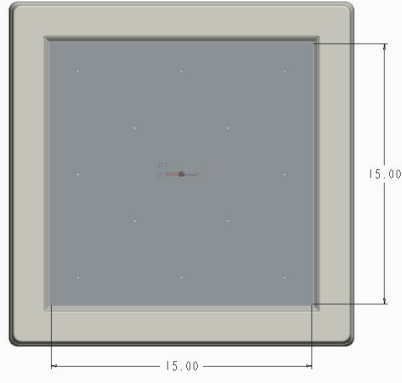
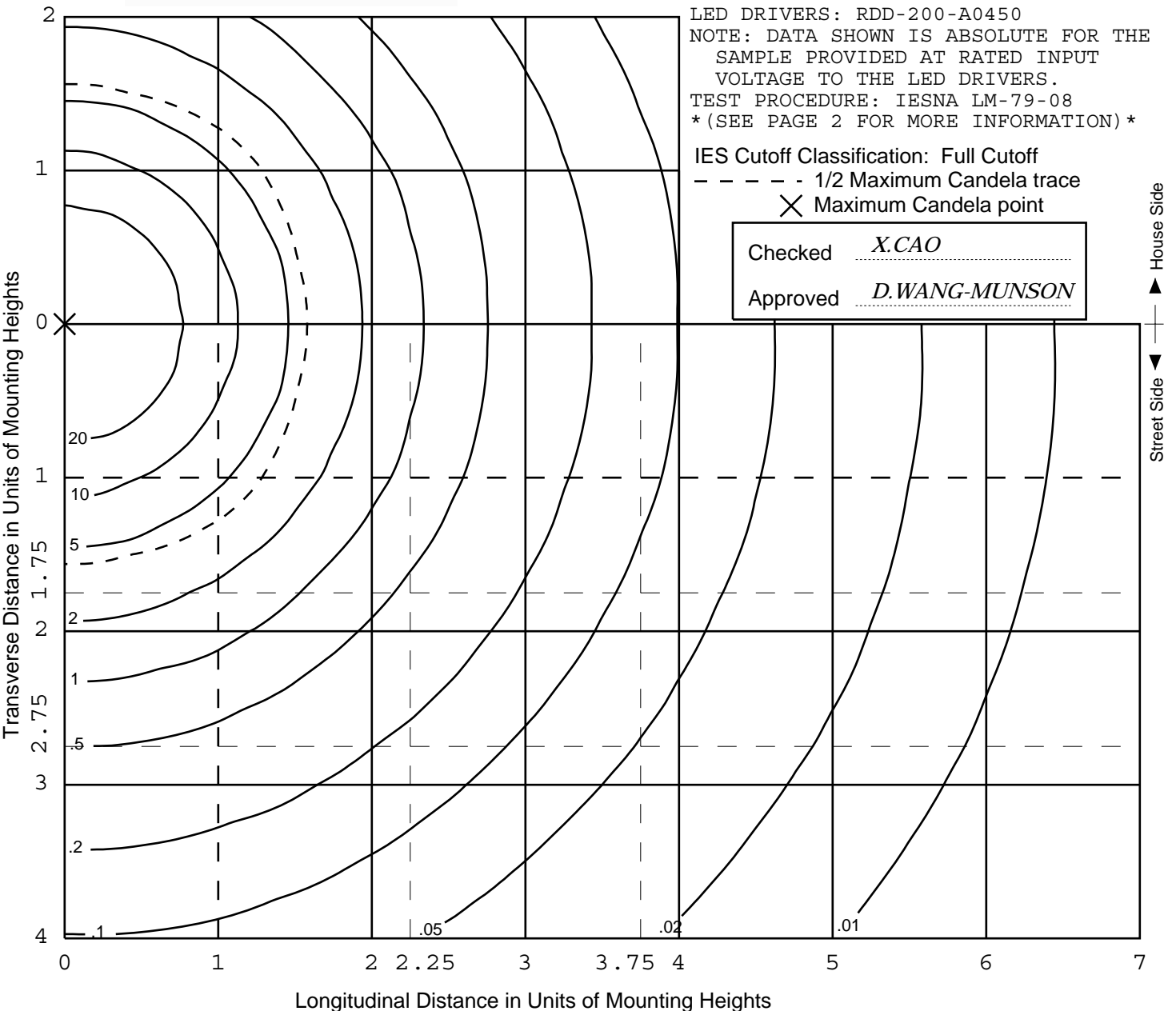


ISOFOOTCANDLE LINES OF HORIZONTAL ILLUMINATION

Values based on 14 foot mounting height.



