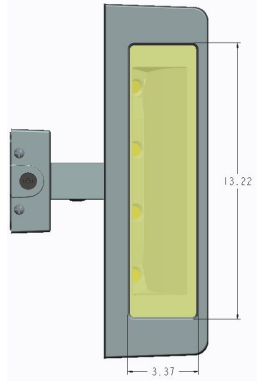


ISOFOOTCANDLE LINES OF HORIZONTAL ILLUMINATION

Values based on 20 foot mounting height.



REPORT NUMBER: RAB01942

ISSUE DATE: 05/11/16

PAGE: 1 OF 9

DATE SAMPLE TESTED: 05/11/16

PREPARED FOR: RAB LIGHTING INC.

CATALOG NUMBER: WPLEDC104N / ALEDC104N
(7.5-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
37.5-DEGREES FROM VERTICAL BASE-UP
POSITION, 2 LEDS CANTED 12-DEGREES
FROM STRAIGHT AHEAD.

(SEE PAGE 2 FOR MORE INFORMATION)

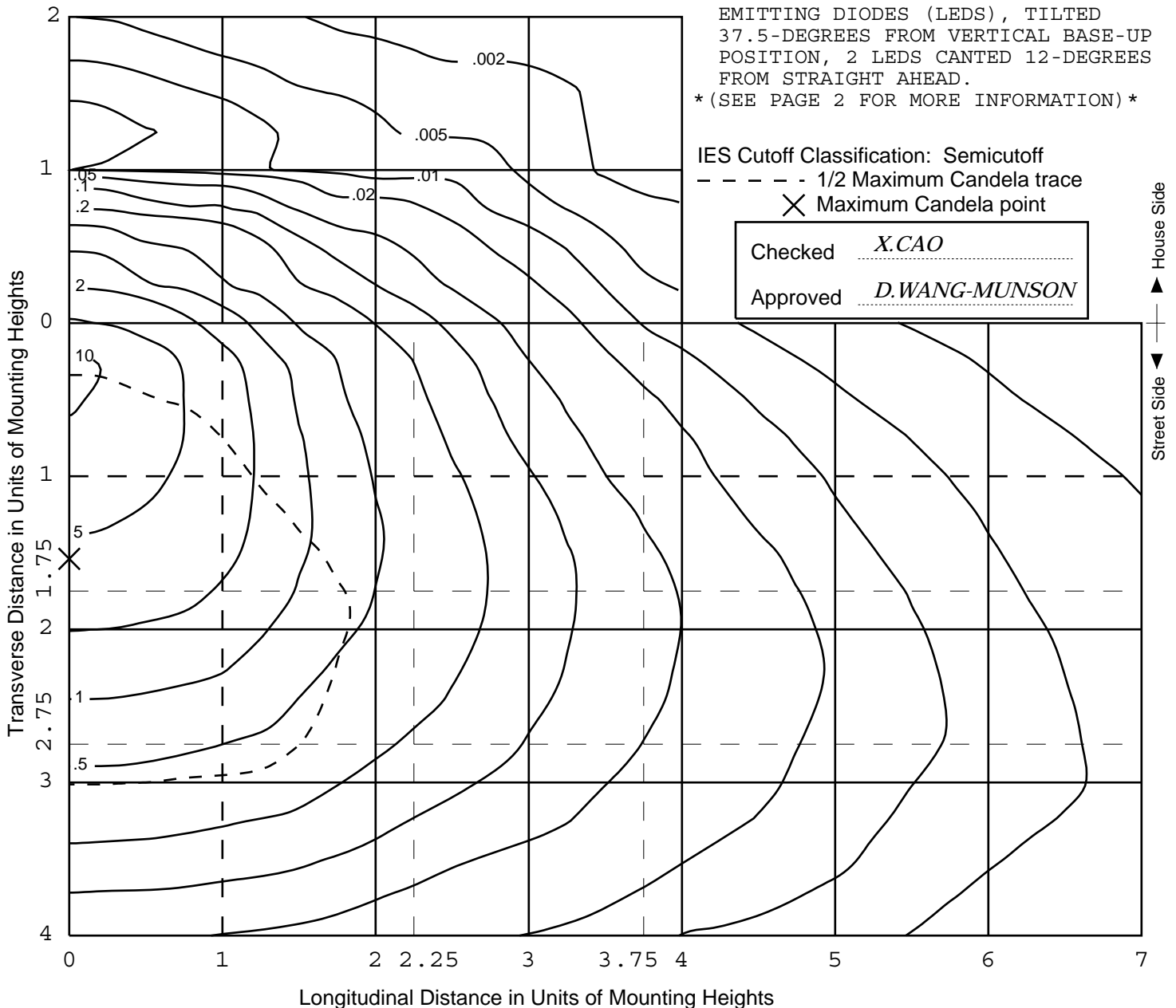
IES Cutoff Classification: Semicutoff

--- 1/2 Maximum Candela trace

X Maximum Candela point

Checked X.CAO

Approved D.WANG-MUNSON



REPORT NUMBER: RAB01942
ISSUE DATE: 05/11/16
PREPARED FOR: RAB LIGHTING INC.

