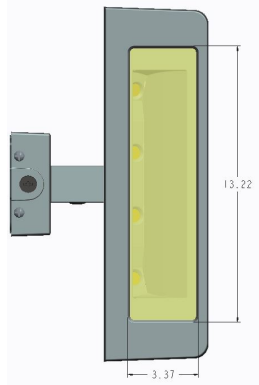


ISOFOOTCANDLE LINES OF HORIZONTAL ILLUMINATION

Values based on 20 foot mounting height.



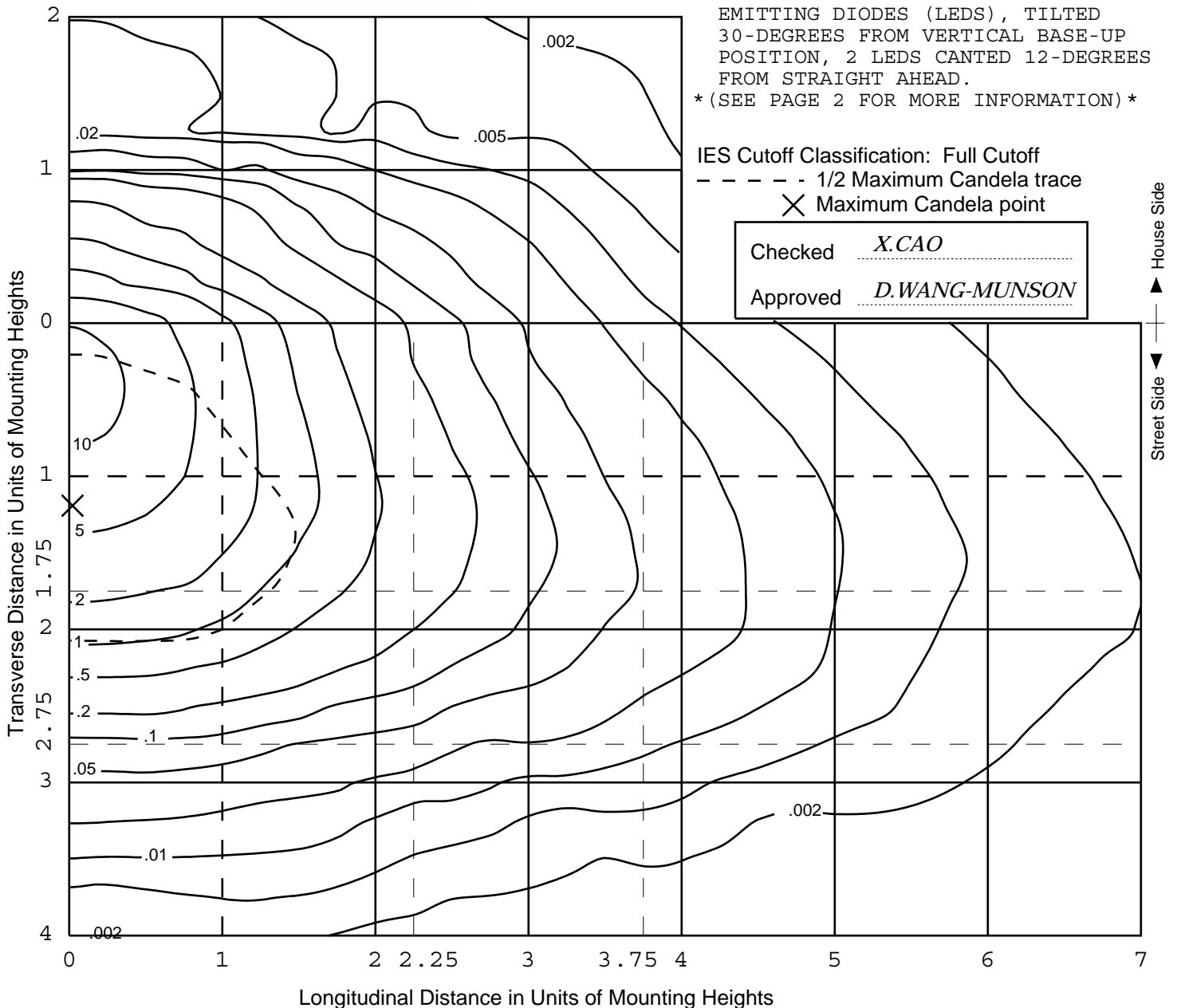
REPORT NUMBER: RAB01941
 ISSUE DATE: 05/10/16 PAGE: 1 OF 9
 DATE SAMPLE TESTED: 05/10/16
 PREPARED FOR: RAB LIGHTING INC.
 CATALOG NUMBER: WPLEDFC104N /
 ALEDFC104N (0-DEGREE UPTILT)
 LUMINAIRE: CAST FINNED METAL HOUSING,
 2-PIECE EXTRUDED METAL HEAT SINK, 4
 CIRCUIT BOARDS EACH WITH 1 LED,
 MOLDED PLASTIC REFLECTOR WITH
 SPECULAR FINISH AND 1 OPTICAL
 COMPARTMENT WITH 1 APERTURE PER LED,
 CLEAR FLAT GLASS LENS IN CAST BROWN
 PAINTED METAL FRAME.
 LAMPS: FOUR WHITE MULTI-CHIP LIGHT
 EMITTING DIODES (LEDs), TILTED
 30-DEGREES FROM VERTICAL BASE-UP
 POSITION, 2 LEDS CANTED 12-DEGREES
 FROM STRAIGHT AHEAD.
 (SEE PAGE 2 FOR MORE INFORMATION)