REPORT NUMBER: RAB00879
 ISSUE DATE: 06/05/15 PAGE: 1 OF 9
 DATE SAMPLE TESTED: 06/05/15
 PREPARED FOR: RAB LIGHTING INC.
 CATALOG NUMBER: MASI20-200W/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 = 211.31 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: RAB00879
ISSUE DATE: 06/05/15
PREPARED FOR: RAB LIGHTING INC.

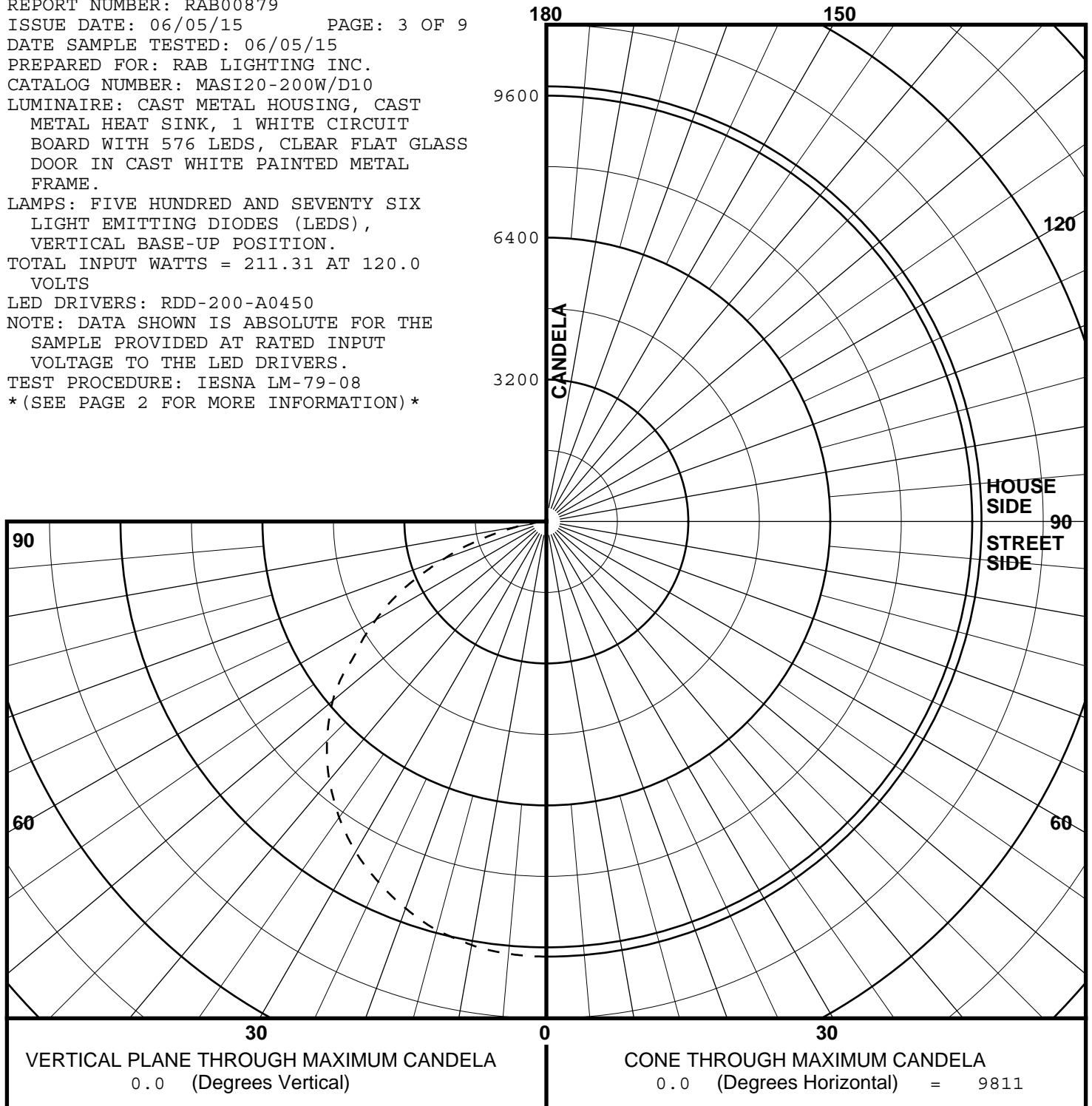
PAGE: 2 OF 9
DATE SAMPLE TESTED: 06/05/15

