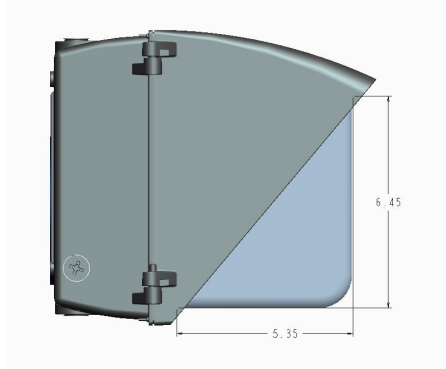


ISOFOOTCANDLE LINES OF HORIZONTAL ILLUMINATION

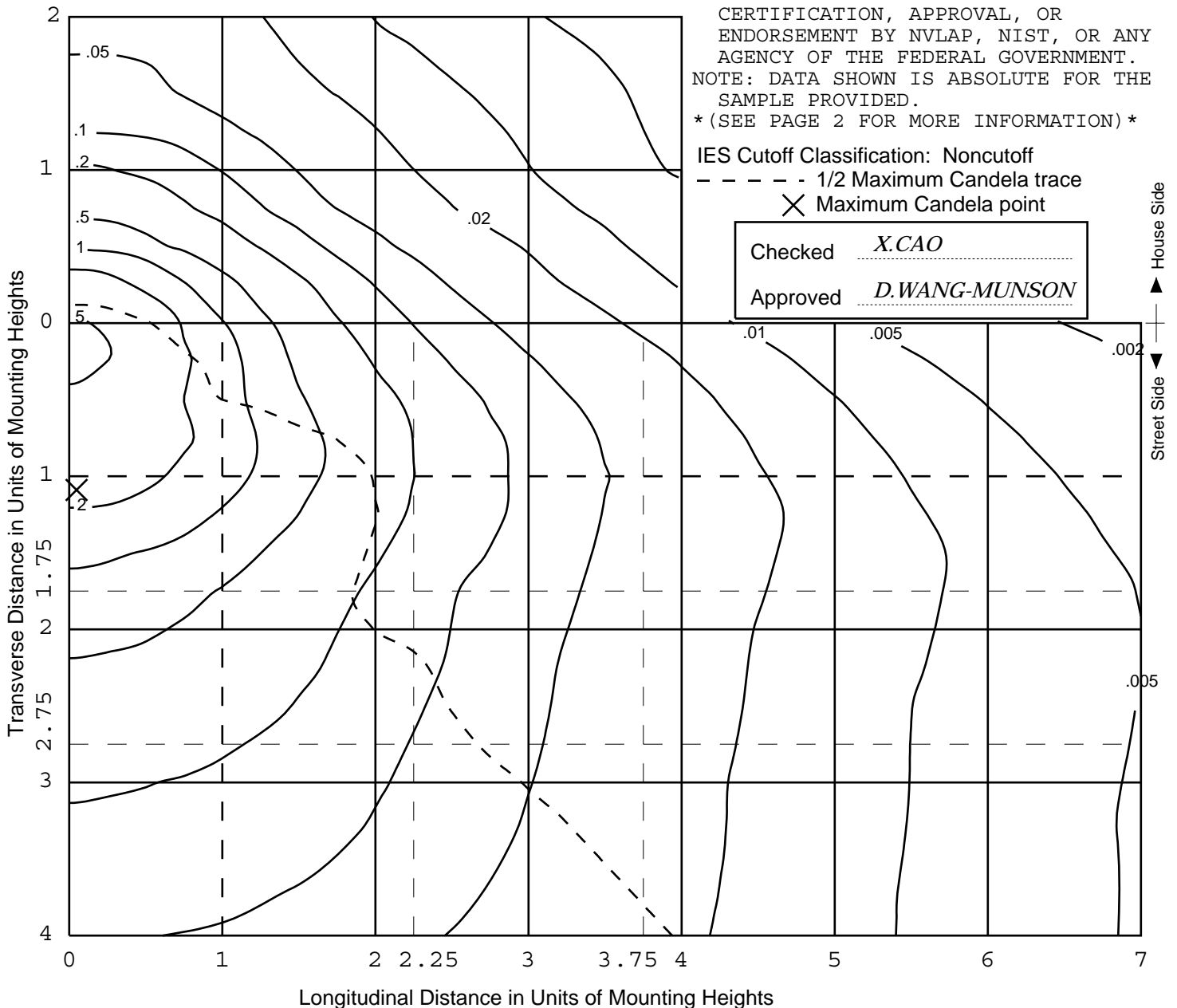
Values based on 20 foot mounting height.



REPORT NUMBER: RAB03168
 ISSUE DATE: 04/10/17 PAGE: 1 OF 9
 DATE SAMPLE TESTED: 04/10/17
 PREPARED FOR: RAB LIGHTING INC.
 CATALOG NUMBER: WP3LED82N/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



Checked X.CAO
 Approved D.WANG-MUNSON

REPORT NUMBER: RAB03168
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PREPARED FOR: RAB LIGHTING INC.

