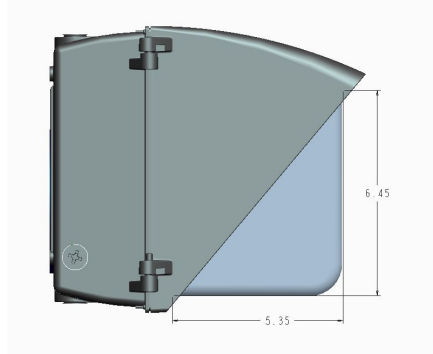


ISOFOOTCANDLE LINES OF HORIZONTAL ILLUMINATION

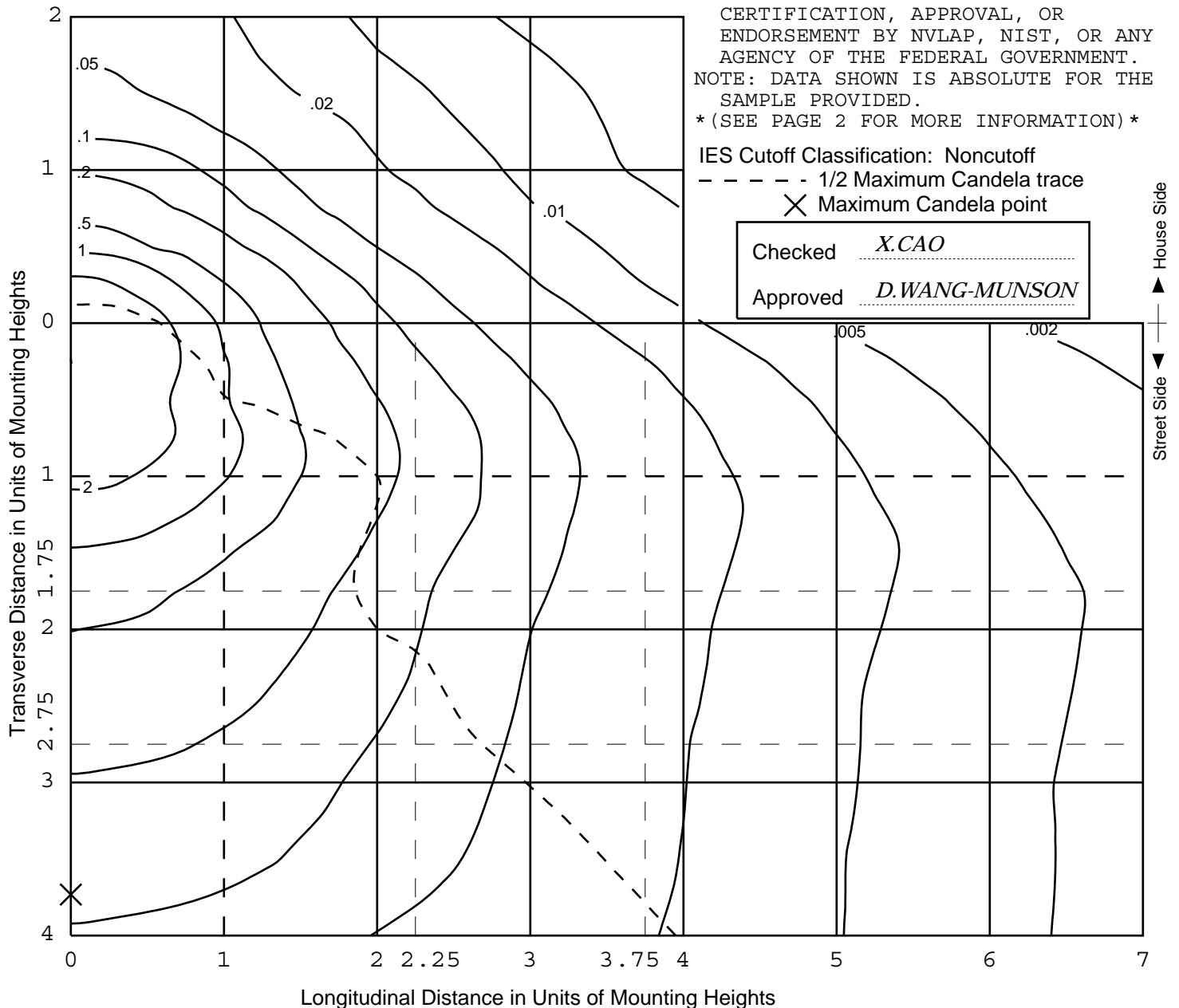
Values based on 20 foot mounting height.



REPORT NUMBER: RAB03170
 ISSUE DATE: 04/07/17 PAGE: 1 OF 9
 DATE SAMPLE TESTED: 04/07/17
 PREPARED FOR: RAB LIGHTING INC.
 CATALOG NUMBER: WP3LED65N/480/D10 (ALSO APPLIES TO 347/RCL) (STANDARD CUTOFF - PRISMATIC GLASS LENS)
 LUMINAIRE: COMPACT WALLPACK WITH VANDAL RESISTANT PRISMATIC POLYCARBONATE REFRACTOR.
 LAMP: ONE-HUNDRED AND FORTY-FOUR WHITE LIGHT EMITTING DIODES (LEDs).
 NOTE: THIS REPORT WITH THE USE OF THE NVLAP LOGO SHALL NOT BE USED BY THE CLIENT TO CLAIM PRODUCT CERTIFICATION, APPROVAL, OR ENDORSEMENT BY NVLAP, NIST, OR ANY AGENCY OF THE FEDERAL GOVERNMENT.
 NOTE: DATA SHOWN IS ABSOLUTE FOR THE SAMPLE PROVIDED.
 (SEE PAGE 2 FOR MORE INFORMATION)

