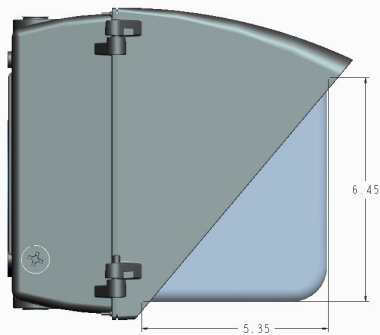


ISOFOOTCANDLE LINES OF HORIZONTAL ILLUMINATION

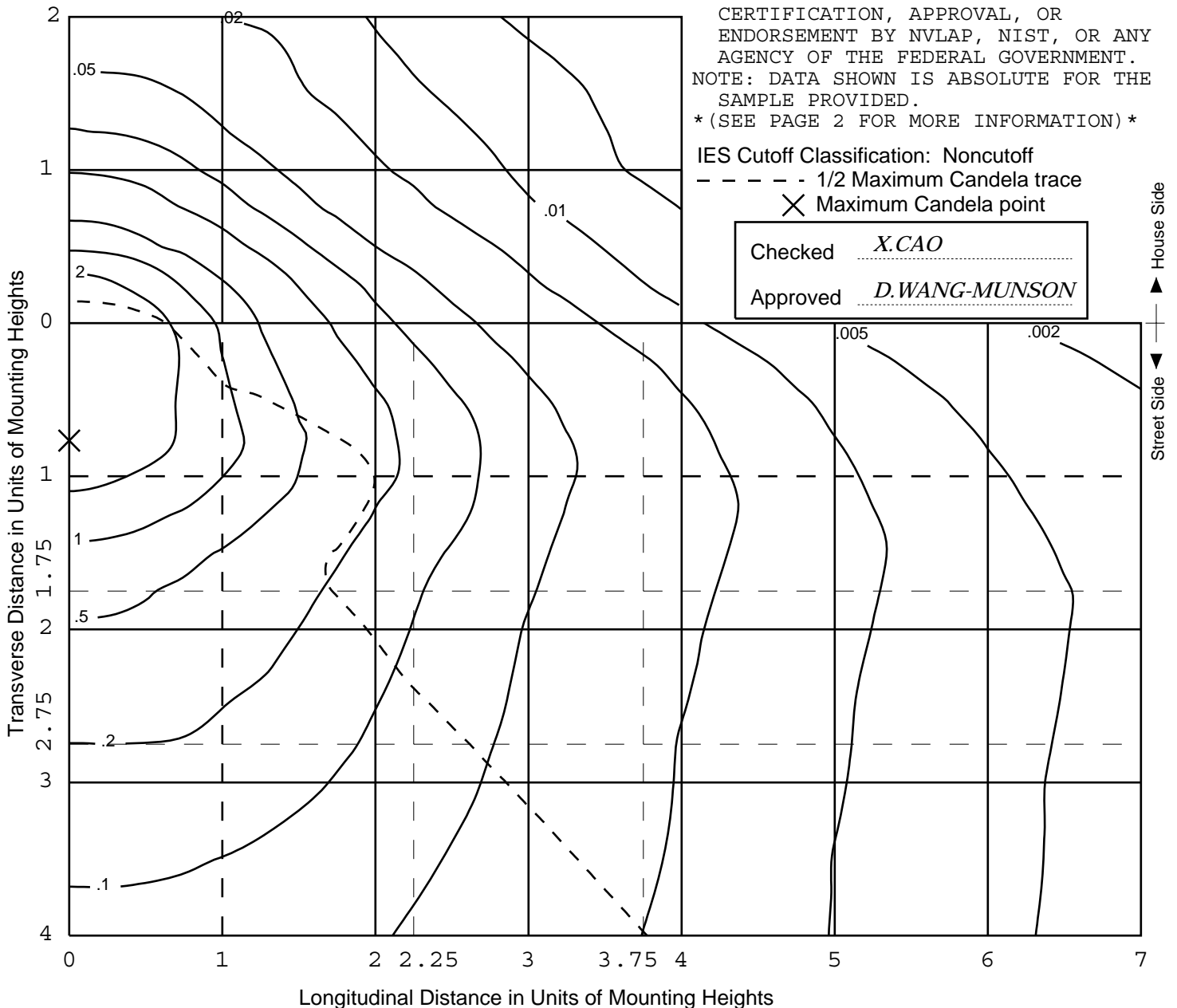
Values based on 20 foot mounting height.



