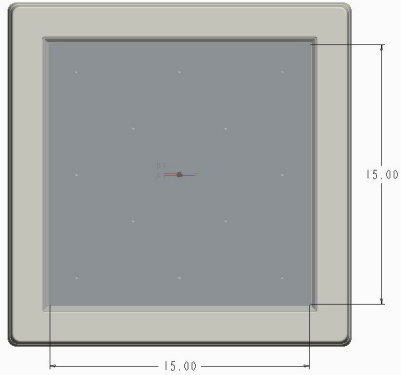


## ISOFOOTCANDLE LINES OF HORIZONTAL ILLUMINATION

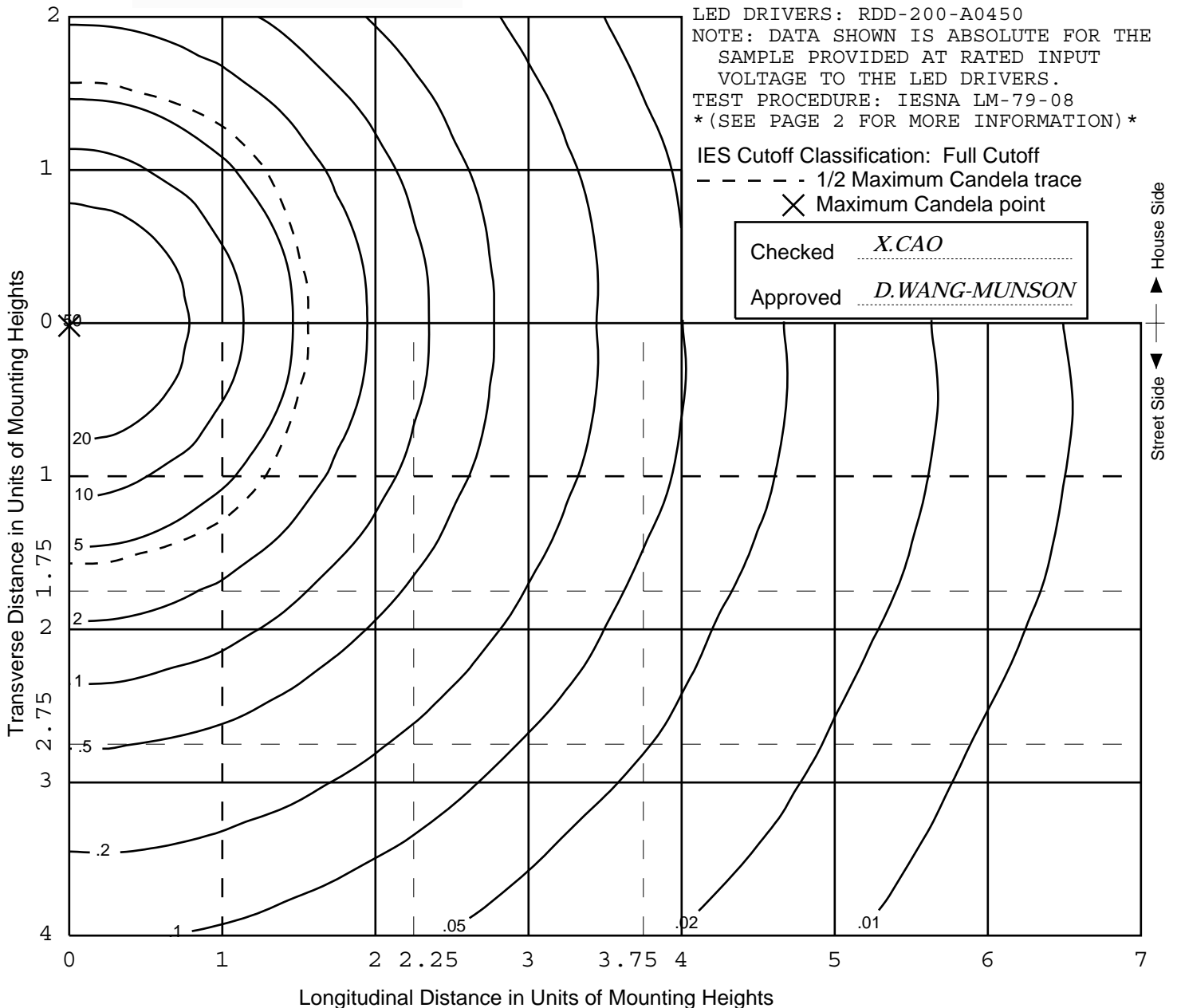
Values based on 14 foot mounting height.



