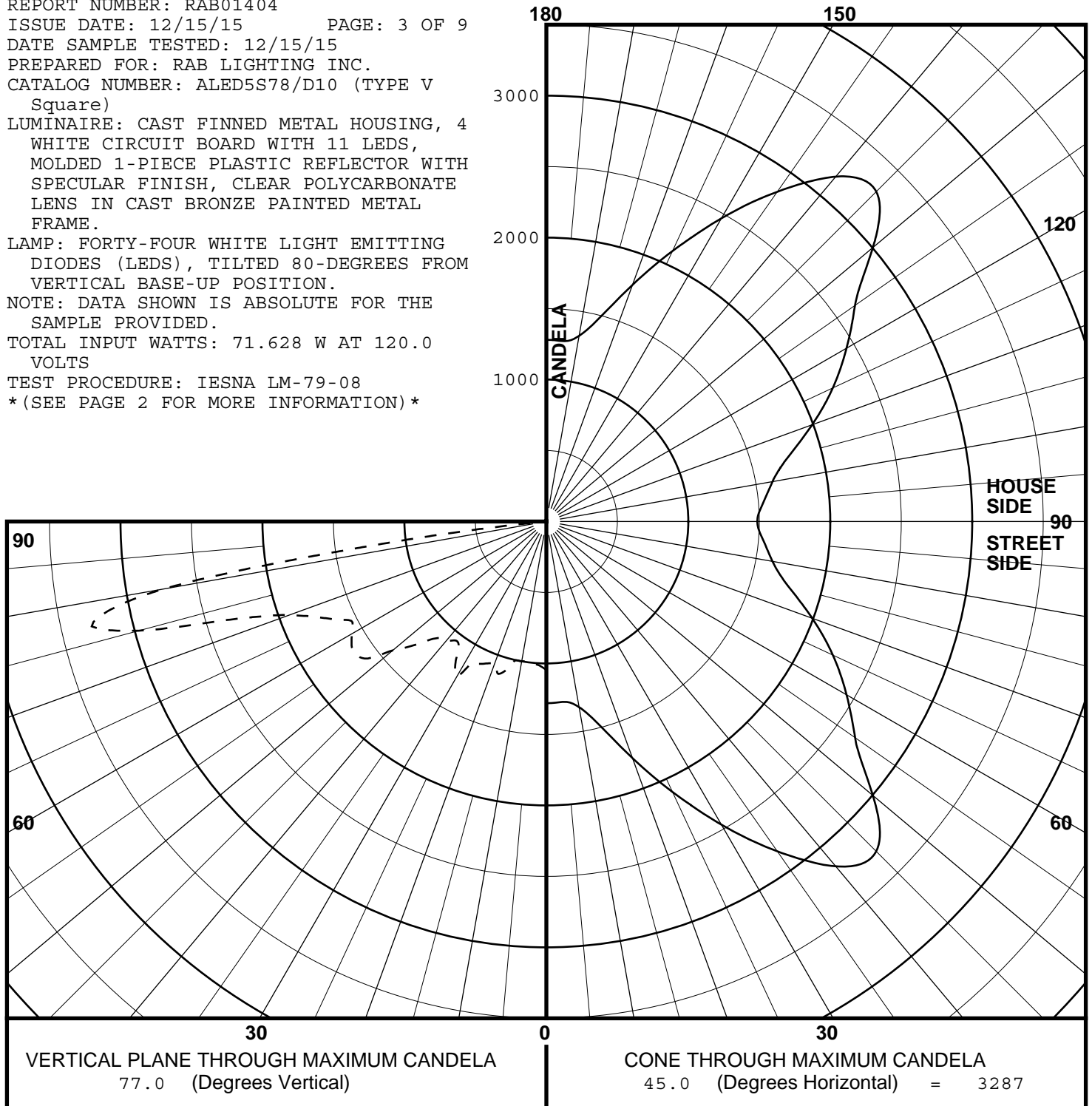
PAGE: 2 OF 9
DATE SAMPLE TESTED: 12/15/15