REPORT NUMBER: RAB03155
 ISSUE DATE: 04/05/17 PAGE: 1 OF 9
 DATE SAMPLE TESTED: 04/05/17
 PREPARED FOR: RAB LIGHTING INC.
 CATALOG NUMBER: WP3LED65/480/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



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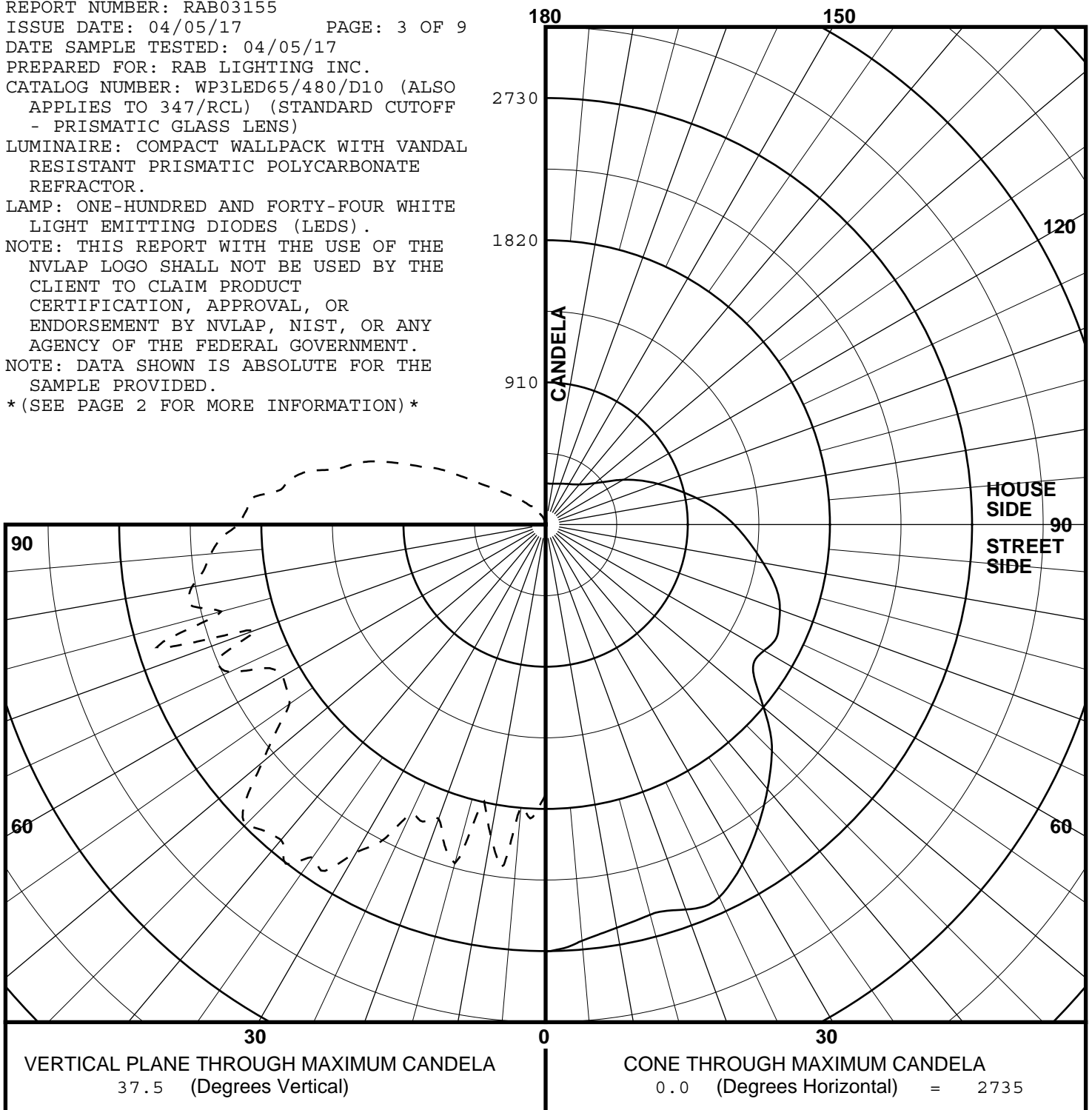
PAGE: 2 OF 9
DATE SAMPLE TESTED: 04/05/17