IES Cutoff Classification: Noncutoff

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



REPORT NUMBER: RAB03170
ISSUE DATE: 04/07/17
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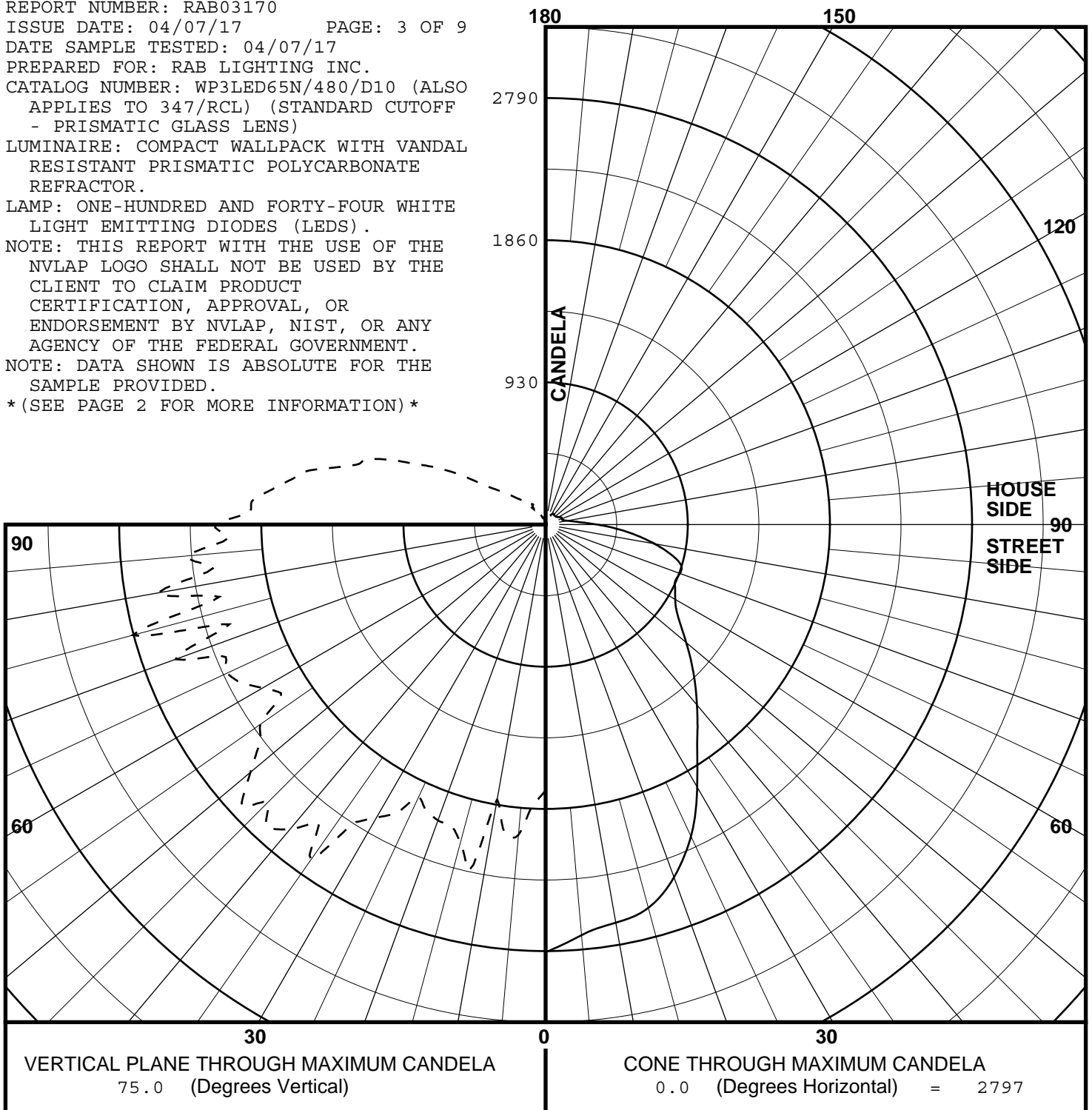
PAGE: 2 OF 9
DATE SAMPLE TESTED: 04/07/17

ADDITIONAL INFORMATION

TOTAL INPUT WATTS = 62.99 W AT 480.0 VAC.
LED DRIVER: RDD-096-A3600-240C
TEST PROCEDURE: IESNA LM-79-08
LM-80 DATA AVAILABLE FROM MANUFACTURER FOR SOLID STATE SOURCE
AMBIENT: 24.6
ACCREDITED LABORATORY CODE 201058-0