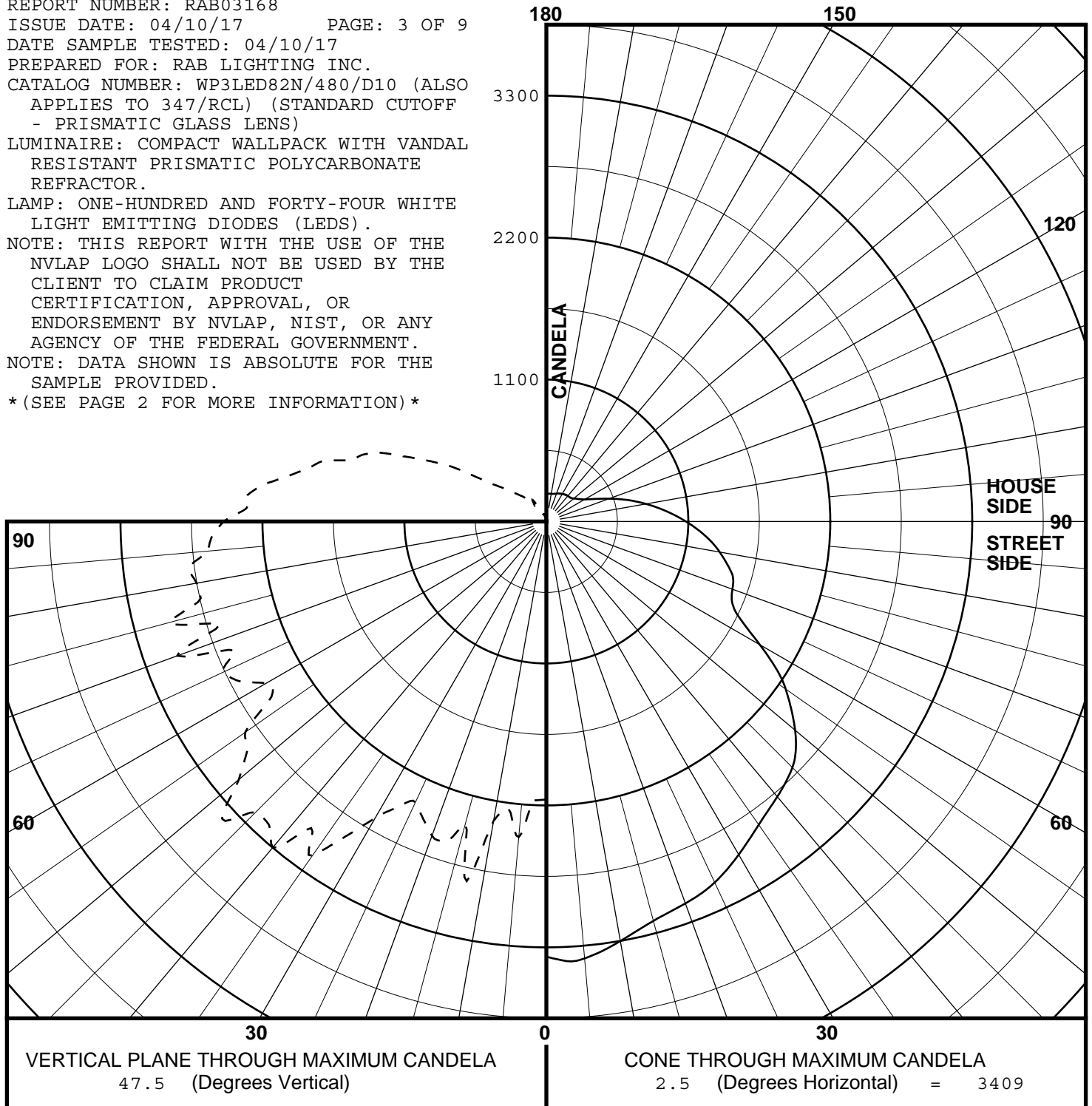
PAGE: 2 OF 9
DATE SAMPLE TESTED: 04/10/17

ADDITIONAL INFORMATION

TOTAL INPUT WATTS = 79.871 W AT 347.0 VAC.
LED DRIVER: RDD-096-A3600-240C
TEST PROCEDURE: IESNA LM-79-08
LM-80 DATA AVAILABLE FROM MANUFACTURER FOR SOLID STATE SOURCE
AMBIENT: 24.9
ACCREDITED LABORATORY CODE 201058-0

