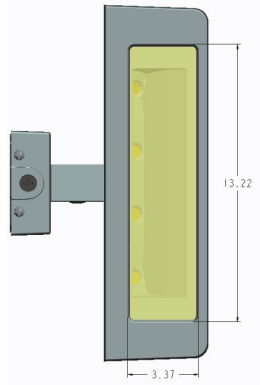


## ISOFOOTCANDLE LINES OF HORIZONTAL ILLUMINATION

Values based on 20 foot mounting height.



REPORT NUMBER: RAB01935  
 ISSUE DATE: 05/13/16 PAGE: 1 OF 9  
 DATE SAMPLE TESTED: 05/13/16  
 PREPARED FOR: RAB LIGHTING INC.  
 CATALOG NUMBER: WPLEDC104 / ALEDC104  
 (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 LEDES CANTED 12-DEGREES  
 FROM STRAIGHT AHEAD.  
 \*(SEE PAGE 2 FOR MORE INFORMATION)\*

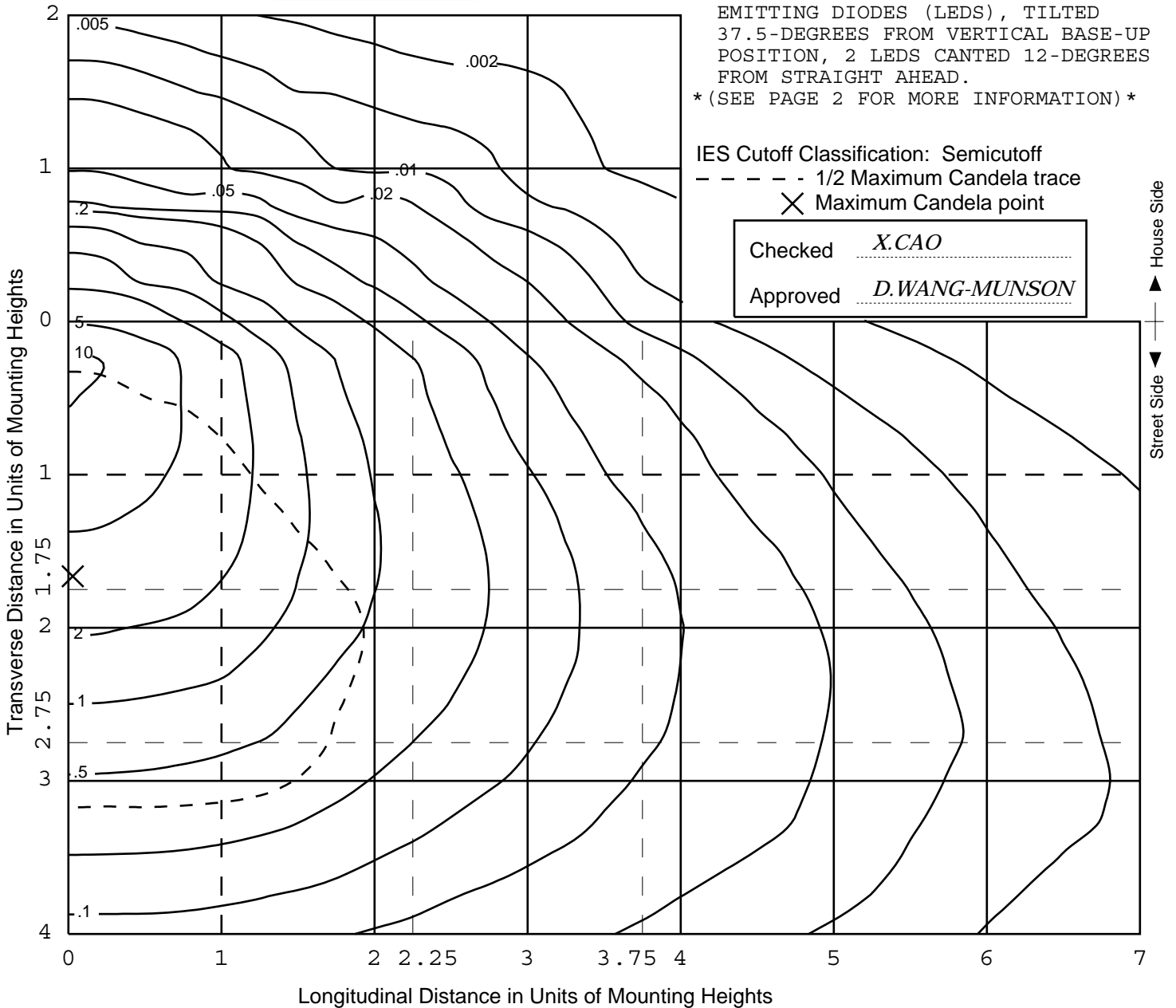
IES Cutoff Classification: Semicutoff

--- 1/2 Maximum Candela trace

X Maximum Candela point

Checked X.CAO

Approved D.WANG-MUNSON



REPORT NUMBER: RAB01935  
ISSUE DATE: 05/13/16  
PREPARED FOR: RAB LIGHTING INC.

