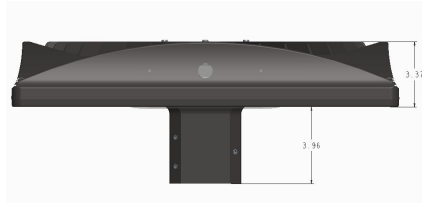


ISOFOOTCANDLE LINES OF HORIZONTAL ILLUMINATION

Values based on 25 foot mounting height.



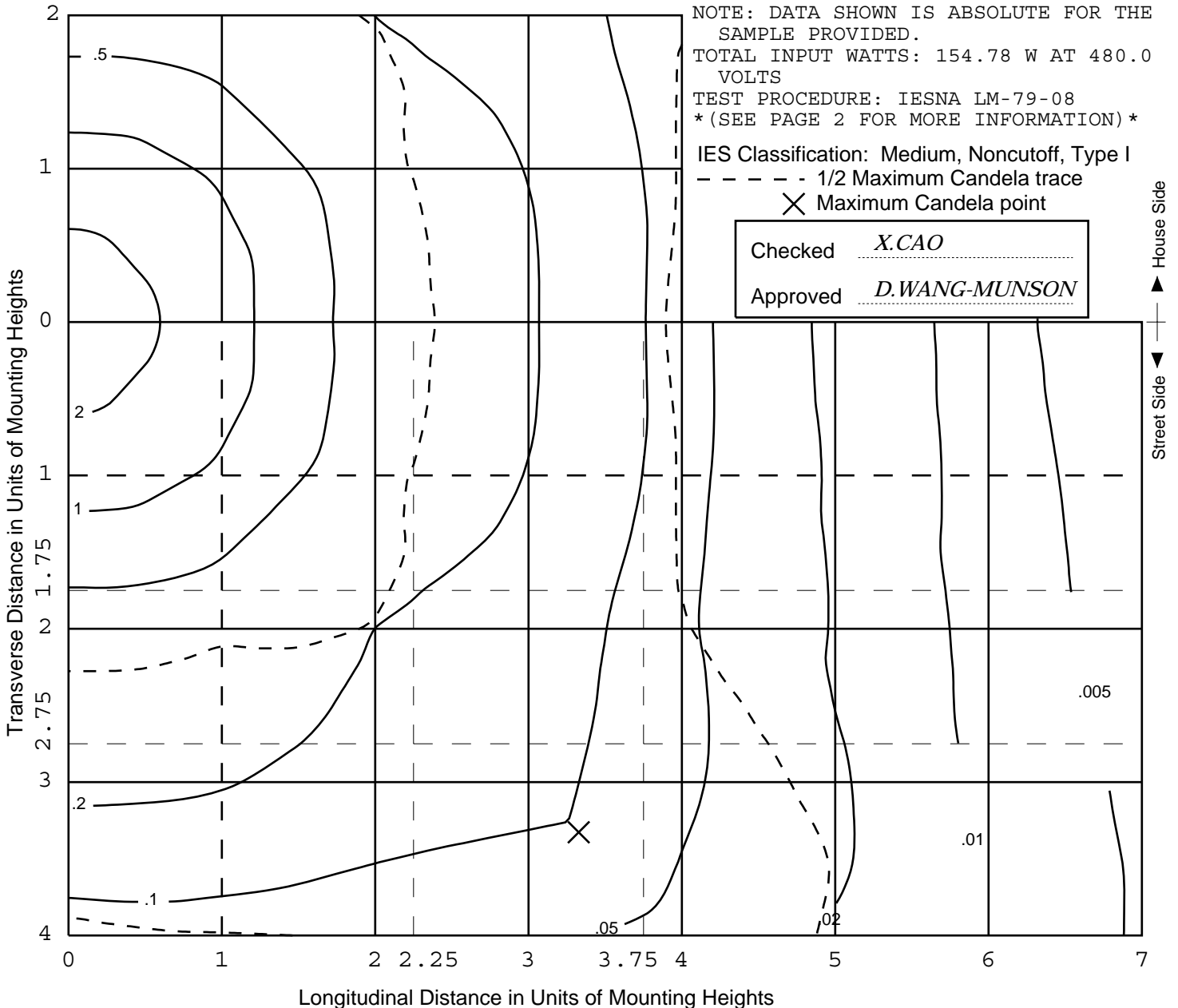
REPORT NUMBER: RAB01462
 ISSUE DATE: 12/17/15 PAGE: 1 OF 9
 DATE SAMPLE TESTED: 12/17/15
 PREPARED FOR: RAB LIGHTING INC.
 CATALOG NUMBER: ALED5S150/480/D10 (TYPE V Square)
 LUMINAIRE: CAST FINNED METAL HOUSING, 4 WHITE CIRCUIT BOARD WITH 11 LEDS, MOLDED 1-PIECE PLASTIC REFLECTOR WITH SPECULAR FINISH, 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: 154.78 W AT 480.0 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

Checked	<i>X.CAO</i>
Approved	<i>D.WANG-MUNSON</i>



REPORT NUMBER: RAB01462
ISSUE DATE: 12/17/15
PREPARED FOR: RAB LIGHTING INC.

