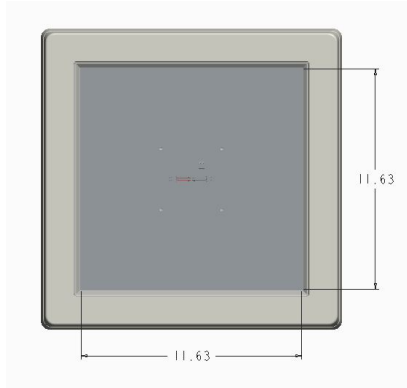


## ISOFOOTCANDLE LINES OF HORIZONTAL ILLUMINATION

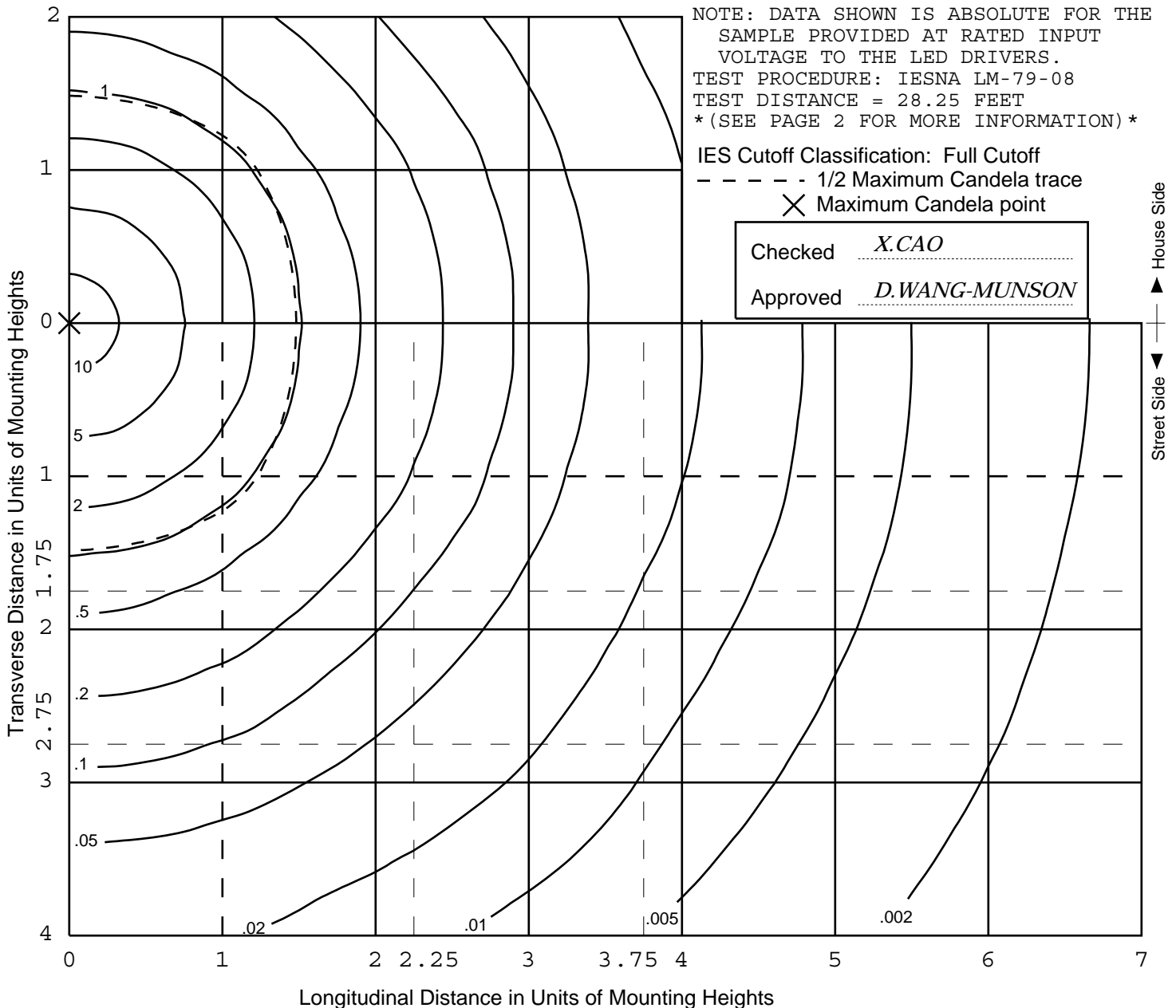
Values based on 14 foot mounting height.