MAXIMUM PLANE AND MAXIMUM CONE PLOTS OF CANDELA

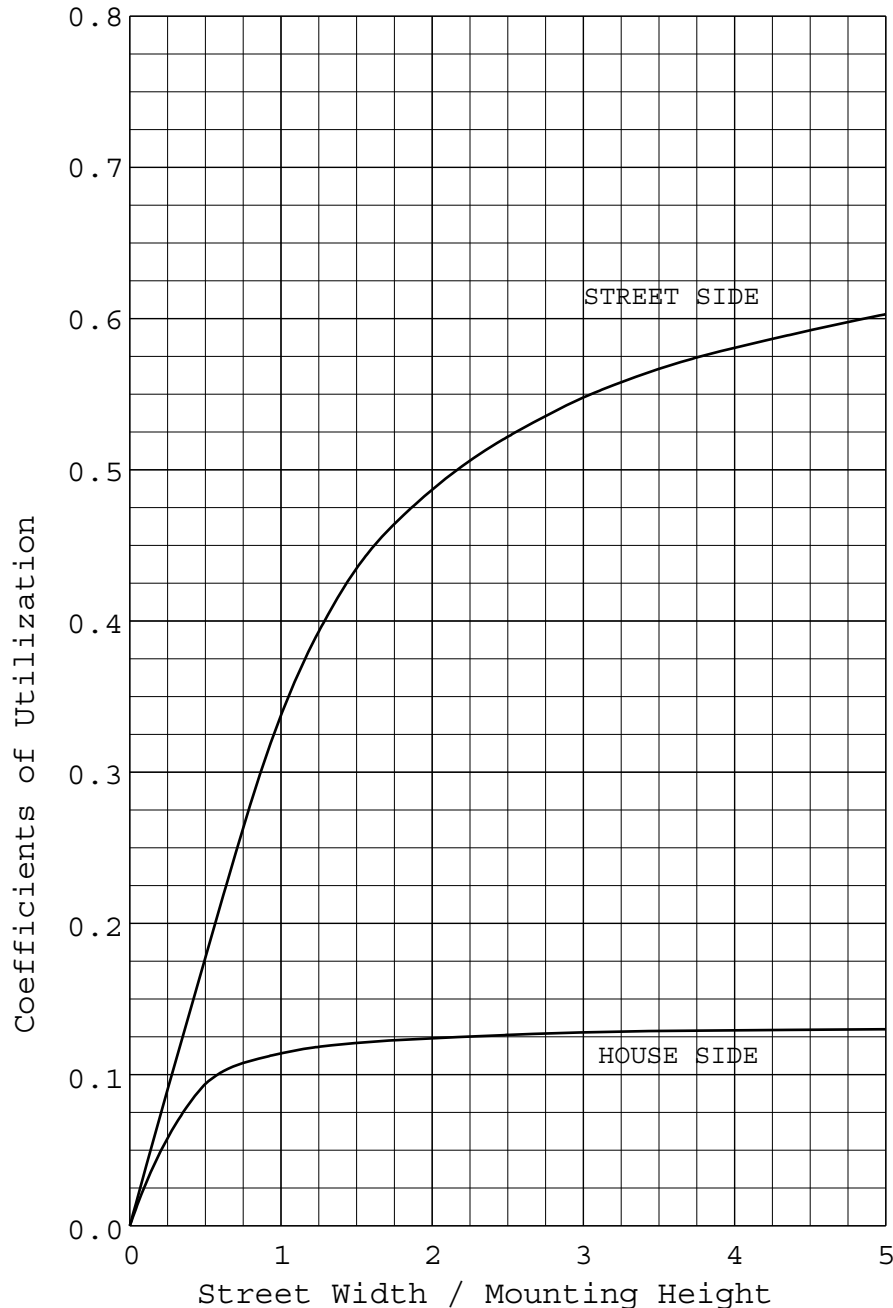
REPORT NUMBER: RAB03170
 ISSUE DATE: 04/07/17 PAGE: 3 OF 9
 DATE SAMPLE TESTED: 04/07/17
 PREPARED FOR: RAB LIGHTING INC.
 CATALOG NUMBER: WP3LED65N/480/D10 (ALSO
 APPLIES TO 347/RCL) (STANDARD CUTOFF
 - PRISMATIC GLASS LENS)
 LUMINAIRE: COMPACT WALLPACK WITH VANDAL
 RESISTANT PRISMATIC POLYCARBONATE
 REFRACTOR.
 LAMP: ONE-HUNDRED AND FORTY-FOUR WHITE
 LIGHT EMITTING DIODES (LEDS).
 NOTE: THIS REPORT WITH THE USE OF THE
 NVLAP LOGO SHALL NOT BE USED BY THE
 CLIENT TO CLAIM PRODUCT
 CERTIFICATION, APPROVAL, OR
 ENDORSEMENT BY NVLAP, NIST, OR ANY
 AGENCY OF THE FEDERAL GOVERNMENT.
 NOTE: DATA SHOWN IS ABSOLUTE FOR THE
 SAMPLE PROVIDED.
 (SEE PAGE 2 FOR MORE INFORMATION)



REPORT NUMBER: RAB03170
ISSUE DATE: 04/07/17
PREPARED FOR: RAB LIGHTING INC.

PAGE: 4 OF 9
DATE SAMPLE TESTED: 04/07/17

COEFFICIENTS OF UTILIZATION AND FLUX DISTRIBUTION



	LUMENS	PERCENT OF FIXTURE
DOWNWARD STREET SIDE	5263.	68.6
DOWNWARD HOUSE SIDE	1013.	13.2
DOWNWARD TOTAL	6276.	81.8
UPWARD STREET SIDE	1342.	17.5
UPWARD HOUSE SIDE	52.	0.7
UPWARD TOTAL	1394.	18.2
TOTAL FLUX	7670.	100.0

TOTAL INPUT WATTS = 63.0
EFFICACY = 121.7 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: RAB03170
 ISSUE DATE: 04/07/17
 PREPARED FOR: RAB LIGHTING INC.