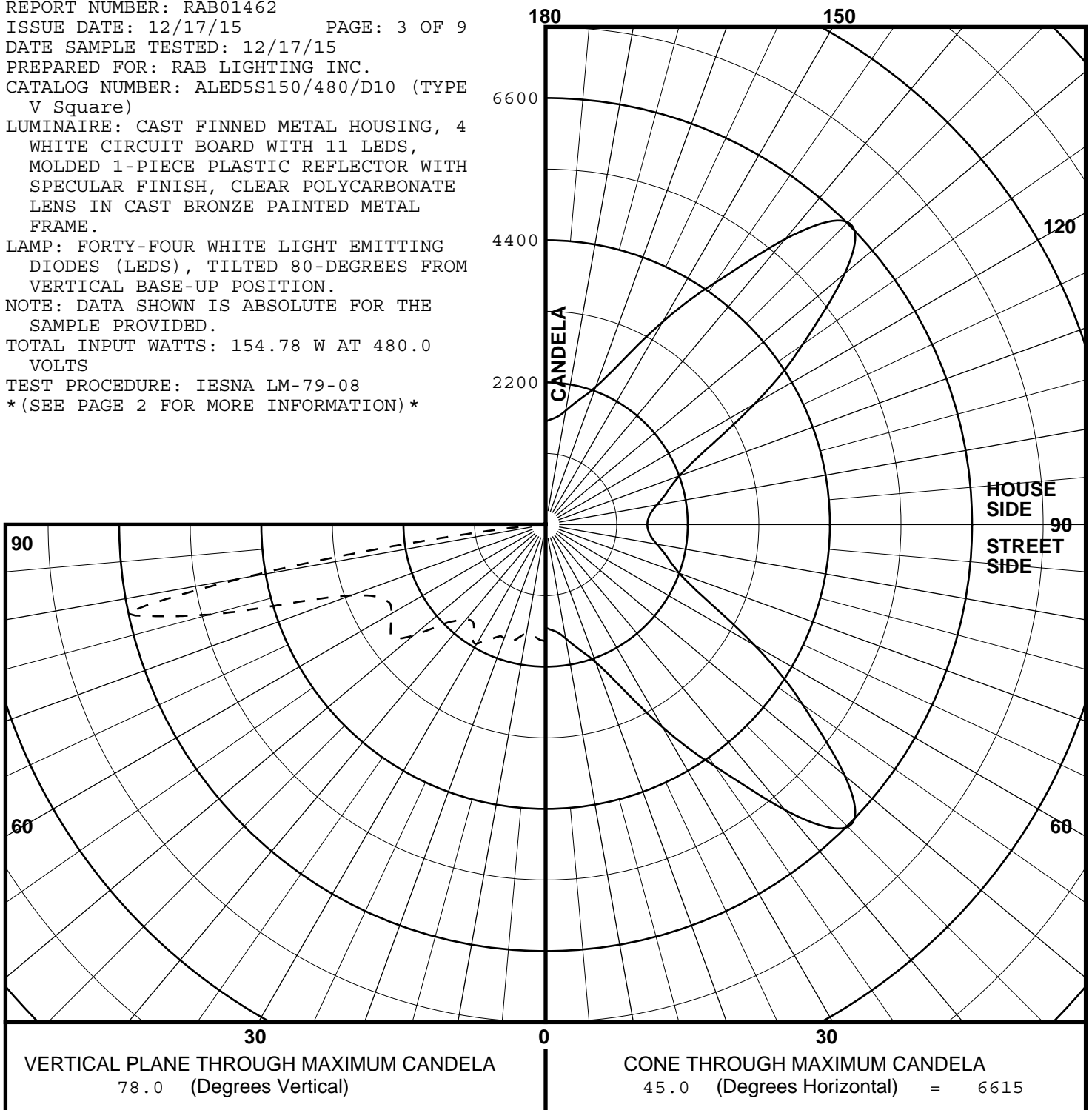
PAGE: 2 OF 9
DATE SAMPLE TESTED: 12/17/15