REPORT NUMBER: RAB00890  
 ISSUE DATE: 06/03/15 PAGE: 1 OF 9  
 PREPARED FOR: RAB LIGHTING INC.  
 CATALOG NUMBER: MASI16-52NW/D10  
 LUMINAIRE: CAST METAL HOUSING, CAST METAL HEAT SINK, 1 WHITE CIRCUIT BOARD WITH 121 LEDS, CLEAR FLAT GLASS DOOR IN CAST WHITE PAINTED METAL FRAME.  
 LAMP: ONE HUNDRED AND TWENTY ONE LIGHT EMITTING DIODES (LEDs), VERTICAL BASE-UP POSITION.  
 TOTAL INPUT WATTS = 54.945 AT 120.0 VOLTS  
 LED DRIVERS: RD-052-A1400-C  
 NOTE: DATA SHOWN IS ABSOLUTE FOR THE SAMPLE PROVIDED AT RATED INPUT VOLTAGE TO THE LED DRIVERS.  
 TEST PROCEDURE: IESNA LM-79-08  
 TEST DISTANCE = 28.25 FEET  
 \*(SEE PAGE 2 FOR MORE INFORMATION) \*

IES Cutoff Classification: Full Cutoff

--- 1/2 Maximum Candela trace  
 X Maximum Candela point



REPORT NUMBER: RAB00890  
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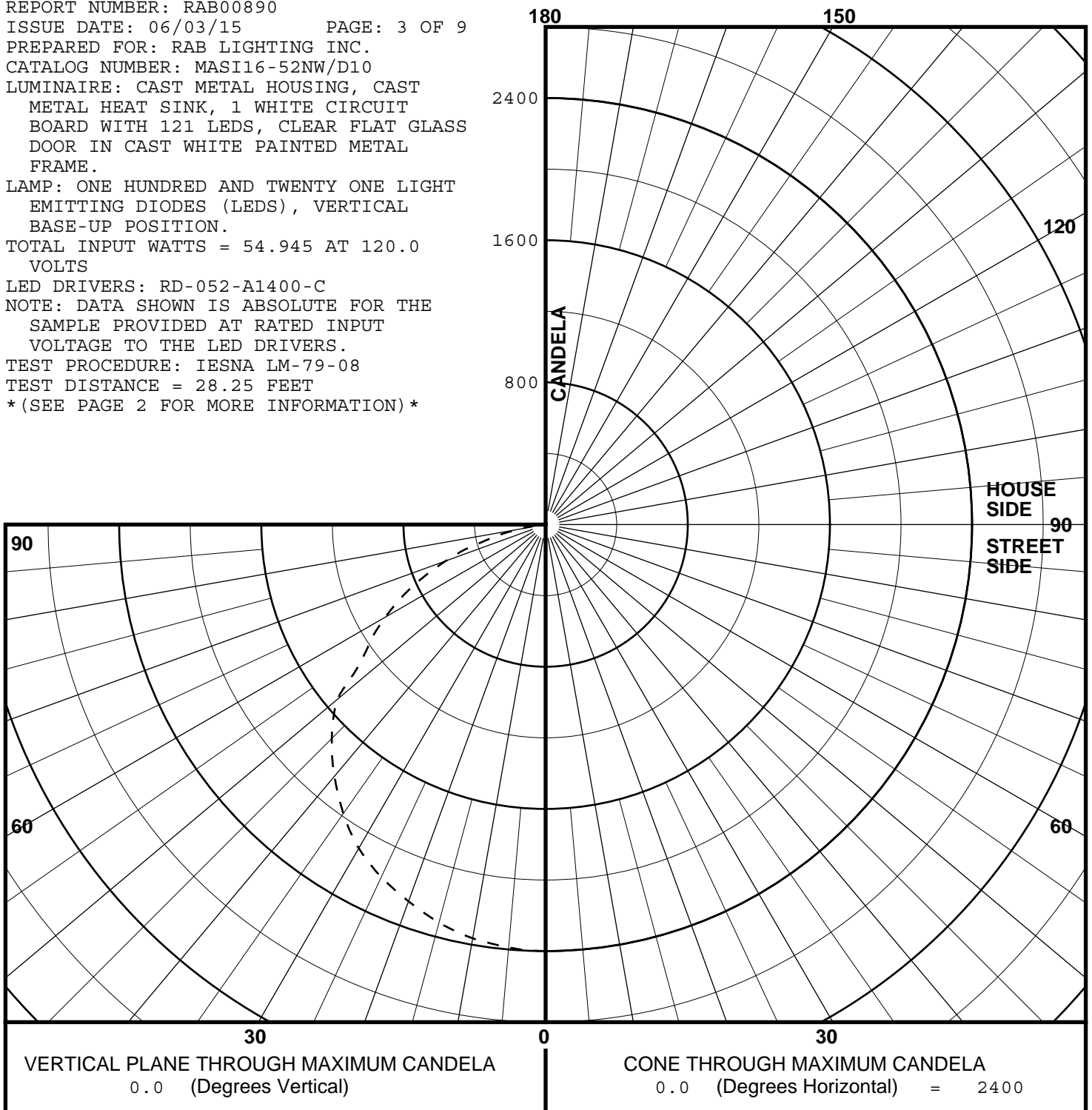
PAGE: 2 OF 9