PAGE: 2 OF 9
DATE SAMPLE TESTED: 05/11/16

ADDITIONAL INFORMATION

NOTE: DATA SHOWN IS ABSOLUTE FOR THE SAMPLE PROVIDED.
TOTAL INPUT WATTS = 105.23 W AT 120.0 VAC.

LED DRIVER: RD-120-A0700

TEST PROCEDURE: IESNA LM-79-08

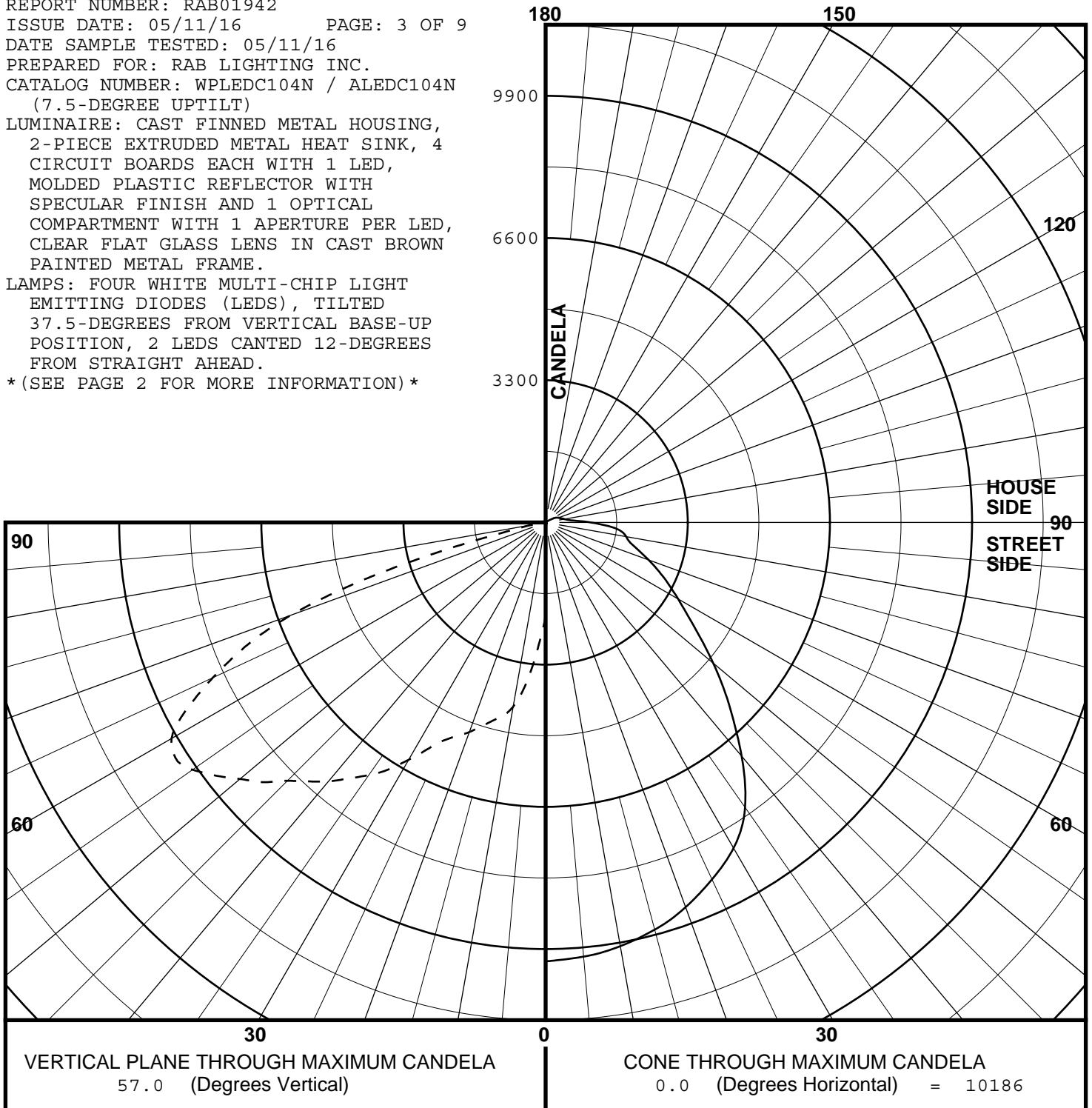
ACCREDITED LABORATORY CODE 201058-0

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

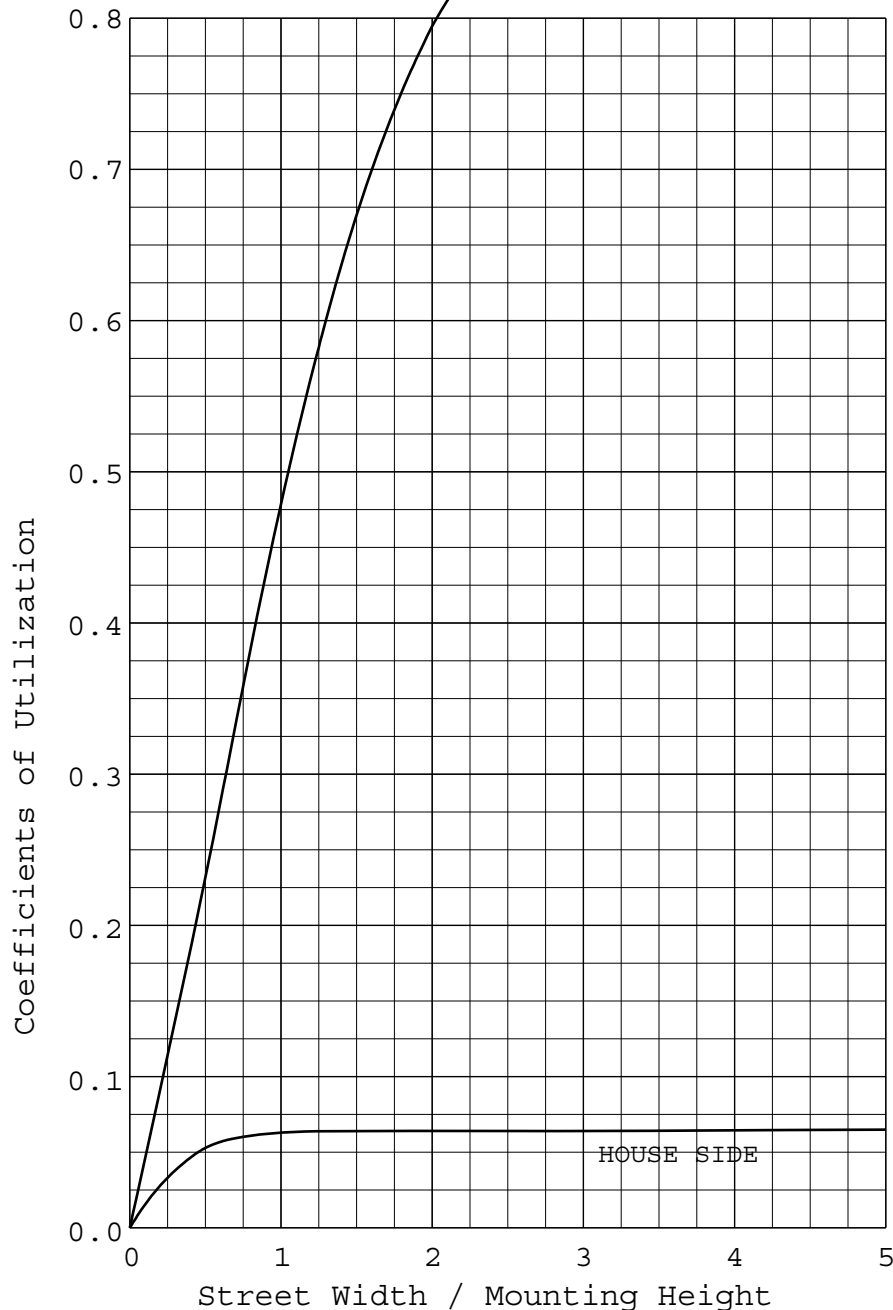
REPORT NUMBER: RAB01942
 ISSUE DATE: 05/11/16 PAGE: 3 OF 9
 DATE SAMPLE TESTED: 05/11/16
 PREPARED FOR: RAB LIGHTING INC.
 CATALOG NUMBER: WPLEDC104N / ALEDC104N
 (7.5-DEGREE UPTILT)
 LUMINAIRE: CAST FINNED METAL HOUSING,
 2-PIECE EXTRUDED METAL HEAT SINK, 4
 CIRCUIT BOARDS EACH WITH 1 LED,
 MOLDED PLASTIC 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
 37.5-DEGREES FROM VERTICAL BASE-UP
 POSITION, 2 LEDS CANTED 12-DEGREES
 FROM STRAIGHT AHEAD.
 *(SEE PAGE 2 FOR MORE INFORMATION) *



REPORT NUMBER: RAB01942 STREET SIDE
ISSUE DATE: 05/11/16
PREPARED FOR: RAB LIGHTING INC.