REPORT NUMBER: RAB00889  
 ISSUE DATE: 06/04/15 PAGE: 1 OF 9  
 DATE SAMPLE TESTED: 06/04/15  
 PREPARED FOR: RAB LIGHTING INC.  
 CATALOG NUMBER: MASI20-200NW/D10  
 LUMINAIRE: CAST METAL HOUSING, CAST METAL HEAT SINK, 1 WHITE CIRCUIT BOARD WITH 576 LEDS, CLEAR FLAT GLASS DOOR IN CAST WHITE PAINTED METAL FRAME.  
 LAMPS: FIVE HUNDRED AND SEVENTY SIX LIGHT EMITTING DIODES (LEDS), VERTICAL BASE-UP POSITION.  
 TOTAL INPUT WATTS = 212.15 AT 120.0 VOLTS  
 LED DRIVERS: RDD-200-A0450  
 NOTE: DATA SHOWN IS ABSOLUTE FOR THE SAMPLE PROVIDED AT RATED INPUT VOLTAGE TO THE LED DRIVERS.  
 TEST PROCEDURE: IESNA LM-79-08  
 \*(SEE PAGE 2 FOR MORE INFORMATION) \*

IES Cutoff Classification: Full Cutoff

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



REPORT NUMBER: RAB00889

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PREPARED FOR: RAB LIGHTING INC.

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DATE SAMPLE TESTED: 06/04/15

ADDITIONAL INFORMATION

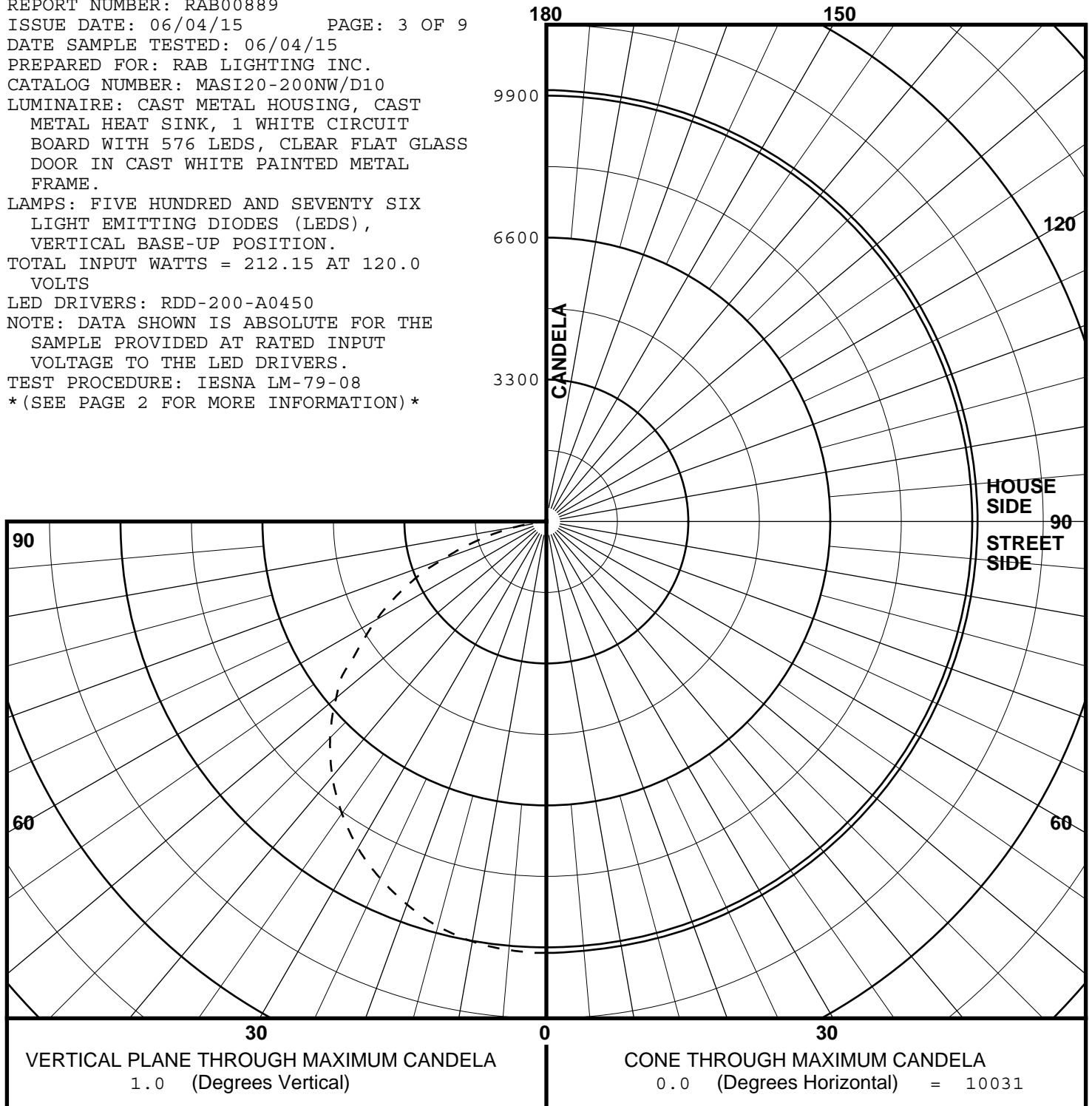
TEST DISTANCE = 28.25 FEET

NOTE: DATA SHOWN IS ABSOLUTE FOR THE SAMPLE PROVIDED.