PAGE: 2 OF 9  
DATE SAMPLE TESTED: 05/13/16

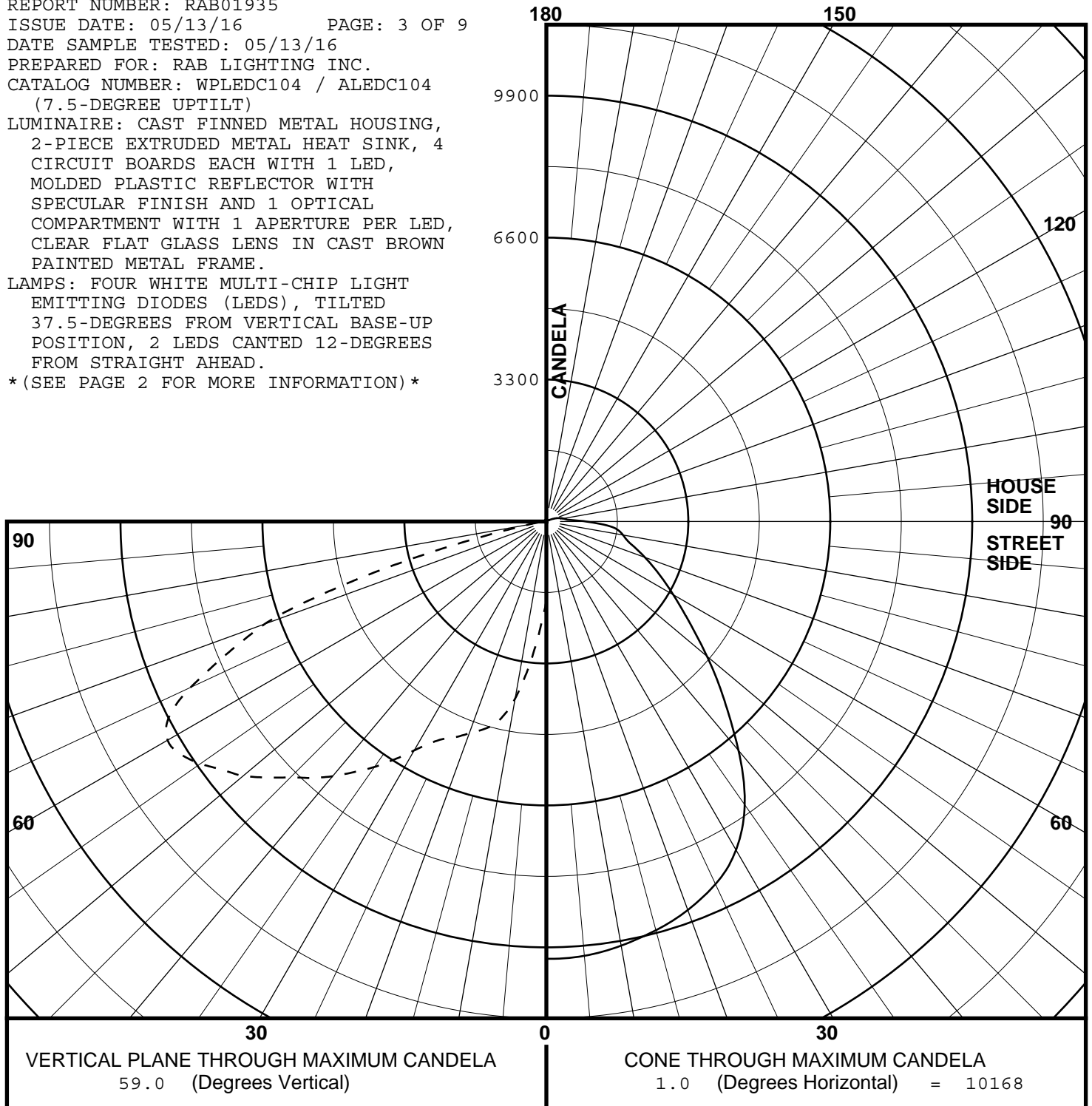
ADDITIONAL INFORMATION

NOTE: DATA SHOWN IS ABSOLUTE FOR THE SAMPLE PROVIDED.  
TOTAL INPUT WATTS = 106.1 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.