ADDITIONAL INFORMATION

TEST DISTANCE: 28.25 FEET
LED DRIVER: 2 X RDD-H100-A2000-480
ACCREDITED LABORATORY CODE 201085-0

MAXIMUM PLANE AND MAXIMUM CONE PLOTS OF CANDELA

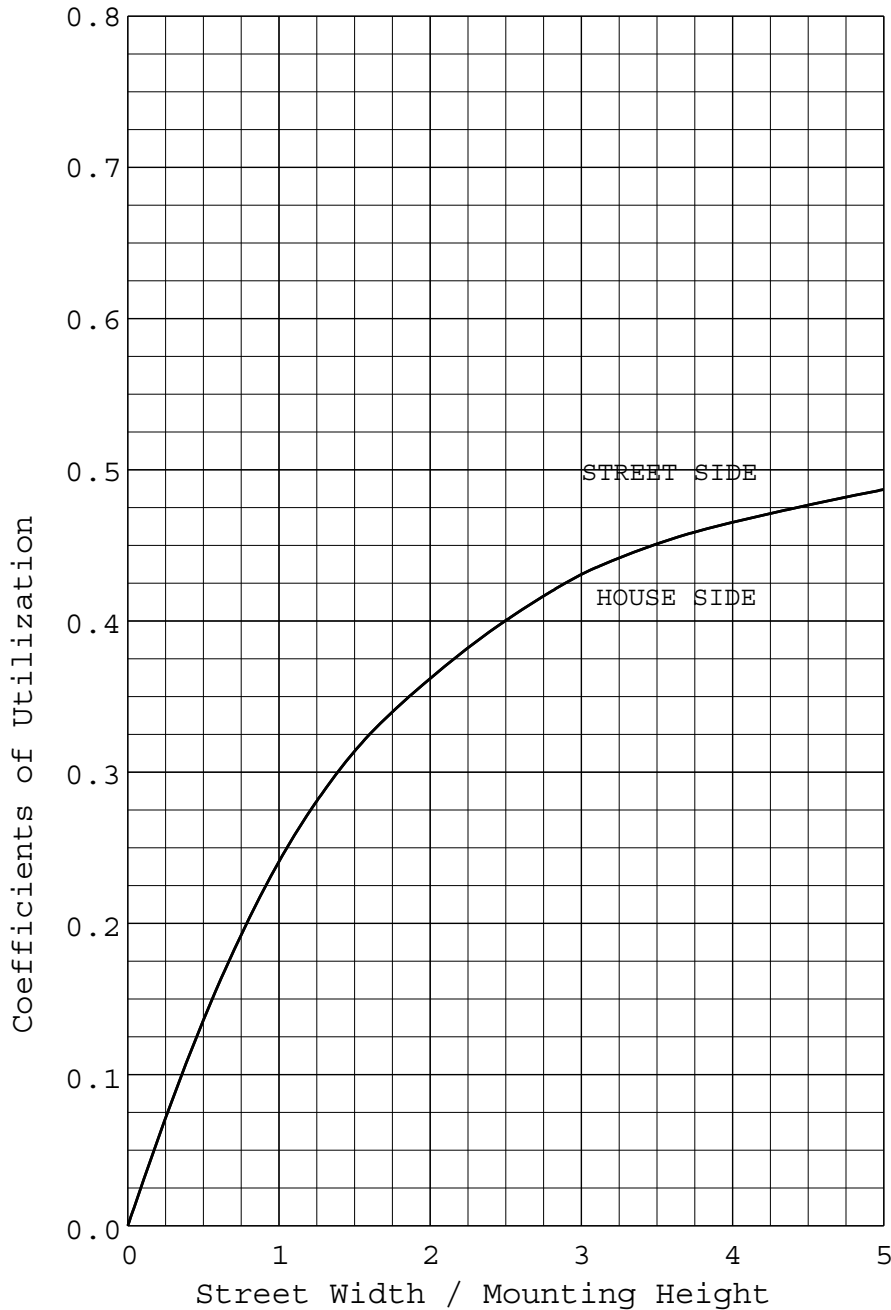
REPORT NUMBER: RAB01462
 ISSUE DATE: 12/17/15 PAGE: 3 OF 9
 DATE SAMPLE TESTED: 12/17/15
 PREPARED FOR: RAB LIGHTING INC.
 CATALOG NUMBER: ALED5S150/480/D10 (TYPE V Square)
 LUMINAIRE: CAST FINNED METAL HOUSING, 4 WHITE CIRCUIT BOARD WITH 11 LEDS, MOLDED 1-PIECE PLASTIC REFLECTOR WITH SPECULAR FINISH, 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: 154.78 W AT 480.0 VOLTS
 TEST PROCEDURE: IESNA LM-79-08
 (SEE PAGE 2 FOR MORE INFORMATION)



REPORT NUMBER: RAB01462
ISSUE DATE: 12/17/15
PREPARED FOR: RAB LIGHTING INC.

PAGE: 4 OF 9
DATE SAMPLE TESTED: 12/17/15

COEFFICIENTS OF UTILIZATION AND FLUX DISTRIBUTION



	LUMENS	PERCENT OF FIXTURE
DOWNWARD STREET SIDE	7450.	50.0
DOWNWARD HOUSE SIDE	7450.	50.0
DOWNWARD TOTAL	14901.	100.0
UPWARD STREET SIDE	0.	0.0
UPWARD HOUSE SIDE	0.	0.0
UPWARD TOTAL	0.	0.0
TOTAL FLUX	14901.	100.0
TOTAL INPUT WATTS = 154.8		
EFFICACY = 96.3 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: RAB01462
 ISSUE DATE: 12/17/15
 PREPARED FOR: RAB LIGHTING INC.