ADDITIONAL INFORMATION

TOTAL INPUT WATTS = 64.465 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

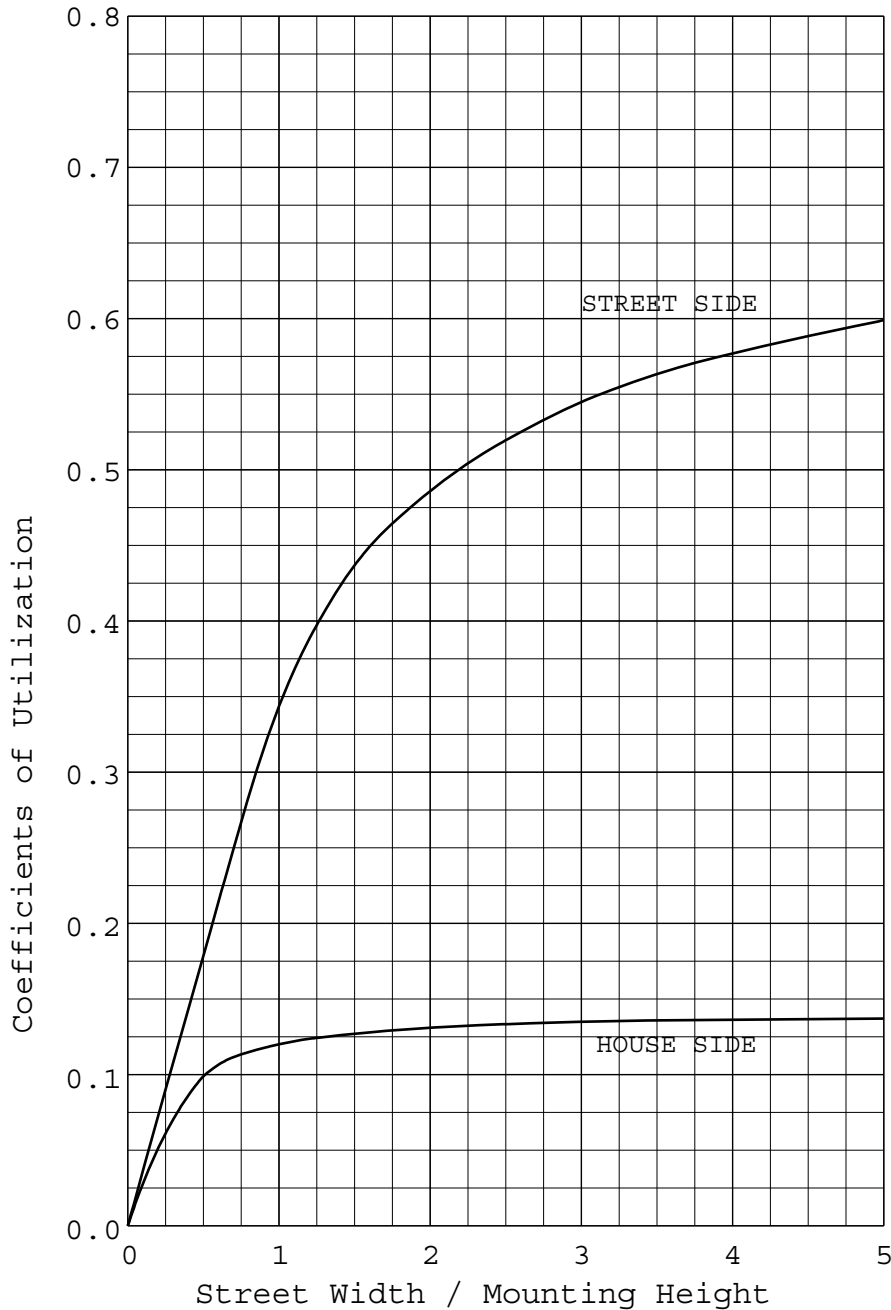
REPORT NUMBER: RAB03155
 ISSUE DATE: 04/05/17 PAGE: 3 OF 9
 DATE SAMPLE TESTED: 04/05/17
 PREPARED FOR: RAB LIGHTING INC.
 CATALOG NUMBER: WP3LED65/480/D10 (ALSO
 APPLIES TO 347/RCL) (STANDARD CUTOFF
 - PRISMATIC GLASS LENS)
 LUMINAIRE: COMPACT WALLPACK WITH VANDAL
 RESISTANT PRISMATIC POLYCARBONATE
 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: RAB03155
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PREPARED FOR: RAB LIGHTING INC.

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DATE SAMPLE TESTED: 04/05/17

COEFFICIENTS OF UTILIZATION AND FLUX DISTRIBUTION



	LUMENS	PERCENT OF FIXTURE
DOWNWARD STREET SIDE	5194.	68.1
DOWNWARD HOUSE SIDE	1061.	13.9
DOWNWARD TOTAL	6256.	82.0
UPWARD STREET SIDE	1322.	17.3
UPWARD HOUSE SIDE	49.	0.6
UPWARD TOTAL	1371.	18.0
TOTAL FLUX	7627.	100.0