MAXIMUM PLANE AND MAXIMUM CONE PLOTS OF CANDELA

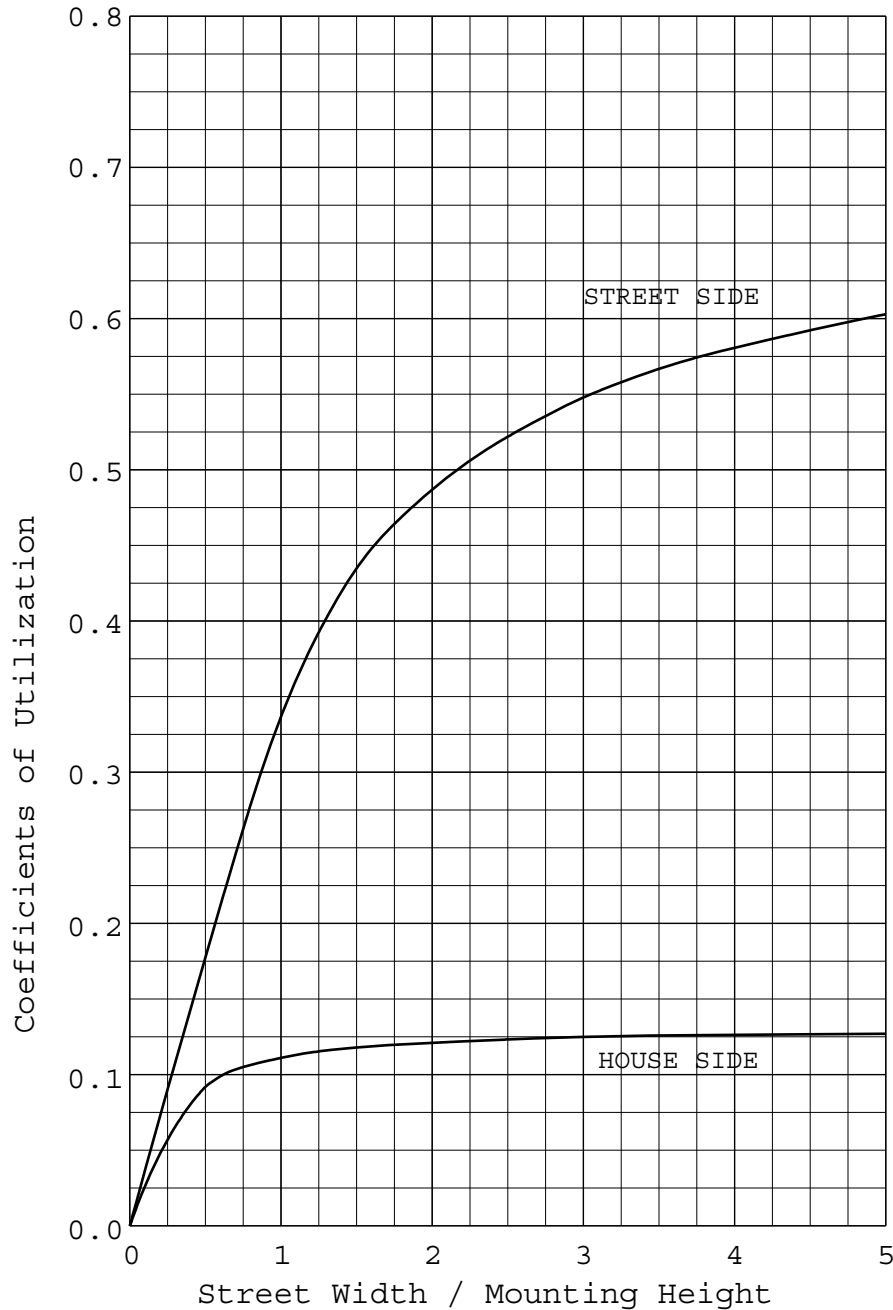
REPORT NUMBER: RAB03168
 ISSUE DATE: 04/10/17 PAGE: 3 OF 9
 DATE SAMPLE TESTED: 04/10/17
 PREPARED FOR: RAB LIGHTING INC.
 CATALOG NUMBER: WP3LED82N/480/D10 (ALSO
 APPLIES TO 347/RCL) (STANDARD CUTOFF
 - PRISMATIC GLASS LENS)
 LUMINAIRE: COMPACT WALLPACK WITH VANDAL
 RESISTANT PRISMATIC POLYCARBONATE
 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)



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COEFFICIENTS OF UTILIZATION AND FLUX DISTRIBUTION



	LUMENS	PERCENT OF FIXTURE
DOWNWARD STREET SIDE	6403.	68.6
DOWNWARD HOUSE SIDE	1203.	12.9
DOWNWARD TOTAL	7606.	81.5
UPWARD STREET SIDE	1668.	17.9
UPWARD HOUSE SIDE	64.	0.7
UPWARD TOTAL	1732.	18.5
TOTAL FLUX	9337.	100.0

TOTAL INPUT WATTS = 79.9
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.