IES Cutoff Classification: Full Cutoff

--- 1/2 Maximum Candela trace

X Maximum Candela point

Checked X.CAO
 Approved D.WANG-MUNSON



REPORT NUMBER: RAB01941
ISSUE DATE: 05/10/16
PREPARED FOR: RAB LIGHTING INC.

PAGE: 2 OF 9
DATE SAMPLE TESTED: 05/10/16

ADDITIONAL INFORMATION

NOTE: DATA SHOWN IS ABSOLUTE FOR THE SAMPLE PROVIDED.
TOTAL INPUT WATTS = 105.27 W AT 120.0 VAC.

LED DRIVER: RD-120-A0700

TEST PROCEDURE: IESNA LM-79-08

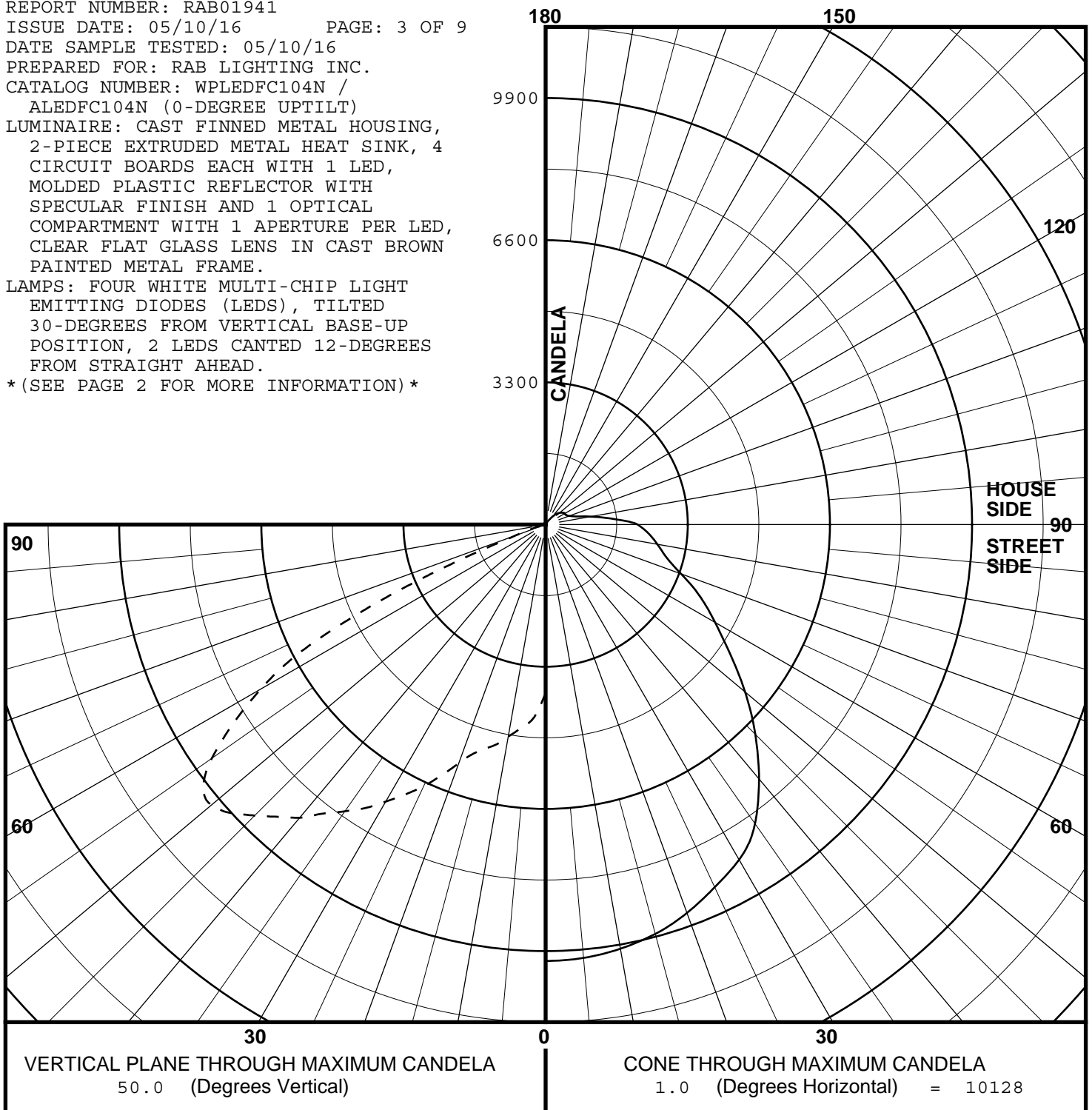
ACCREDITED LABORATORY CODE 201058-0

TEST DISTANCE : 28.25 FEET

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.

MAXIMUM PLANE AND MAXIMUM CONE PLOTS OF CANDELA

REPORT NUMBER: RAB01941
 ISSUE DATE: 05/10/16 PAGE: 3 OF 9
 DATE SAMPLE TESTED: 05/10/16
 PREPARED FOR: RAB LIGHTING INC.
 CATALOG NUMBER: WPLEDFC104N /
 ALEDFC104N (0-DEGREE UPTILT)
 LUMINAIRE: CAST FINNED METAL HOUSING,
 2-PIECE EXTRUDED METAL HEAT SINK, 4
 CIRCUIT BOARDS EACH WITH 1 LED,
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 EMITTING DIODES (LEDs), TILTED
 30-DEGREES FROM VERTICAL BASE-UP
 POSITION, 2 LEDS CANTED 12-DEGREES
 FROM STRAIGHT AHEAD.
 *(SEE PAGE 2 FOR MORE INFORMATION) *