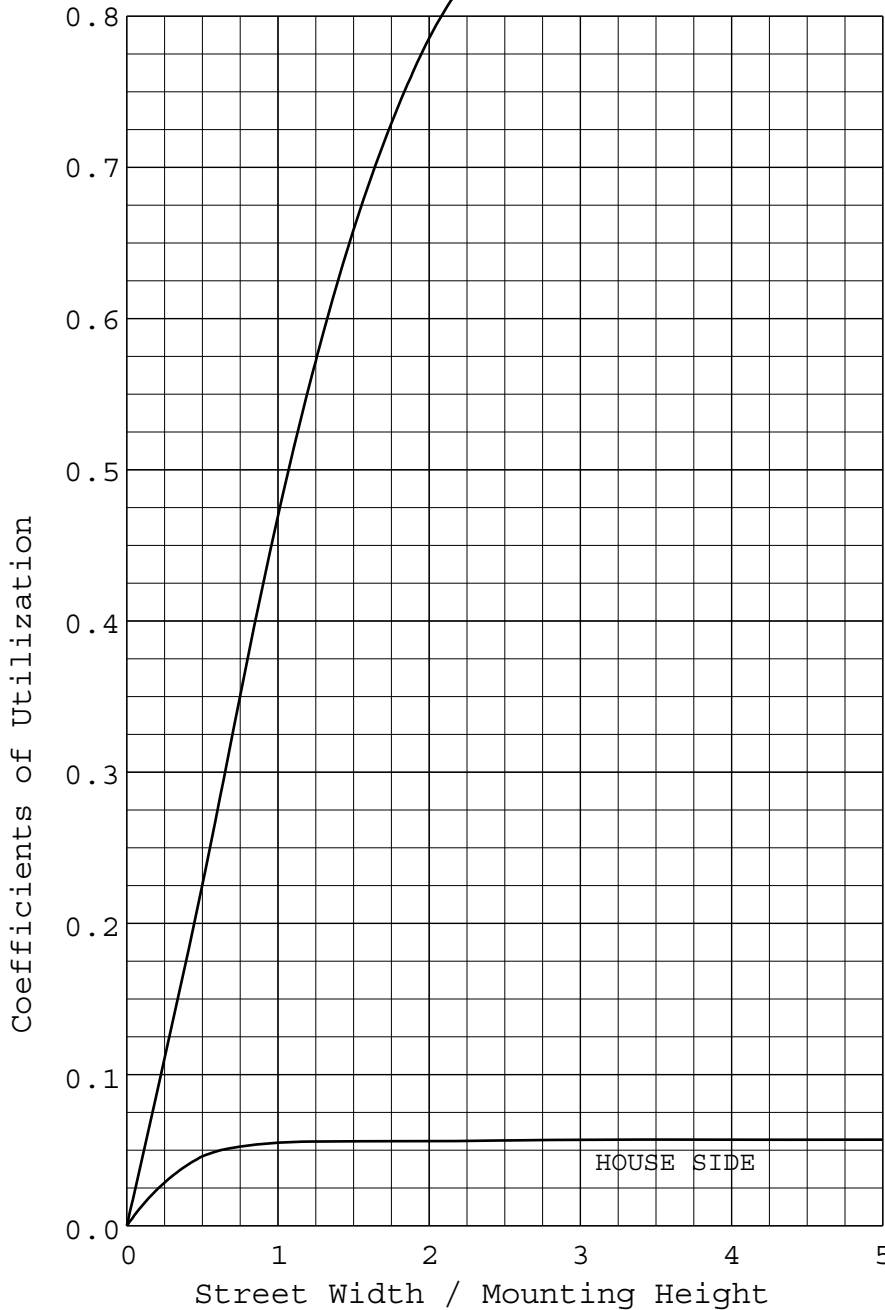
MAXIMUM PLANE AND MAXIMUM CONE PLOTS OF CANDELA

REPORT NUMBER: RAB01935  
 ISSUE DATE: 05/13/16 PAGE: 3 OF 9  
 DATE SAMPLE TESTED: 05/13/16  
 PREPARED FOR: RAB LIGHTING INC.  
 CATALOG NUMBER: WPLEDC104 / ALEDC104  
 (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 LEDES CANTED 12-DEGREES  
 FROM STRAIGHT AHEAD.  
 \*(SEE PAGE 2 FOR MORE INFORMATION)\*



REPORT NUMBER: RAB01935      STREET SIDE      PAGE: 4 OF 9  
 ISSUE DATE: 05/13/16      DATE SAMPLE TESTED: 05/13/16  
 PREPARED FOR: RAB LIGHTING INC.

COEFFICIENTS OF UTILIZATION AND FLUX DISTRIBUTION



	LUMENS	PERCENT OF FIXTURE
DOWNWARD STREET SIDE	12328.	94.2
DOWNWARD HOUSE SIDE	754.	5.8
DOWNWARD TOTAL	13082.	100.0
UPWARD STREET SIDE	0.	0.0
UPWARD HOUSE SIDE	0.	0.0
UPWARD TOTAL	0.	0.0
TOTAL FLUX	13082.	100.0

TOTAL INPUT WATTS = 106.1  
 EFFICACY = 123.3 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: RAB01935  
 ISSUE DATE: 05/13/16  
 PREPARED FOR: RAB LIGHTING INC.