ACCREDITED LABORATORY CODE 201058-0

## MAXIMUM PLANE AND MAXIMUM CONE PLOTS OF CANDELA

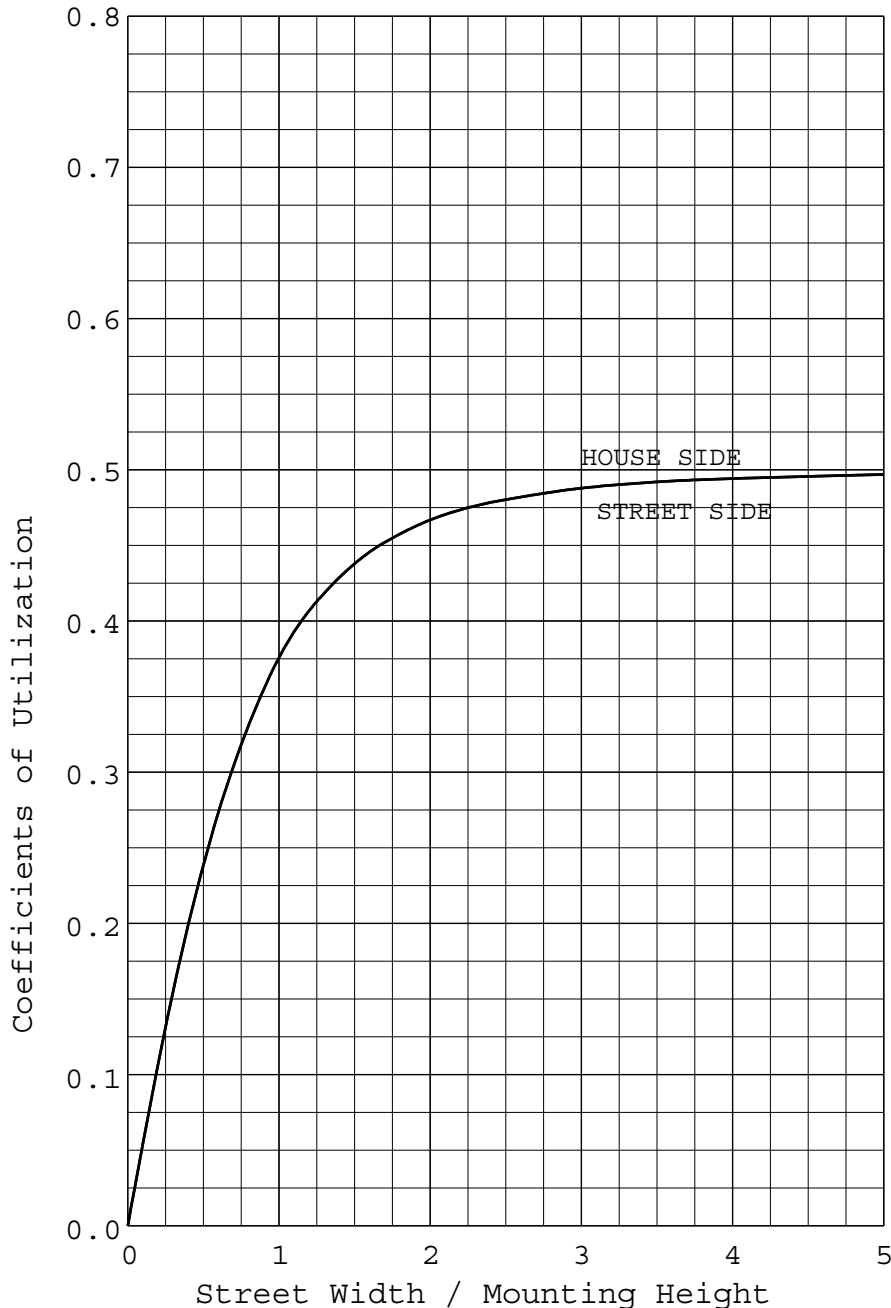
REPORT NUMBER: RAB00889  
 ISSUE DATE: 06/04/15 PAGE: 3 OF 9  
 DATE SAMPLE TESTED: 06/04/15  
 PREPARED FOR: RAB LIGHTING INC.  
 CATALOG NUMBER: MASI20-200NW/D10  
 LUMINAIRE: CAST METAL HOUSING, CAST METAL HEAT SINK, 1 WHITE CIRCUIT BOARD WITH 576 LEDS, CLEAR FLAT GLASS DOOR IN CAST WHITE PAINTED METAL FRAME.  
 LAMPS: FIVE HUNDRED AND SEVENTY SIX LIGHT EMITTING DIODES (LEDS), VERTICAL BASE-UP POSITION.  
 TOTAL INPUT WATTS = 212.15 AT 120.0 VOLTS  
 LED DRIVERS: RDD-200-A0450  
 NOTE: DATA SHOWN IS ABSOLUTE FOR THE SAMPLE PROVIDED AT RATED INPUT VOLTAGE TO THE LED DRIVERS.  
 TEST PROCEDURE: IESNA LM-79-08  
 \*(SEE PAGE 2 FOR MORE INFORMATION)\*



REPORT NUMBER: RAB00889  
ISSUE DATE: 06/04/15  
PREPARED FOR: RAB LIGHTING INC.