ADDITIONAL INFORMATION

NOTE: DATA SHOWN IS ABSOLUTE FOR THE SAMPLE PROVIDED.  
ACCREDITED LABORATORY CODE 201058-0

## MAXIMUM PLANE AND MAXIMUM CONE PLOTS OF CANDELA

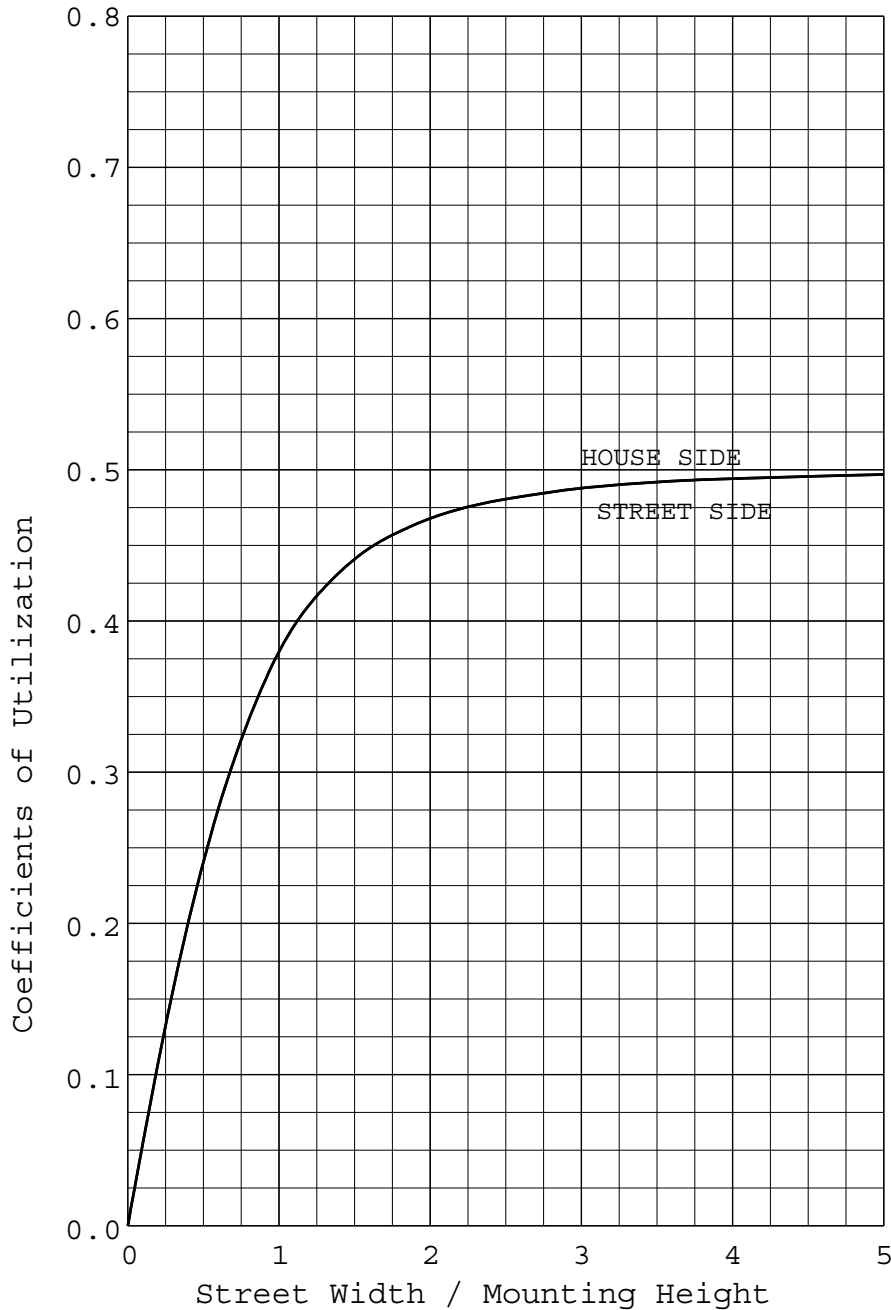
REPORT NUMBER: RAB00890  
 ISSUE DATE: 06/03/15 PAGE: 3 OF 9  
 PREPARED FOR: RAB LIGHTING INC.  
 CATALOG NUMBER: MASI16-52NW/D10  
 LUMINAIRE: CAST METAL HOUSING, CAST  
 METAL HEAT SINK, 1 WHITE CIRCUIT  
 BOARD WITH 121 LEDS, CLEAR FLAT GLASS  
 DOOR IN CAST WHITE PAINTED METAL  
 FRAME.  
 LAMP: ONE HUNDRED AND TWENTY ONE LIGHT  
 EMITTING DIODES (LEDS), VERTICAL  
 BASE-UP POSITION.  
 TOTAL INPUT WATTS = 54.945 AT 120.0  
 VOLTS  
 LED DRIVERS: RD-052-A1400-C  
 NOTE: DATA SHOWN IS ABSOLUTE FOR THE  
 SAMPLE PROVIDED AT RATED INPUT  
 VOLTAGE TO THE LED DRIVERS.  
 TEST PROCEDURE: IESNA LM-79-08  
 TEST DISTANCE = 28.25 FEET  
 \*(SEE PAGE 2 FOR MORE INFORMATION)\*