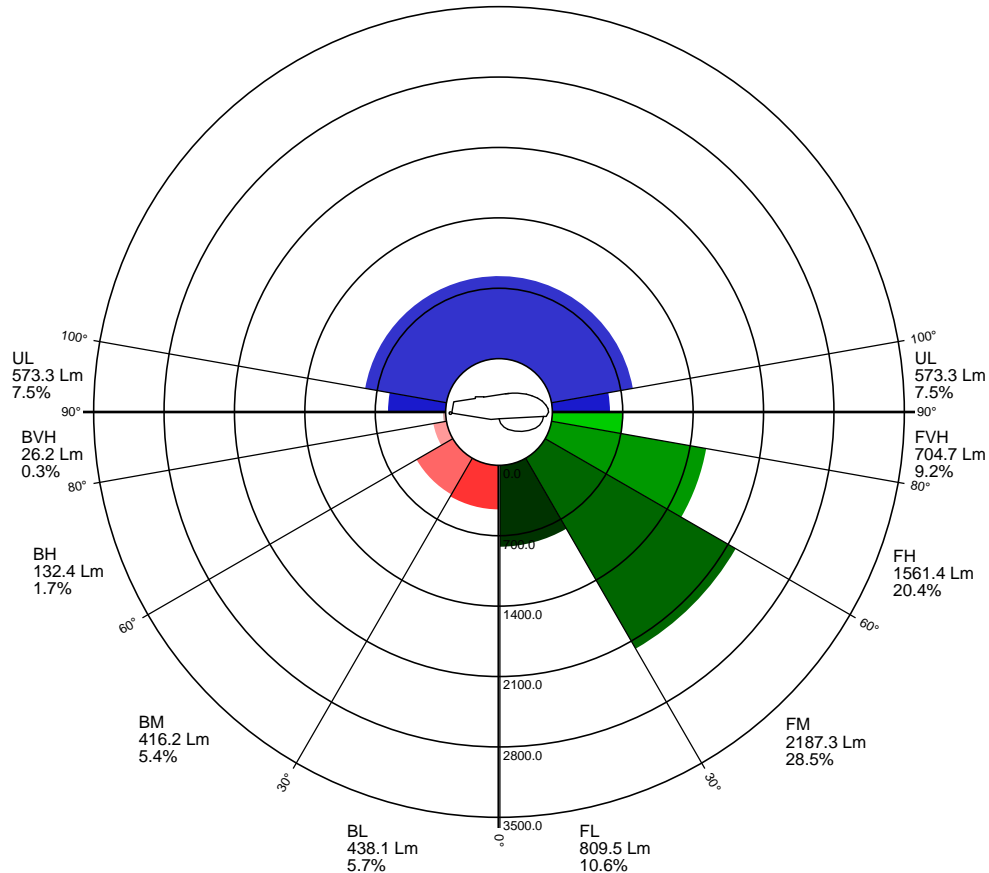
PAGE: 5 OF 9
 DATE SAMPLE TESTED: 04/07/17

BUG Rating:				<div>B1 U4 G4</div>		
Zonal Summary				Zone Ratings		
		Lumens	% of Fixture	B	U	G
Forward		5263	68.6			
FL	(0° - 30°)	809.5	10.6			
FM	(30° - 60°)	2187.3	28.5			
FH	(60° - 80°)	1561.4	20.4			G1
FVH	(80° - 90°)	704.7	9.2			G4
Backward		1013	13.2			
BL	(0° - 30°)	438.1	5.7	B1		
BM	(30° - 60°)	416.2	5.4	B1		
BH	(60° - 80°)	132.4	1.7	B1		G1
BVH	(80° - 90°)	26.2	0.3			G1
Upward		1394	18.2			
UL	(90° - 100°)	573.3	7.5		U4	
UH	(100° - 180°)	820.9	10.7		U4	
Trapped Light		0	0.0			
Total Flux		7670	100.0			

Zonal Lumen Summary

(Linear scale)

UH
820.9 Lm
10.7%

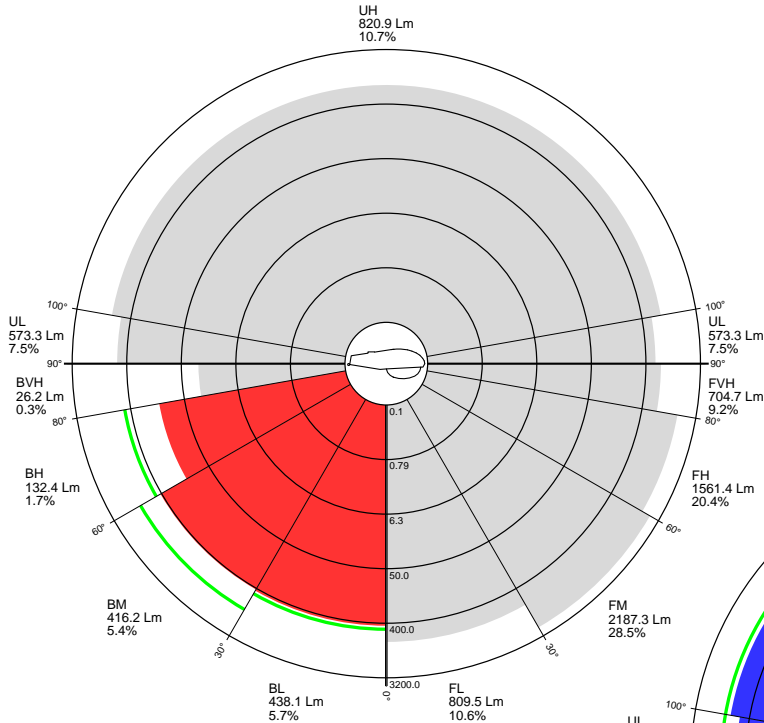


REPORT NUMBER: RAB03170
ISSUE DATE: 04/07/17
PREPARED FOR: RAB LIGHTING INC.