PAGE: 4 OF 9  
DATE SAMPLE TESTED: 06/04/15

COEFFICIENTS OF UTILIZATION AND FLUX DISTRIBUTION



	LUMENS	PERCENT OF FIXTURE
DOWNWARD STREET SIDE	14586.	50.0
DOWNWARD HOUSE SIDE	14586.	50.0
DOWNWARD TOTAL	29172.	100.0
UPWARD STREET SIDE	0.	0.0
UPWARD HOUSE SIDE	0.	0.0
UPWARD TOTAL	0.	0.0
TOTAL FLUX	29172.	100.0
TOTAL INPUT WATTS = 212.1		
EFFICACY = 137.5 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: RAB00889  
 ISSUE DATE: 06/04/15  
 PREPARED FOR: RAB LIGHTING INC.

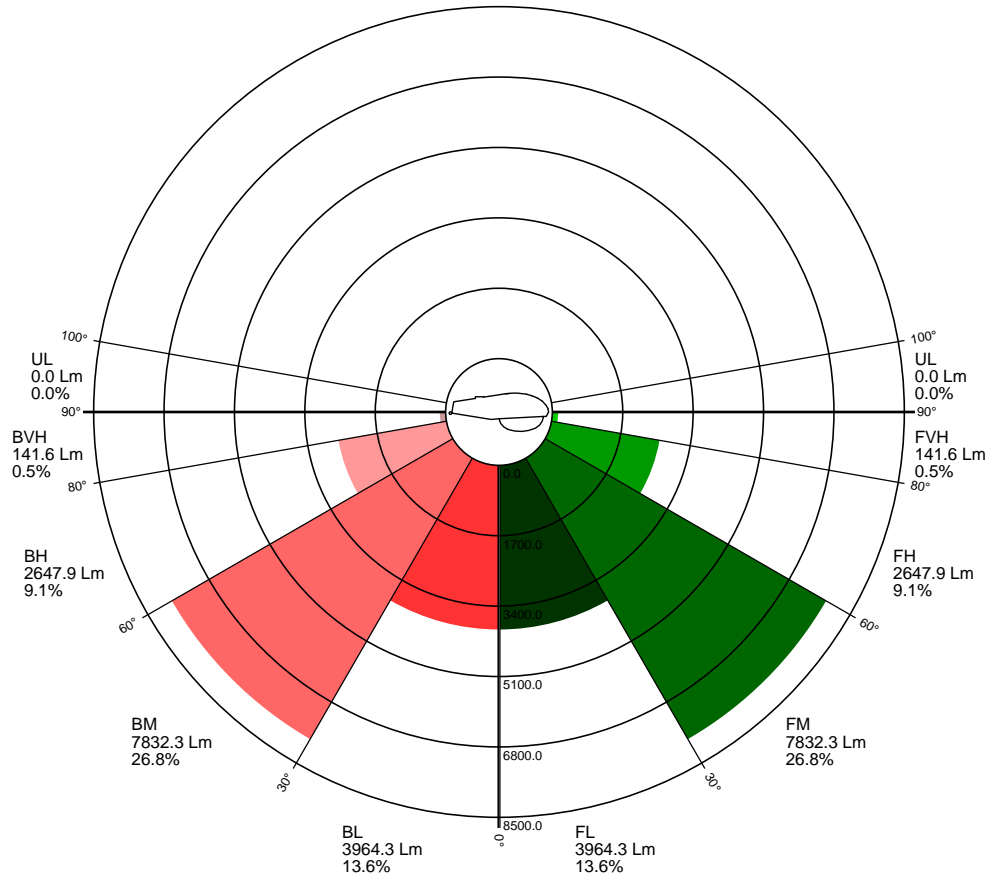
PAGE: 5 OF 9  
 DATE SAMPLE TESTED: 06/04/15

BUG Rating:				B4	U0	G2
Zonal Summary		Lumens	% of Fixture	Zone Ratings		
				B	U	G
Forward		14586	50.0			
FL	(0° – 30°)	3964.3	13.6			
FM	(30° – 60°)	7832.3	26.8			
FH	(60° – 80°)	2647.9	9.1			G2
FVH	(80° – 90°)	141.6	0.5			G2
Backward		14586	50.0			
BL	(0° – 30°)	3964.3	13.6	B4		
BM	(30° – 60°)	7832.3	26.8	B4		
BH	(60° – 80°)	2647.9	9.1	B4		G2
BVH	(80° – 90°)	141.6	0.5			G2
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		29172	100.0			

### Zonal Lumen Summary

(Linear scale)