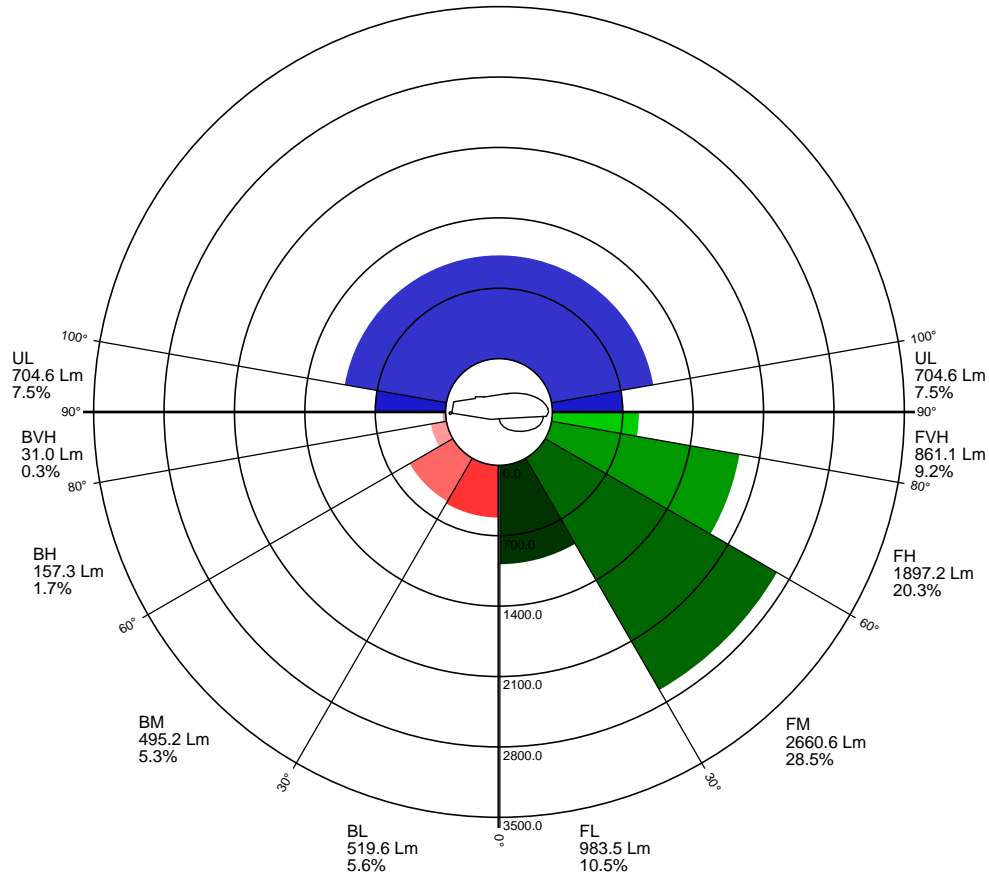
REPORT NUMBER: RAB03168
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BUG Rating:				B2 U5 G5		
Zonal Summary		Lumens	% of Fixture	Zone Ratings		
				B	U	G
Forward		6403	68.6			
FL	(0° - 30°)	983.5	10.5			
FM	(30° - 60°)	2660.6	28.5			
FH	(60° - 80°)	1897.2	20.3			G2
FVH	(80° - 90°)	861.1	9.2			G5
Backward		1203	12.9			
BL	(0° - 30°)	519.6	5.6	B2		
BM	(30° - 60°)	495.2	5.3	B1		
BH	(60° - 80°)	157.3	1.7	B1		G1
BVH	(80° - 90°)	31.0	0.3			G1
Upward		1732	18.5			
UL	(90° - 100°)	704.6	7.5		U4	
UH	(100° - 180°)	1027.0	11.0		U5	
Trapped Light		0	0.0			
Total Flux		9337	100.0			