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

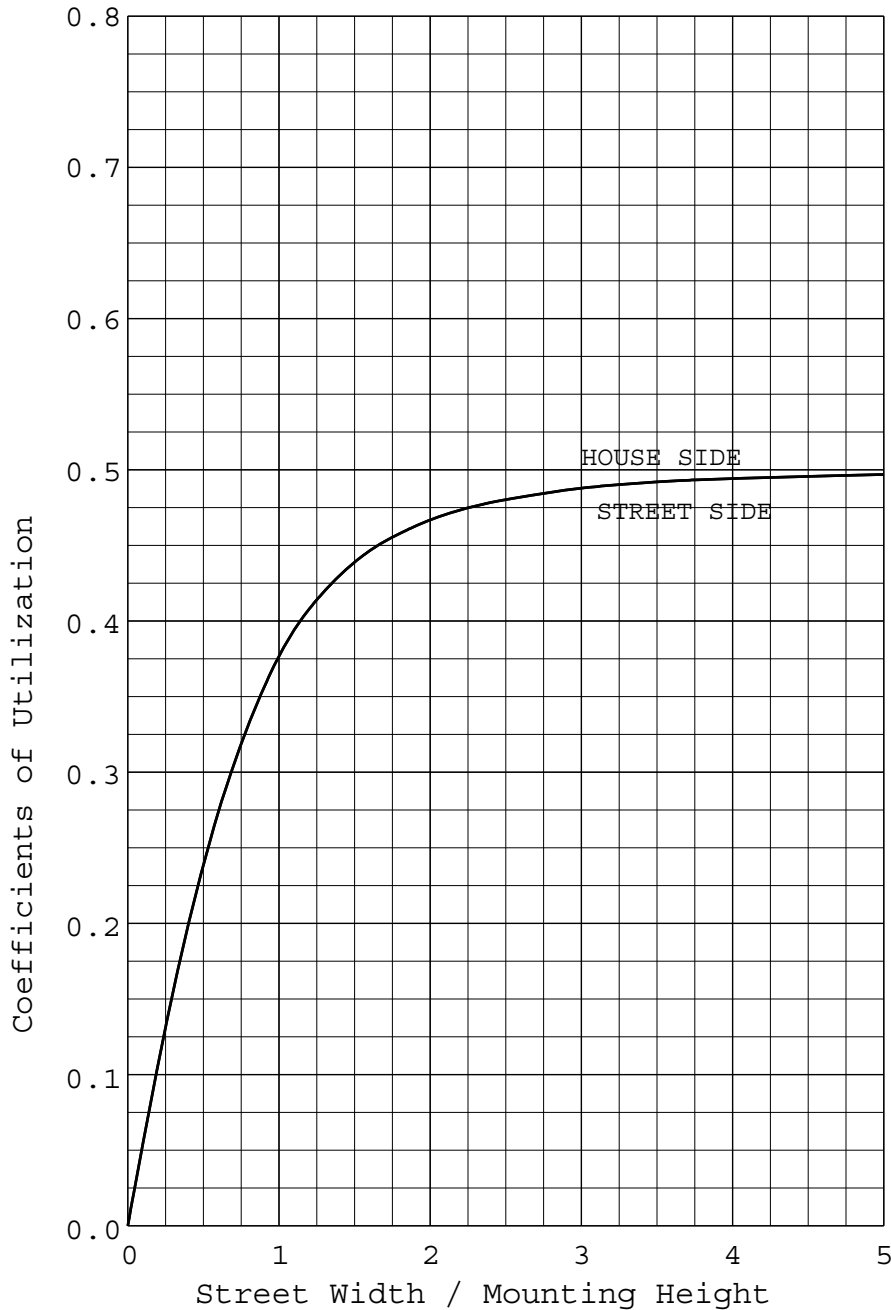
REPORT NUMBER: RAB00879
 ISSUE DATE: 06/05/15 PAGE: 3 OF 9
 DATE SAMPLE TESTED: 06/05/15
 PREPARED FOR: RAB LIGHTING INC.
 CATALOG NUMBER: MASI20-200W/D10
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 LED DRIVERS: RDD-200-A0450
 NOTE: DATA SHOWN IS ABSOLUTE FOR THE SAMPLE PROVIDED AT RATED INPUT VOLTAGE TO THE LED DRIVERS.
 TEST PROCEDURE: IESNA LM-79-08
 (SEE PAGE 2 FOR MORE INFORMATION)