TOTAL INPUT WATTS = 64.5
EFFICACY = 118.2 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: RAB03155
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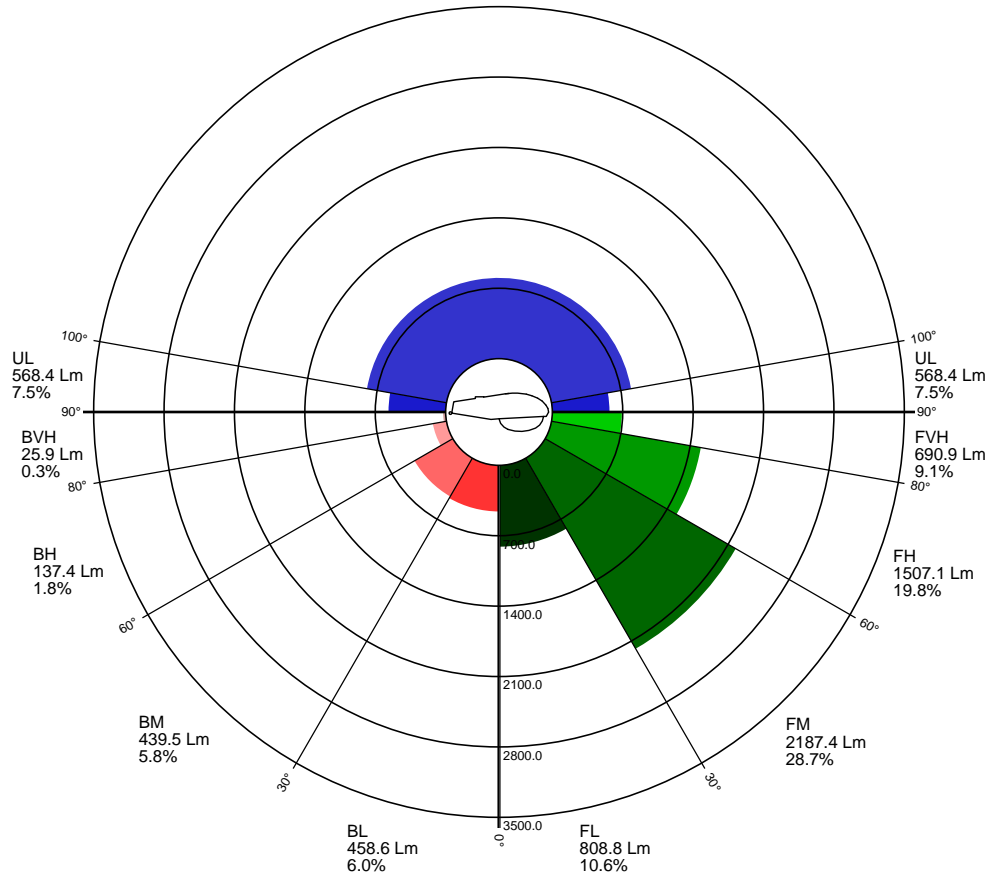
PAGE: 5 OF 9
 DATE SAMPLE TESTED: 04/05/17

BUG Rating:				Zone Ratings		
Zonal Summary				B	U	G
Forward		Lumens	% of Fixture			
FL	(0° - 30°)	808.8	10.6			
FM	(30° - 60°)	2187.4	28.7			
FH	(60° - 80°)	1507.1	19.8			G1
FVH	(80° - 90°)	690.9	9.1			G4
Backward		1061	13.9			
BL	(0° - 30°)	458.6	6.0	B1		
BM	(30° - 60°)	439.5	5.8	B1		
BH	(60° - 80°)	137.4	1.8	B1		G1
BVH	(80° - 90°)	25.9	0.3			G1
Upward		1371	18.0			
UL	(90° - 100°)	568.4	7.5		U4	
UH	(100° - 180°)	802.8	10.5		U4	
Trapped Light		0	0.0			
Total Flux		7627	100.0			

Zonal Lumen Summary

(Linear scale)

UH
802.8 Lm
10.5%

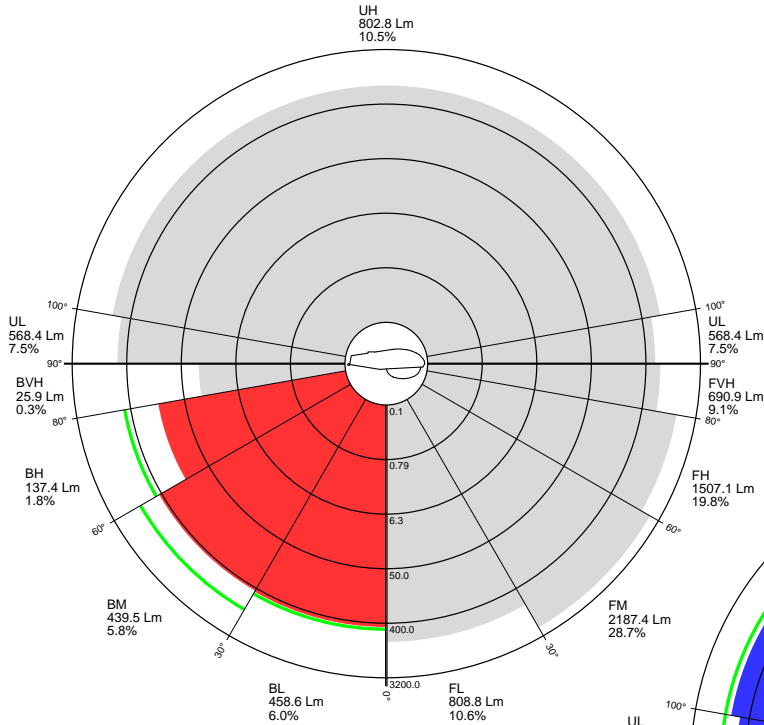


REPORT NUMBER: RAB03155
 ISSUE DATE: 04/05/17
 PREPARED FOR: RAB LIGHTING INC.