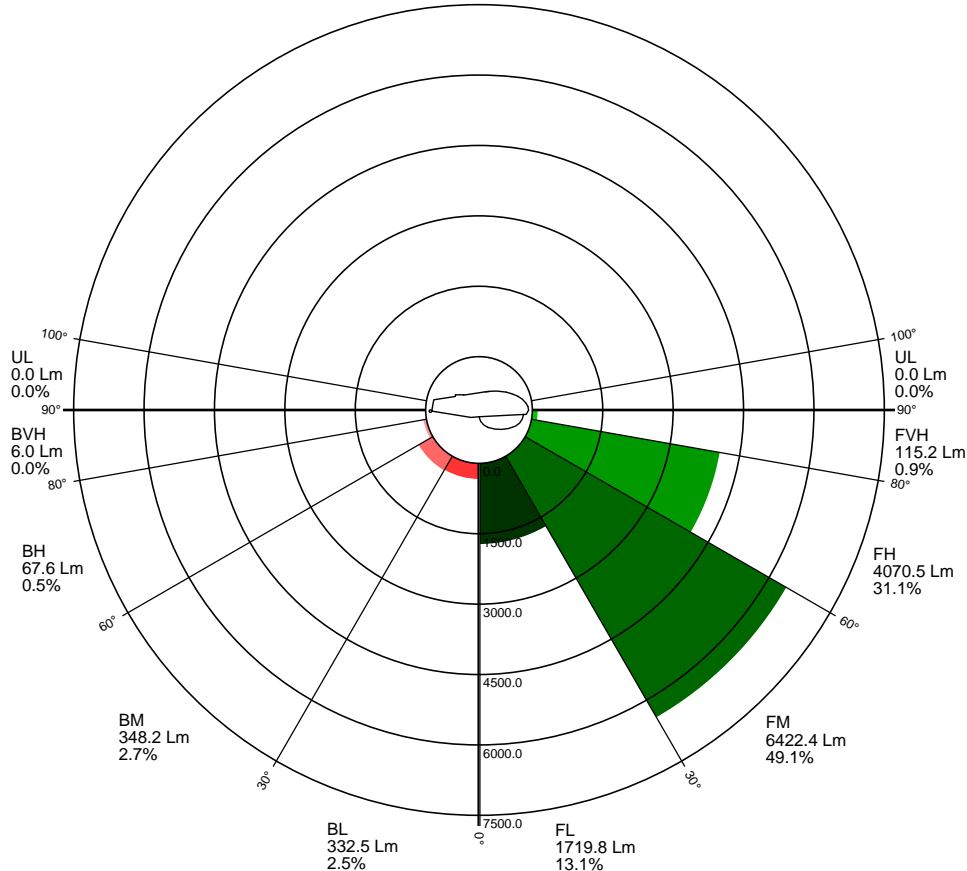
PAGE: 5 OF 9  
 DATE SAMPLE TESTED: 05/13/16

BUG Rating:			B1	U0	G2	
Zonal Summary		Lumens	% of Fixture	Zone Ratings		
				B	U	G
Forward		12328	94.2			
FL	(0° - 30°)	1719.8	13.1			
FM	(30° - 60°)	6422.4	49.1			
FH	(60° - 80°)	4070.5	31.1			G2
FVH	(80° - 90°)	115.2	0.9			G2
Backward		754	5.8			
BL	(0° - 30°)	332.5	2.5	B1		
BM	(30° - 60°)	348.2	2.7	B1		
BH	(60° - 80°)	67.6	0.5	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		13082	100.0			

### Zonal Lumen Summary

(Linear scale)