PAGE: 4 OF 9
DATE SAMPLE TESTED: 05/11/16

COEFFICIENTS OF UTILIZATION AND FLUX DISTRIBUTION



	LUMENS	PERCENT OF FIXTURE
DOWNWARD STREET SIDE	12212.	93.5
DOWNWARD HOUSE SIDE	855.	6.5
DOWNWARD TOTAL	13067.	100.0
UPWARD STREET SIDE	0.	0.0
UPWARD HOUSE SIDE	0.	0.0
UPWARD TOTAL	0.	0.0
TOTAL FLUX	13067.	100.0
TOTAL INPUT WATTS = 105.2		
EFFICACY = 124.2 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: RAB01942
 ISSUE DATE: 05/11/16
 PREPARED FOR: RAB LIGHTING INC.

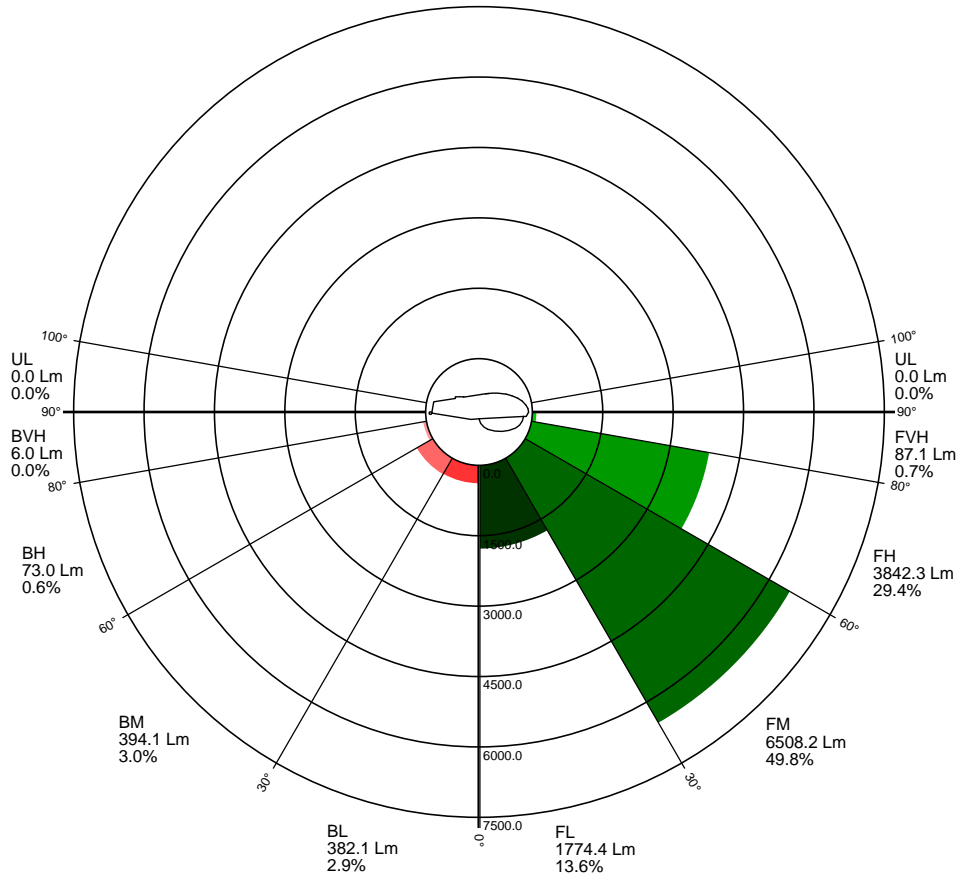
PAGE: 5 OF 9
 DATE SAMPLE TESTED: 05/11/16