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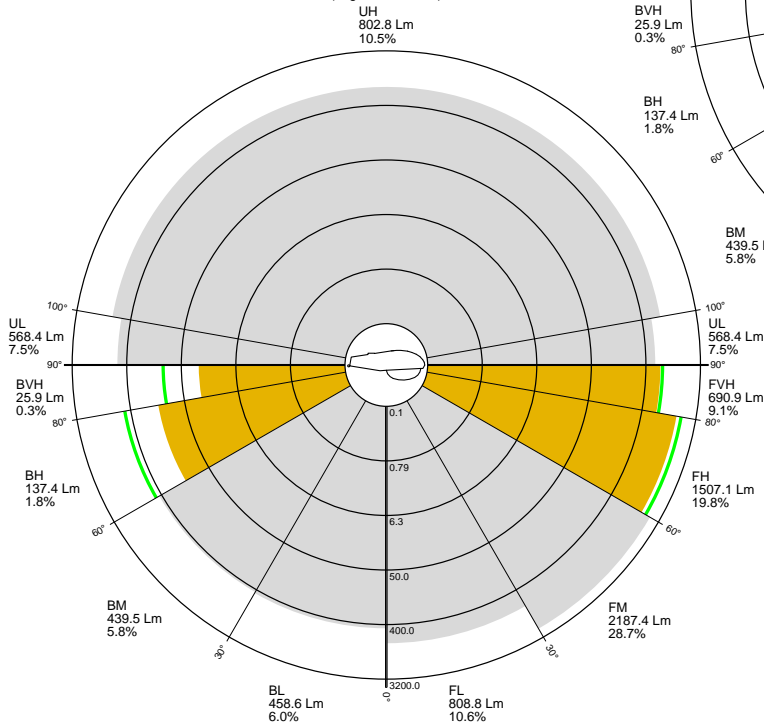
Backlight Rating Details

(Logarithmic scale)



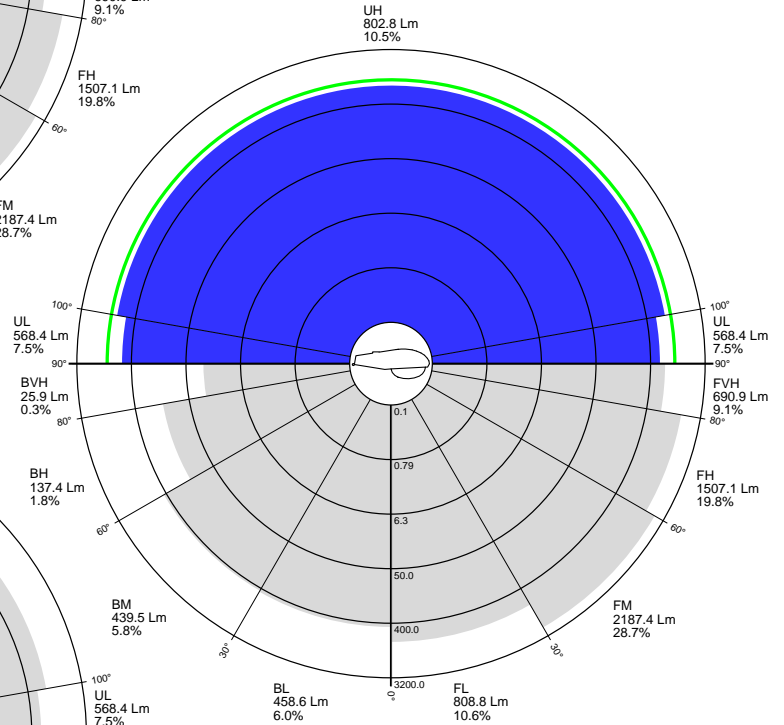
Glare Rating Details

(Logarithmic scale)



Uplight Rating Details

(Logarithmic scale)



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 PREPARED FOR: RAB LIGHTING INC.