ADDITIONAL INFORMATION

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

MAXIMUM PLANE AND MAXIMUM CONE PLOTS OF CANDELA

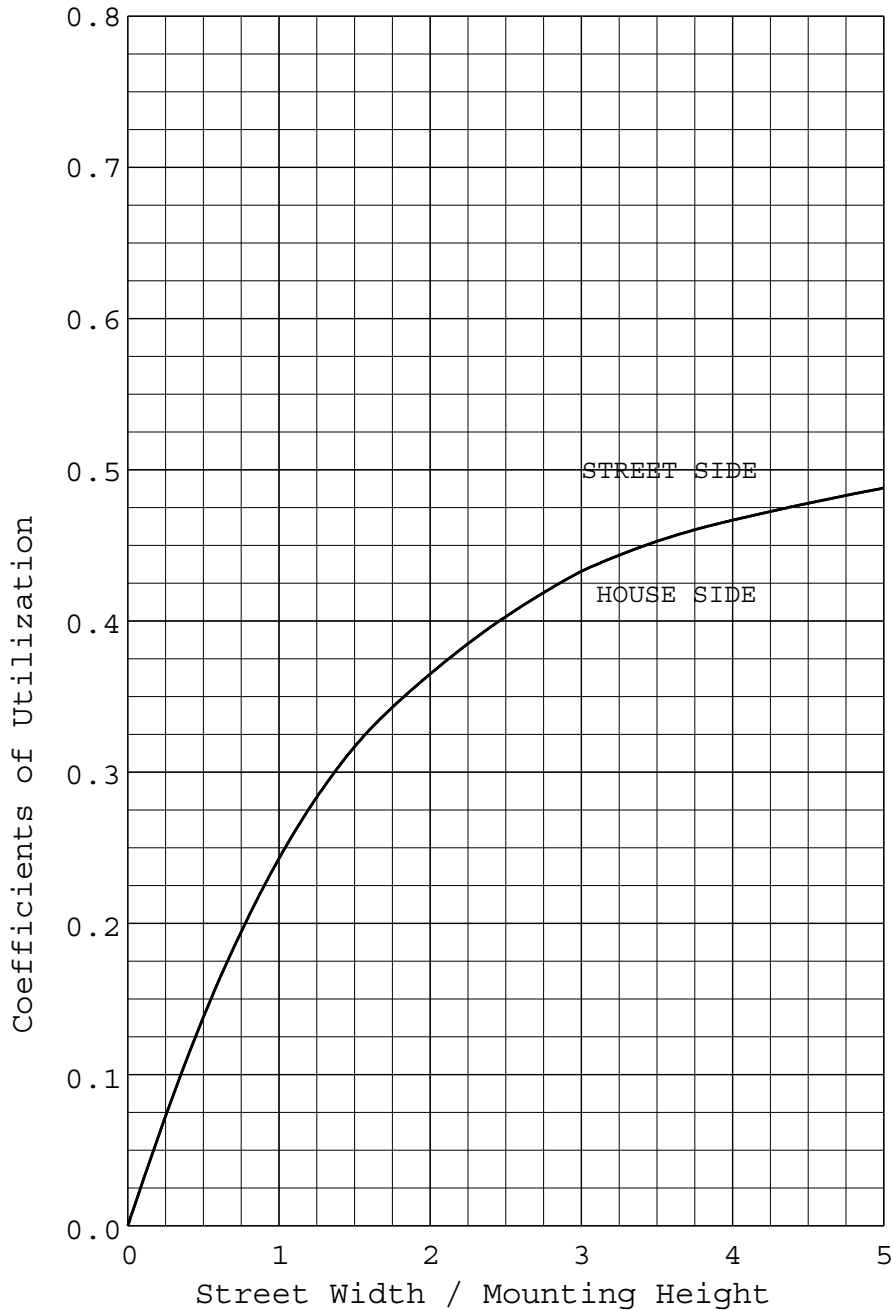
REPORT NUMBER: RAB01404
 ISSUE DATE: 12/15/15 PAGE: 3 OF 9
 DATE SAMPLE TESTED: 12/15/15
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 (SEE PAGE 2 FOR MORE INFORMATION)