PAGE: 6 OF 9
DATE SAMPLE TESTED: 04/07/17

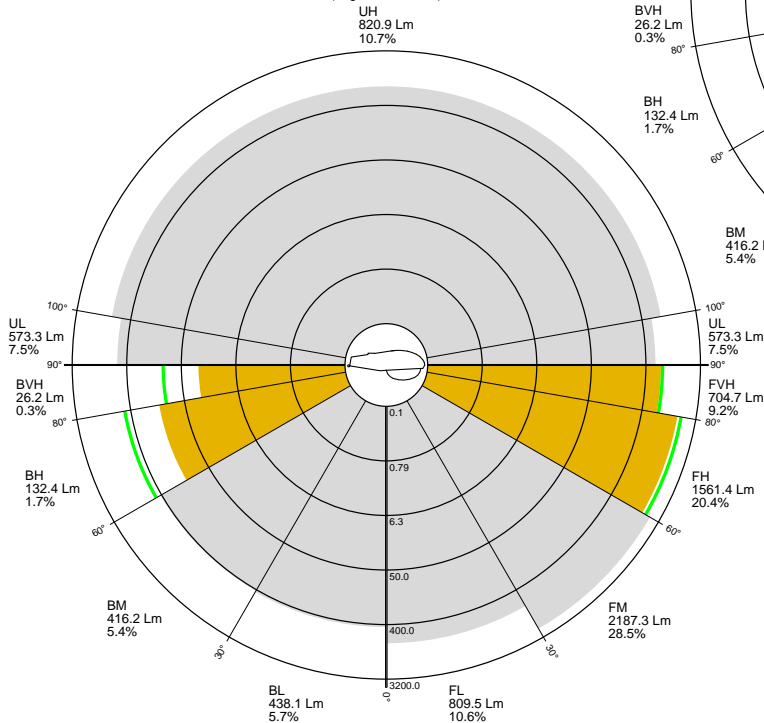
Backlight Rating Details

(Logarithmic scale)



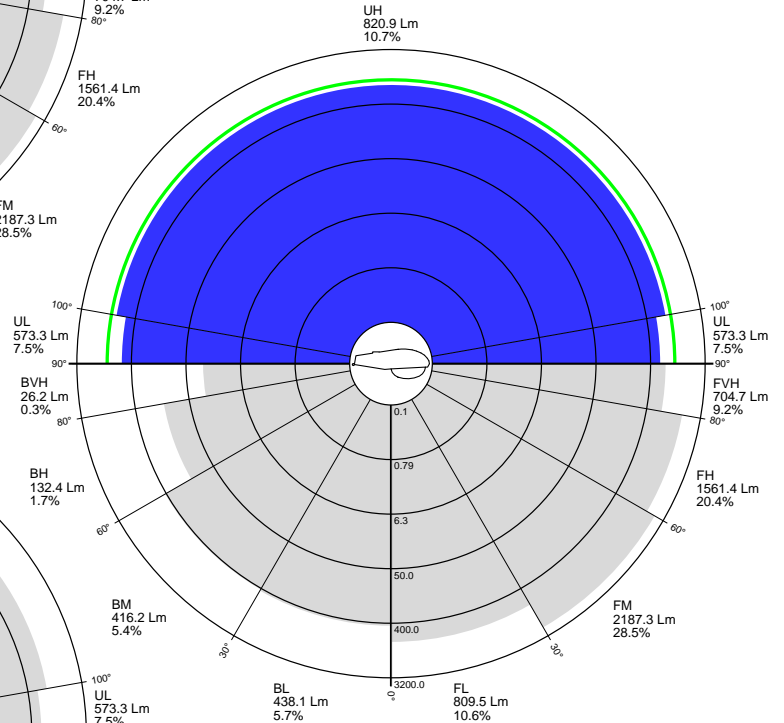
Glare Rating Details

(Logarithmic scale)



Uplight Rating Details

(Logarithmic scale)



REPORT NUMBER: RAB03170
 ISSUE DATE: 04/07/17
 PREPARED FOR: RAB LIGHTING INC.