BUG Rating:				Zone Ratings		
Zonal Summary				B	U	G
Forward		Lumens	% of Fixture			
FL	(0° - 30°)	1774.4	13.6			
FM	(30° - 60°)	6508.2	49.8			
FH	(60° - 80°)	3842.3	29.4			G2
FVH	(80° - 90°)	87.1	0.7			G1
Backward		855	6.5			
BL	(0° - 30°)	382.1	2.9	B1		
BM	(30° - 60°)	394.1	3.0	B1		
BH	(60° - 80°)	73.0	0.6	B0		G0
BVH	(80° - 90°)	6.0	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		13067	100.0			

Zonal Lumen Summary

(Linear scale)

UH
0.0 Lm
0.0%

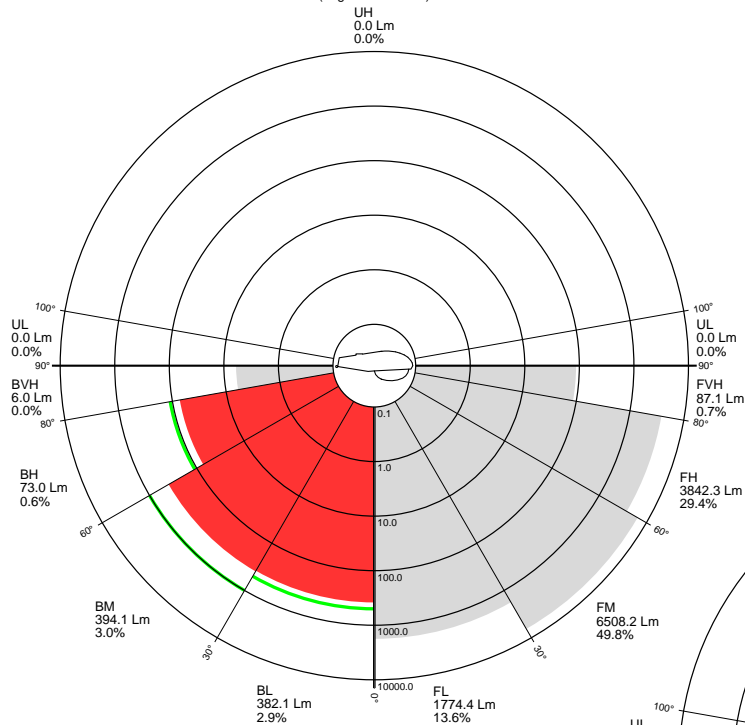


REPORT NUMBER: RAB01942
 ISSUE DATE: 05/11/16
 PREPARED FOR: RAB LIGHTING INC.

PAGE: 6 OF 9
 DATE SAMPLE TESTED: 05/11/16

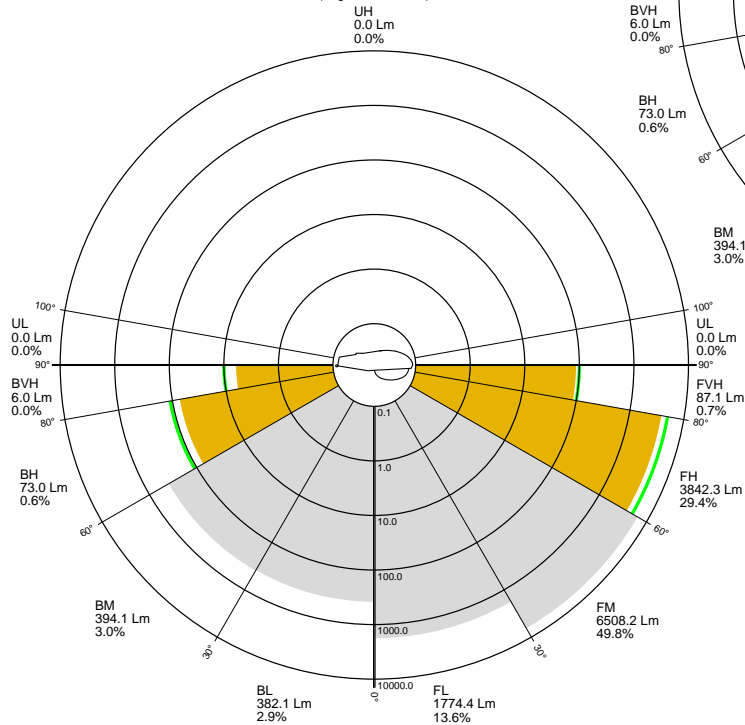
Backlight Rating Details

(Logarithmic scale)