REPORT NUMBER: RAB00890  
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 PREPARED FOR: RAB LIGHTING INC.

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## COEFFICIENTS OF UTILIZATION AND FLUX DISTRIBUTION



	LUMENS	PERCENT OF FIXTURE
DOWNWARD STREET SIDE	3429.	50.0
DOWNWARD HOUSE SIDE	3429.	50.0
DOWNWARD TOTAL	6857.	100.0
UPWARD STREET SIDE	0.	0.0
UPWARD HOUSE SIDE	0.	0.0
UPWARD TOTAL	0.	0.0
TOTAL FLUX	6857.	100.0
TOTAL INPUT WATTS = 54.9		
EFFICACY = 124.9 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: RAB00890  
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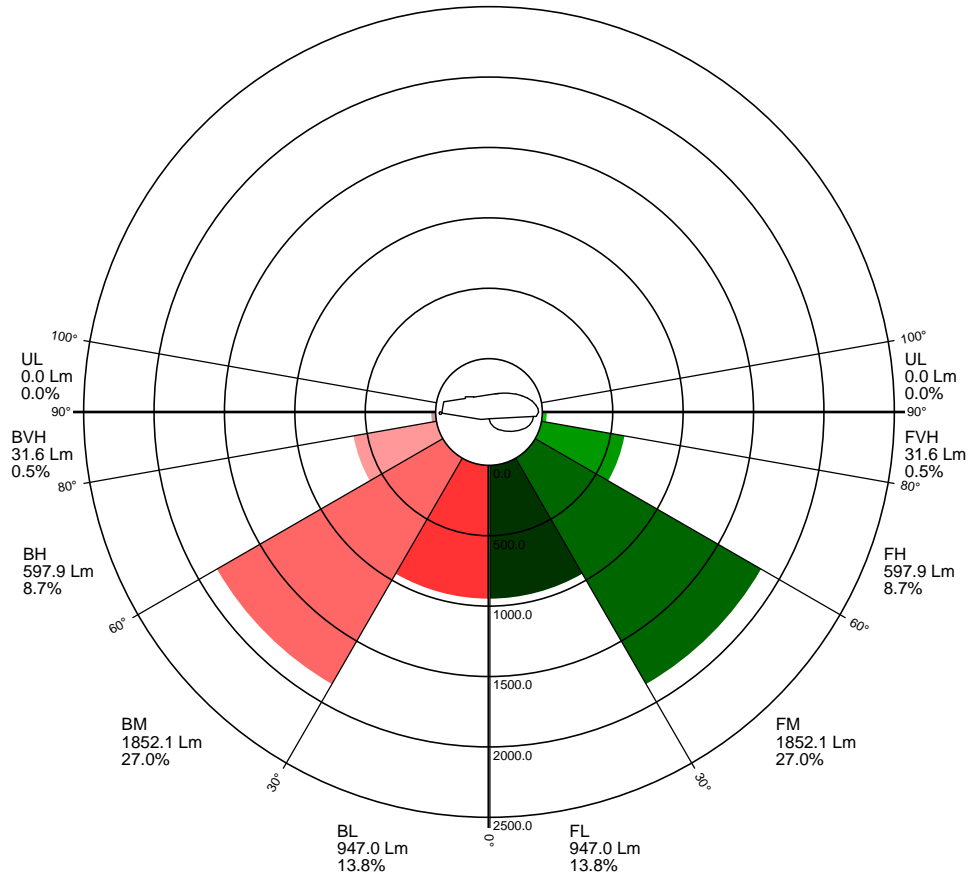
PAGE: 5 OF 9