UH  
0.0 Lm  
0.0%

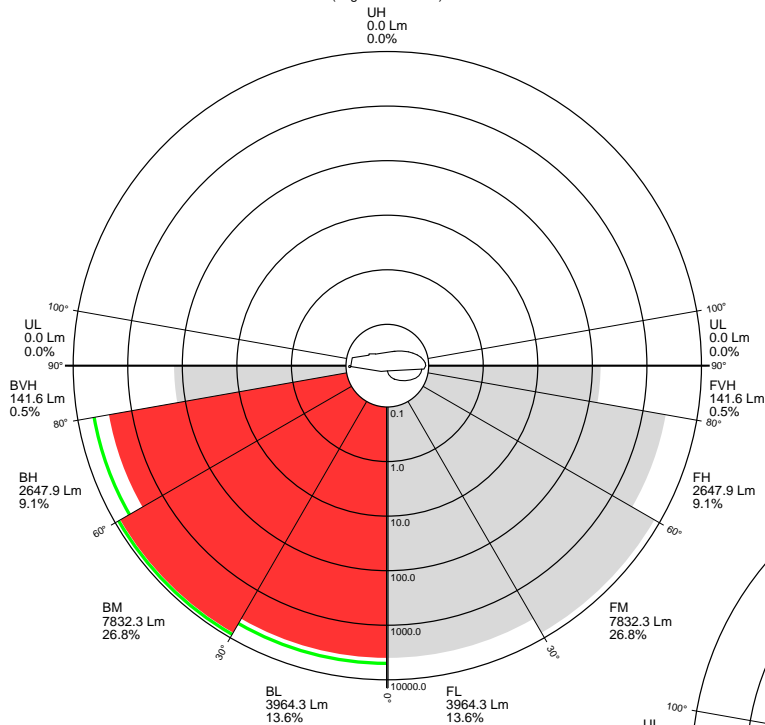


REPORT NUMBER: RAB00889  
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 PREPARED FOR: RAB LIGHTING INC.

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 DATE SAMPLE TESTED: 06/04/15

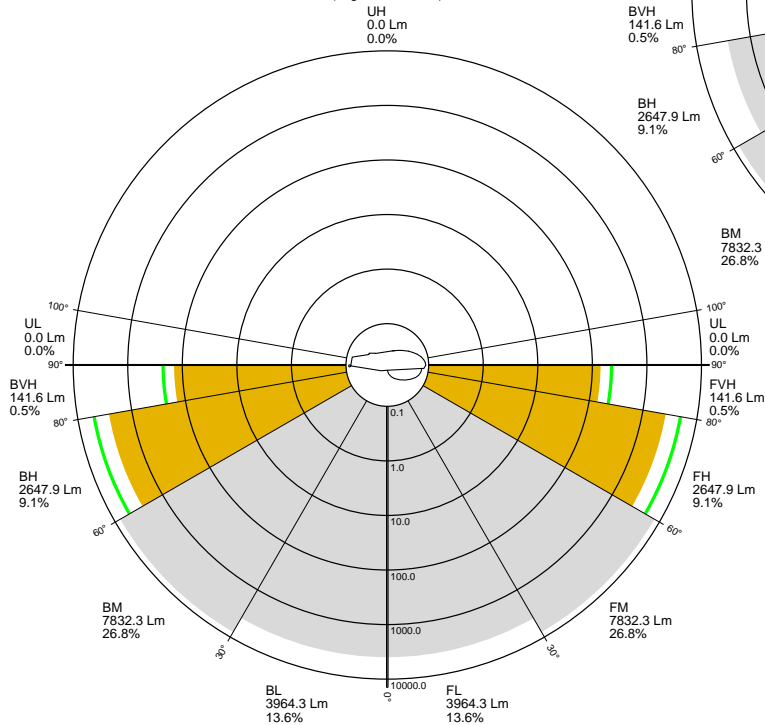
## Backlight Rating Details

(Logarithmic scale)



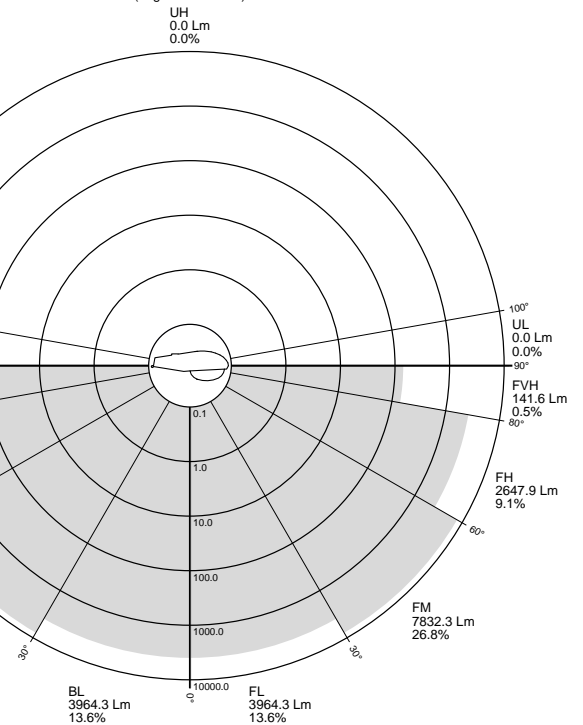
## Glare Rating Details

(Logarithmic scale)



## Uplight Rating Details

(Logarithmic scale)



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ISSUE DATE: 06/04/15  
PREPARED FOR: RAB LIGHTING INC.