Zonal Lumen Summary

(Linear scale)
 UH
 1027.0 Lm
 11.0%

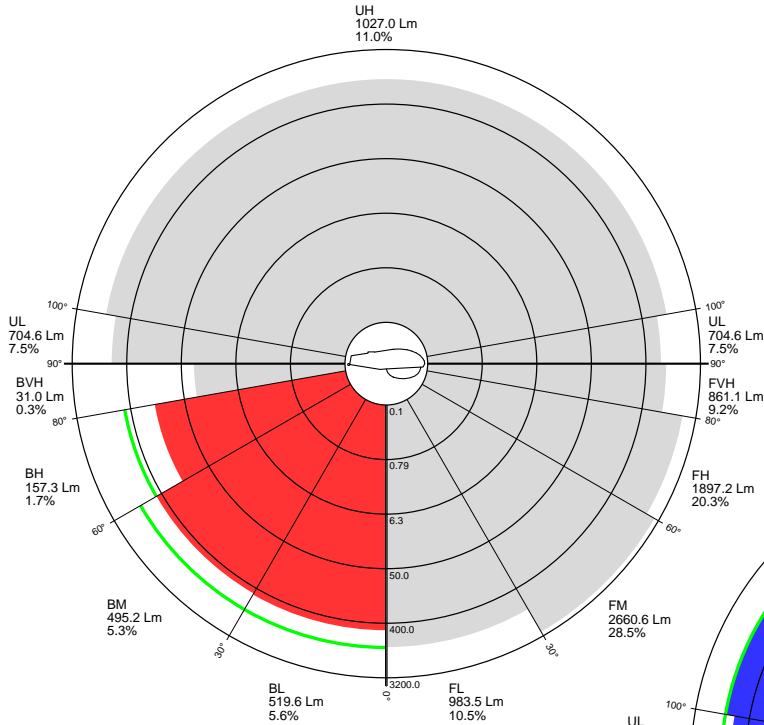


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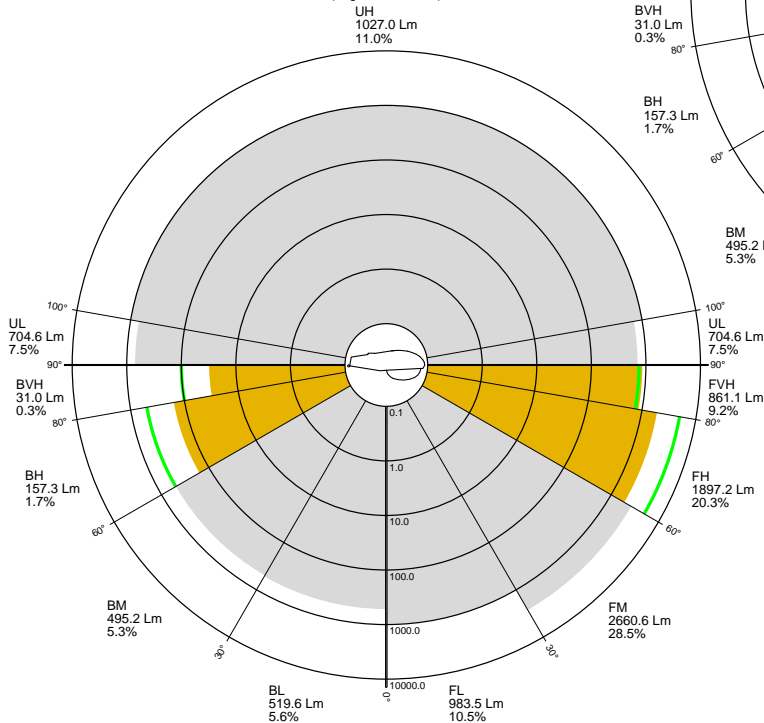
Backlight Rating Details

(Logarithmic scale)



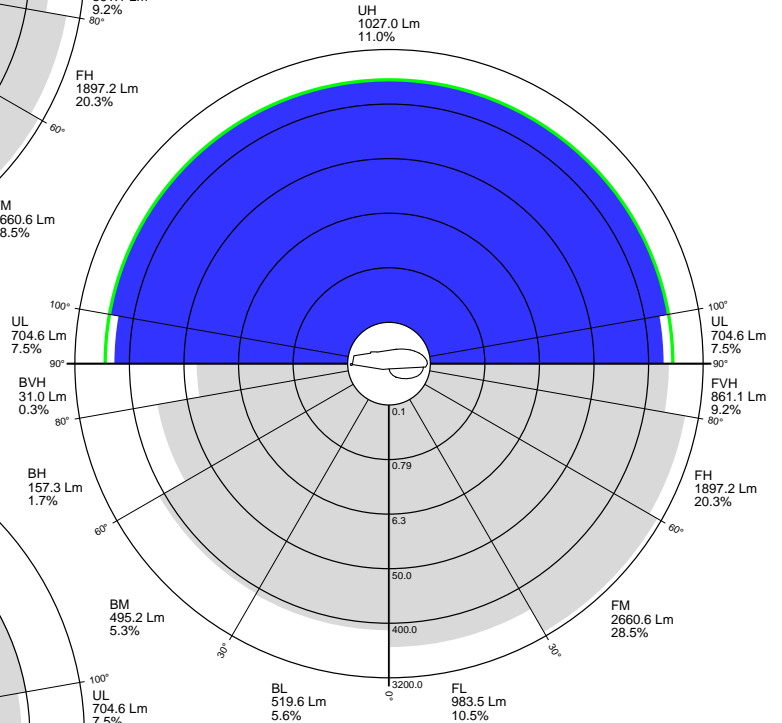
Glare Rating Details

(Logarithmic scale)



Uplight Rating Details

(Logarithmic scale)