PAGE: 7 OF 9
 DATE SAMPLE TESTED: 04/07/17

CANDELA TABULATION

	STREET SIDE	LATERAL ANGLE								
		0.0	5.0	15.0	25.0	35.0	45.0	55.0	65.0	75.0 85.0
	180.0	4.	4.	4.	4.	4.	4.	4.	4.	4.
	175.0	1.	1.	2.	3.	4.	5.	6.	6.	7.
	165.0	25.	25.	24.	21.	19.	15.	10.	8.	7.
	155.0	60.	60.	58.	55.	50.	42.	34.	24.	11.
	145.0	152.	149.	146.	140.	127.	97.	69.	53.	31.
	135.0	228.	225.	214.	182.	143.	102.	89.	81.	52.
	125.0	402.	395.	371.	343.	271.	203.	126.	76.	65.
	115.0	937.	923.	852.	728.	514.	370.	227.	121.	84.
	105.0	1437.	1415.	1363.	1208.	953.	686.	431.	246.	114.
	95.0	1915.	1857.	1783.	1666.	1397.	1039.	699.	470.	260.
	90.0	2158.	2081.	2019.	1841.	1588.	1205.	831.	559.	388.
	87.5	2081.	2033.	1999.	1867.	1634.	1278.	885.	615.	464.
	85.0	2348.	2266.	2210.	1993.	1703.	1311.	912.	672.	540.
V	82.5	2197.	2119.	2053.	1972.	1781.	1354.	951.	716.	632.
E	80.0	2575.	2508.	2468.	2183.	1726.	1385.	985.	771.	734.
R	77.5	2187.	2119.	2063.	1886.	1817.	1397.	1019.	851.	811.
T	75.0 <<	2797.	2696.	2596.	2250.	1730.	1367.	1060.	933.	891.
I	72.5	2170.	2107.	2034.	1889.	1770.	1454.	1102.	1128.	956.
C	70.0	2575.	2495.	2389.	2085.	1706.	1385.	1180.	1214.	1009.
A	67.5	2265.	2202.	2176.	1989.	1747.	1461.	1359.	1285.	1012.
L	65.0	2300.	2239.	2153.	1899.	1649.	1516.	1606.	1427.	1038.
	62.5	2241.	2186.	2109.	1871.	1721.	1779.	1733.	1472.	967.
A	60.0	2138.	2086.	2014.	1886.	1916.	1936.	1847.	1440.	945.
N	57.5	2052.	2010.	1998.	2058.	2064.	2091.	1845.	1524.	963.
G	55.0	2279.	2257.	2271.	2206.	2257.	2174.	1930.	1478.	1004.
L	52.5	2360.	2362.	2355.	2399.	2347.	2150.	1966.	1423.	1047.
E	50.0	2521.	2541.	2520.	2561.	2369.	2262.	1886.	1315.	1108.
	47.5	2698.	2759.	2717.	2502.	2355.	2209.	1953.	1324.	1195.
	45.0	2571.	2601.	2606.	2554.	2460.	2268.	1734.	1375.	1292.
	42.5	2688.	2696.	2587.	2545.	2388.	2149.	1713.	1451.	1387.
	40.0	2601.	2655.	2707.	2467.	2375.	1988.	1574.	1523.	1468.
	37.5	2454.	2478.	2517.	2566.	2256.	1936.	1589.	1569.	1517.
	35.0	2672.	2697.	2548.	2329.	2081.	1775.	1687.	1609.	1547.
	30.0	2213.	2207.	2173.	2094.	1874.	1830.	1853.	1889.	1578.
	25.0	1967.	1957.	1955.	2001.	1983.	1958.	1788.	1677.	1720.
	20.0	2059.	2070.	2121.	2022.	2139.	1852.	2028.	2108.	1885.
	15.0	2151.	2095.	1973.	1923.	2318.	1844.	2234.	1760.	1857.
	10.0	1827.	1823.	1834.	2162.	2278.	1834.	1884.	1978.	1811.
	5.0	2038.	2032.	2020.	1992.	1948.	1849.	1776.	1805.	1708.
	0.0	1739.	1739.	1739.	1739.	1739.	1739.	1739.	1739.	1739.

||
 PLANE OF MAXIMUM CANDELA

CONE OF MAXIMUM CANDELA

REPORT NUMBER: RAB03170
 ISSUE DATE: 04/07/17
 PREPARED FOR: RAB LIGHTING INC.

PAGE: 8 OF 9
 DATE SAMPLE TESTED: 04/07/17

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	4.	4.	4.	4.	4.	4.	4.	4.	4.	4.
	175.0	7.	7.	7.	7.	6.	6.	5.	3.	2.	2.
	165.0	7.	7.	7.	7.	7.	6.	5.	4.	3.	3.
	155.0	9.	8.	8.	7.	7.	6.	5.	5.	4.	4.
	145.0	12.	10.	9.	9.	8.	7.	6.	5.	5.	4.
	135.0	19.	16.	12.	11.	10.	8.	6.	5.	5.	4.
	125.0	33.	28.	21.	18.	14.	10.	6.	5.	5.	5.
	115.0	54.	44.	36.	27.	19.	14.	9.	6.	6.	6.
	105.0	57.	49.	44.	39.	26.	17.	12.	9.	9.	9.
	95.0	56.	56.	54.	51.	35.	22.	15.	12.	11.	11.
	90.0	62.	58.	65.	61.	40.	25.	17.	13.	12.	12.
	87.5	82.	65.	73.	68.	46.	29.	19.	13.	11.	12.
	85.0	114.	79.	81.	79.	53.	36.	21.	13.	11.	11.
V	82.5	158.	100.	89.	89.	60.	53.	35.	27.	24.	26.
E	80.0	214.	127.	100.	100.	70.	67.	48.	42.	39.	39.
R	77.5	278.	163.	109.	107.	79.	75.	68.	55.	55.	52.
T	75.0<<	337.	206.	117.	110.	88.	80.	88.	65.	67.	68.
I	72.5	384.	250.	128.	112.	94.	84.	105.	75.	73.	80.
C	70.0	429.	295.	146.	115.	101.	88.	113.	93.	80.	85.
A	67.5	467.	339.	173.	121.	111.	93.	109.	117.	91.	88.
L	65.0	503.	391.	207.	131.	121.	99.	102.	135.	110.	98.
	62.5	538.	436.	244.	146.	132.	114.	101.	131.	138.	117.
A	60.0	576.	480.	283.	169.	145.	131.	111.	118.	153.	152.
N	57.5	634.	530.	331.	199.	159.	149.	128.	116.	135.	163.
G	55.0	685.	582.	379.	233.	176.	167.	148.	130.	124.	138.
L	52.5	759.	645.	433.	272.	199.	184.	172.	151.	134.	125.
E	50.0	819.	707.	489.	310.	226.	199.	193.	176.	160.	148.
	47.5	897.	778.	548.	350.	257.	217.	212.	201.	191.	182.
	45.0	972.	856.	612.	403.	292.	239.	224.	220.	214.	211.
	42.5	1050.	927.	681.	471.	330.	265.	237.	234.	224.	220.
	40.0	1126.	1006.	753.	536.	374.	296.	256.	245.	233.	226.
	37.5	1200.	1082.	835.	612.	439.	333.	286.	259.	247.	237.
	35.0	1270.	1154.	904.	696.	512.	380.	325.	280.	270.	259.
	30.0	1402.	1303.	1052.	865.	706.	566.	441.	370.	332.	318.
	25.0	1525.	1399.	1195.	1049.	923.	788.	683.	589.	510.	476.
	20.0	1661.	1499.	1357.	1230.	1078.	987.	892.	836.	787.	752.
	15.0	1732.	1570.	1446.	1353.	1273.	1148.	1137.	1044.	1002.	960.
	10.0	1757.	1717.	1567.	1475.	1432.	1348.	1317.	1266.	1250.	1228.
	5.0	1734.	1788.	1662.	1571.	1550.	1509.	1486.	1476.	1467.	1461.
	0.0	1739.	1739.	1739.	1739.	1739.	1739.	1739.	1739.	1739.	1739.