REPORT NUMBER: RAB00879
ISSUE DATE: 06/05/15
PREPARED FOR: RAB LIGHTING INC.

PAGE: 4 OF 9
DATE SAMPLE TESTED: 06/05/15

COEFFICIENTS OF UTILIZATION AND FLUX DISTRIBUTION



	LUMENS	PERCENT OF FIXTURE
DOWNWARD STREET SIDE	14239.	50.0
DOWNWARD HOUSE SIDE	14239.	50.0
DOWNWARD TOTAL	28478.	100.0
UPWARD STREET SIDE	0.	0.0
UPWARD HOUSE SIDE	0.	0.0
UPWARD TOTAL	0.	0.0
TOTAL FLUX	28478.	100.0
TOTAL INPUT WATTS = 211.3		
EFFICACY = 134.8 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: RAB00879
 ISSUE DATE: 06/05/15
 PREPARED FOR: RAB LIGHTING INC.

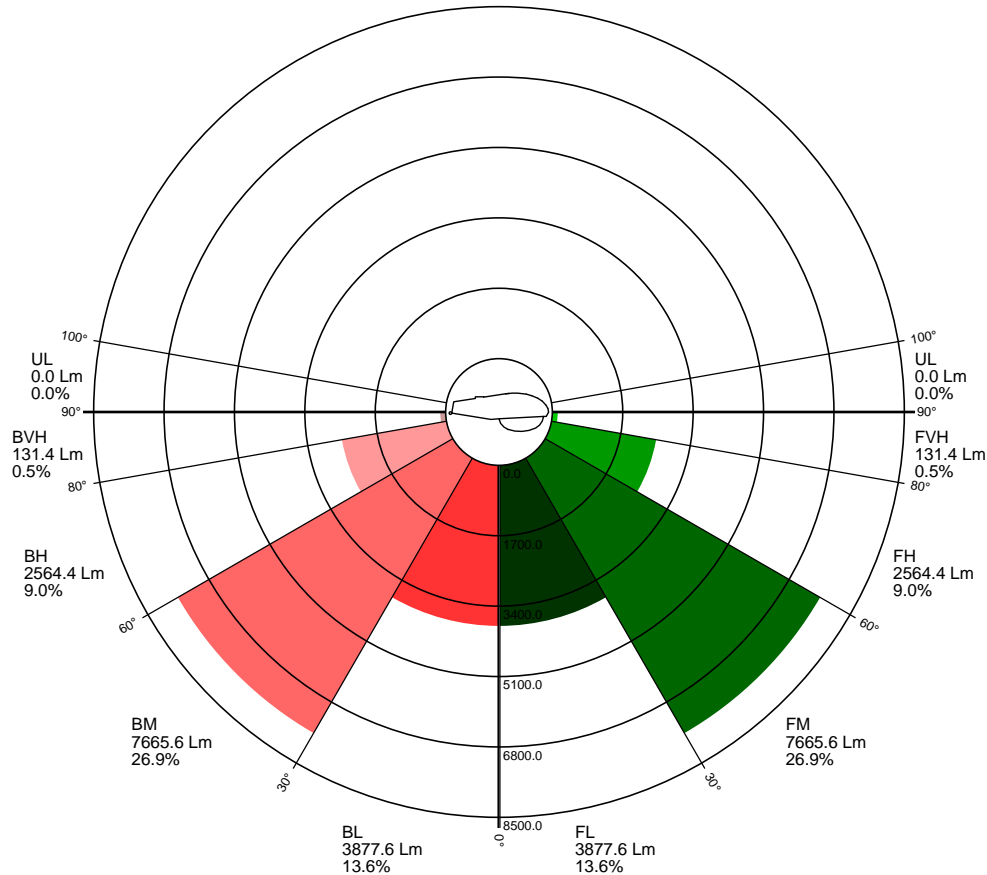
PAGE: 5 OF 9
 DATE SAMPLE TESTED: 06/05/15