UH  
0.0 Lm  
0.0%

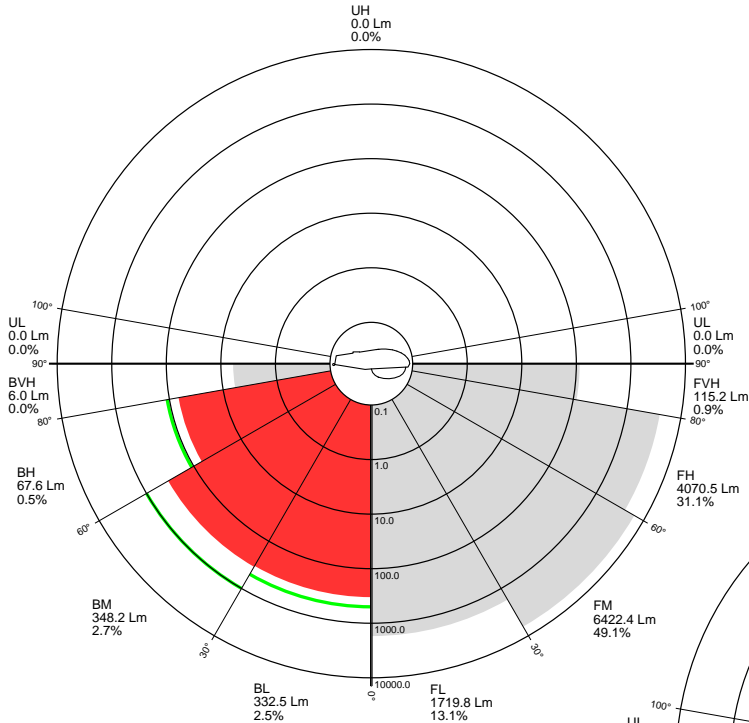


REPORT NUMBER: RAB01935  
 ISSUE DATE: 05/13/16  
 PREPARED FOR: RAB LIGHTING INC.

PAGE: 6 OF 9  
 DATE SAMPLE TESTED: 05/13/16

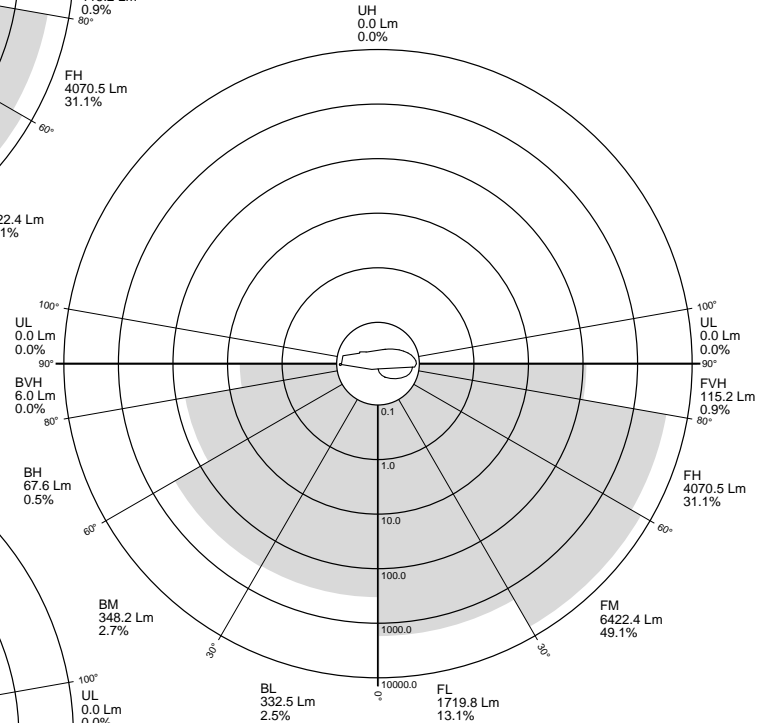
### Backlight Rating Details

(Logarithmic scale)



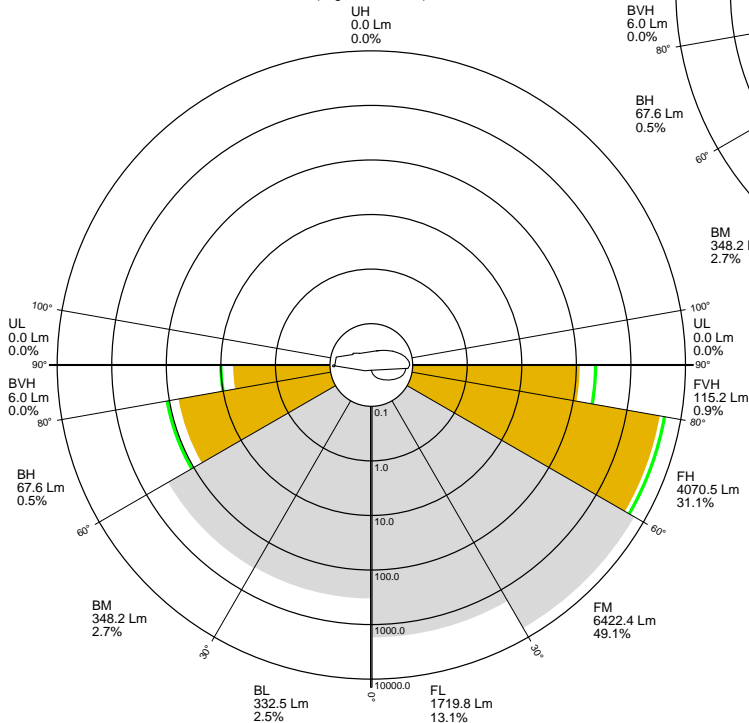
### Uplight Rating Details

(Logarithmic scale)



### Glare Rating Details

(Logarithmic scale)



REPORT NUMBER: RAB01935  
 ISSUE DATE: 05/13/16  
 PREPARED FOR: RAB LIGHTING INC.