PAGE: 7 OF 9  
DATE SAMPLE TESTED: 06/04/15

## 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	64.	70.	69.	72.	73.	73.	75.	69.	75.
	85.0	183.	196.	189.	191.	191.	188.	191.	181.	197.
	82.5	406.	427.	415.	410.	412.	407.	412.	395.	426.
	80.0	726.	759.	741.	732.	730.	714.	730.	712.	759.
	77.5	1135.	1179.	1156.	1122.	1149.	1109.	1166.	1104.	1178.
	75.0	1568.	1628.	1622.	1595.	1579.	1560.	1597.	1582.	1636.
	72.5	2071.	2117.	2077.	2088.	2061.	2084.	2060.	2067.	2104.
	70.0	2549.	2589.	2560.	2650.	2572.	2572.	2601.	2583.	2581.
V	67.5	3133.	3183.	3155.	3167.	3155.	3055.	3182.	3144.	3155.
E	65.0	3616.	3666.	3647.	3656.	3650.	3532.	3650.	3629.	3644.
R	62.5	4099.	4137.	4119.	4124.	4141.	4252.	4138.	4098.	4121.
T	60.0	4563.	4593.	4575.	4565.	4677.	4723.	4638.	4540.	4572.
I	57.5	4991.	5022.	5015.	5074.	5223.	5202.	5219.	4996.	5012.
C	55.0	5447.	5503.	5572.	5634.	5643.	5621.	5644.	5591.	5509.
A	52.5	6030.	6069.	6062.	6045.	6060.	6043.	6041.	6017.	6057.
L	50.0	6377.	6438.	6429.	6408.	6425.	6425.	6398.	6423.	6448.
	47.5	6757.	6795.	6798.	6772.	6793.	6783.	6776.	6783.	6800.
A	45.0	7109.	7138.	7139.	7138.	7132.	7125.	7115.	7139.	7139.
N	42.5	7434.	7477.	7469.	7464.	7455.	7449.	7457.	7464.	7473.
G	40.0	7741.	7773.	7768.	7766.	7753.	7752.	7744.	7765.	7767.
L	37.5	8022.	8051.	8051.	8051.	8041.	8041.	8031.	8049.	8053.
E	35.0	8286.	8320.	8316.	8316.	8311.	8308.	8301.	8317.	8318.
	30.0	8763.	8775.	8775.	8775.	8785.	8785.	8774.	8783.	8787.
	25.0	9150.	9163.	9160.	9163.	9167.	9179.	9168.	9165.	9168.
	20.0	9474.	9475.	9480.	9481.	9482.	9495.	9482.	9485.	9486.
	15.0	9745.	9740.	9738.	9735.	9736.	9742.	9738.	9741.	9739.
	10.0	9914.	9909.	9908.	9910.	9911.	9911.	9908.	9913.	9908.
	5.0	10000.	9992.	9996.	9994.	9995.	9993.	9995.	9996.	9996.
	1.0	10031.	10017.	10026.	10026.	10025.	10026.	10026.	10025.	10024.
	0.0	10026.	10026.	10026.	10026.	10026.	10026.	10026.	10026.	10026.