BUG Rating:				B4	U0	G2
Zonal Summary		Lumens	% of Fixture	Zone Ratings		
				B	U	G
Forward		14239	50.0			
FL	(0° – 30°)	3877.6	13.6			
FM	(30° – 60°)	7665.6	26.9			
FH	(60° – 80°)	2564.4	9.0			G2
FVH	(80° – 90°)	131.4	0.5			G2
Backward		14239	50.0			
BL	(0° – 30°)	3877.6	13.6	B4		
BM	(30° – 60°)	7665.6	26.9	B4		
BH	(60° – 80°)	2564.4	9.0	B4		G2
BVH	(80° – 90°)	131.4	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		28478	100.0			

Zonal Lumen Summary

(Linear scale)

UH
0.0 Lm
0.0%

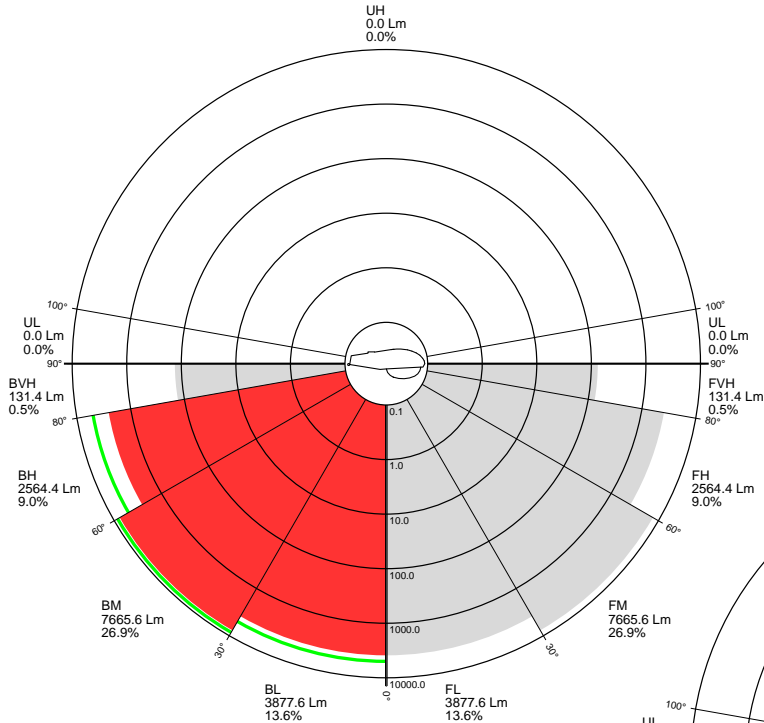


REPORT NUMBER: RAB00879
ISSUE DATE: 06/05/15
PREPARED FOR: RAB LIGHTING INC.