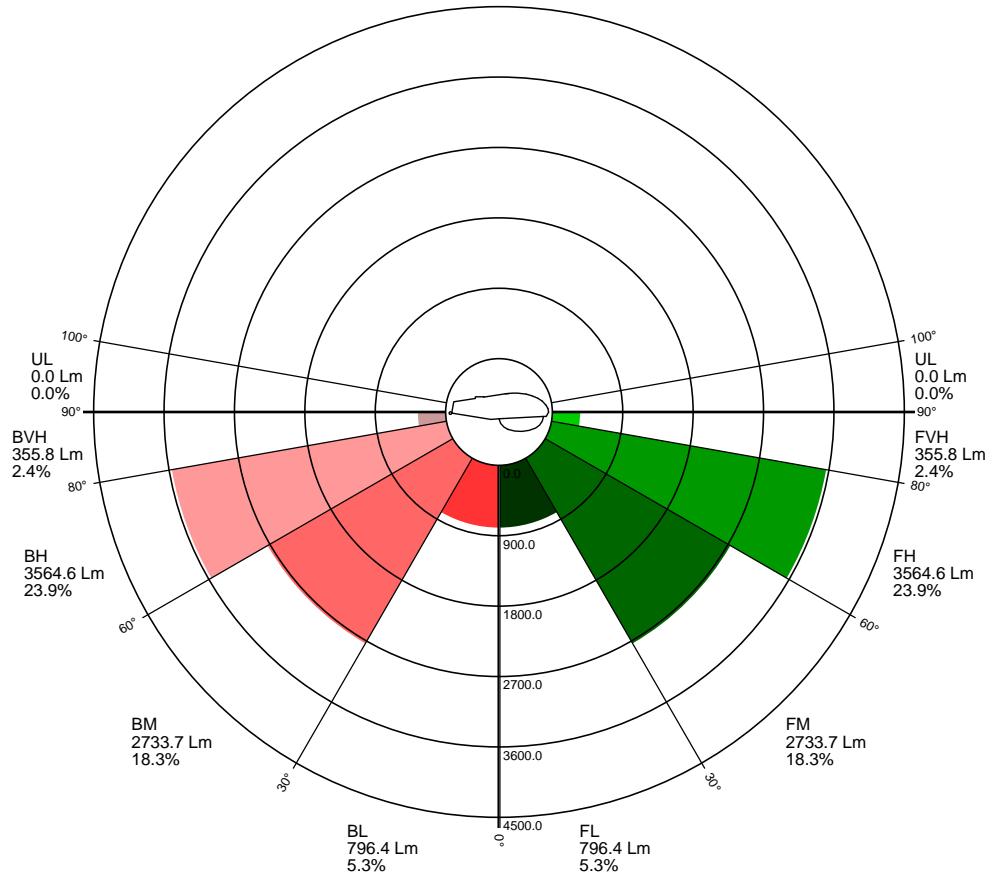
PAGE: 5 OF 9
 DATE SAMPLE TESTED: 12/17/15

BUG Rating:				B4 U0 G3		
Zonal Summary				Zone Ratings		
		Lumens	% of Fixture	B	U	G
<hr/>						
Forward		7450	50.0			
FL	(0° - 30°)	796.4	5.3			
FM	(30° - 60°)	2733.7	18.3			
FH	(60° - 80°)	3564.6	23.9			G2
FVH	(80° - 90°)	355.8	2.4			G3
Backward		7450	50.0			
BL	(0° - 30°)	796.4	5.3	B2		
BM	(30° - 60°)	2733.7	18.3	B3		
BH	(60° - 80°)	3564.6	23.9	B4		G2
BVH	(80° - 90°)	355.8	2.4			G3
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		14901	100.0			

Zonal Lumen Summary

(Linear scale)

UH
0.0 Lm
0.0%

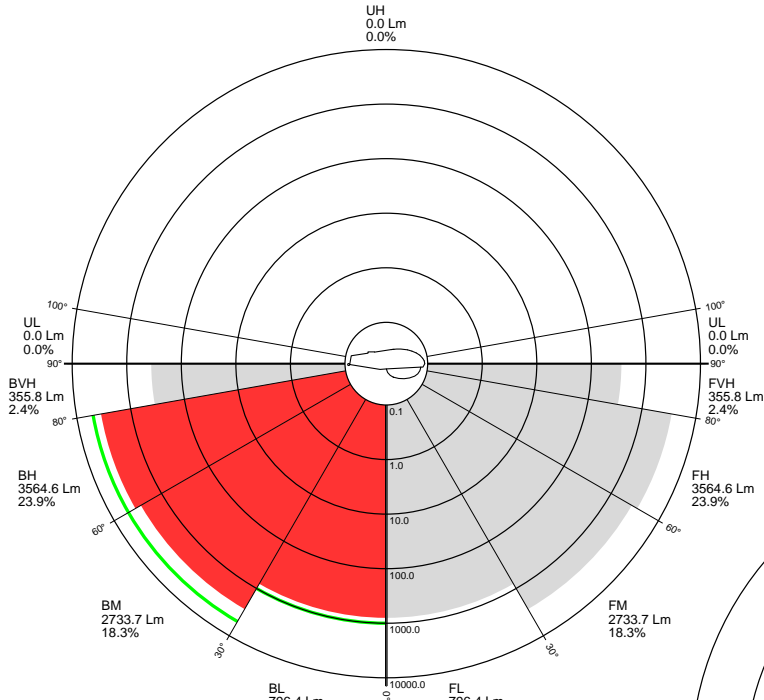


REPORT NUMBER: RAB01462
ISSUE DATE: 12/17/15
PREPARED FOR: RAB LIGHTING INC.