	STREET	CANDELA TABULATION SIDE		LATERAL ANGLE								
		0.0	2.5	5.0	15.0	25.0	35.0	45.0	55.0	65.0	75.0	85.0
V	180.0	5.	5.	5.	5.	5.	5.	5.	5.	5.	5.	
E	175.0	1.	1.	1.	2.	4.	5.	6.	7.	8.	9.	
R	165.0	34.	35.	34.	32.	29.	25.	20.	14.	10.	9.	
T	155.0	79.	79.	76.	74.	70.	63.	53.	44.	31.	15.	
I	145.0	168.	171.	171.	171.	168.	158.	125.	89.	66.	40.	
C	135.0	287.	285.	281.	270.	229.	184.	129.	107.	99.	67.	
A	125.0	515.	502.	496.	482.	434.	345.	255.	161.	95.	81.	
L	115.0	1190.	1182.	1168.	1099.	928.	645.	465.	288.	151.	103.	
A	105.0	1824.	1802.	1790.	1706.	1480.	1193.	856.	534.	310.	140.	
N	95.0	2377.	2327.	2301.	2186.	2036.	1723.	1274.	865.	575.	320.	
G	90.0	2581.	2499.	2496.	2417.	2234.	1924.	1468.	1018.	683.	472.	
L	87.5	2645.	2592.	2567.	2508.	2317.	2028.	1565.	1083.	751.	567.	
E	85.0	2754.	2637.	2703.	2632.	2432.	2068.	1599.	1117.	820.	661.	
	82.5	2829.	2792.	2705.	2644.	2391.	2170.	1645.	1162.	877.	778.	
	80.0	2906.	2752.	2885.	2856.	2688.	2125.	1684.	1201.	940.	897.	
	77.5	2781.	2743.	2675.	2615.	2297.	2125.	1701.	1244.	1038.	994.	
	75.0	3167.	3015.	3127.	3058.	2803.	2181.	1648.	1299.	1135.	1082.	
	72.5	2709.	2652.	2617.	2503.	2275.	2076.	1770.	1339.	1408.	1164.	
	70.0	3131.	3044.	3065.	2945.	2577.	2112.	1677.	1450.	1513.	1228.	
	67.5	2683.	2615.	2631.	2594.	2389.	2089.	1776.	1729.	1553.	1223.	
	65.0	2808.	2761.	2742.	2617.	2314.	2015.	1857.	1973.	1699.	1235.	
	62.5	2737.	2680.	2663.	2543.	2275.	2118.	2191.	2089.	1820.	1161.	
	60.0	2550.	2507.	2502.	2415.	2297.	2409.	2415.	2239.	1738.	1145.	
	57.5	2554.	2525.	2496.	2521.	2560.	2528.	2528.	2298.	1835.	1174.	
	55.0	2861.	2848.	2824.	2774.	2715.	2816.	2689.	2289.	1775.	1231.	
	52.5	2925.	2924.	2906.	2930.	2923.	2842.	2621.	2423.	1684.	1293.	
	50.0	3089.	3112.	3101.	3166.	3120.	2916.	2749.	2285.	1572.	1374.	
	47.5<<	3373.	3409.	3399.	3204.	3087.	2869.	2696.	2264.	1607.	1480.	
	45.0	3168.	3187.	3187.	3279.	3042.	2991.	2704.	2112.	1682.	1586.	
	42.5	3149.	3185.	3210.	3123.	3164.	2930.	2609.	1979.	1768.	1674.	
	40.0	3282.	3298.	3336.	3196.	3020.	2786.	2352.	1902.	1846.	1732.	
	37.5	2975.	2995.	3024.	3194.	3000.	2760.	2337.	1952.	1878.	1781.	
	35.0	3110.	3161.	3180.	2945.	2890.	2482.	2128.	2072.	2009.	1821.	
	30.0	2635.	2652.	2661.	2673.	2480.	2294.	2249.	2321.	2201.	1951.	
	25.0	2409.	2402.	2389.	2421.	2455.	2446.	2425.	2215.	2130.	2173.	
	20.0	2611.	2592.	2558.	2556.	2503.	2674.	2301.	2233.	2383.	2279.	
	15.0	2377.	2427.	2439.	2309.	2501.	2757.	2199.	2593.	2		