PAGE: 7 OF 9  
 DATE SAMPLE TESTED: 05/13/16

CANDELA TABULATION

	LATERAL ANGLE										
	0.0	1.0	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.	0.
	87.5	19.	18.	18.	17.	17.	15.	16.	15.	29.	33.
	85.0	22.	23.	24.	29.	31.	49.	80.	95.	180.	274.
	82.5	251.	242.	243.	255.	228.	208.	249.	525.	864.	458.
	80.0	431.	427.	443.	456.	522.	665.	1104.	1667.	1341.	617.
	77.5	1117.	1113.	1148.	1323.	1632.	2074.	2632.	2460.	1850.	749.
	75.0	2870.	2844.	2922.	3274.	3722.	3787.	3651.	3080.	2097.	964.
	72.5	5118.	5068.	5139.	5519.	5926.	4920.	4396.	3556.	2251.	1152.
	70.0	7005.	6970.	7010.	7077.	7349.	5865.	5051.	3778.	2353.	1334.
V	67.5	8062.	8037.	8063.	8064.	8528.	6864.	5351.	3854.	2488.	1506.
E	65.0	9146.	9123.	9118.	9049.	9300.	7526.	5481.	3871.	2631.	1672.
R	62.5	9872.	9905.	9848.	9666.	9480.	7909.	5590.	3912.	2764.	1841.
T	60.0	10160.	10166.	10129.	9853.	9386.	8053.	5749.	3981.	2863.	1983.
I	59.0	10167.	10168.	10135.	9838.	9302.	8039.	5837.	4045.	2890.	2042.
C	57.5	10101.	10080.	10067.	9757.	9125.	8000.	5948.	4175.	2943.	2127.
A	55.0	9845.	9816.	9816.	9488.	8804.	7857.	6108.	4434.	3057.	2284.
L	52.5	9513.	9486.	9491.	9178.	8528.	7538.	6202.	4681.	3216.	2505.
	50.0	9221.	9199.	9182.	8864.	8185.	7221.	6235.	4869.	3444.	2799.
A	47.5	8817.	8813.	8768.	8424.	7840.	6951.	6127.	4958.	3719.	3070.
N	45.0	8424.	8413.	8350.	8058.	7554.	6673.	5921.	4960.	3937.	3305.
G	42.5	8093.	8086.	8007.	7745.	7245.	6476.	5643.	4869.	4102.	3512.
L	40.0	7741.	7730.	7663.	7422.	6942.	6260.	5385.	4758.	4217.	3641.
E	37.5	7348.	7342.	7322.	7108.	6638.	5995.	5204.	4665.	4257.	3667.
	35.0	6972.	6966.	6977.	6786.	6315.	5743.	5105.	4613.	4265.	3603.
	30.0	6134.	6147.	6134.	6030.	5704.	5347.	4980.	4660.	4299.	3459.
	25.0	5565.	5570.	5573.	5518.	5361.	5122.	4862.	4586.	4102.	3207.
	20.0	5237.	5242.	5239.	5193.	5065.	4953.	4711.	4291.	3648.	2829.
	15.0	4917.	4925.	4897.	4840.	4709.	4559.	4260.	3826.	3240.	2634.
	10.0	4161.	4175.	4138.	4056.	3884.	3720.	3424.	3098.	2736.	2364.
	5.0	2895.	2912.	2883.	2825.	2725.	2664.	2534.	2396.	2234.	2075.
	0.0	1834.	1834.	1834.	1834.	1834.	1834.	1834.	1834.	1834.	1834.

||  
 PLANE OF MAXIMUM CANDELA

CONE OF MAXIMUM CANDELA

REPORT NUMBER: RAB01935  
 ISSUE DATE: 05/13/16  
 PREPARED FOR: RAB LIGHTING INC.