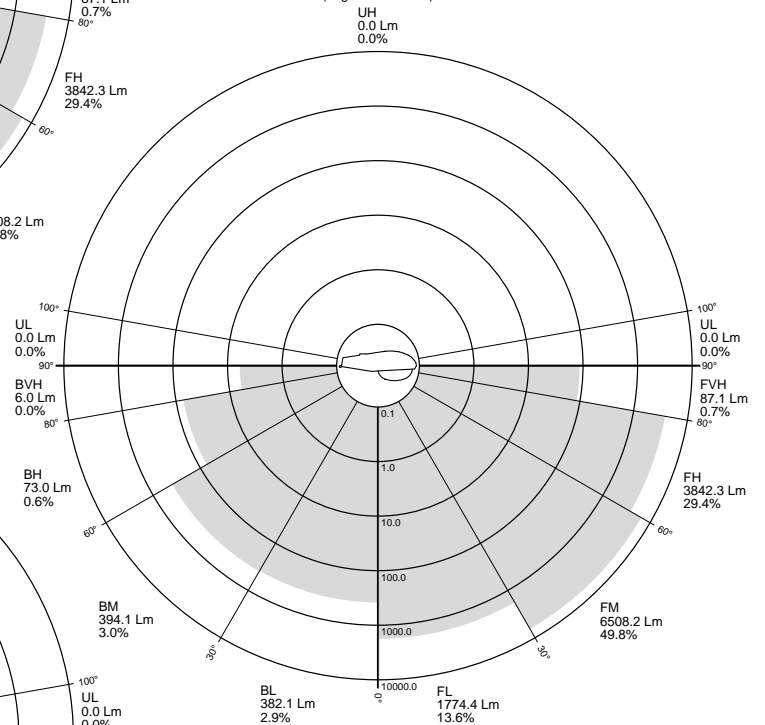
Glare Rating Details

(Logarithmic scale)



Uplight Rating Details

(Logarithmic scale)



REPORT NUMBER: RAB01942
 ISSUE DATE: 05/11/16
 PREPARED FOR: RAB LIGHTING INC.

PAGE: 7 OF 9
 DATE SAMPLE TESTED: 05/11/16

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
	90.0	0.	0.	0.	0.	0.	0.	0.	0.	0.
	87.5	21.	20.	18.	15.	16.	19.	15.	20.	23.
	85.0	29.	29.	32.	27.	25.	32.	68.	122.	237.
	82.5	41.	55.	76.	126.	166.	155.	295.	749.	438.
	80.0	361.	365.	354.	342.	375.	728.	1359.	1266.	613.
	77.5	716.	717.	754.	1024.	1419.	2260.	2264.	1827.	726.
	75.0	2187.	2177.	2407.	3008.	3210.	3447.	2862.	2106.	949.
	72.5	4459.	4444.	4668.	5246.	4566.	4157.	3461.	2277.	1141.
	70.0	6299.	6442.	6551.	6893.	5463.	4838.	3805.	2368.	1328.
V	67.5	7563.	7630.	7610.	8074.	6453.	5325.	3933.	2489.	1498.
E	65.0	8527.	8591.	8538.	8971.	7366.	5539.	3934.	2620.	1660.
R	62.5	9397.	9451.	9353.	9427.	7879.	5670.	3954.	2759.	1824.
T	60.0	10027.	10022.	9760.	9432.	8121.	5807.	4003.	2890.	1958.
I	57.5	10183.	10141.	9810.	9209.	8108.	6010.	4165.	2999.	2091.
C	57.0	10186.	10115.	9784.	9139.	8072.	6040.	4208.	3028.	2120.
A	55.0	10003.	9918.	9594.	8867.	7941.	6150.	4431.	3161.	2238.
L	52.5	9651.	9562.	9249.	8554.	7685.	6237.	4719.	3346.	2410.
	50.0	9263.	9207.	8933.	8268.	7332.	6283.	4960.	3538.	2646.
A	47.5	8921.	8887.	8548.	7898.	7038.	6193.	5087.	3766.	2892.
N	45.0	8476.	8436.	8136.	7592.	6794.	6032.	5100.	3963.	3173.
G	42.5	8151.	8082.	7816.	7316.	6552.	5816.	4993.	4122.	3431.
L	40.0	7845.	7764.	7508.	7013.	6380.	5567.	4826.	4193.	3623.
E	37.5	7485.	7407.	7175.	6764.	6161.	5372.	4691.	4173.	3688.
	35.0	7156.	7112.	6908.	6477.	5912.	5220.	4626.	4143.	3692.
	30.0	6360.	6354.	6225.	5830.	5418.	4997.	4565.	4199.	3651.
	25.0	5580.	5610.	5552.	5353.	5134.	4806.	4489.	4149.	3501.
	20.0	5176.	5188.	5161.	5024.	4831.	4633.	4329.	3861.	3162.
	15.0	4764.	4783.	4764.	4699.	4582.	4392.	4090.	3583.	2979.
	10.0	4340.	4327.	4291.	4186.	4046.	3795.	3501.	3116.	2705.
	5.0	3305.	3257.	3263.	3162.	3076.	2905.	2772.	2577.	2416.
	0.0	2165.	2165.	2165.	2165.	2165.	2165.	2165.	2165.	2165.