||  
PLANE OF MAXIMUM CANDELA

CONE OF MAXIMUM CANDELA

REPORT NUMBER: RAB00889  
 ISSUE DATE: 06/04/15  
 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
90.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
87.5	63.	71.	75.	69.	75.	73.	73.	72.	69.	70.	64.
85.0	177.	191.	197.	181.	191.	188.	191.	191.	189.	196.	183.
82.5	393.	426.	426.	395.	412.	407.	412.	410.	415.	427.	406.
80.0	715.	758.	759.	712.	730.	714.	730.	732.	741.	759.	726.
77.5	1124.	1175.	1178.	1104.	1166.	1109.	1149.	1122.	1156.	1179.	1135.
75.0	1545.	1607.	1636.	1582.	1597.	1560.	1579.	1595.	1622.	1628.	1568.
72.5	2058.	2112.	2104.	2067.	2060.	2084.	2061.	2088.	2077.	2117.	2071.
70.0	2536.	2564.	2581.	2583.	2601.	2572.	2572.	2650.	2560.	2589.	2549.
V 67.5	3077.	3125.	3155.	3144.	3182.	3055.	3155.	3167.	3155.	3183.	3133.
E 65.0	3605.	3648.	3644.	3629.	3650.	3532.	3650.	3656.	3647.	3666.	3616.
R 62.5	4085.	4122.	4121.	4098.	4138.	4252.	4141.	4124.	4119.	4137.	4099.
T 60.0	4545.	4576.	4572.	4540.	4638.	4723.	4677.	4565.	4575.	4593.	4563.
I 57.5	4978.	5007.	5012.	4996.	5219.	5202.	5223.	5074.	5015.	5022.	4991.
C 55.0	5398.	5447.	5509.	5591.	5644.	5621.	5643.	5634.	5572.	5503.	5447.
A 52.5	5986.	6024.	6057.	6017.	6041.	6043.	6060.	6045.	6062.	6069.	6030.
L 50.0	6406.	6435.	6448.	6423.	6398.	6425.	6425.	6408.	6429.	6438.	6377.
47.5	6789.	6808.	6800.	6783.	6776.	6783.	6793.	6772.	6798.	6795.	6757.
A 45.0	7130.	7145.	7139.	7139.	7115.	7125.	7132.	7138.	7139.	7138.	7109.
N 42.5	7457.	7470.	7473.	7464.	7457.	7449.	7455.	7464.	7469.	7477.	7434.
G 40.0	7760.	7773.	7767.	7765.	7744.	7752.	7753.	7766.	7768.	7773.	7741.
L 37.5	8045.	8054.	8053.	8049.	8031.	8041.	8041.	8051.	8051.	8051.	8022.
E 35.0	8311.	8308.	8318.	8317.	8301.	8308.	8311.	8316.	8316.	8320.	8286.
30.0	8780.	8779.	8787.	8783.	8774.	8785.	8785.	8775.	8775.	8775.	8763.
25.0	9164.	9166.	9168.	9165.	9168.	9179.	9167.	9163.	9160.	9163.	9150.
20.0	9489.	9484.	9486.	9485.	9482.	9495.	9482.	9481.	9480.	9475.	9474.
15.0	9747.	9743.	9739.	9741.	9738.	9742.	9736.	9735.	9738.	9740.	9745.
10.0	9912.	9905.	9908.	9913.	9908.	9911.	9911.	9910.	9908.	9909.	9914.
5.0	9999.	9988.	9996.	9996.	9995.	9993.	9995.	9994.	9996.	9992.	10000.
1.0<	10026.	10019.	10024.	10025.	10026.	10026.	10025.	10026.	10026.	10017.	10031.
0.0	10026.	10026.	10026.	10026.	10026.	10026.	10026.	10026.	10026.	10026.	10026.

CONE OF MAXIMUM CANDELA



REPORT NUMBER: RAB00889  
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PREPARED FOR: RAB LIGHTING INC.

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5-DEGREE  
ZONAL LUMEN SUMMARY

0- 5	239
5- 10	712
10- 15	1166
15- 20	1584
20- 25	1956
25- 30	2271
30- 35	2517
35- 40	2682
40- 45	2759
45- 50	2740
50- 55	2617
55- 60	2350
60- 65	2006
65- 70	1582
70- 75	1090
75- 80	618
80- 85	238
85- 90	46

10-DEGREE  
ZONAL LUMEN SUMMARY

0- 10	951
0- 20	3701
0- 30	7929
0- 40	13128
0- 50	18627
0- 60	23593
0- 70	27181
0- 80	28889
0- 90	29172

REPORT NUMBER: RAB00922  
 DATE: 6/4/2015  
 PREPARED FOR: RAB LIGHTING INC.  
 CATALOG NUMBER: MASI20-200NW/D10

ADDRESS: 170 LUDLOW AVE, NORTHVALE, NJ 07647

LUMINAIRE: CAST METAL HOUSING, CAST METAL HEAT SINK, 1 WHITE CIRCUIT BOARD WITH 576 LEDS, CLEAR FLAT GLASS DOOR IN CAST WHITE PAINTED METAL FRAME.

LAMP: FIVE HUNDRED AND SEVENTY SIX LIGHT EMITTING DIODES (LEDs), VERTICAL BASE-UP POSITION.

DRIVER: RDD-200-A0450

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 X.CAO

Approved D.WANG-MUNSON  
 Lighting Engineer

REPORT NUMBER: RAB00922  
 DATE: 6/4/2015  
 PREPARED FOR: RAB LIGHTING INC.  
 CATALOG NUMBER: MASI20-200NW/D10

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### RESULTS:

<b>PHOTOMETRIC</b>	
Total Integrated Flux (lumens)	29172 *
<b>SPECTRORADIOMETRIC</b>	
Observer	CIE 1931 2 degree
Chromaticity Ordinate x	0.3831
Chromaticity Ordinate y	0.3818
Observer	CIE 1976 2 degree
Chromaticity Ordinate u'	0.2248
Chromaticity Ordinate v'	0.5042
Correlated Color Temp CCT (K)	3967
ANSI C78.377-2008 Duv	0.002
Total Radiant Flux (milliWatts)	84262 *
<b>ELECTRICAL</b>	
Input Voltage (Volts AC)	120.0
Input Current (Amps AC)	1.77
Input Power (Watts)	212.2
Input Power Factor (%)	99.9
Input Current THD (%)	4.7
Input Voltage THD (%)	0.2
<b>EFFICACY (Lumens/Watt)</b>	
	137.5
<b>ELECTRICAL AT MAX NONIMAL INPUT</b>	
Input Voltage (Volts AC)	277.0
Input Current (Amps AC)	0.794
Input Power (Watts)	207.7
Input Power Factor (%)	94.4
Input Current THD (%)	11.7
Input Voltage THD (%)	0.2
<b>Off-State Power (Watts)</b>	
	0.0