REPORT NUMBER: RAB01404
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PAGE: 4 OF 9
DATE SAMPLE TESTED: 12/15/15

COEFFICIENTS OF UTILIZATION AND FLUX DISTRIBUTION



	LUMENS	PERCENT OF FIXTURE
DOWNWARD STREET SIDE	4184.	50.0
DOWNWARD HOUSE SIDE	4184.	50.0
DOWNWARD TOTAL	8368.	100.0
UPWARD STREET SIDE	0.	0.0
UPWARD HOUSE SIDE	0.	0.0
UPWARD TOTAL	0.	0.0
TOTAL FLUX	8368.	100.0
TOTAL INPUT WATTS = 71.6		
EFFICACY = 116.9 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: RAB01404
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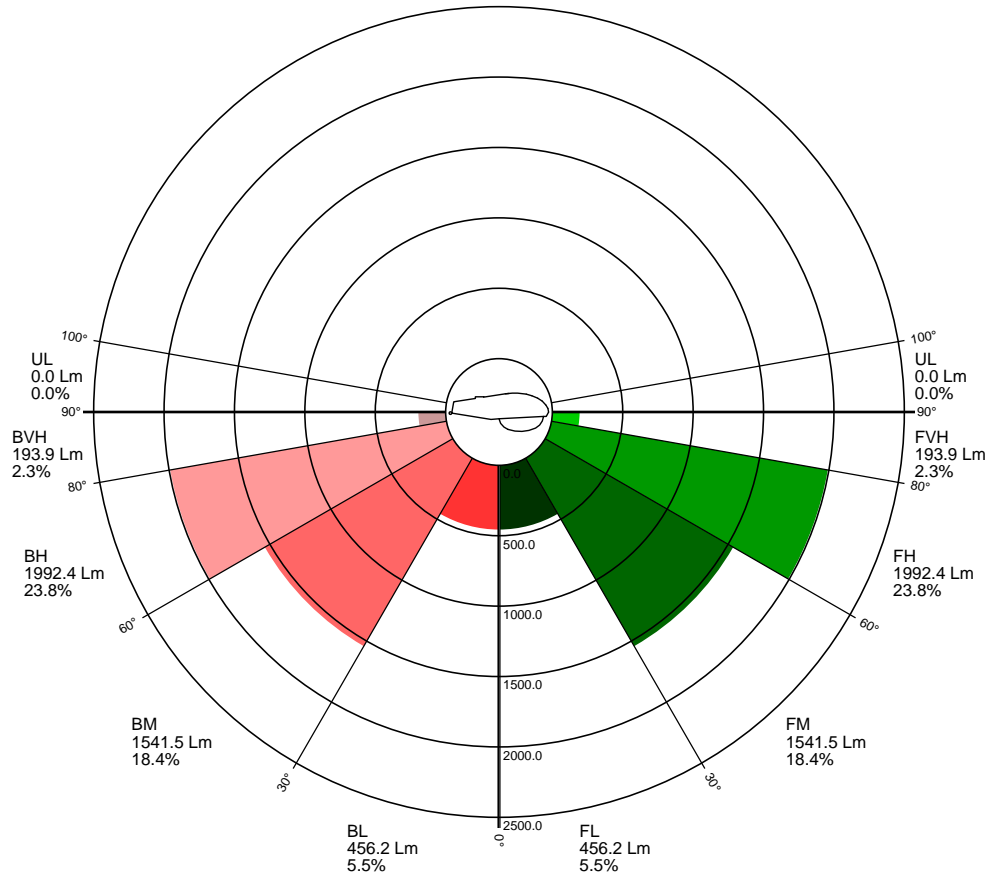
PAGE: 5 OF 9
 DATE SAMPLE TESTED: 12/15/15

BUG Rating:				B3	U0	G2
Zonal Summary		Lumens	% of Fixture	Zone Ratings		
				B	U	G
Forward		4184	50.0			
FL	(0° – 30°)	456.2	5.5			
FM	(30° – 60°)	1541.5	18.4			
FH	(60° – 80°)	1992.4	23.8			G2
FVH	(80° – 90°)	193.9	2.3			G2
Backward		4184	50.0			
BL	(0° – 30°)	456.2	5.5	B1		
BM	(30° – 60°)	1541.5	18.4	B2		
BH	(60° – 80°)	1992.4	23.8	B3		G2
BVH	(80° – 90°)	193.9	2.3			G2
Upward		0	0.0			
UL	(90° – 100°)	0.0	0.0		U0	
UH	(100° – 180°)	0.0	0.0		U0	
Trapped Light		0	0.0			
Total Flux		8368	100.0			