PAGE: 6 OF 9
DATE SAMPLE TESTED: 06/05/15

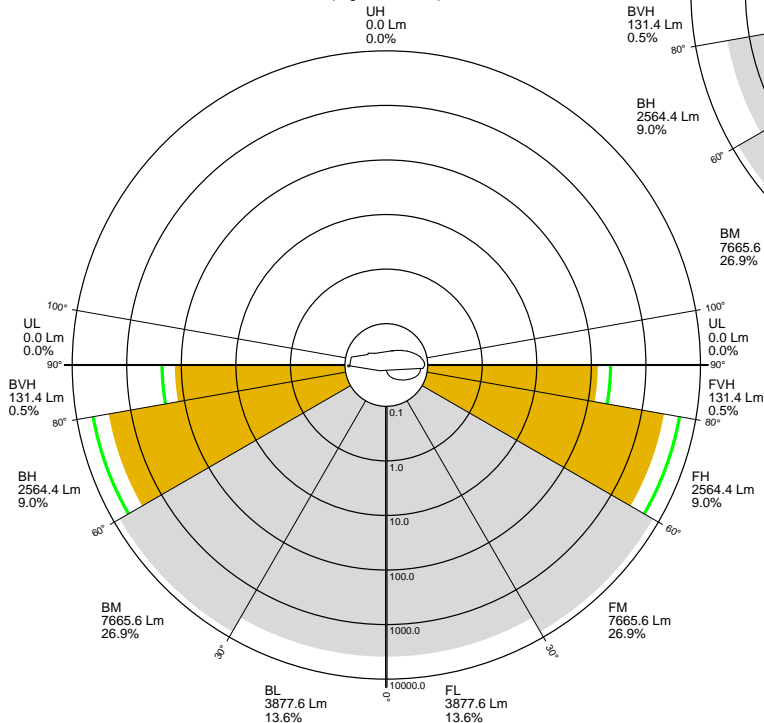
Backlight Rating Details

(Logarithmic scale)



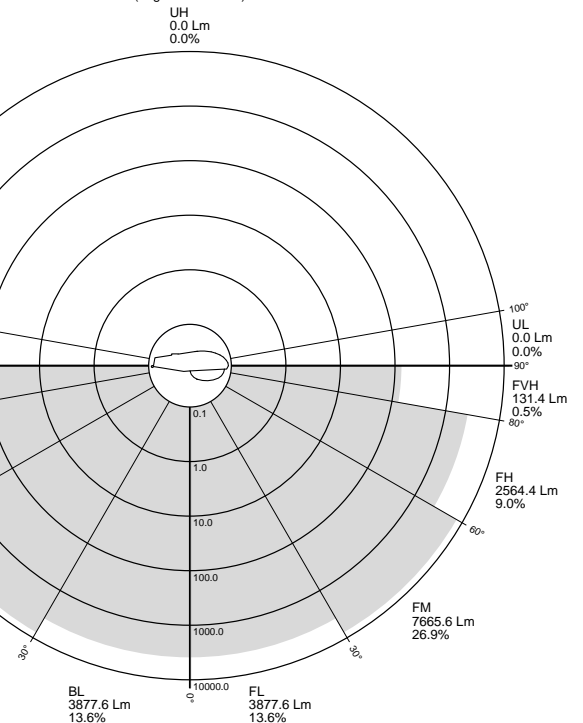
Glare Rating Details

(Logarithmic scale)



Uplight Rating Details

(Logarithmic scale)



REPORT NUMBER: RAB00879
 ISSUE DATE: 06/05/15
 PREPARED FOR: RAB LIGHTING INC.