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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	5.	5.	5.	5.	5.	5.	5.	5.	5.	5.	5.
175.0	9.	9.	9.	8.	8.	7.	5.	4.	3.	2.	2.
165.0	9.	9.	9.	9.	8.	7.	6.	5.	4.	4.	3.
155.0	10.	10.	9.	9.	8.	8.	7.	5.	5.	4.	4.
145.0	14.	12.	10.	11.	10.	8.	7.	6.	6.	5.	5.
135.0	25.	19.	14.	15.	12.	9.	7.	6.	5.	5.	5.
125.0	43.	35.	26.	22.	17.	12.	8.	6.	6.	6.	6.
115.0	68.	55.	44.	33.	24.	17.	11.	8.	8.	8.	8.
105.0	71.	59.	53.	48.	31.	21.	15.	11.	11.	11.	11.
95.0	67.	68.	65.	62.	42.	26.	18.	14.	13.	14.	14.
90.0	76.	71.	79.	73.	49.	31.	21.	15.	14.	14.	14.
87.5	100.	79.	88.	83.	56.	35.	23.	16.	14.	14.	15.
85.0	139.	95.	97.	94.	63.	41.	25.	16.	14.	14.	14.
V 82.5	192.	122.	108.	107.	71.	60.	38.	27.	23.	22.	19.
E 80.0	258.	152.	120.	121.	83.	79.	53.	47.	41.	44.	45.
R 77.5	335.	193.	132.	130.	95.	91.	75.	63.	60.	58.	59.
T 75.0	407.	245.	141.	134.	105.	98.	100.	76.	78.	77.	78.
I 72.5	461.	301.	155.	137.	114.	101.	122.	87.	86.	94.	95.
C 70.0	514.	356.	173.	139.	121.	106.	136.	107.	94.	101.	102.
A 67.5	558.	408.	205.	146.	131.	113.	136.	136.	105.	106.	105.
L 65.0	600.	464.	243.	157.	145.	118.	126.	160.	126.	114.	112.
62.5	650.	518.	285.	174.	157.	135.	123.	162.	156.	134.	130.
A 60.0	692.	572.	334.	200.	173.	154.	131.	146.	185.	174.	169.
N 57.5	761.	635.	389.	234.	190.	177.	150.	139.	170.	200.	200.
G 55.0	834.	699.	446.	275.	210.	200.	174.	154.	151.	174.	181.
L 52.5	911.	775.	505.	321.	236.	222.	202.	179.	158.	152.	152.
E 50.0	985.	847.	572.	368.	268.	241.	228.	207.	186.	173.	169.
47.5<<	1082.	930.	646.	413.	304.	262.	254.	239.	222.	216.	214.
45.0	1168.	1024.	724.	471.	345.	287.	270.	264.	256.	253.	250.
42.5	1261.	1113.	807.	546.	391.	317.	284.	283.	271.	267.	265.
40.0	1351.	1204.	892.	636.	441.	353.	304.	296.	280.	274.	274.
37.5	1437.	1292.	990.	725.	509.	396.	337.	313.	296.	285.	284.
35.0	1522.	1377.	1072.	832.	605.	450.	385.	336.	321.	311.	308.
30.0	1664.	1555.	1255.	1031.	827.	655.	502.	439.	390.	381.	379.
25.0	1781.	1701.	1433.	1241.	1084.	945.	784.	686.	576.	536.	535.
20.0	1912.	1816.	1620.	1475.	1296.	1149.	1062.	987.	920.	890.	870.
15.0	2032.	1882.	1731.	1599.	1501.	1413.	1348.	1221.	1153.	1141.	1141.
10.0	2155.	1978.	1874.	1781.	1735.	1597.	1561.	1514.	1468.	1429.	1416.
5.0	2168.	2089.	1933.	1896.	1844.	1811.	1787.	1778.	1752.	1747.	1739.
0.0	2154.	2154.	2154.	2154.	2154.	2154.	2154.	2154.	2154.	2154.	2154.

CONE OF MAXIMUM CANDELA

REPORT NUMBER: RAB03168
 ISSUE DATE: 04/10/17
 PREPARED FOR: RAB LIGHTING INC.

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5-DEGREE ZONAL LUMEN SUMMARY

0- 5	49
5- 10	144
10- 15	235
15- 20	308
20- 25	368
25- 30	399
30- 35	446
35- 40	494
40- 45	537
45- 50	566
50- 55	567
55- 60	545
60- 65	526
65- 70	519
70- 75	513
75- 80	496
80- 85	467
85- 90	425
90- 95	377
95-100	328
100-105	272
105-110	218
110-115	168
115-120	117
120-125	78
125-130	53
130-135	38
135-140	28
140-145	20
145-150	16
150-155	9
155-160	5
160-165	3
165-170	1
170-175	0
175-180	0

10-DEGREE ZONAL LUMEN SUMMARY

0- 10	193
0- 20	736
0- 30	1503
0- 40	2443
0- 50	3547
0- 60	4659
0- 70	5705
0- 80	6714
0- 90	7606
0-100	8310
0-110	8800
0-120	9085
0-130	9216
0-140	9282
0-150	9318
0-160	9332
0-170	9337
0-180	9337

REPORT NUMBER: RAB03169
 DATE: 4/10/2017
 PREPARED FOR: RAB LIGHTING INC.
 CATALOG NUMBER: WP3LED82N/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 (347.0 AND 480.0 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	04/10/18
	RAB 2.0 meter Diameter Integrating Sphere, 4PI Geometry	04/10/18

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 (480.0 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: RAB03169
 DATE: 4/10/2017
 PREPARED FOR: RAB LIGHTING INC.
 CATALOG NUMBER: WP3LED82N/480/D10 (ALSO APPLIES TO 347/RCL) (STANDARD CUTOFF - PRISMATIC GLASS LENS)

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RESULTS:

PHOTOMETRIC	
Total Integrated Flux (lumens)	9337 *
SPECTRORADIOMETRIC	
Observer	CIE 1931 2 degree
Chromaticity Ordinate x	0.3761
Chromaticity Ordinate y	0.3757
Observer	CIE 1976 2 degree
Chromaticity Ordinate u'	0.2227
Chromaticity Ordinate v'	0.5005
Correlated Color Temp CCT (K)	4113
ANSI C78.377-2008 Duv	0.001
Total Radiant Flux (milliWatts)	28595 *
ELECTRICAL	
Input Voltage (Volts AC)	347.0
Input Current (Amps AC)	0.233
Input Power (Watts)	79.9
Input Power Factor (%)	98.8
Input Current THD (%)	10.6
Input Voltage THD (%)	0.2
EFFICACY (Lumens/Watt)	
	116.9
ELECTRICAL AT MAX NONIMAL INPUT	
Input Voltage (Volts AC)	480.0
Input Current (Amps AC)	0.176
Input Power (Watts)	79.8
Input Power Factor (%)	94.5
Input Current THD (%)	12.0
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	82
R5 Light bluish green	82
R6 Light blue	85
R7 Light violet	86
R8 Light reddish purple	65
R9 Strong red	8
R10 Strong yellow	73
R11 Strong green	81
R12 Strong blue	67
R13 Light yellowish pink (skin)	82
R14 Moderate olive green (leaf)	97