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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	24.	24.	23.	21.	18.	14.	10.	6.	7.
	155.0	67.	67.	64.	61.	54.	46.	34.	22.	9.
	145.0	152.	151.	145.	132.	115.	93.	70.	54.	29.
	135.0	220.	216.	201.	173.	136.	104.	98.	83.	54.
	125.0	400.	393.	375.	332.	265.	191.	116.	73.	70.
	115.0	874.	864.	800.	677.	507.	359.	223.	113.	78.
	105.0	1375.	1391.	1361.	1209.	934.	661.	423.	240.	105.
	95.0	1892.	1909.	1848.	1641.	1367.	1009.	684.	443.	247.
	90.0	1970.	2015.	2037.	1859.	1564.	1184.	808.	548.	379.
	87.5	2084.	2098.	1987.	1819.	1591.	1213.	838.	600.	456.
	85.0	2152.	2195.	2168.	2015.	1682.	1271.	886.	630.	531.
V	82.5	2205.	2225.	2198.	2002.	1669.	1297.	910.	699.	614.
E	80.0	2300.	2357.	2241.	1987.	1700.	1300.	942.	759.	701.
R	77.5	2337.	2349.	2367.	2117.	1677.	1315.	961.	829.	801.
T	75.0	2150.	2182.	2080.	1884.	1665.	1317.	1009.	880.	905.
I	72.5	2609.	2640.	2494.	2102.	1645.	1311.	1059.	1005.	950.
C	70.0	1975.	2005.	1994.	1860.	1676.	1348.	1124.	1237.	1012.
A	67.5	2271.	2289.	2140.	1870.	1561.	1353.	1219.	1369.	1066.
L	65.0	2232.	2241.	2153.	1914.	1620.	1419.	1491.	1351.	1089.
	62.5	1991.	2003.	1903.	1719.	1600.	1602.	1690.	1431.	1052.
A	60.0	1943.	1953.	1868.	1737.	1672.	1758.	1813.	1585.	1007.
N	57.5	1965.	1975.	1911.	1897.	1960.	2101.	1824.	1532.	1005.
G	55.0	2003.	2019.	2036.	2100.	2097.	2082.	1989.	1580.	1018.
L	52.5	2175.	2174.	2126.	2197.	2308.	2198.	1955.	1565.	1050.
E	50.0	2369.	2379.	2469.	2457.	2365.	2277.	2028.	1454.	1105.
	47.5	2601.	2582.	2629.	2502.	2373.	2245.	2027.	1371.	1174.
	45.0	2712.	2638.	2547.	2527.	2454.	2316.	1933.	1393.	1250.
	42.5	2661.	2629.	2618.	2515.	2475.	2272.	1844.	1431.	1337.
	40.0	2635.	2566.	2567.	2585.	2474.	2208.	1709.	1525.	1429.
	37.5<<	2735.	2674.	2585.	2631.	2366.	2049.	1621.	1641.	1523.
	35.0	2599.	2582.	2733.	2419.	2337.	1951.	1657.	1616.	1607.
	30.0	2422.	2393.	2412.	2222.	1963.	1827.	1744.	1754.	1660.
	25.0	2048.	2026.	1991.	1991.	1926.	1977.	1987.	1799.	1665.
	20.0	2004.	1991.	2018.	2208.	1933.	2116.	2193.	1870.	1715.
	15.0	2244.	2270.	2287.	1982.	1834.	2192.	1774.	1884.	1868.
	10.0	2023.	1957.	1877.	1726.	1924.	2165.	1842.	1873.	1860.
	5.0	1816.	1826.	1819.	1850.	1886.	1925.	1899.	1800.	1729.
	0.0	1729.	1729.	1729.	1729.	1729.	1729.	1729.	1729.	1729.

||
 PLANE OF MAXIMUM CANDELA

CONE OF MAXIMUM CANDELA

REPORT NUMBER: RAB03155
 ISSUE DATE: 04/05/17
 PREPARED FOR: RAB LIGHTING INC.

PAGE: 8 OF 9
 DATE SAMPLE TESTED: 04/05/17

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.	4.
175.0	7.	7.	7.	6.	6.	5.	4.	3.	2.	1.	1.
165.0	7.	7.	7.	7.	6.	6.	5.	4.	3.	2.	2.
155.0	8.	8.	7.	7.	7.	6.	5.	4.	3.	3.	3.
145.0	11.	9.	8.	8.	7.	6.	5.	4.	4.	4.	4.
135.0	20.	16.	12.	12.	10.	7.	5.	4.	4.	4.	3.
125.0	35.	28.	20.	18.	13.	9.	6.	4.	4.	4.	4.
115.0	54.	44.	33.	26.	19.	13.	8.	5.	5.	5.	5.
105.0	57.	48.	42.	37.	25.	16.	11.	8.	8.	8.	8.
95.0	48.	53.	54.	50.	34.	21.	14.	10.	10.	10.	10.
90.0	59.	53.	65.	59.	40.	25.	16.	11.	10.	10.	10.
87.5	79.	60.	72.	65.	46.	29.	19.	12.	10.	11.	11.
85.0	108.	77.	79.	74.	54.	34.	22.	12.	9.	10.	10.
V 82.5	154.	101.	89.	86.	63.	50.	37.	27.	27.	27.	28.
E 80.0	216.	130.	98.	98.	71.	69.	51.	47.	41.	44.	45.
R 77.5	280.	165.	108.	106.	80.	86.	63.	65.	56.	54.	55.
T 75.0	346.	209.	118.	112.	88.	97.	77.	76.	76.	67.	67.
I 72.5	399.	256.	131.	116.	96.	99.	94.	82.	94.	89.	89.
C 70.0	445.	303.	150.	119.	101.	102.	115.	89.	101.	111.	111.
A 67.5	480.	351.	177.	125.	108.	106.	129.	101.	102.	118.	121.
L 65.0	502.	399.	209.	134.	119.	108.	130.	119.	104.	112.	112.
62.5	544.	446.	247.	151.	132.	120.	129.	141.	114.	105.	103.
A 60.0	595.	487.	290.	175.	147.	129.	131.	148.	137.	121.	119.
N 57.5	638.	538.	339.	208.	164.	146.	141.	148.	163.	148.	147.
G 55.0	692.	593.	390.	245.	186.	166.	154.	152.	161.	177.	179.
L 52.5	760.	639.	444.	286.	212.	188.	171.	166.	163.	168.	170.
E 50.0	826.	711.	503.	328.	243.	210.	194.	179.	176.	167.	167.
47.5	897.	782.	568.	376.	279.	235.	215.	202.	191.	186.	187.
45.0	980.	855.	636.	439.	317.	264.	237.	227.	217.	212.	213.
42.5	1060.	934.	711.	504.	359.	294.	261.	248.	237.	231.	233.
40.0	1138.	1017.	784.	582.	411.	327.	285.	267.	252.	246.	246.
37.5<<	1208.	1098.	865.	668.	482.	366.	314.	288.	271.	263.	264.
35.0	1288.	1178.	942.	753.	579.	424.	352.	319.	295.	285.	287.
30.0	1431.	1323.	1100.	929.	783.	620.	488.	408.	377.	354.	360.
25.0	1559.	1424.	1251.	1090.	960.	843.	755.	642.	566.	516.	526.
20.0	1651.	1510.	1397.	1269.	1137.	1031.	953.	897.	856.	826.	836.
15.0	1700.	1636.	1532.	1426.	1311.	1209.	1170.	1098.	1054.	1037.	1044.
10.0	1715.	1699.	1591.	1535.	1498.	1431.	1353.	1308.	1308.	1304.	1309.
5.0	1715.	1708.	1694.	1647.	1585.	1550.	1555.	1536.	1538.	1536.	1542.
0.0	1729.	1729.	1729.	1729.	1729.	1729.	1729.	1729.	1729.	1729.	1729.