REPORT NUMBER: RAB01941

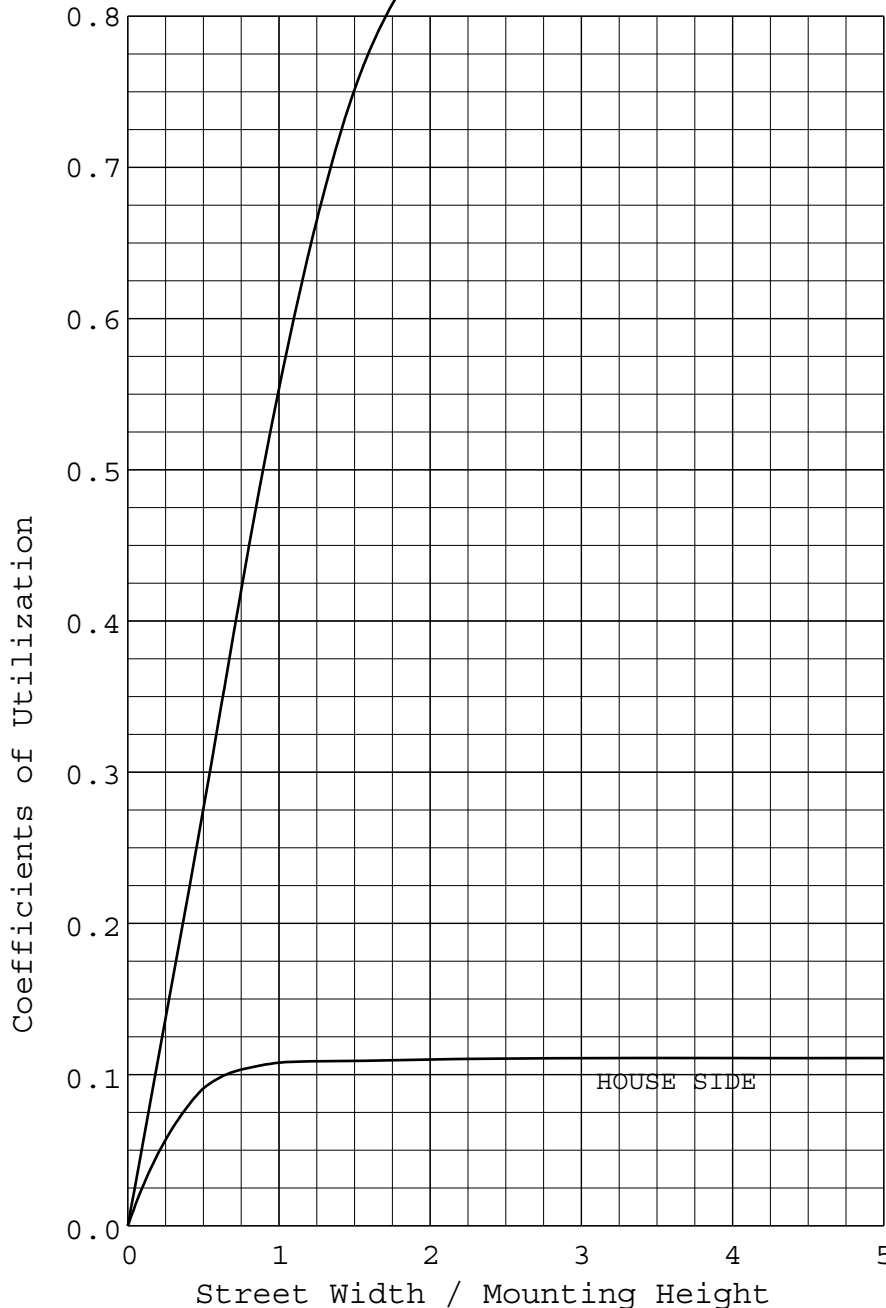
ISSUE DATE: 05/10/16

PREPARED FOR: RAB LIGHTING INC. STREET SIDE

PAGE: 4 OF 9

DATE SAMPLE TESTED: 05/10/16

COEFFICIENTS OF UTILIZATION AND FLUX DISTRIBUTION



	LUMENS	PERCENT OF FIXTURE
DOWNWARD STREET SIDE	11651.	88.8
DOWNWARD HOUSE SIDE	1467.	11.2
DOWNWARD TOTAL	13118.	100.0