Zonal Lumen Summary

(Linear scale)

UH
0.0 Lm
0.0%

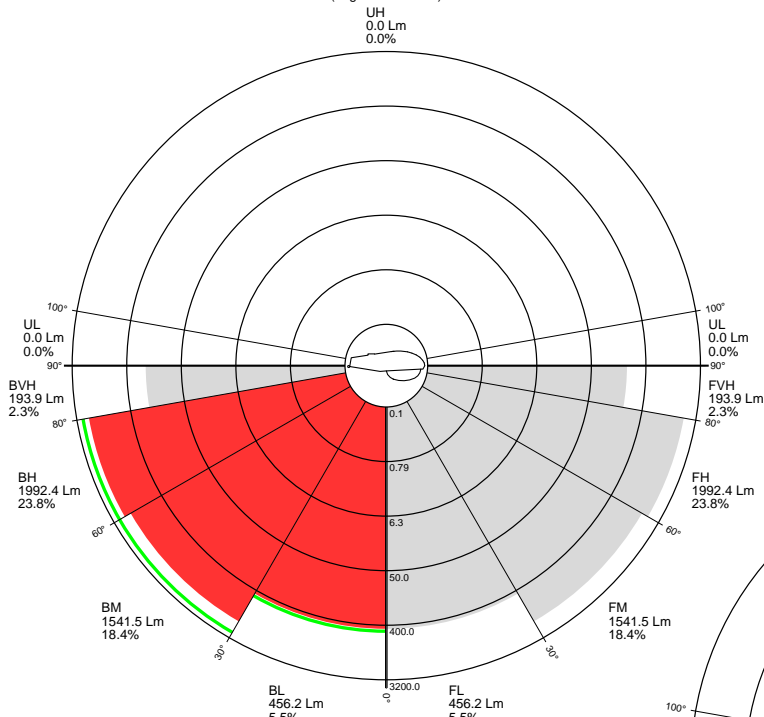


REPORT NUMBER: RAB01404
 ISSUE DATE: 12/15/15
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 DATE SAMPLE TESTED: 12/15/15

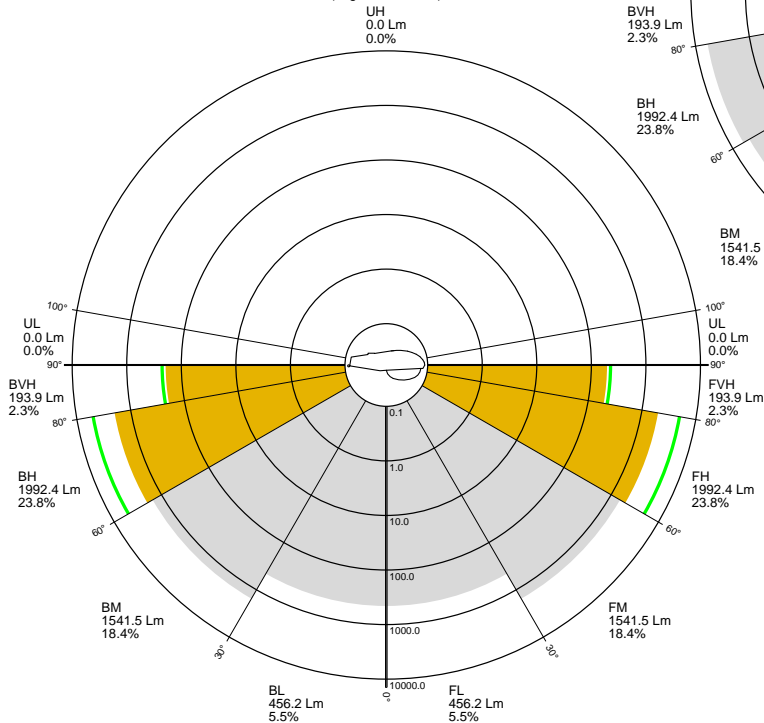
Backlight Rating Details

(Logarithmic scale)