CONE OF MAXIMUM CANDELA

REPORT NUMBER: RAB03170
 ISSUE DATE: 04/07/17
 PREPARED FOR: RAB LIGHTING INC.

PAGE: 9 OF 9
 DATE SAMPLE TESTED: 04/07/17

5-DEGREE ZONAL LUMEN SUMMARY

0- 5	41
5- 10	120
10- 15	196
15- 20	257
20- 25	303
25- 30	332
30- 35	370
35- 40	410
40- 45	445
45- 50	467
50- 55	465
55- 60	446
60- 65	433
65- 70	428
70- 75	422
75- 80	410
80- 85	383
85- 90	348
90- 95	308
95-100	266
100-105	220
105-110	175
110-115	134
115-120	92
120-125	62
125-130	42
130-135	30
135-140	22
140-145	17
145-150	13
150-155	7
155-160	4
160-165	2
165-170	1
170-175	0
175-180	0

10-DEGREE ZONAL LUMEN SUMMARY

0- 10	161
0- 20	613
0- 30	1248
0- 40	2028
0- 50	2940
0- 60	3851
0- 70	4713
0- 80	5545
0- 90	6276
0-100	6849
0-110	7244
0-120	7470
0-130	7574
0-140	7626
0-150	7655
0-160	7666
0-170	7670
0-180	7670

REPORT NUMBER: RAB03171
DATE: 4/6/2017
PREPARED FOR: RAB LIGHTING INC.
CATALOG NUMBER: WP3LED65N/480/D10 (ALSO APPLIES TO 347/RCL) (STANDARD CUTOFF - PRISMATIC GLASS LENS)

ADDRESS: 170 LUDLOW AVE, NORTHVALE, NJ 07647

LUMINAIRE: COMPACT WALLPACK WITH VANDAL RESISTANT PRISMATIC POLYCARBONATE REFRACTOR.

LAMP: ONE-HUNDRED AND FORTY-FOUR WHITE LIGHT EMITTING DIODES (LEDs).

DRIVER: RDD-096-A3600-240C

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:	GWINSTEK PROGRAMMABLE AC POWER SOURCE APS-7100	Calibration Due:
	CHROMA PROGRAMMABLE DIGITAL POWER METER MODEL 66202	N/A
	OCEAN OPTICS QE65PRO Spectroradiometer	3/01/18
	RAB 2.0 meter Diameter Integrating Sphere, 4PI Geometry	03/07/18

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: RAB03171
 DATE: 4/6/2017
 PREPARED FOR: RAB LIGHTING INC.
 CATALOG NUMBER: WP3LED65N/480/D10 (ALSO APPLIES TO 347/RCL) (STANDARD CUTOFF - PRISMATIC GLASS LENS)

Page 2 of 4

RESULTS:

PHOTOMETRIC	
Total Integrated Flux (lumens)	7670 *
SPECTRORADIOMETRIC	
Observer	CIE 1931 2 degree
Chromaticity Ordinate x	0.3777
Chromaticity Ordinate y	0.3772
Observer	CIE 1976 2 degree
Chromaticity Ordinate u'	0.2231
Chromaticity Ordinate v'	0.5014
Correlated Color Temp CCT (K)	4080
ANSI C78.377-2008 Duv	0.001
Total Radiant Flux (milliWatts)	23437 *
ELECTRICAL	
Input Voltage (Volts AC)	480.0
Input Current (Amps AC)	0.143
Input Power (Watts)	63.0
Input Power Factor (%)	91.7
Input Current THD (%)	15.7
Input Voltage THD (%)	0.2
EFFICACY (Lumens/Watt)	
	121.7
ELECTRICAL AT MAX NONIMAL INPUT	
Input Voltage (Volts AC)	347.0
Input Current (Amps AC)	0.185
Input Power (Watts)	62.8
Input Power Factor (%)	98.1
Input Current THD (%)	12.3
Input Voltage THD (%)	0.2
Off-State Power (Watts)	
	0.0