CONE OF MAXIMUM CANDELA

REPORT NUMBER: RAB03155
 ISSUE DATE: 04/05/17
 PREPARED FOR: RAB LIGHTING INC.

PAGE: 9 OF 9
 DATE SAMPLE TESTED: 04/05/17

5-DEGREE ZONAL LUMEN SUMMARY

0- 5	41
5- 10	122
10- 15	195
15- 20	260
20- 25	304
25- 30	345
30- 35	386
35- 40	426
40- 45	454
45- 50	469
50- 55	458
55- 60	434
60- 65	417
65- 70	415
70- 75	414
75- 80	399
80- 85	376
85- 90	341
90- 95	305
95-100	263
100-105	218
105-110	171
110-115	128
115-120	89
120-125	60
125-130	41
130-135	29
135-140	22
140-145	17
145-150	12
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	164
0- 20	619
0- 30	1267
0- 40	2079
0- 50	3002
0- 60	3894
0- 70	4726
0- 80	5539
0- 90	6256
0-100	6824
0-110	7213
0-120	7431
0-130	7532
0-140	7583
0-150	7612
0-160	7623
0-170	7626
0-180	7627

REPORT NUMBER: RAB03156
 DATE: 4/4/2017
 PREPARED FOR: RAB LIGHTING INC.
 CATALOG NUMBER: WP3LED65/480/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: N/A
	CHROMA PROGRAMMABLE DIGITAL POWER METER MODEL 66202	3/01/18
	OCEAN OPTICS QE65PRO Spectroradiometer	03/07/18
	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: RAB03156
 DATE: 4/4/2017
 PREPARED FOR: RAB LIGHTING INC.
 CATALOG NUMBER: WP3LED65/480/D10 (ALSO APPLIES TO 347/RCL) (STANDARD CUTOFF - PRISMATIC GLASS LENS)

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RESULTS:

PHOTOMETRIC	
Total Integrated Flux (lumens)	7627 *
SPECTRORADIOMETRIC	
Observer	CIE 1931 2 degree
Chromaticity Ordinate x	0.3393
Chromaticity Ordinate y	0.3476
Observer	CIE 1976 2 degree
Chromaticity Ordinate u'	0.2090
Chromaticity Ordinate v'	0.4818
Correlated Color Temp CCT (K)	5218
ANSI C78.377-2008 Duv	0.000
Total Radiant Flux (milliWatts)	24354 *
ELECTRICAL	
Input Voltage (Volts AC)	480.0
Input Current (Amps AC)	0.146
Input Power (Watts)	64.5
Input Power Factor (%)	92.0
Input Current THD (%)	15.2
Input Voltage THD (%)	0.2
EFFICACY (Lumens/Watt)	
	118.2
ELECTRICAL AT MAX NONIMAL INPUT	
Input Voltage (Volts AC)	347.0
Input Current (Amps AC)	0.189
Input Power (Watts)	64.3
Input Power Factor (%)	98.2
Input Current THD (%)	12.1
Input Voltage THD (%)	0.2
Off-State Power (Watts)	
	0.0

COLOR RENDERING INDICES	CRI
Ra (Average 1-8)	82
R1 Light greyish red	81
R2 Dark greyish yellow	85
R3 Strong yellowish green	88
R4 Moderate yellowish green	83
R5 Light bluish green	82
R6 Light blue	80
R7 Light violet	86
R8 Light reddish purple	70
R9 Strong red	12
R10 Strong yellow	65
R11 Strong green	83
R12 Strong blue	65
R13 Light yellowish pink (skin)	81
R14 Moderate olive green (leaf)	94