PAGE: 7 OF 9
 DATE SAMPLE TESTED: 06/05/15

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	59.	61.	65.	68.	68.	70.	69.	71.	68. 67.
	85.0	156.	163.	168.	172.	173.	174.	175.	179.	180. 179.
	82.5	374.	372.	379.	380.	379.	380.	381.	386.	391. 388.
	80.0	676.	682.	695.	689.	677.	679.	681.	704.	699. 696.
	77.5	1068.	1086.	1105.	1071.	1071.	1060.	1077.	1077.	1103. 1089.
	75.0	1486.	1511.	1524.	1538.	1517.	1502.	1518.	1524.	1551. 1552.
	72.5	2003.	2017.	2016.	2020.	1965.	2023.	1999.	2023.	2015. 2030.
V	70.0	2451.	2484.	2484.	2519.	2517.	2498.	2506.	2553.	2492. 2496.
E	67.5	2959.	2991.	3062.	3091.	3072.	2980.	3037.	3092.	3047. 3029.
R	65.0	3513.	3544.	3533.	3571.	3568.	3471.	3554.	3570.	3557. 3562.
T	62.5	3997.	4017.	4001.	4035.	4021.	4113.	4034.	4034.	4028. 4020.
I	60.0	4443.	4458.	4456.	4476.	4496.	4641.	4562.	4473.	4474. 4467.
C	57.5	4883.	4887.	4891.	4914.	5081.	5099.	5098.	4976.	4920. 4885.
A	55.0	5288.	5298.	5350.	5484.	5512.	5529.	5512.	5498.	5423. 5371.
L	52.5	5846.	5845.	5914.	5911.	5922.	5919.	5920.	5918.	5922. 5859.
	50.0	6285.	6284.	6301.	6295.	6294.	6291.	6285.	6302.	6309. 6278.
A	47.5	6651.	6651.	6666.	6651.	6658.	6644.	6646.	6660.	6665. 6647.
N	45.0	6995.	6989.	6999.	6994.	6986.	6987.	6986.	7001.	6989. 6984.
G	42.5	7311.	7307.	7319.	7317.	7299.	7302.	7293.	7314.	7307. 7298.
L	40.0	7613.	7603.	7611.	7612.	7595.	7584.	7591.	7601.	7596. 7601.
E	37.5	7881.	7874.	7888.	7888.	7872.	7865.	7868.	7875.	7872. 7869.
	35.0	8144.	8138.	8139.	8145.	8132.	8126.	8129.	8137.	8133. 8128.
	30.0	8598.	8594.	8598.	8595.	8597.	8589.	8591.	8591.	8590. 8587.
	25.0	8965.	8966.	8969.	8967.	8976.	8969.	8976.	8963.	8963. 8963.
	20.0	9281.	9273.	9276.	9274.	9274.	9279.	9275.	9273.	9274. 9272.
	15.0	9535.	9526.	9525.	9518.	9519.	9520.	9524.	9522.	9524. 9520.
	10.0	9695.	9690.	9686.	9692.	9693.	9693.	9692.	9690.	9689. 9684.
	5.0	9781.	9773.	9774.	9775.	9775.	9777.	9779.	9776.	9776. 9774.
	0.0<<	9811.	9811.	9811.	9811.	9811.	9811.	9811.	9811.	9811. 9811.

||
 PLANE OF MAXIMUM CANDELA
 |
 CONE OF MAXIMUM CANDELA

REPORT NUMBER: RAB00879
 ISSUE DATE: 06/05/15
 PREPARED FOR: RAB LIGHTING INC.

PAGE: 8 OF 9
 DATE SAMPLE TESTED: 06/05/15

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	63.	67.	68.	71.	69.	70.	68.	68.	65.	61.
	85.0	173.	179.	180.	179.	175.	174.	173.	172.	168.	163.
	82.5	382.	388.	391.	386.	381.	380.	379.	380.	379.	372.
	80.0	683.	696.	699.	704.	681.	679.	677.	689.	695.	682.
	77.5	1073.	1089.	1103.	1077.	1077.	1060.	1071.	1071.	1105.	1086.
	75.0	1529.	1552.	1551.	1524.	1518.	1502.	1517.	1538.	1524.	1511.
	72.5	2004.	2030.	2015.	2023.	1999.	2023.	1965.	2020.	2016.	2017.
V	70.0	2475.	2496.	2492.	2553.	2506.	2498.	2517.	2519.	2484.	2484.
E	67.5	3017.	3029.	3047.	3092.	3037.	2980.	3072.	3091.	3062.	2991.
R	65.0	3545.	3562.	3557.	3570.	3554.	3471.	3568.	3571.	3533.	3544.
T	62.5	4017.	4020.	4028.	4034.	4034.	4113.	4021.	4035.	4001.	4017.
I	60.0	4471.	4467.	4474.	4473.	4562.	4641.	4496.	4476.	4456.	4458.
C	57.5	4901.	4885.	4920.	4976.	5098.	5099.	5081.	4914.	4891.	4887.
A	55.0	5374.	5371.	5423.	5498.	5512.	5529.	5512.	5484.	5350.	5298.
L	52.5	5863.	5859.	5922.	5918.	5920.	5919.	5922.	5911.	5914.	5845.
	50.0	6289.	6278.	6309.	6302.	6285.	6291.	6294.	6295.	6301.	6284.
A	47.5	6658.	6647.	6665.	6660.	6646.	6644.	6658.	6651.	6666.	6651.
N	45.0	6984.	6984.	6989.	7001.	6986.	6987.	6986.	6994.	6999.	6989.
G	42.5	7297.	7298.	7307.	7314.	7293.	7302.	7299.	7317.	7319.	7307.
L	40.0	7596.	7601.	7596.	7601.	7591.	7584.	7595.	7612.	7611.	7603.
E	37.5	7872.	7869.	7872.	7875.	7868.	7865.	7872.	7888.	7888.	7874.
	35.0	8138.	8128.	8133.	8137.	8129.	8126.	8132.	8145.	8139.	8138.
	30.0	8585.	8587.	8590.	8591.	8591.	8589.	8597.	8595.	8598.	8594.
	25.0	8964.	8963.	8963.	8963.	8976.	8969.	8976.	8967.	8969.	8966.
	20.0	9265.	9272.	9274.	9273.	9275.	9279.	9274.	9274.	9276.	9273.
	15.0	9512.	9520.	9524.	9522.	9524.	9520.	9519.	9518.	9525.	9526.
	10.0	9677.	9684.	9689.	9690.	9692.	9693.	9693.	9692.	9686.	9690.
	5.0	9759.	9774.	9776.	9776.	9779.	9777.	9775.	9775.	9774.	9773.
	0.0<<	9811.	9811.	9811.	9811.	9811.	9811.	9811.	9811.	9811.	9811.