UPWARD STREET SIDE	0.	0.0
UPWARD HOUSE SIDE	0.	0.0
UPWARD TOTAL	0.	0.0
TOTAL FLUX	13118.	100.0

TOTAL INPUT WATTS = 105.3
EFFICACY = 124.6 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: RAB01941
 ISSUE DATE: 05/10/16
 PREPARED FOR: RAB LIGHTING INC.

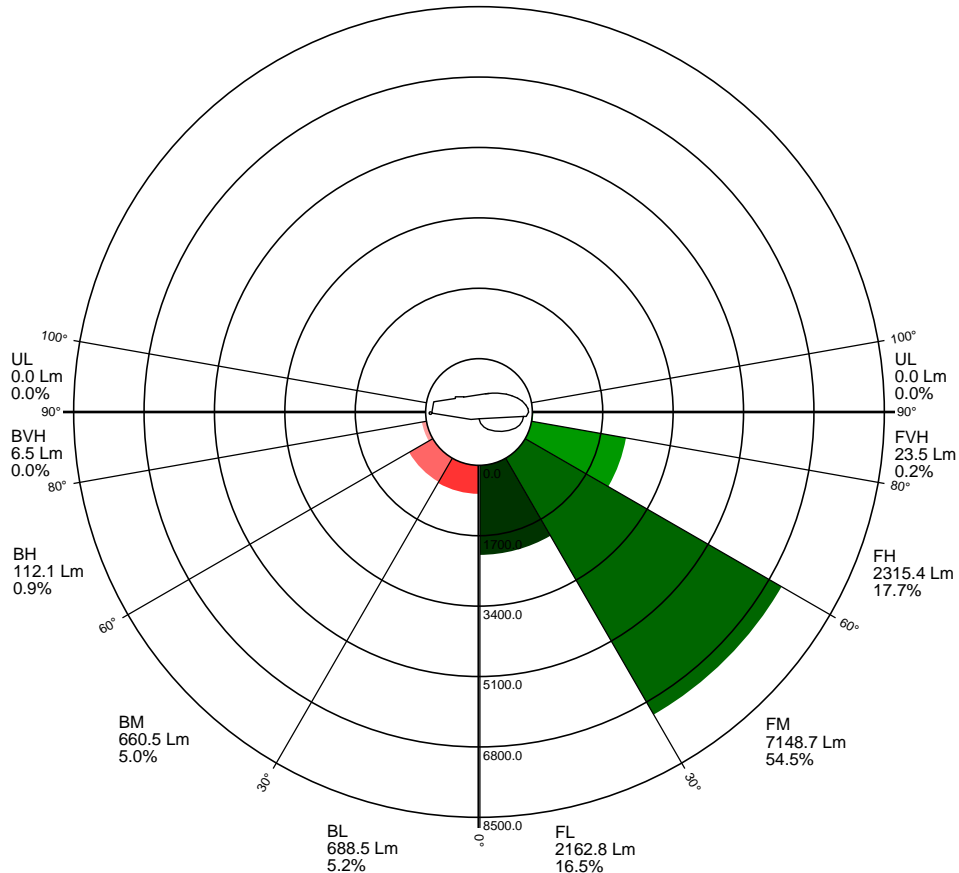
PAGE: 5 OF 9
 DATE SAMPLE TESTED: 05/10/16