*NOTE:

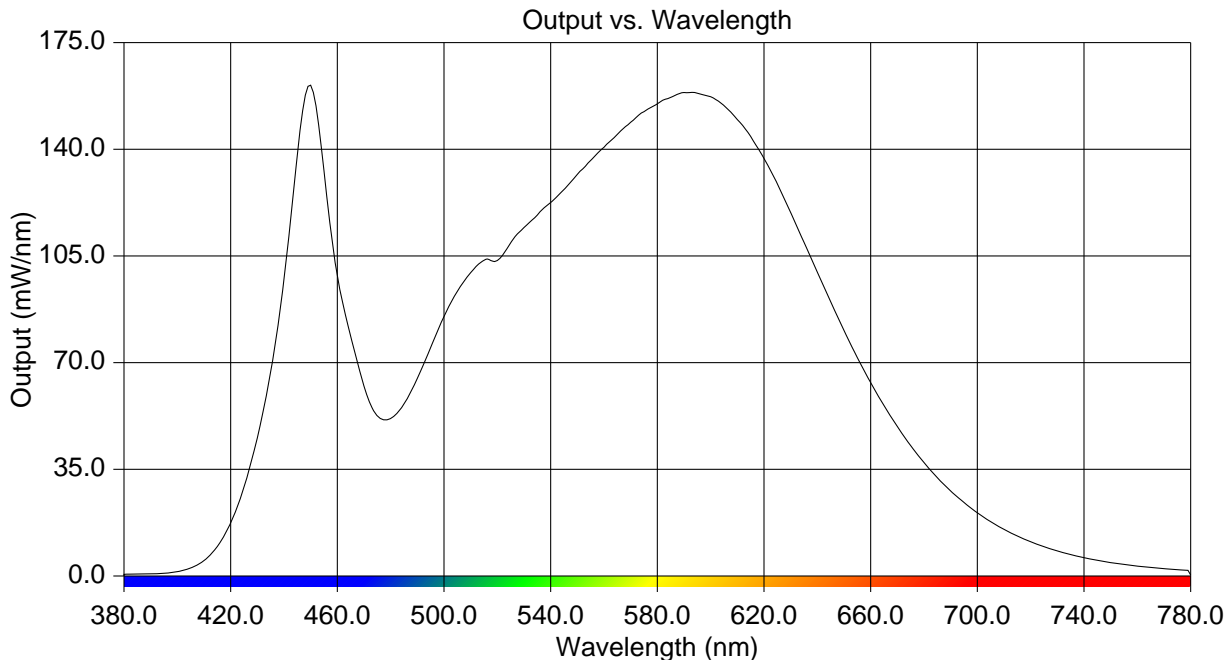
Proper calibration of integrating spheres for measuring total flux output of non-directional samples will produce reliable, repeatable results within the calibration tolerances of the equipment used. However, measurement of test samples with significant self absorption and/or directional output, even 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: RAB03169
 DATE: 4/10/2017
 PREPARED FOR: RAB LIGHTING INC.
 CATALOG NUMBER: WP3LED82N/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	0.537	515	103.554	650	80.524
385	0.595	520	103.515	655	71.652
390	0.685	525	109.268	660	63.425
395	0.906	530	114.341	665	55.940
400	1.444	535	118.430	670	49.081
405	2.544	540	122.551	675	42.795
410	5.060	545	126.731	680	37.229
415	9.681	550	131.783	685	32.244
420	17.352	555	136.388	690	27.876
425	29.273	560	140.674	695	24.134
430	45.298	565	144.897	700	20.747
435	67.087	570	148.882	705	17.812
440	97.640	575	152.355	710	15.332
445	138.330	580	155.018	715	13.104
450	161.042	585	157.027	720	11.239
455	132.941	590	158.644	725	9.609
460	98.456	595	158.422	730	8.218
465	78.649	600	157.263	735	6.992
470	62.272	605	154.314	740	5.993
475	52.615	610	149.760	745	5.153
480	51.612	615	144.241	750	4.419
485	56.520	620	136.942	755	3.781
490	64.845	625	128.776	760	3.254
495	75.013	630	119.260	765	2.800
500	85.137	635	109.514	770	2.396
505	93.289	640	99.800	775	2.067
510	99.534	645	89.911	780	0.314



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DATE: 4/10/2017
PREPARED FOR: RAB LIGHTING INC.
CATALOG NUMBER: WP3LED82N/480/D10 (ALSO APPLIES TO 347/RCL) (STANDARD CUTOFF - PRISMATIC GLASS LENS)

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CIE Chromaticity Diagram