PAGE: 6 OF 9
DATE SAMPLE TESTED: 12/17/15

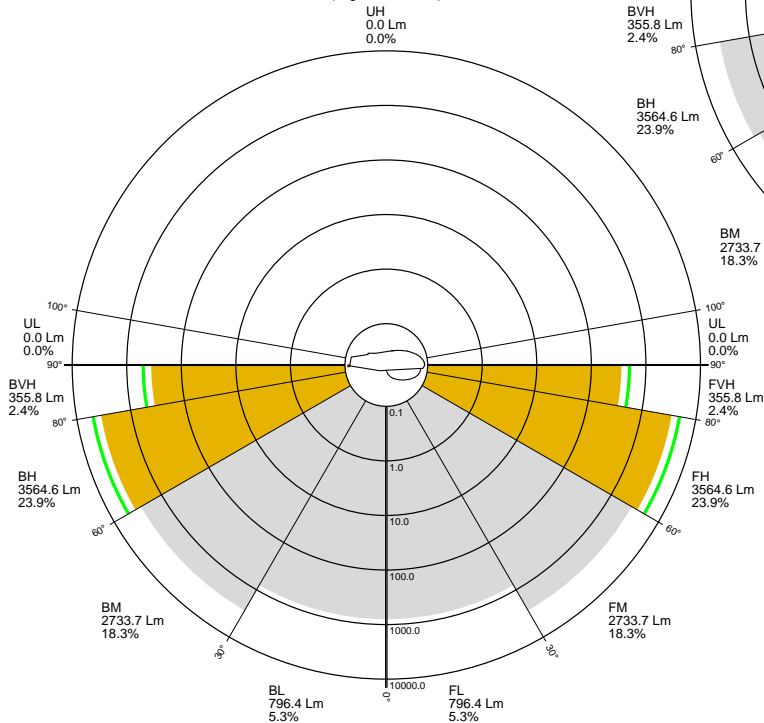
Backlight Rating Details

(Logarithmic scale)



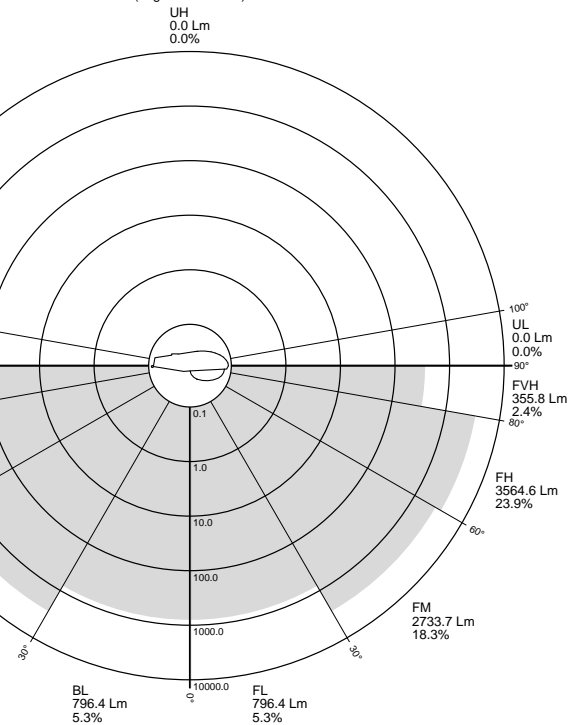
Glare Rating Details

(Logarithmic scale)



Uplight Rating Details

(Logarithmic scale)