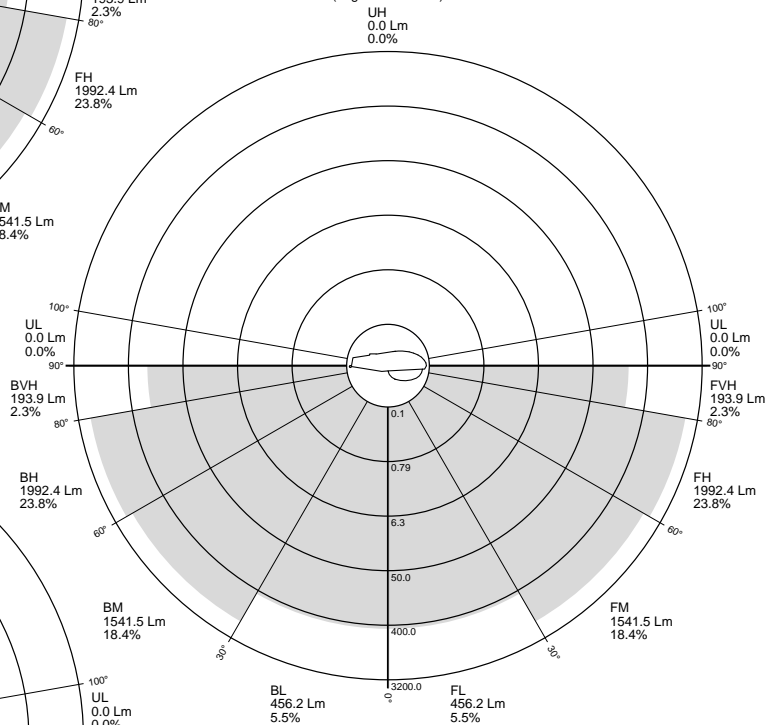
Glare Rating Details

(Logarithmic scale)



Uplight Rating Details

(Logarithmic scale)



CONE OF MAXIMUM CANDELA

REPORT NUMBER: RAB01404
 ISSUE DATE: 12/15/15
 PREPARED FOR: RAB LIGHTING INC.

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 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	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
175.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
165.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
155.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
145.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
135.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
125.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
115.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
105.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
95.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
90.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
87.5	4.	4.	4.	6.	13.	14.	11.	6.	3.	3.	4.
85.0	17.	21.	57.	149.	267.	35.	260.	166.	41.	16.	14.
82.5	73.	98.	256.	729.	1366.	1031.	1389.	615.	232.	88.	72.
V 80.0	680.	697.	835.	1203.	2139.	2750.	1843.	1067.	780.	665.	652.
E 77.5	1316.	1365.	1565.	2089.	2676.	3268.	2762.	1872.	1317.	1120.	1111.
R 77.0<<	1486.	1534.	1765.	2227.	2654.	3287.	2836.	2102.	1499.	1276.	1281.
T 75.0	2085.	2095.	2242.	2398.	2677.	2972.	2751.	2562.	2338.	2060.	2081.
I 72.5	2139.	2161.	2303.	2373.	2322.	2273.	2441.	2478.	2385.	2303.	2279.
C 70.0	2114.	2104.	2128.	2136.	1963.	1928.	2030.	2169.	2213.	2223.	2208.
A 67.5	1919.	1916.	1900.	1877.	1759.	1756.	1774.	1875.	1920.	1947.	1932.
L 65.0	1669.	1682.	1660.	1762.	1698.	1634.	1675.	1723.	1654.	1685.	1666.
62.5	1553.	1558.	1574.	1665.	1695.	1539.	1662.	1621.	1550.	1535.	1502.
A 60.0	1471.	1483.	1536.	1624.	1614.	1582.	1616.	1553.	1513.	1448.	1417.
N 57.5	1498.	1479.	1536.	1506.	1608.	1627.	1583.	1478.	1525.	1422.	1440.
G 55.0	1389.	1389.	1456.	1499.	1543.	1633.	1545.	1483.	1434.	1374.	1383.
L 52.5	1374.	1369.	1449.	1497.	1522.	1585.	1506.	1494.	1409.	1358.	1365.
E 50.0	1398.	1402.	1475.	1507.	1405.	1414.	1431.	1515.	1454.	1383.	1382.
47.5	1413.	1426.	1512.	1480.	1319.	1302.	1346.	1538.	1503.	1400.	1405.
45.0	1375.	1365.	1405.	1420.	1224.	1188.	1214.	1499.	1456.	1389.	1396.
42.5	1308.	1295.	1320.	1280.	1160.	1114.	1160.	1277.	1366.	1332.	1353.
40.0	1219.	1196.	1210.	1162.	1108.	1097.	1124.	1152.	1235.	1175.	1191.
37.5	1183.	1162.	1160.	1102.	1148.	1056.	1168.	1098.	1192.	1155.	1170.
35.0	1138.	1114.	1075.	1104.	1151.	1076.	1169.	1092.	1110.	1118.	1135.
30.0	1120.	1101.	1057.	1057.	1135.	1258.	1100.	1085.	1082.	1091.	1104.
25.0	1118.	1111.	1132.	1179.	1102.	1107.	1123.	1195.	1113.	1103.	1107.
20.0	1087.	1077.	1070.	1047.	1083.	1063.	1121.	1092.	1079.	1097.	1103.
15.0	1068.	1063.	1051.	1059.	1062.	1080.	1065.	1029.	1031.	1045.	1048.
10.0	1056.	1053.	1030.	1035.	1022.	1000.	980.	1008.	996.	1015.	1021.
5.0	1015.	1016.	1035.	1010.	1009.	1007.	1002.	1001.	1027.	1008.	1005.
0.0	1044.	1044.	1044.	1044.	1044.	1044.	1044.	1044.	1044.	1044.	1044.