*NOTE:

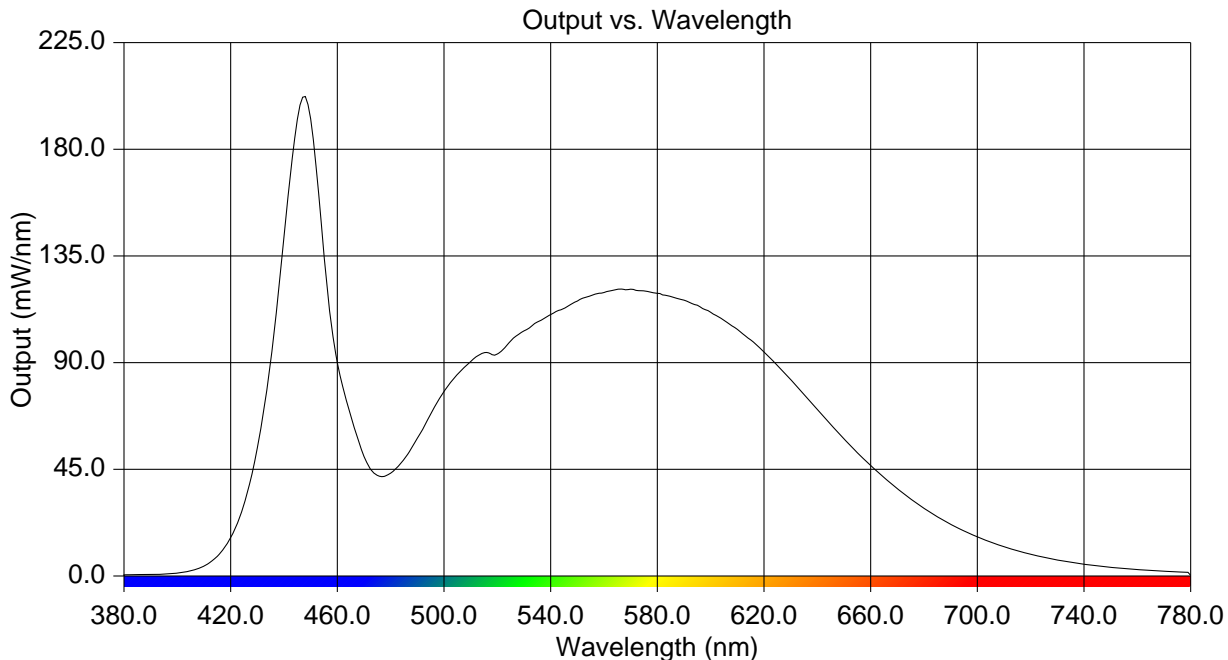
Proper calibration of integrating spheres for measuring total flux output of non-directional samples will produce reliable, repeatable results within the calibration tolerances of the equipment used. However, measurement of test samples with significant self absorption and/or directional output, even 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: RAB03156
 DATE: 4/4/2017
 PREPARED FOR: RAB LIGHTING INC.
 CATALOG NUMBER: WP3LED65/480/D10 (ALSO APPLIES TO 347/RCL) (STANDARD CUTOFF - PRISMATIC GLASS LENS)

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RESULTS:

Wavelength	mW per nm	Wavelength	mW per nm	Wavelength	mW per nm
380	0.471	515	94.212	650	57.736
385	0.555	520	93.655	655	51.994
390	0.631	525	99.174	660	46.637
395	0.798	530	103.412	665	41.585
400	1.228	535	107.150	670	36.836
405	2.161	540	110.269	675	32.471
410	4.191	545	112.898	680	28.534
415	8.304	550	115.983	685	24.989
420	16.082	555	118.275	690	21.796
425	30.326	560	119.590	695	19.009
430	54.051	565	121.038	700	16.547
435	90.703	570	120.997	705	14.285
440	142.726	575	120.268	710	12.313
445	192.596	580	119.250	715	10.632
450	192.875	585	117.996	720	9.180
455	135.470	590	116.375	725	7.869
460	89.979	595	114.241	730	6.774
465	67.553	600	111.261	735	5.789
470	50.420	605	107.890	740	4.970
475	42.494	610	104.058	745	4.278
480	43.385	615	99.615	750	3.681
485	49.229	620	94.443	755	3.144
490	58.127	625	89.013	760	2.715
495	68.348	630	82.837	765	2.342
500	77.888	635	76.572	770	2.004
505	84.896	640	70.260	775	1.737
510	90.455	645	63.951	780	0.262



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DATE: 4/4/2017
PREPARED FOR: RAB LIGHTING INC.
CATALOG NUMBER: WP3LED65/480/D10 (ALSO APPLIES TO 347/RCL) (STANDARD CUTOFF - PRISMATIC GLASS LENS)

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CIE Chromaticity Diagram