PAGE: 7 OF 9
DATE SAMPLE TESTED: 12/17/15

STREET		LATERAL ANGLE									
		0.0	5.0	15.0	25.0	35.0	45.0	55.0	65.0	75.0	85.0
180.0		0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
175.0		0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
165.0		0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
155.0		0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
145.0		0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
135.0		0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
125.0		0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
115.0		0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
105.0		0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
95.0		0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
90.0		0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
87.5		10.	10.	11.	15.	24.	27.	25.	17.	11.	10.
85.0		35.	40.	112.	269.	375.	380.	402.	348.	159.	48.
82.5		139.	214.	620.	1210.	2232.	1781.	2242.	1328.	758.	398.
V	80.0	1242.	1262.	1495.	1894.	3545.	4766.	3637.	1939.	1419.	1213.
E	78.0<<	1595.	1657.	1998.	2784.	4565.	6615.	4858.	2737.	1948.	1613.
R	77.5	1815.	1927.	2319.	3142.	4905.	6504.	5151.	3104.	2200.	1865.
T	75.0	3734.	3915.	4471.	4997.	5165.	5379.	4961.	4736.	4477.	3869.
I	72.5	4683.	4677.	4822.	4650.	4304.	3940.	4080.	4445.	4492.	4358.
C	70.0	4170.	4157.	4118.	3930.	3498.	3211.	3361.	3808.	3950.	3928.
A	67.5	3553.	3525.	3483.	3410.	3035.	2889.	3012.	3247.	3292.	3389.
L	65.0	3047.	3045.	2946.	3055.	2816.	2745.	2912.	3018.	2811.	2885.
	62.5	2655.	2689.	2669.	2816.	2843.	2703.	2848.	2890.	2654.	2603.
A	60.0	2463.	2489.	2590.	2700.	2863.	2757.	2846.	2718.	2570.	2533.
N	57.5	2462.	2470.	2591.	2637.	2890.	2838.	2800.	2627.	2576.	2421.
G	55.0	2450.	2436.	2576.	2646.	2789.	2930.	2730.	2587.	2487.	2357.
L	52.5	2488.	2445.	2575.	2646.	2676.	2905.	2633.	2577.	2476.	2346.
E	50.0	2510.	2495.	2614.	2636.	2565.	2668.	2628.	2602.	2529.	2354.
	47.5	2510.	2473.	2650.	2697.	2427.	2384.	2514.	2706.	2574.	2392.
	45.0	2509.	2479.	2609.	2597.	2230.	2145.	2228.	2661.	2702.	2480.
	42.5	2368.	2349.	2431.	2372.	2083.	2015.	2085.	2342.	2525.	2451.
	40.0	2269.	2217.	2231.	2099.	2024.	1919.	2026.	2095.	2188.	2211.
	37.5	2101.	2091.	2101.	1963.	2057.	1878.	2017.	1956.	2023.	2042.
	35.0	2015.	1988.	1972.	1947.	2012.	1934.	1950.	1922.	1909.	1932.
	30.0	1933.	1915.	1863.	1918.	1994.	2129.	2000.	1875.	1886.	1889.
	25.0	1974.	1975.	1959.	2032.	1928.	1944.	1961.	2020.	1943.	1941.
	20.0	1942.	1943.	1918.	1879.	1922.	1876.	1894.	1878.	1885.	1925.
	15.0	1824.	1828.	1834.	1826.	1816.	1852.	1865.	1836.	1815.	1829.
	10.0	1798.	1800.	1807.	1849.	1738.	1715.	1732.	1754.	1788.	1840.
	5.0	1761.	1767.	1799.	1748.	1744.	1751.	1757.	1772.	1807.	1781.
	0.0	1805.	1805.	1805.	1805.	1805.	1805.	1805.	1805.	1805.	1805.

PLANE OF MAXIMUM CANDELA

CONE OF MAXIMUM CANDELA

REPORT NUMBER: RAB01462
 ISSUE DATE: 12/17/15
 PREPARED FOR: RAB LIGHTING INC.