BUG Rating:				B2	U0	G2
Zonal Summary		Lumens	% of Fixture	Zone Ratings		
				B	U	G
Forward		11651	88.8			
FL	(0° – 30°)	2162.8	16.5			
FM	(30° – 60°)	7148.7	54.5			
FH	(60° – 80°)	2315.4	17.7			G2
FVH	(80° – 90°)	23.5	0.2			G1
Backward		1467	11.2			
BL	(0° – 30°)	688.5	5.2	B2		
BM	(30° – 60°)	660.5	5.0	B1		
BH	(60° – 80°)	112.1	0.9	B1		G1
BVH	(80° – 90°)	6.5	0.0			G0
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		13118	100.0			

Zonal Lumen Summary

(Linear scale)

UH
0.0 Lm
0.0%

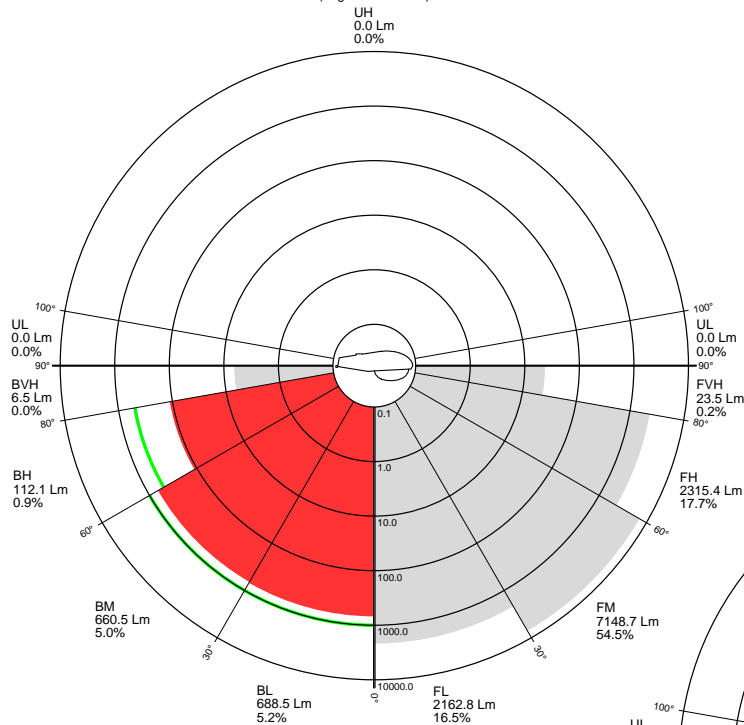


REPORT NUMBER: RAB01941
ISSUE DATE: 05/10/16
PREPARED FOR: RAB LIGHTING INC.

PAGE: 6 OF 9
DATE SAMPLE TESTED: 05/10/16

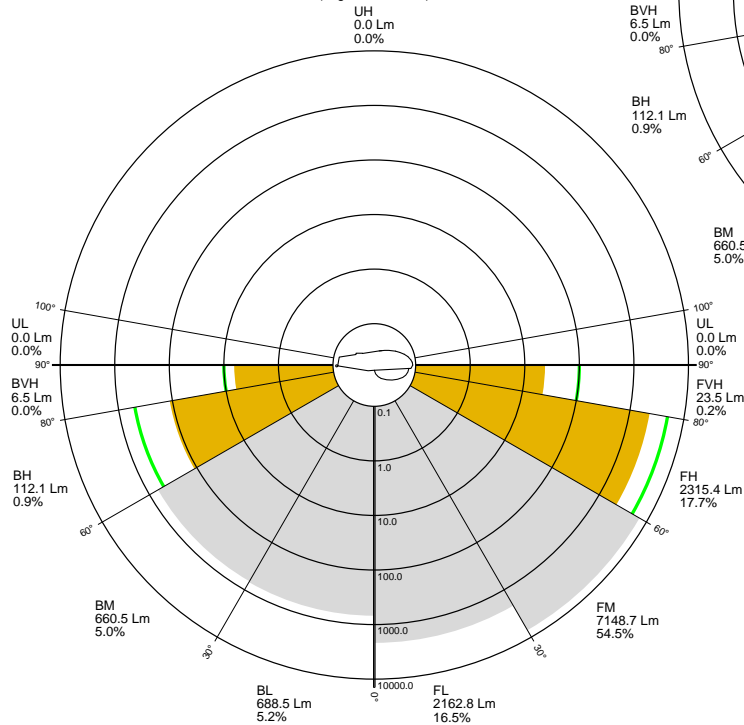
Backlight Rating Details

(Logarithmic scale)