CONE OF MAXIMUM CANDELA

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5-DEGREE ZONAL LUMEN SUMMARY

0- 5	24
5- 10	73
10- 15	124
15- 20	176
20- 25	233
25- 30	283
30- 35	325
35- 40	380
40- 45	466
45- 50	570
50- 55	637
55- 60	705
60- 65	782
65- 70	950
70- 75	1206
75- 80	1046
80- 85	370
85- 90	17
90- 95	0
95-100	0
100-105	0
105-110	0
110-115	0
115-120	0
120-125	0
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	97
0- 20	397
0- 30	912
0- 40	1617
0- 50	2654
0- 60	3995
0- 70	5728
0- 80	7980
0- 90	8368
0-100	8368
0-110	8368
0-120	8368
0-130	8368
0-140	8368
0-150	8368
0-160	8368
0-170	8368
0-180	8368

REPORT NUMBER: RAB01405
DATE: 12/14/2015
PREPARED FOR: RAB LIGHTING INC.
CATALOG NUMBER: ALED5S78/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: 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: RAB01405
 DATE: 12/14/2015
 PREPARED FOR: RAB LIGHTING INC.
 CATALOG NUMBER: ALED5S78/D10 (TYPE V Square)

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RESULTS:

PHOTOMETRIC	
Total Integrated Flux (lumens)	8368 *
SPECTRORADIOMETRIC	
Observer	CIE 1931 2 degree
Chromaticity Ordinate x	0.3489
Chromaticity Ordinate y	0.3620
Observer	CIE 1976 2 degree
Chromaticity Ordinate u'	0.2100
Chromaticity Ordinate v'	0.4902
Correlated Color Temp CCT (K)	4897
ANSI C78.377-2008 Duv	0.004
Total Radiant Flux (milliWatts)	25142 *
ELECTRICAL	
Input Voltage (Volts AC)	120.0
Input Current (Amps AC)	0.600
Input Power (Watts)	71.6
Input Power Factor (%)	99.5
Input Current THD (%)	8.0
Input Voltage THD (%)	0.2
EFFICACY (Lumens/Watt)	
	116.9
ELECTRICAL AT MAX NONIMAL INPUT	
Input Voltage (Volts AC)	277.0
Input Current (Amps AC)	0.276
Input Power (Watts)	70.6
Input Power Factor (%)	92.3
Input Current THD (%)	14.4
Input Voltage THD (%)	0.2
Off-State Power (Watts)	0.0

COLOR RENDERING INDICES	CRI
Ra (Average 1-8)	73
R1 Light greyish red	71
R2 Dark greyish yellow	76
R3 Strong yellowish green	80
R4 Moderate yellowish green	74
R5 Light bluish green	72
R6 Light blue	68
R7 Light violet	81
R8 Light reddish purple	60
R9 Strong red	-22
R10 Strong yellow	44
R11 Strong green	73
R12 Strong blue	46
R13 Light yellowish pink (skin)	71
R14 Moderate olive green (leaf)	89