PAGE: 8 OF 9
 DATE SAMPLE TESTED: 12/17/15

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	10.	10.	11.	17.	25.	27.	24.	15.	11.	10.	10.
85.0	36.	48.	159.	348.	402.	380.	375.	269.	112.	40.	35.
82.5	275.	398.	758.	1328.	2242.	1781.	2232.	1210.	620.	214.	139.
V 80.0	1177.	1213.	1419.	1939.	3637.	4766.	3545.	1894.	1495.	1262.	1242.
E 78.0<<	1573.	1613.	1948.	2737.	4858.	6615.	4565.	2784.	1998.	1657.	1595.
R 77.5	1784.	1865.	2200.	3104.	5151.	6504.	4905.	3142.	2319.	1927.	1815.
T 75.0	3778.	3869.	4477.	4736.	4961.	5379.	5165.	4997.	4471.	3915.	3734.
I 72.5	4302.	4358.	4492.	4445.	4080.	3940.	4304.	4650.	4822.	4677.	4683.
C 70.0	3934.	3928.	3950.	3808.	3361.	3211.	3498.	3930.	4118.	4157.	4170.
A 67.5	3358.	3389.	3292.	3247.	3012.	2889.	3035.	3410.	3483.	3525.	3553.
L 65.0	2817.	2885.	2811.	3018.	2912.	2745.	2816.	3055.	2946.	3045.	3047.
62.5	2572.	2603.	2654.	2890.	2848.	2703.	2843.	2816.	2669.	2689.	2655.
A 60.0	2461.	2533.	2570.	2718.	2846.	2757.	2863.	2700.	2590.	2489.	2463.
N 57.5	2420.	2421.	2576.	2627.	2800.	2838.	2890.	2637.	2591.	2470.	2462.
G 55.0	2340.	2357.	2487.	2587.	2730.	2930.	2789.	2646.	2576.	2436.	2450.
L 52.5	2370.	2346.	2476.	2577.	2633.	2905.	2676.	2646.	2575.	2445.	2488.
E 50.0	2372.	2354.	2529.	2602.	2628.	2668.	2565.	2636.	2614.	2495.	2510.
47.5	2410.	2392.	2574.	2706.	2514.	2384.	2427.	2697.	2650.	2473.	2510.
45.0	2478.	2480.	2702.	2661.	2228.	2145.	2230.	2597.	2609.	2479.	2509.
42.5	2449.	2451.	2525.	2342.	2085.	2015.	2083.	2372.	2431.	2349.	2368.
40.0	2253.	2211.	2188.	2095.	2026.	1919.	2024.	2099.	2231.	2217.	2269.
37.5	2065.	2042.	2023.	1956.	2017.	1878.	2057.	1963.	2101.	2091.	2101.
35.0	1979.	1932.	1909.	1922.	1950.	1934.	2012.	1947.	1972.	1988.	2015.
30.0	1920.	1889.	1886.	1875.	2000.	2129.	1994.	1918.	1863.	1915.	1933.
25.0	1942.	1941.	1943.	2020.	1961.	1944.	1928.	2032.	1959.	1975.	1974.
20.0	1930.	1925.	1885.	1878.	1894.	1876.	1922.	1879.	1918.	1943.	1942.
15.0	1836.	1829.	1815.	1836.	1865.	1852.	1816.	1826.	1834.	1828.	1824.
10.0	1831.	1840.	1788.	1754.	1732.	1715.	1738.	1849.	1807.	1800.	1798.
5.0	1771.	1781.	1807.	1772.	1757.	1751.	1744.	1748.	1799.	1767.	1761.
0.0	1805.	1805.	1805.	1805.	1805.	1805.	1805.	1805.	1805.	1805.	1805.

CONE OF MAXIMUM CANDELA

REPORT NUMBER: RAB01462
 ISSUE DATE: 12/17/15
 PREPARED FOR: RAB LIGHTING INC.

PAGE: 9 OF 9
 DATE SAMPLE TESTED: 12/17/15

5-DEGREE ZONAL LUMEN SUMMARY

0- 5	43
5- 10	126
10- 15	215
15- 20	307
20- 25	407
25- 30	495
30- 35	572
35- 40	676
40- 45	849
45- 50	1021
50- 55	1126
55- 60	1224
60- 65	1346
65- 70	1671
70- 75	2257
75- 80	1854
80- 85	675
85- 90	37
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	169
0- 20	691
0- 30	1593
0- 40	2840
0- 50	4710
0- 60	7060
0- 70	10078
0- 80	14189
0- 90	14901
0-100	14901
0-110	14901
0-120	14901
0-130	14901
0-140	14901
0-150	14901
0-160	14901
0-170	14901
0-180	14901

REPORT NUMBER: RAB01463
DATE: 12/18/2015
PREPARED FOR: RAB LIGHTING INC.
CATALOG NUMBER: ALED5S150/480/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-H100-A2000-480

OBJECT OF TEST: DATA SHOWN IS ABSOLUTE FOR THE SAMPLE PROVIDED AT THE RATED INPUT VOLTAGES (480.0 AND 347.0 VAC, 60Hz) TO THE TEST SAMPLE.

INSTRUMENTS:	CHROMA PROGRAMMABLE AC POWER SOURCE MODEL 6460	Calibration Due:
	CHROMA PROGRAMMABLE DIGITAL POWER METER MODEL 66202	N/A
	OCEAN OPTICS QE65PRO Spectroradiometer	3/9/16
	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 (347.0 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	<u>X.CAO</u>
Approved	<u>D.WANG-MUNSON</u> Lighting Engineer

REPORT NUMBER: RAB01463
 DATE: 12/18/2015
 PREPARED FOR: RAB LIGHTING INC.
 CATALOG NUMBER: ALED5S150/480/D10 (TYPE V Square)

Page 2 of 4

RESULTS:

PHOTOMETRIC	
Total Integrated Flux (lumens)	14901 *
SPECTRORADIOMETRIC	
Observer	CIE 1931 2 degree
Chromaticity Ordinate x	0.3456
Chromaticity Ordinate y	0.3593
Observer	CIE 1976 2 degree
Chromaticity Ordinate u'	0.2088
Chromaticity Ordinate v'	0.4884
Correlated Color Temp CCT (K)	5005
ANSI C78.377-2008 Duv	0.004
Total Radiant Flux (milliWatts)	45335 *
ELECTRICAL	
Input Voltage (Volts AC)	480.0
Input Current (Amps AC)	0.366
Input Power (Watts)	154.8
Input Power Factor (%)	88.2
Input Current THD (%)	14.4
Input Voltage THD (%)	0.2
EFFICACY (Lumens/Watt)	
	96.3
ELECTRICAL AT MAX NONIMAL INPUT	
Input Voltage (Volts AC)	347.0
Input Current (Amps AC)	0.455
Input Power (Watts)	151.7
Input Power Factor (%)	96.1
Input Current THD (%)	11.9
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	77
R3 Strong yellowish green	82
R4 Moderate yellowish green	75
R5 Light bluish green	73
R6 Light blue	70
R7 Light violet	81
R8 Light reddish purple	59
R9 Strong red	-22
R10 Strong yellow	46
R11 Strong green	73
R12 Strong blue	51
R13 Light yellowish pink (skin)	71
R14 Moderate olive green (leaf)	89