||
 PLANE OF MAXIMUM CANDELA

CONE OF MAXIMUM CANDELA

REPORT NUMBER: RAB01942
 ISSUE DATE: 05/11/16
 PREPARED FOR: RAB LIGHTING INC.

PAGE: 8 OF 9
 DATE SAMPLE TESTED: 05/11/16

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
	90.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
	87.5	17.	16.	15.	14.	13.	12.	10.	8.	5.	4.
	85.0	21.	18.	16.	14.	13.	11.	9.	7.	5.	3.
	82.5	75.	25.	19.	14.	13.	11.	9.	7.	4.	3.
	80.0	125.	59.	28.	17.	12.	11.	9.	7.	4.	3.
	77.5	170.	77.	42.	32.	14.	11.	9.	7.	5.	3.
	75.0	223.	110.	31.	42.	17.	11.	9.	7.	4.	3.
	72.5	389.	247.	62.	56.	22.	13.	9.	7.	4.	3.
	70.0	556.	311.	121.	50.	28.	16.	11.	8.	6.	5.
V	67.5	708.	404.	205.	31.	41.	21.	17.	12.	10.	11.
E	65.0	799.	473.	265.	31.	41.	27.	21.	19.	16.	17.
R	62.5	917.	529.	288.	52.	31.	36.	27.	22.	23.	26.
T	60.0	1005.	541.	317.	119.	18.	39.	38.	28.	26.	29.
I	57.5	1041.	566.	365.	233.	26.	33.	42.	38.	34.	36.
C	57.0<<	1047.	576.	374.	260.	29.	31.	42.	39.	37.	38.
A	55.0	1146.	673.	438.	361.	47.	22.	39.	40.	43.	49.
L	52.5	1290.	818.	521.	433.	142.	22.	29.	36.	43.	51.
	50.0	1383.	878.	551.	472.	282.	35.	19.	29.	37.	46.
A	47.5	1478.	937.	573.	497.	388.	96.	27.	19.	26.	34.
N	45.0	1549.	977.	605.	522.	433.	204.	45.	22.	18.	23.
G	42.5	1620.	1020.	649.	551.	449.	309.	114.	37.	30.	25.
L	40.0	1709.	1098.	696.	577.	470.	364.	219.	98.	53.	38.
E	37.5	1810.	1201.	742.	606.	486.	383.	310.	224.	160.	106.
	35.0	1867.	1312.	787.	634.	499.	406.	358.	359.	310.	250.
	30.0	1978.	1481.	898.	653.	524.	454.	458.	479.	470.	462.
	25.0	1997.	1552.	931.	666.	587.	560.	569.	557.	542.	528.
	20.0	1954.	1602.	1045.	845.	731.	706.	680.	642.	620.	605.
	15.0	2090.	1828.	1358.	1072.	952.	817.	776.	742.	726.	715.
	10.0	2144.	1973.	1635.	1349.	1167.	1065.	1014.	947.	906.	868.
	5.0	2146.	2065.	1910.	1758.	1627.	1515.	1431.	1362.	1341.	1304.
	0.0	2165.	2165.	2165.	2165.	2165.	2165.	2165.	2165.	2165.	2165.

CONE OF MAXIMUM CANDELA

REPORT NUMBER: RAB01942
ISSUE DATE: 05/11/16
PREPARED FOR: RAB LIGHTING INC.

PAGE: 9 OF 9
DATE SAMPLE TESTED: 05/11/16

5-DEGREE
ZONAL LUMEN SUMMARY

0- 5	52
5- 10	166
10- 15	293
15- 20	417
20- 25	545
25- 30	683
30- 35	829
35- 40	968
40- 45	1104
45- 50	1235
50- 55	1345
55- 60	1422
60- 65	1415
65- 70	1251
70- 75	882
75- 80	368
80- 85	84
85- 90	9

10-DEGREE
ZONAL LUMEN SUMMARY

0- 10	218
0- 20	928
0- 30	2157
0- 40	3953
0- 50	6291
0- 60	9059
0- 70	11724
0- 80	12974
0- 90	13067