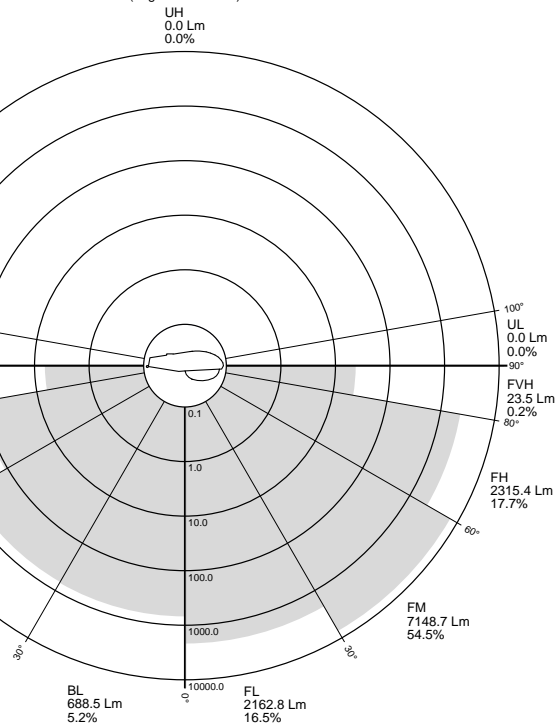
Glare Rating Details

(Logarithmic scale)



Uplight Rating Details

(Logarithmic scale)



[illegible]

CONE OF MAXIMUM CANDELA

REPORT NUMBER: RAB01941
 ISSUE DATE: 05/10/16
 PREPARED FOR: RAB LIGHTING INC.

PAGE: 8 OF 9
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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	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	15.	15.	14.	13.	12.	10.	8.	6.	4.	3.	3.
85.0	21.	19.	19.	13.	12.	10.	8.	7.	5.	4.	4.
V 82.5	86.	35.	23.	20.	13.	10.	8.	7.	5.	5.	4.
E 80.0	164.	69.	34.	35.	16.	11.	9.	7.	5.	4.	4.
R 77.5	217.	103.	36.	53.	23.	13.	10.	8.	6.	7.	6.
T 75.0	304.	184.	85.	59.	29.	19.	13.	12.	10.	11.	11.
I 72.5	478.	325.	164.	40.	42.	23.	20.	20.	16.	18.	17.
C 70.0	717.	430.	224.	40.	42.	34.	23.	24.	24.	28.	27.
A 67.5	925.	582.	304.	81.	29.	37.	33.	28.	26.	30.	30.
L 65.0	1126.	680.	336.	163.	20.	35.	40.	39.	33.	36.	35.
62.5	1307.	827.	362.	242.	36.	25.	40.	42.	42.	48.	47.
A 60.0	1470.	942.	399.	311.	98.	18.	30.	39.	42.	51.	50.
N 57.5	1579.	1019.	477.	403.	247.	33.	19.	30.	36.	45.	46.
G 55.0	1741.	1197.	596.	467.	383.	90.	24.	20.	26.	34.	35.
L 52.5	1948.	1384.	668.	494.	444.	224.	41.	20.	17.	22.	22.
E 50.0<<	2135.	1551.	729.	525.	480.	343.	110.	37.	26.	23.	21.
47.5	2378.	1726.	774.	565.	513.	403.	224.	95.	47.	37.	35.
45.0	2597.	1901.	845.	617.	538.	425.	321.	211.	145.	106.	94.
42.5	2836.	2099.	930.	671.	562.	445.	361.	329.	294.	250.	237.
40.0	3034.	2315.	1074.	724.	595.	467.	385.	400.	421.	393.	384.
37.5	3161.	2465.	1253.	782.	628.	489.	418.	450.	467.	461.	458.
35.0	3258.	2598.	1443.	862.	651.	514.	459.	503.	501.	489.	485.
30.0	3434.	2899.	1819.	1030.	696.	592.	586.	599.	576.	562.	557.
25.0	3595.	3132.	2112.	1280.	887.	734.	732.	709.	679.	665.	658.
20.0	3604.	3223.	2408.	1761.	1275.	1050.	924.	825.	789.	777.	772.
15.0	3742.	3465.	2886.	2336.	1901.	1556.	1278.	1161.	1087.	1060.	1053.
10.0	3862.	3677.	3281.	2888.	2557.	2306.	2080.	1921.	1785.	1771.	1727.
5.0	3892.	3800.	3618.	3437.	3271.	3145.	3008.	2913.	2848.	2802.	2821.
0.0	3909.	3909.	3909.	3909.	3909.	3909.	3909.	3909.	3909.	3909.	3909.