BUG Rating:				B2 U0 G1		
Zonal Summary		Lumens	% of Fixture	Zone Ratings		
				B	U	G
Forward		3429	50.0			
FL	(0° - 30°)	947.0	13.8			
FM	(30° - 60°)	1852.1	27.0			
FH	(60° - 80°)	597.9	8.7			G0
FVH	(80° - 90°)	31.6	0.5			G1
Backward		3429	50.0			
BL	(0° - 30°)	947.0	13.8	B2		
BM	(30° - 60°)	1852.1	27.0	B2		
BH	(60° - 80°)	597.9	8.7	B2		G0
BVH	(80° - 90°)	31.6	0.5			G1
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		6857	100.0			

### Zonal Lumen Summary

(Linear scale)

UH  
0.0 Lm  
0.0%



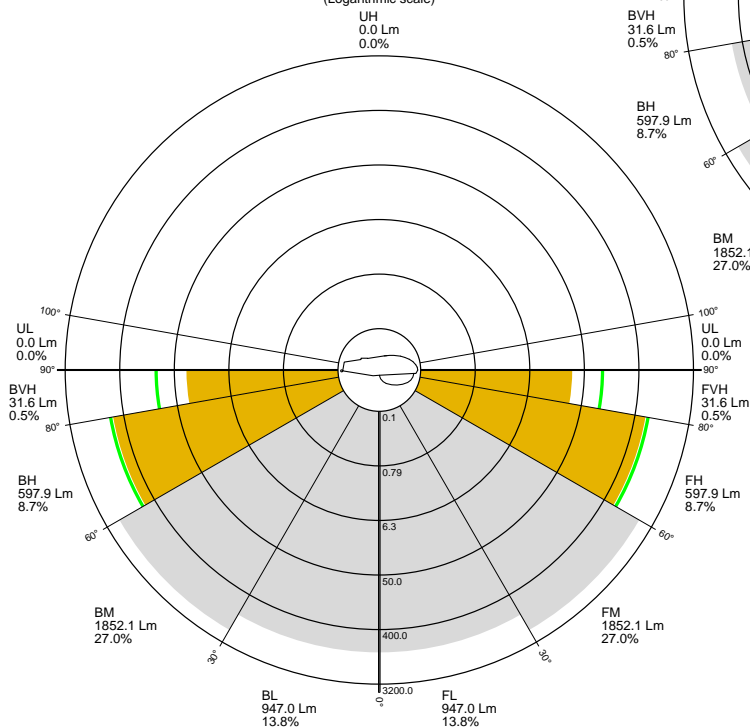
(Logarithmic scale)



(Logarithmic scale)