*NOTE:

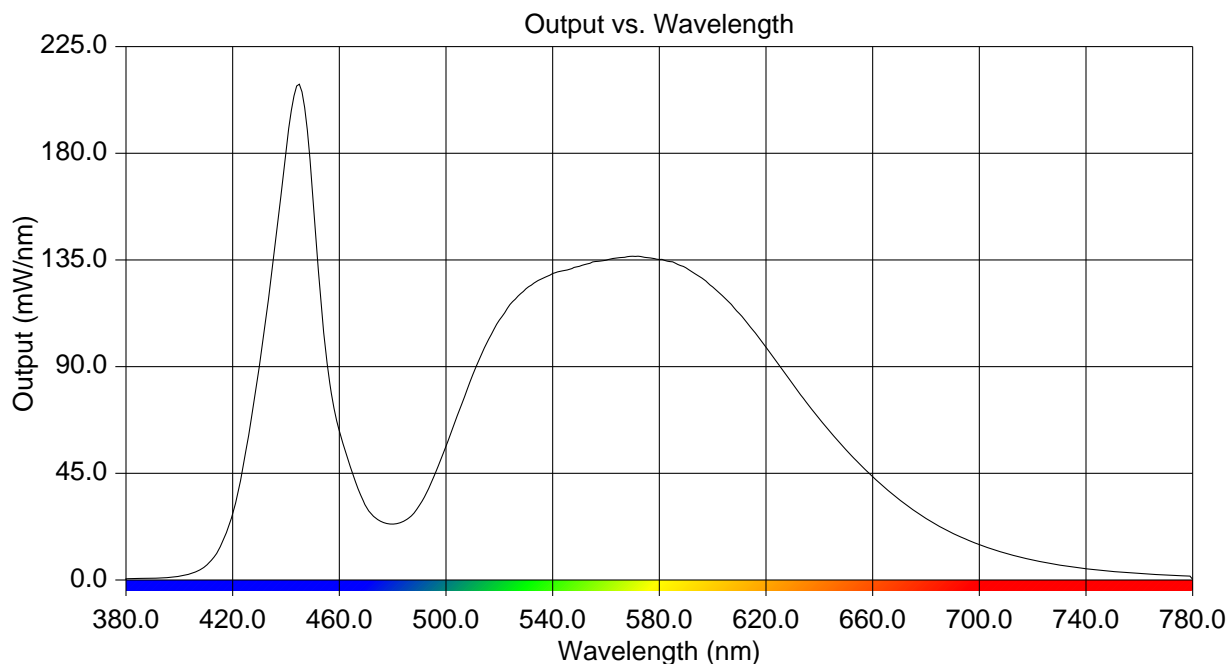
Proper calibration of integrating spheres for measuring total flux output of non-directional samples will produce reliable, repeatable results within the calibration tolerances of the equipment used. However, measurement of test samples with significant self absorption and/or directional output, even 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.

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RESULTS:

Wavelength	mW per nm	Wavelength	mW per nm	Wavelength	mW per nm
380	0.499	515	99.347	650	54.913
385	0.598	520	109.642	655	49.069
390	0.739	525	117.463	660	43.604
395	0.995	530	122.872	665	38.536
400	1.593	535	126.580	670	33.983
405	2.906	540	129.302	675	29.715
410	6.092	545	130.689	680	25.974
415	13.091	550	132.326	685	22.630
420	28.092	555	134.190	690	19.766
425	54.153	560	134.889	695	17.211
430	90.379	565	135.982	700	14.894
435	131.961	570	136.585	705	12.909
440	181.453	575	136.062	710	11.221
445	209.159	580	135.219	715	9.715
450	162.468	585	134.230	720	8.424
455	95.446	590	131.692	725	7.307
460	62.847	595	128.009	730	6.335
465	44.869	600	123.642	735	5.492
470	31.151	605	118.498	740	4.750
475	24.977	610	112.402	745	4.135
480	23.646	615	105.556	750	3.606
485	25.371	620	98.174	755	3.132
490	31.448	625	90.538	760	2.733
495	42.398	630	82.713	765	2.384
500	56.406	635	75.150	770	2.096
505	71.506	640	68.000	775	1.817
510	86.493	645	61.285	780	0.277



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CIE Chromaticity Diagram