CONE OF MAXIMUM CANDELA

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 PREPARED FOR: RAB LIGHTING INC.

PAGE: 9 OF 9
 DATE SAMPLE TESTED: 05/10/16

5-DEGREE ZONAL LUMEN SUMMARY

0- 5	92
5- 10	263
10- 15	411
15- 20	545
20- 25	691
25- 30	849
30- 35	1008
35- 40	1170
40- 45	1318
45- 50	1428
50- 55	1476
55- 60	1409
60- 65	1200
65- 70	774
70- 75	340
75- 80	113
80- 85	26
85- 90	4
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	355
0- 20	1311
0- 30	2851
0- 40	5028
0- 50	7775
0- 60	10661
0- 70	12634
0- 80	13088
0- 90	13118
0-100	13118
0-110	13118
0-120	13118
0-130	13118
0-140	13118
0-150	13118
0-160	13118
0-170	13118
0-180	13118

REPORT NUMBER: RAB01943
 DATE: 5/10/2016
 PREPARED FOR: RAB LIGHTING INC.
 CATALOG NUMBER: WPLEDC104N / ALEDC104N (7.5-DEGREE UPTILT)

ADDRESS: 170 LUDLOW AVE, NORTHVALE, NJ 07647

LUMINAIRE: CAST FINNED METAL HOUSING, 2-PIECE EXTRUDED METAL HEAT SINK, 4 CIRCUIT BOARDS EACH WITH 1 LED, MOLDED PLASTIC REFLECTOR WITH SPECULAR FINISH AND 1 OPTICAL COMPARTMENT WITH 1 APERTURE PER LED, CLEAR FLAT GLASS LENS IN CAST BROWN PAINTED METAL FRAME.

LAMP: FOUR WHITE MULTI-CHIP LIGHT EMITTING DIODES (LEDS), TILTED 37.5-DEGREES FROM VERTICAL BASE-UP POSITION, 2 LEDS CANTED 12-DEGREES FROM STRAIGHT AHEAD.

DRIVER: RD-120-A0700

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:	GWINSTEK PROGRAMMABLE AC POWER SOURCE APS-7100	Calibration Due: N/A
	CHROMA PROGRAMMABLE DIGITAL POWER METER MODEL 66202	2/26/17
	OCEAN OPTICS QE65PRO Spectroradiometer	4/4/17
	RAB 2.0 meter Diameter Integrating Sphere, 4PI Geometry	4/4/17

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	<u>X.CAO</u>
Approved	<u>D.WANG-MUNSON</u> Lighting Engineer

REPORT NUMBER: RAB01943
 DATE: 5/10/2016
 PREPARED FOR: RAB LIGHTING INC.
 CATALOG NUMBER: WPLEDC104N / ALEDC104N (7.5-DEGREE UPTILT)

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RESULTS:

PHOTOMETRIC	
Total Integrated Flux (lumens)	13118 *
SPECTRORADIOMETRIC	
Observer	CIE 1931 2 degree
Chromaticity Ordinate x	0.3832
Chromaticity Ordinate y	0.3875
Observer	CIE 1976 2 degree
Chromaticity Ordinate u'	0.2227
Chromaticity Ordinate v'	0.5066
Correlated Color Temp CCT (K)	4004
ANSI C78.377-2008 Duv	0.004
Total Radiant Flux (milliWatts)	37192 *
ELECTRICAL	
Input Voltage (Volts AC)	120.0
Input Current (Amps AC)	0.881
Input Power (Watts)	105.3
Input Power Factor (%)	99.6
Input Current THD (%)	5.8
Input Voltage THD (%)	0.2
EFFICACY (Lumens/Watt)	
	124.6
ELECTRICAL AT MAX NONIMAL INPUT	
Input Voltage (Volts AC)	277.0
Input Current (Amps AC)	0.408
Input Power (Watts)	103.6
Input Power Factor (%)	91.7
Input Current THD (%)	10.9
Input Voltage THD (%)	0.2
Off-State Power (Watts)	
	0.0

COLOR RENDERING INDICES	CRI
Ra (Average 1-8)	71
R1 Light greyish red	68
R2 Dark greyish yellow	77
R3 Strong yellowish green	85
R4 Moderate yellowish green	70
R5 Light bluish green	67
R6 Light blue	68
R7 Light violet	82
R8 Light reddish purple	52
R9 Strong red	-33
R10 Strong yellow	46
R11 Strong green	65
R12 Strong blue	39
R13 Light yellowish pink (skin)	69
R14 Moderate olive green (leaf)	91