COLOR RENDERING INDICES	CRI
Ra (Average 1-8)	83
R1 Light greyish red	81
R2 Dark greyish yellow	89
R3 Strong yellowish green	95
R4 Moderate yellowish green	83
R5 Light bluish green	82
R6 Light blue	85
R7 Light violet	86
R8 Light reddish purple	65
R9 Strong red	9
R10 Strong yellow	74
R11 Strong green	81
R12 Strong blue	67
R13 Light yellowish pink (skin)	83
R14 Moderate olive green (leaf)	97

*NOTE:

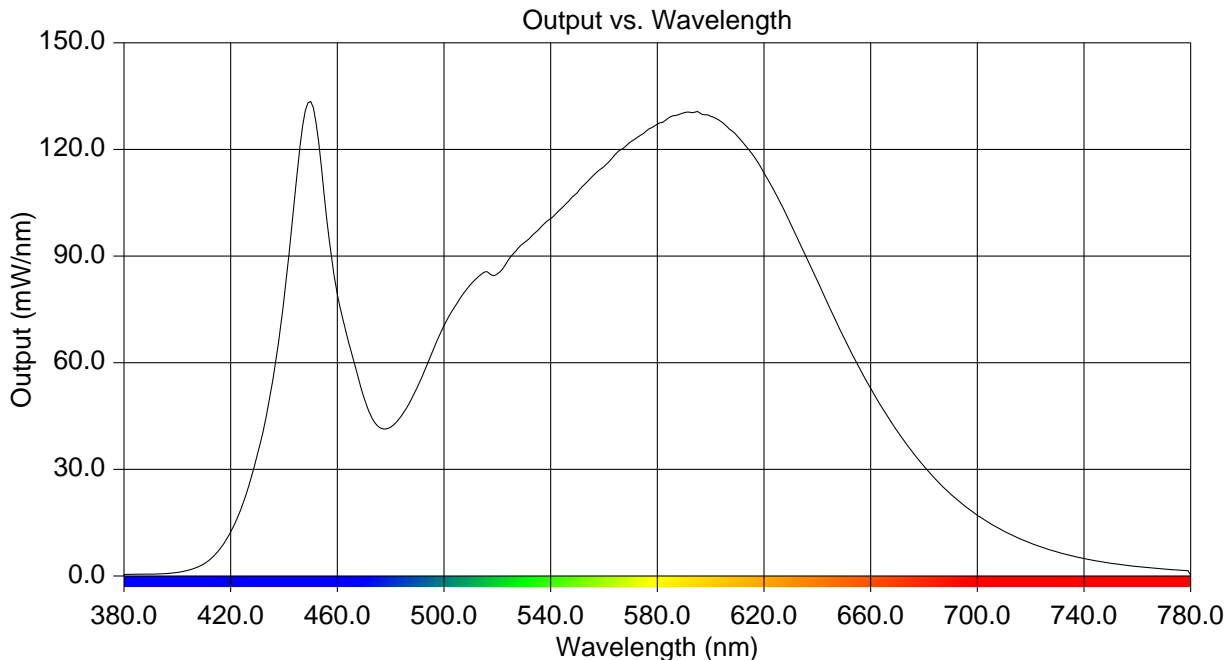
Proper calibration of integrating spheres for measuring total flux output of non-directional samples will produce reliable, repeatable results within the calibration tolerances of the equipment used. However, measurement of test samples with significant self absorption and/or directional output, even 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: RAB03171
 DATE: 4/6/2017
 PREPARED FOR: RAB LIGHTING INC.
 CATALOG NUMBER: WP3LED65N/480/D10 (ALSO APPLIES TO 347/RCL) (STANDARD CUTOFF - PRISMATIC GLASS LENS)

Page 3 of 4

RESULTS:

Wavelength	mW per nm	Wavelength	mW per nm	Wavelength	mW per nm
380	0.416	515	85.422	650	66.886
385	0.469	520	84.969	655	59.576
390	0.520	525	89.814	660	52.768
395	0.657	530	93.720	665	46.474
400	1.011	535	97.140	670	40.723
405	1.775	540	100.496	675	35.447
410	3.452	545	104.103	680	30.841
415	6.709	550	107.795	685	26.688
420	12.299	555	111.898	690	23.026
425	21.290	560	115.143	695	19.921
430	34.135	565	119.224	700	17.094
435	51.550	570	122.095	705	14.685
440	77.564	575	124.558	710	12.604
445	113.836	580	127.069	715	10.787
450	133.469	585	129.214	720	9.201
455	107.625	590	130.280	725	7.867
460	79.206	595	130.658	730	6.749
465	63.599	600	129.296	735	5.756
470	50.119	605	127.115	740	4.904
475	42.273	610	123.739	745	4.215
480	41.909	615	119.266	750	3.594
485	46.163	620	113.339	755	3.075
490	53.138	625	106.722	760	2.660
495	62.007	630	99.004	765	2.264
500	70.496	635	91.144	770	1.953
505	76.822	640	83.060	775	1.680
510	82.003	645	74.937	780	0.254



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Page 4 of 4

CIE Chromaticity Diagram