(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
	90.0	0.	0.	0.	0.	0.	0.	0.	0.	0.
	87.5	17.	18.	19.	19.	19.	20.	19.	18.	17.
	85.0	44.	44.	44.	43.	42.	43.	41.	42.	42.
	82.5	94.	95.	93.	95.	88.	90.	88.	91.	90.
	80.0	162.	165.	168.	164.	162.	155.	160.	161.	161.
	77.5	264.	264.	268.	246.	243.	262.	241.	246.	259.
	75.0	354.	354.	360.	337.	359.	355.	358.	342.	355.
	72.5	491.	486.	497.	490.	459.	457.	459.	487.	489.
V	70.0	596.	610.	609.	606.	561.	562.	561.	603.	609.
E	67.5	713.	721.	719.	721.	680.	666.	680.	720.	716.
R	65.0	829.	830.	829.	833.	831.	766.	827.	831.	825.
T	62.5	939.	937.	937.	936.	939.	891.	939.	936.	933.
I	60.0	1041.	1041.	1039.	1041.	1041.	1124.	1042.	1040.	1038.
C	57.5	1143.	1140.	1137.	1136.	1195.	1242.	1198.	1137.	1137.
A	55.0	1230.	1227.	1229.	1269.	1341.	1346.	1343.	1270.	1233.
L	52.5	1345.	1345.	1385.	1437.	1443.	1447.	1443.	1440.	1396.
	50.0	1529.	1524.	1531.	1536.	1534.	1539.	1536.	1533.	1535.
A	47.5	1621.	1621.	1624.	1622.	1622.	1623.	1624.	1623.	1625.
N	45.0	1702.	1704.	1704.	1704.	1703.	1706.	1705.	1704.	1708.
G	42.5	1778.	1780.	1782.	1782.	1779.	1782.	1781.	1783.	1786.
L	40.0	1849.	1854.	1854.	1852.	1852.	1854.	1854.	1855.	1859.
E	37.5	1917.	1920.	1922.	1921.	1920.	1921.	1921.	1923.	1926.
	35.0	1985.	1982.	1984.	1984.	1984.	1983.	1982.	1988.	1988.
	30.0	2103.	2097.	2099.	2098.	2096.	2093.	2097.	2102.	2097.
	25.0	2189.	2188.	2190.	2188.	2189.	2188.	2192.	2189.	2187.
	20.0	2256.	2263.	2264.	2265.	2267.	2268.	2268.	2263.	2262.
	15.0	2319.	2327.	2329.	2330.	2331.	2328.	2328.	2326.	2327.
	10.0	2364.	2368.	2369.	2369.	2368.	2367.	2367.	2368.	2370.
	5.0	2388.	2387.	2387.	2388.	2387.	2386.	2389.	2388.	2388.
	0.0<<	2400.	2400.	2400.	2400.	2400.	2400.	2400.	2400.	2400.

||  
 PLANE OF MAXIMUM CANDELA  
 |  
 CONE OF MAXIMUM CANDELA

REPORT NUMBER: RAB00890  
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 PREPARED FOR: RAB LIGHTING INC.

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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
	90.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
	87.5	17.	17.	18.	18.	19.	20.	19.	19.	18.	17.
	85.0	40.	42.	41.	42.	41.	43.	42.	43.	44.	44.
	82.5	91.	90.	87.	91.	88.	90.	88.	95.	93.	95.
	80.0	159.	161.	162.	161.	160.	155.	162.	164.	168.	165.
	77.5	255.	259.	261.	246.	241.	262.	243.	246.	268.	264.
	75.0	349.	355.	354.	342.	358.	355.	359.	337.	360.	354.
	72.5	480.	490.	489.	487.	459.	457.	459.	490.	497.	486.
V	70.0	601.	609.	604.	603.	561.	562.	561.	606.	609.	610.
E	67.5	715.	723.	716.	720.	680.	666.	680.	721.	719.	721.
R	65.0	827.	831.	825.	831.	827.	766.	831.	833.	829.	830.
T	62.5	935.	934.	933.	936.	939.	891.	939.	936.	937.	937.
I	60.0	1041.	1036.	1038.	1040.	1042.	1124.	1041.	1041.	1039.	1041.
C	57.5	1138.	1134.	1137.	1137.	1198.	1242.	1195.	1136.	1137.	1140.
A	55.0	1229.	1227.	1233.	1270.	1343.	1346.	1341.	1269.	1229.	1227.
L	52.5	1350.	1350.	1396.	1440.	1443.	1447.	1443.	1437.	1385.	1345.
	50.0	1532.	1532.	1535.	1533.	1536.	1539.	1534.	1536.	1531.	1524.
A	47.5	1624.	1622.	1625.	1623.	1624.	1623.	1622.	1622.	1624.	1621.
N	45.0	1707.	1704.	1708.	1704.	1705.	1706.	1703.	1704.	1704.	1704.
G	42.5	1786.	1782.	1786.	1783.	1781.	1782.	1779.	1782.	1782.	1780.
L	40.0	1858.	1854.	1859.	1855.	1854.	1854.	1852.	1852.	1854.	1854.
E	37.5	1923.	1923.	1926.	1923.	1921.	1921.	1920.	1921.	1922.	1920.
	35.0	1987.	1987.	1988.	1988.	1982.	1983.	1984.	1984.	1984.	1982.
	30.0	2099.	2099.	2097.	2102.	2097.	2093.	2096.	2098.	2099.	2097.
	25.0	2190.	2188.	2187.	2189.	2192.	2188.	2189.	2188.	2190.	2188.
	20.0	2269.	2265.	2262.	2263.	2268.	2268.	2267.	2265.	2264.	2263.
	15.0	2334.	2329.	2327.	2326.	2328.	2328.	2331.	2330.	2329.	2327.
	10.0	2375.	2370.	2370.	2368.	2367.	2367.	2368.	2369.	2369.	2368.
	5.0	2392.	2388.	2388.	2388.	2389.	2386.	2387.	2388.	2387.	2387.
	0.0<<	2400.	2400.	2400.	2400.	2400.	2400.	2400.	2400.	2400.	2400.