*NOTE:

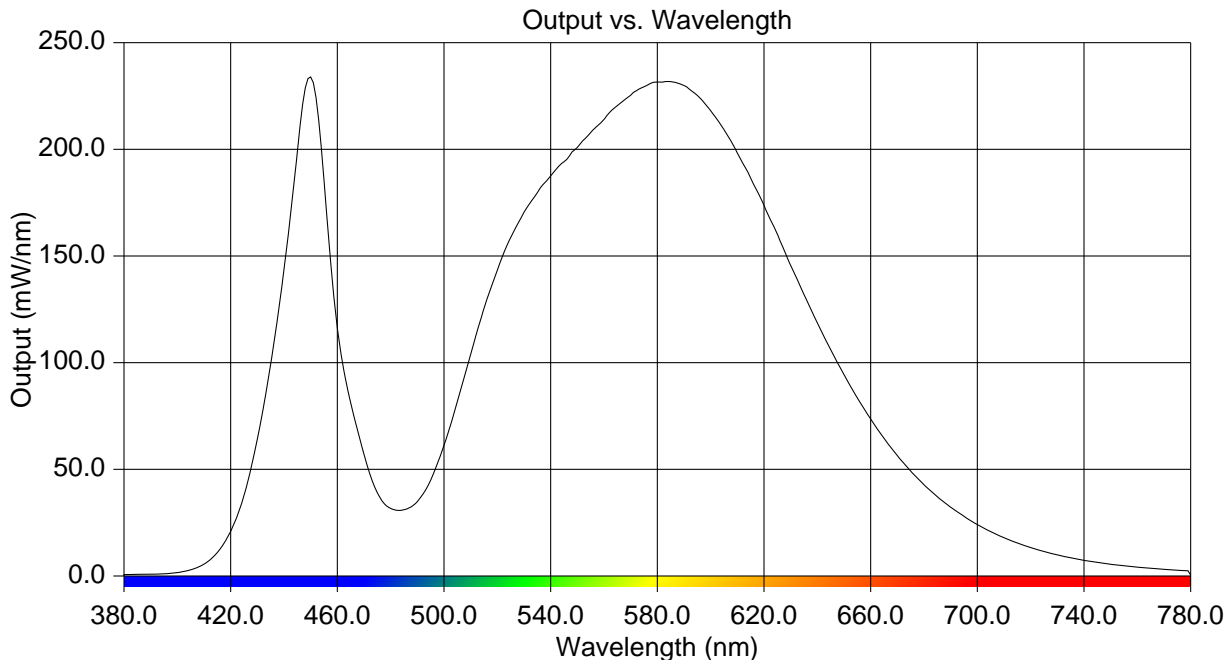
Proper calibration of integrating spheres for measuring total flux output of non-directional samples will produce reliable, repeatable results within the calibration tolerances of the equipment used. However, measurement of test samples with significant self absorption and/or directional output, even 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: RAB01943
 DATE: 5/10/2016
 PREPARED FOR: RAB LIGHTING INC.
 CATALOG NUMBER: WPLED104N / ALED104N (7.5-DEGREE UPTILT)

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RESULTS:

Wavelength	mW per nm	Wavelength	mW per nm	Wavelength	mW per nm
380	0.637	515	125.327	650	94.392
385	0.718	520	143.333	655	83.457
390	0.814	525	158.882	660	73.546
395	1.052	530	170.511	665	64.555
400	1.614	535	179.664	670	56.434
405	2.845	540	187.580	675	49.114
410	5.594	545	194.176	680	42.771
415	11.006	550	200.885	685	37.136
420	20.877	555	207.865	690	32.216
425	37.910	560	214.072	695	27.992
430	64.156	565	220.592	700	24.024
435	99.571	570	225.359	705	20.755
440	143.209	575	229.319	710	17.911
445	199.883	580	231.494	715	15.525
450	233.912	585	231.651	720	13.262
455	185.596	590	229.997	725	11.466
460	116.256	595	225.280	730	9.857
465	81.213	600	218.014	735	8.505
470	56.977	605	209.167	740	7.382
475	39.007	610	198.260	745	6.385
480	31.691	615	186.512	750	5.527
485	31.015	620	173.799	755	4.782
490	34.887	625	160.193	760	4.153
495	44.908	630	145.577	765	3.582
500	61.319	635	131.928	770	3.110
505	81.784	640	118.654	775	2.716
510	103.816	645	106.164	780	0.415



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CATALOG NUMBER: WPLED104N / ALED104N (7.5-DEGREE UPTILT)

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CIE Chromaticity Diagram