COLOR RENDERING INDICES	CRI
Ra (Average 1-8)	72
R1 Light greyish red	69
R2 Dark greyish yellow	78
R3 Strong yellowish green	84
R4 Moderate yellowish green	71
R5 Light bluish green	68
R6 Light blue	68
R7 Light violet	82
R8 Light reddish purple	54
R9 Strong red	-25
R10 Strong yellow	46
R11 Strong green	65
R12 Strong blue	38
R13 Light yellowish pink (skin)	70
R14 Moderate olive green (leaf)	90

### \*NOTE:

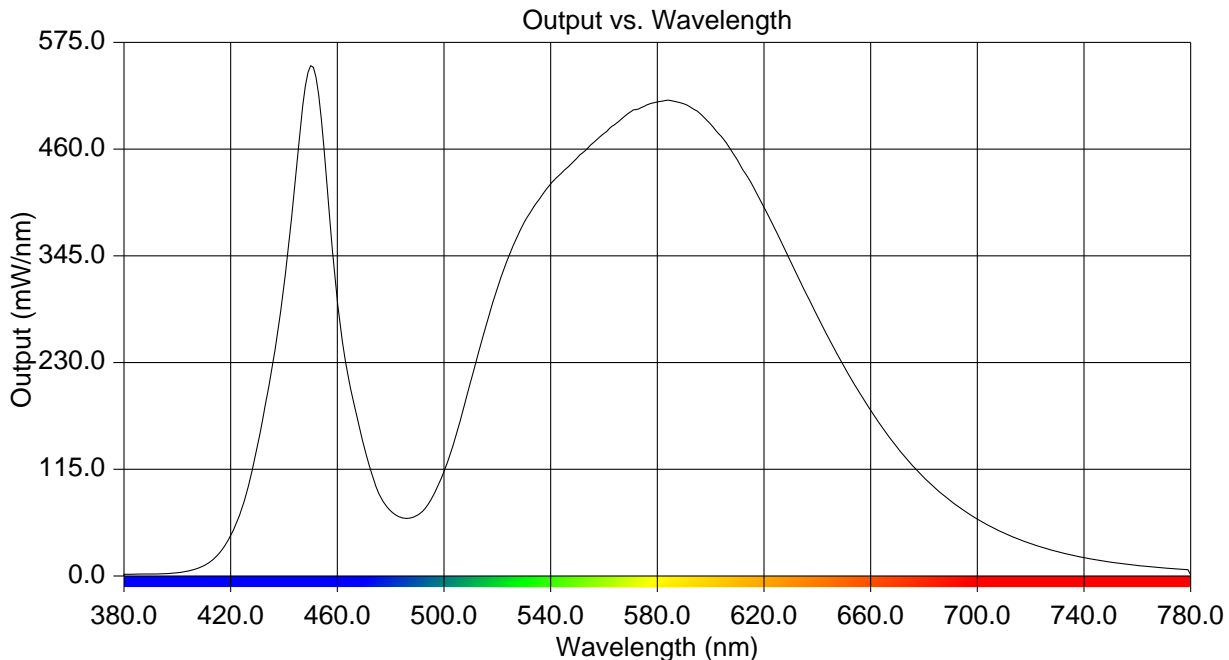
Proper calibration of integrating spheres for measuring total flux output of non-directional samples will produce reliable, repeatable results within the calibration tolerances of the equipment used. However, measurement of test samples with significant self absorption and/or directional output, even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

REPORT NUMBER: RAB00922  
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### RESULTS:

Wavelength	mW per nm	Wavelength	mW per nm	Wavelength	mW per nm
380	1.761	515	262.214	650	225.952
385	1.967	520	310.042	655	201.532
390	1.975	525	350.108	660	178.640
395	2.611	530	380.843	665	157.641
400	3.576	535	403.471	670	138.325
405	5.827	540	422.863	675	121.427
410	11.228	545	437.194	680	105.917
415	22.199	550	451.236	685	92.530
420	43.448	555	464.682	690	80.921
425	79.994	560	477.062	695	70.553
430	139.522	565	488.853	700	61.284
435	216.504	570	500.443	705	53.309
440	312.082	575	506.277	710	46.286
445	450.603	580	511.358	715	40.269
450	550.132	585	512.675	720	34.841
455	461.108	590	508.993	725	30.346
460	297.133	595	501.173	730	26.250
465	201.451	600	487.197	735	22.711
470	139.787	605	470.513	740	19.856
475	93.256	610	448.636	745	17.244
480	69.941	615	424.865	750	14.968
485	62.502	620	397.486	755	13.009
490	65.350	625	369.108	760	11.346
495	81.647	630	339.240	765	9.864
500	112.574	635	309.007	770	8.611
505	156.507	640	280.452	775	7.571
510	209.366	645	252.264	780	1.148



REPORT NUMBER: RAB00922  
DATE: 6/4/2015  
PREPARED FOR: RAB LIGHTING INC.  
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## CIE Chromaticity Diagram