CONE OF MAXIMUM CANDELA



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PREPARED FOR: RAB LIGHTING INC.

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## 5-DEGREE ZONAL LUMEN SUMMARY

0- 5	57
5- 10	170
10- 15	279
15- 20	378
20- 25	467
25- 30	542
30- 35	601
35- 40	641
40- 45	659
45- 50	655
50- 55	611
55- 60	537
60- 65	454
65- 70	357
70- 75	248
75- 80	137
80- 85	52
85- 90	11

## 10-DEGREE ZONAL LUMEN SUMMARY

0- 10	227
0- 20	885
0- 30	1894
0- 40	3136
0- 50	4450
0- 60	5598
0- 70	6409
0- 80	6794
0- 90	6857

REPORT NUMBER: RAB00923  
DATE: 6/3/2015  
PREPARED FOR: RAB LIGHTING INC.  
CATALOG NUMBER: MASI16-52NW/D10

ADDRESS: 170 LUDLOW AVE, NORTHVALE, NJ 07647

LUMINAIRE: CAST METAL HOUSING, CAST METAL HEAT SINK, 1 WHITE CIRCUIT BOARD WITH 121 LEDS, CLEAR FLAT GLASS DOOR IN CAST WHITE PAINTED METAL FRAME.

LAMP: ONE HUNDRED AND TWENTY ONE LIGHT EMITTING DIODES (LEDs), VERTICAL BASE-UP POSITION.

DRIVER: RD-052-A1400-C

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:	CHROMA PROGRAMMABLE AC POWER SOURCE MODEL 61602	Calibration Due: N/A
	CHROMA PROGRAMMABLE DIGITAL POWER METER MODEL 66202	3/9/16
	OCEAN OPTICS QE65PRO Spectroradiometer	6/2/16
	RAB 2.0 meter Diameter Integrating Sphere, 4PI Geometry	6/2/16

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: RAB00923  
 DATE: 6/3/2015  
 PREPARED FOR: RAB LIGHTING INC.  
 CATALOG NUMBER: MASI16-52NW/D10

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### RESULTS:

PHOTOMETRIC	
Total Integrated Flux (lumens)	6857 *
SPECTRORADIOMETRIC	
Observer	CIE 1931 2 degree
Chromaticity Ordinate x	0.3822
Chromaticity Ordinate y	0.3807
Observer	CIE 1976 2 degree
Chromaticity Ordinate u'	0.2246
Chromaticity Ordinate v'	0.5036
Correlated Color Temp CCT (K)	3983
ANSI C78.377-2008 Duv	0.001
Total Radiant Flux (milliWatts)	19828 *
ELECTRICAL	
Input Voltage (Volts AC)	120.0
Input Current (Amps AC)	0.461
Input Power (Watts)	54.9
Input Power Factor (%)	99.2
Input Current THD (%)	6.6
Input Voltage THD (%)	0.2
EFFICACY (Lumens/Watt)	
	124.9
ELECTRICAL AT MAX NONIMAL INPUT	
Input Voltage (Volts AC)	277.0
Input Current (Amps AC)	0.205
Input Power (Watts)	54.8
Input Power Factor (%)	96.5
Input Current THD (%)	7.8
Input Voltage THD (%)	0.2
Off-State Power (Watts)	
	0.0

COLOR RENDERING INDICES	CRI
Ra (Average 1-8)	72
R1 Light greyish red	70
R2 Dark greyish yellow	78
R3 Strong yellowish green	83
R4 Moderate yellowish green	72
R5 Light bluish green	69
R6 Light blue	68
R7 Light violet	82
R8 Light reddish purple	55
R9 Strong red	-23
R10 Strong yellow	47
R11 Strong green	66
R12 Strong blue	38
R13 Light yellowish pink (skin)	71
R14 Moderate olive green (leaf)	90