PAGE: 8 OF 9  
 DATE SAMPLE TESTED: 05/13/16

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.	16.	15.	14.	12.	10.	8.	6.	5.
	85.0	20.	18.	16.	15.	13.	11.	10.	7.	5.	4.
	82.5	60.	23.	18.	15.	14.	12.	9.	7.	4.	3.
	80.0	104.	50.	27.	16.	13.	12.	10.	7.	5.	3.
	77.5	149.	67.	43.	24.	13.	12.	10.	8.	6.	5.
	75.0	186.	105.	42.	36.	15.	11.	10.	8.	6.	6.
	72.5	344.	237.	53.	55.	19.	13.	10.	8.	6.	6.
	70.0	503.	280.	90.	59.	26.	14.	11.	8.	6.	6.
V	67.5	621.	353.	180.	57.	37.	20.	13.	10.	8.	8.
E	65.0	717.	440.	247.	44.	45.	25.	20.	15.	12.	13.
R	62.5	836.	472.	265.	42.	49.	34.	26.	23.	20.	20.
T	60.0	911.	487.	293.	76.	44.	43.	35.	28.	29.	30.
I	59.0 <<	919.	489.	310.	106.	40.	46.	40.	31.	31.	33.
C	57.5	931.	511.	333.	167.	34.	48.	45.	36.	34.	35.
A	55.0	1025.	594.	406.	302.	39.	46.	50.	44.	44.	45.
L	52.5	1151.	702.	477.	391.	73.	37.	52.	48.	51.	55.
	50.0	1224.	755.	498.	436.	192.	35.	47.	49.	54.	58.
A	47.5	1283.	795.	521.	469.	319.	50.	37.	45.	54.	58.
N	45.0	1329.	820.	552.	494.	398.	128.	35.	36.	48.	52.
G	42.5	1381.	853.	595.	522.	423.	232.	61.	34.	39.	43.
L	40.0	1445.	911.	640.	542.	436.	317.	148.	52.	41.	39.
E	37.5	1538.	994.	680.	560.	453.	356.	248.	139.	85.	58.
	35.0	1618.	1076.	714.	577.	468.	375.	324.	276.	214.	159.
	30.0	1701.	1203.	756.	597.	481.	423.	420.	454.	444.	423.
	25.0	1700.	1256.	792.	606.	536.	516.	536.	522.	505.	492.
	20.0	1665.	1309.	872.	706.	670.	655.	623.	595.	579.	563.
	15.0	1789.	1516.	1114.	933.	800.	746.	715.	689.	671.	658.
	10.0	1826.	1643.	1323.	1105.	976.	910.	842.	801.	787.	774.
	5.0	1825.	1738.	1572.	1430.	1311.	1216.	1157.	1118.	1093.	1076.
	0.0	1834.	1834.	1834.	1834.	1834.	1834.	1834.	1834.	1834.	1834.

CONE OF MAXIMUM CANDELA



REPORT NUMBER: RAB01935  
ISSUE DATE: 05/13/16  
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PAGE: 9 OF 9  
DATE SAMPLE TESTED: 05/13/16

5-DEGREE  
ZONAL LUMEN SUMMARY

0- 5	44
5- 10	145
10- 15	270
15- 20	401
20- 25	529
25- 30	663
30- 35	801
35- 40	939
40- 45	1079
45- 50	1214
50- 55	1327
55- 60	1409
60- 65	1431
65- 70	1299
70- 75	964
75- 80	445
80- 85	110
85- 90	11

10-DEGREE  
ZONAL LUMEN SUMMARY

0- 10	189
0- 20	860
0- 30	2052
0- 40	3793
0- 50	6086
0- 60	8823
0- 70	11552
0- 80	12961
0- 90	13082

REPORT NUMBER: RAB01936  
DATE: 5/10/2016  
PREPARED FOR: RAB LIGHTING INC.  
CATALOG NUMBER: WPLEDC104 / ALEDC104 (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:
	CHROMA PROGRAMMABLE DIGITAL POWER METER MODEL 66202	N/A
	OCEAN OPTICS QE65PRO Spectroradiometer	2/26/17
	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: RAB01936  
 DATE: 5/10/2016  
 PREPARED FOR: RAB LIGHTING INC.  
 CATALOG NUMBER: WPLEDC104 / ALEDC104 (7.5-DEGREE UPTILT)

RESULTS:

<b>PHOTOMETRIC</b>	
Total Integrated Flux (lumens)	13082 *
<b>SPECTRORADIOMETRIC</b>	
Observer	CIE 1931 2 degree
Chromaticity Ordinate x	0.3452
Chromaticity Ordinate y	0.3620
Observer	CIE 1976 2 degree
Chromaticity Ordinate u'	0.2075
Chromaticity Ordinate v'	0.4896
Correlated Color Temp CCT (K)	5031
ANSI C78.377-2008 Duv	0.005
Total Radiant Flux (milliWatts)	38459 *
<b>ELECTRICAL</b>	
Input Voltage (Volts AC)	120.0
Input Current (Amps AC)	0.888
Input Power (Watts)	106.1
Input Power Factor (%)	99.6
Input Current THD (%)	5.1
Input Voltage THD (%)	0.2
<b>EFFICACY (Lumens/Watt)</b>	
123.3	
<b>ELECTRICAL AT MAX NONIMAL INPUT</b>	
Input Voltage (Volts AC)	277.0
Input Current (Amps AC)	0.410
Input Power (Watts)	104.4
Input Power Factor (%)	91.9
Input Current THD (%)	10.1
Input Voltage THD (%)	0.2
<b>Off-State Power (Watts)</b>	
0.0	