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 X.CAO

Approved D.WANG-MUNSON
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)	13067 *
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)	37047 *
ELECTRICAL	
Input Voltage (Volts AC)	120.0
Input Current (Amps AC)	0.881
Input Power (Watts)	105.2
Input Power Factor (%)	99.6
Input Current THD (%)	5.8
Input Voltage THD (%)	0.2
EFFICACY (Lumens/Watt)	
	124.2
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 (%)	10.8
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:

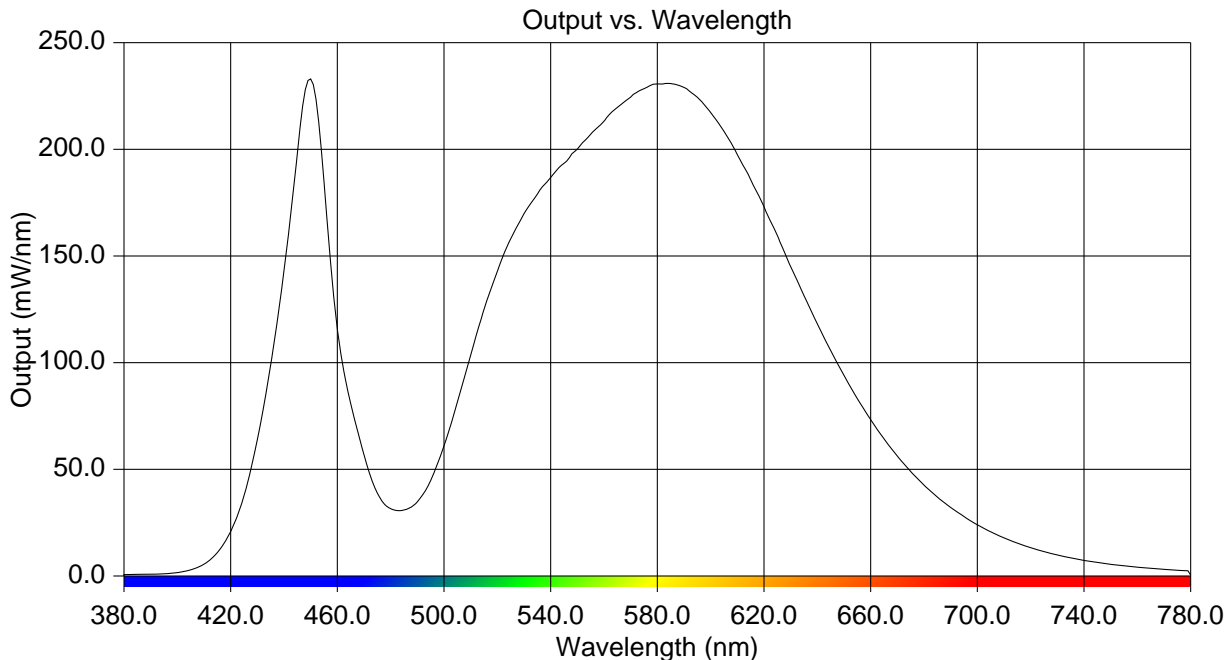
Proper calibration of integrating spheres for measuring total flux output of non-directional samples will produce reliable, repeatable results within the calibration tolerances of the equipment used. However, measurement of test samples with significant self absorption and/or directional output, even 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
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 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	0.634	515	124.839	650	94.025
385	0.715	520	142.776	655	83.133
390	0.811	525	158.264	660	73.261
395	1.048	530	169.849	665	64.304
400	1.608	535	178.966	670	56.215
405	2.834	540	186.851	675	48.923
410	5.572	545	193.421	680	42.605
415	10.964	550	200.104	685	36.992
420	20.796	555	207.057	690	32.090
425	37.762	560	213.239	695	27.884
430	63.907	565	219.735	700	23.930
435	99.183	570	224.483	705	20.674
440	142.652	575	228.427	710	17.841
445	199.106	580	230.594	715	15.464
450	233.003	585	230.751	720	13.210
455	184.875	590	229.103	725	11.421
460	115.804	595	224.405	730	9.818
465	80.897	600	217.167	735	8.472
470	56.756	605	208.354	740	7.354
475	38.856	610	197.489	745	6.361
480	31.568	615	185.787	750	5.505
485	30.894	620	173.123	755	4.764
490	34.752	625	159.570	760	4.137
495	44.733	630	145.011	765	3.568
500	61.080	635	131.415	770	3.098
505	81.466	640	118.192	775	2.706
510	103.413	645	105.751	780	0.413



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

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CIE Chromaticity Diagram