### \*NOTE:

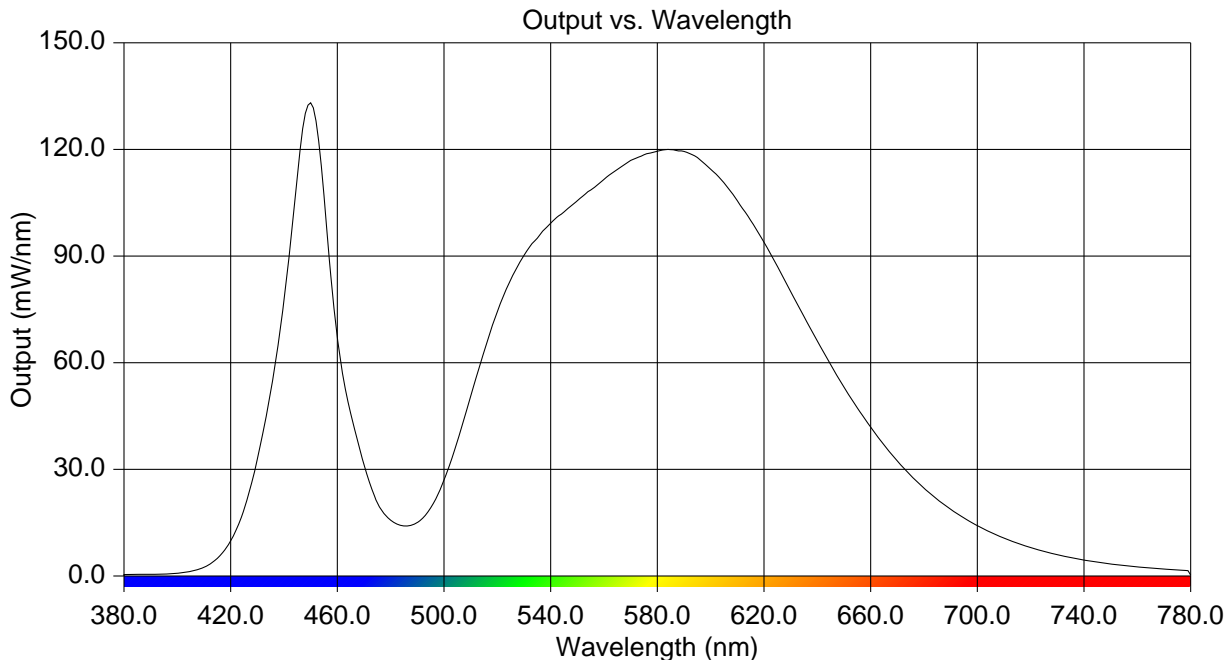
Proper calibration of integrating spheres for measuring total flux output of non-directional samples will produce reliable, repeatable results within the calibration tolerances of the equipment used. However, measurement of test samples with significant self absorption and/or directional output, even 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.

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### RESULTS:

Wavelength	mW per nm	Wavelength	mW per nm	Wavelength	mW per nm
380	0.387	515	63.085	650	53.118
385	0.423	520	74.332	655	47.268
390	0.461	525	83.453	660	41.879
395	0.548	530	90.177	665	36.862
400	0.788	535	95.009	670	32.349
405	1.289	540	99.172	675	28.301
410	2.441	545	102.385	680	24.689
415	4.958	550	105.611	685	21.541
420	9.872	555	108.541	690	18.738
425	18.656	560	111.557	695	16.327
430	32.885	565	114.345	700	14.148
435	52.158	570	116.881	705	12.287
440	77.193	575	118.470	710	10.660
445	112.635	580	119.471	715	9.217
450	133.092	585	119.908	720	7.970
455	107.006	590	119.412	725	6.912
460	67.159	595	117.707	730	5.989
465	45.735	600	114.446	735	5.189
470	31.306	605	110.562	740	4.489
475	20.711	610	105.549	745	3.895
480	15.666	615	100.002	750	3.392
485	14.132	620	93.830	755	2.938
490	14.969	625	87.209	760	2.551
495	19.162	630	79.975	765	2.223
500	26.978	635	72.982	770	1.938
505	37.893	640	66.155	775	1.699
510	50.545	645	59.361	780	0.254



REPORT NUMBER: RAB00923  
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## CIE Chromaticity Diagram