COLOR RENDERING INDICES	CRI
Ra (Average 1-8)	71
R1 Light greyish red	68
R2 Dark greyish yellow	76
R3 Strong yellowish green	81
R4 Moderate yellowish green	72
R5 Light bluish green	69
R6 Light blue	67
R7 Light violet	81
R8 Light reddish purple	55
R9 Strong red	-35
R10 Strong yellow	42
R11 Strong green	68
R12 Strong blue	42
R13 Light yellowish pink (skin)	69
R14 Moderate olive green (leaf)	89

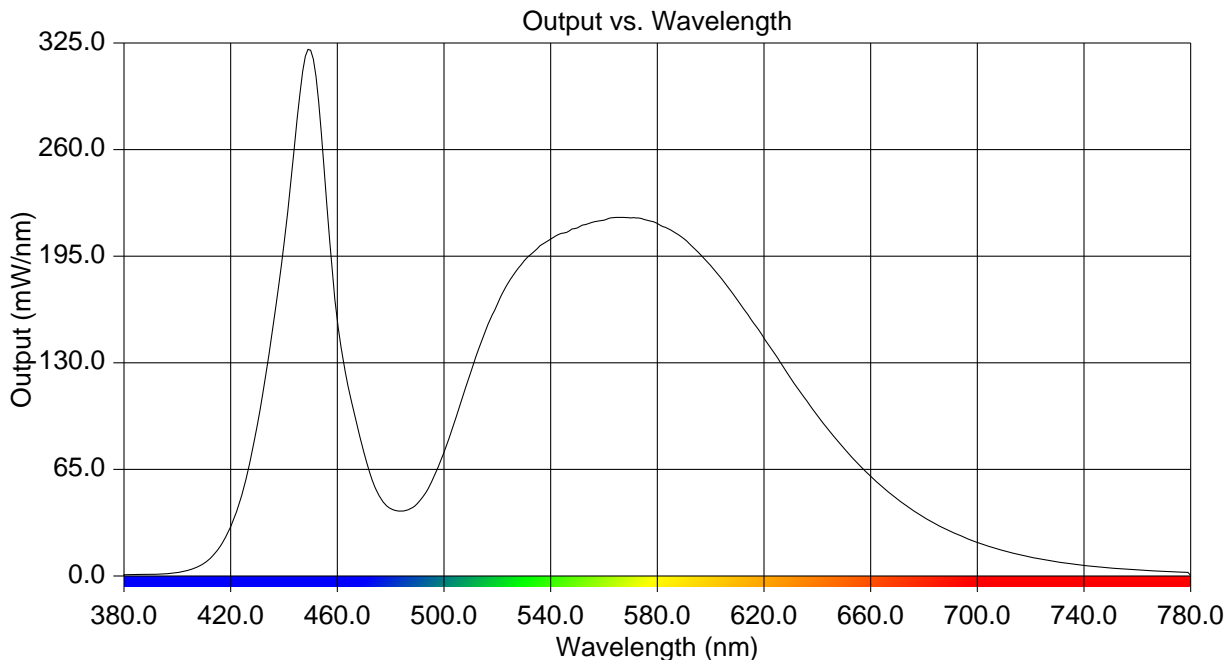
\*NOTE:

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: RAB01936  
 DATE: 5/10/2016  
 PREPARED FOR: RAB LIGHTING INC.  
 CATALOG NUMBER: WPLEDC104 / ALEDC104 (7.5-DEGREE UPTILT)

RESULTS:

Wavelength	mW per nm	Wavelength	mW per nm	Wavelength	mW per nm
380	0.715	515	147.020	650	77.866
385	0.847	520	165.553	655	68.850
390	0.982	525	181.171	660	60.737
395	1.315	530	191.925	665	53.457
400	2.138	535	199.516	670	46.827
405	3.891	540	205.388	675	40.955
410	7.772	545	209.020	680	35.708
415	15.600	550	212.102	685	31.135
420	30.036	555	215.134	690	27.156
425	54.591	560	216.814	695	23.670
430	92.033	565	218.585	700	20.409
435	141.974	570	218.178	705	17.687
440	202.369	575	217.293	710	15.359
445	279.814	580	214.730	715	13.312
450	320.368	585	210.729	720	11.468
455	249.011	590	205.511	725	9.911
460	155.455	595	198.049	730	8.627
465	108.424	600	189.007	735	7.451
470	75.084	605	179.215	740	6.453
475	50.986	610	168.227	745	5.584
480	41.068	615	156.686	750	4.884
485	39.659	620	145.158	755	4.229
490	44.132	625	133.158	760	3.687
495	56.085	630	120.472	765	3.206
500	75.646	635	108.982	770	2.807
505	99.349	640	97.671	775	2.443
510	123.966	645	87.504	780	0.369



REPORT NUMBER: RAB01936  
DATE: 5/10/2016  
PREPARED FOR: RAB LIGHTING INC.  
CATALOG NUMBER: WPLEDC104 / ALEDC104 (7.5-DEGREE UPTILT)

Page 4 of 4

## CIE Chromaticity Diagram