*NOTE:

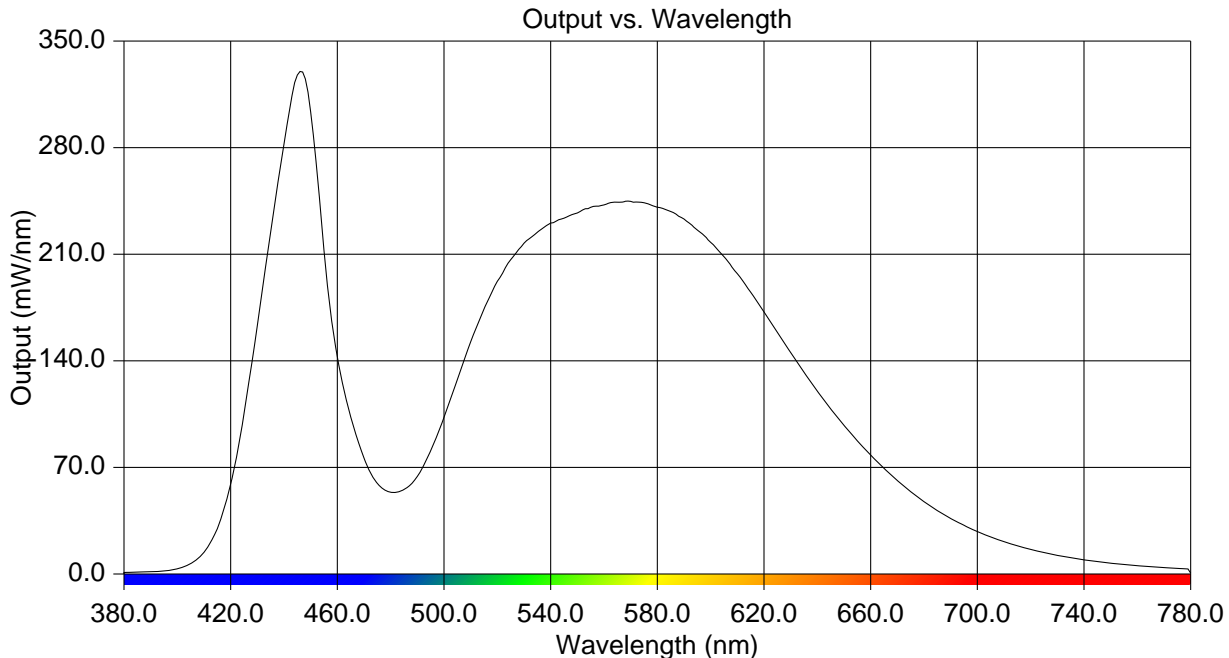
Proper calibration of integrating spheres for measuring total flux output of non-directional samples will produce reliable, repeatable results within the calibration tolerances of the equipment used. However, measurement of test samples with significant self absorption and/or directional output, even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

REPORT NUMBER: RAB01463
 DATE: 12/18/2015
 PREPARED FOR: RAB LIGHTING INC.
 CATALOG NUMBER: ALED5S150/480/D10 (TYPE V Square)

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RESULTS:

Wavelength	mW per nm	Wavelength	mW per nm	Wavelength	mW per nm
380	0.990	515	173.865	650	97.485
385	1.230	520	192.073	655	87.374
390	1.461	525	206.231	660	78.110
395	2.031	530	217.078	665	69.364
400	3.467	535	224.260	670	61.431
405	6.761	540	230.295	675	54.023
410	14.468	545	233.501	680	47.476
415	29.691	550	236.913	685	41.745
420	58.904	555	240.634	690	36.450
425	104.927	560	242.212	695	31.985
430	163.046	565	244.110	700	27.837
435	224.479	570	244.535	705	24.171
440	283.249	575	243.551	710	21.215
445	327.436	580	240.690	715	18.497
450	303.209	585	237.904	720	16.181
455	212.844	590	232.962	725	14.032
460	141.815	595	225.508	730	12.238
465	103.387	600	217.631	735	10.702
470	76.116	605	208.176	740	9.299
475	59.435	610	197.083	745	8.149
480	53.625	615	184.952	750	7.095
485	55.360	620	172.056	755	6.224
490	64.044	625	158.612	760	5.434
495	80.781	630	145.283	765	4.762
500	103.147	635	132.223	770	4.171
505	127.472	640	120.085	775	3.662
510	152.365	645	108.459	780	0.558



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CIE Chromaticity Diagram