CONE OF MAXIMUM CANDELA

REPORT NUMBER: RAB00879
ISSUE DATE: 06/05/15
PREPARED FOR: RAB LIGHTING INC.

PAGE: 9 OF 9
DATE SAMPLE TESTED: 06/05/15

5-DEGREE
ZONAL LUMEN SUMMARY

0- 5	234
5- 10	696
10- 15	1140
15- 20	1549
20- 25	1913
25- 30	2223
30- 35	2464
35- 40	2625
40- 45	2702
45- 50	2685
50- 55	2558
55- 60	2297
60- 65	1957
65- 70	1535
70- 75	1051
75- 80	585
80- 85	221
85- 90	42

10-DEGREE
ZONAL LUMEN SUMMARY

0- 10	931
0- 20	3619
0- 30	7755
0- 40	12844
0- 50	18232
0- 60	23086
0- 70	26579
0- 80	28215
0- 90	28478

REPORT NUMBER: RAB00917
DATE: 6/5/2015
PREPARED FOR: RAB LIGHTING INC.
CATALOG NUMBER: MASI20-200W/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: RAB00917
 DATE: 6/5/2015
 PREPARED FOR: RAB LIGHTING INC.
 CATALOG NUMBER: MASI20-200W/D10

Page 2 of 4

RESULTS:

PHOTOMETRIC	
Total Integrated Flux (lumens)	28478 *
SPECTRORADIOMETRIC	
Observer	CIE 1931 2 degree
Chromaticity Ordinate x	0.3426
Chromaticity Ordinate y	0.3506
Observer	CIE 1976 2 degree
Chromaticity Ordinate u'	0.2101
Chromaticity Ordinate v'	0.4838
Correlated Color Temp CCT (K)	5095
ANSI C78.377-2008 Duv	0.001
Total Radiant Flux (milliWatts)	86446 *
ELECTRICAL	
Input Voltage (Volts AC)	120.0
Input Current (Amps AC)	1.76
Input Power (Watts)	211.3
Input Power Factor (%)	99.9
Input Current THD (%)	4.7
Input Voltage THD (%)	0.2
EFFICACY (Lumens/Watt)	
	134.8
ELECTRICAL AT MAX NONIMAL INPUT	
Input Voltage (Volts AC)	277.0
Input Current (Amps AC)	0.791
Input Power (Watts)	206.9
Input Power Factor (%)	94.4
Input Current THD (%)	11.8
Input Voltage THD (%)	0.2
Off-State Power (Watts)	
	0.0

COLOR RENDERING INDICES	CRI
Ra (Average 1-8)	74
R1 Light greyish red	73
R2 Dark greyish yellow	79
R3 Strong yellowish green	82
R4 Moderate yellowish green	76
R5 Light bluish green	74
R6 Light blue	71
R7 Light violet	82
R8 Light reddish purple	60
R9 Strong red	-18
R10 Strong yellow	48
R11 Strong green	73
R12 Strong blue	47
R13 Light yellowish pink (skin)	73
R14 Moderate olive green (leaf)	90

*NOTE:

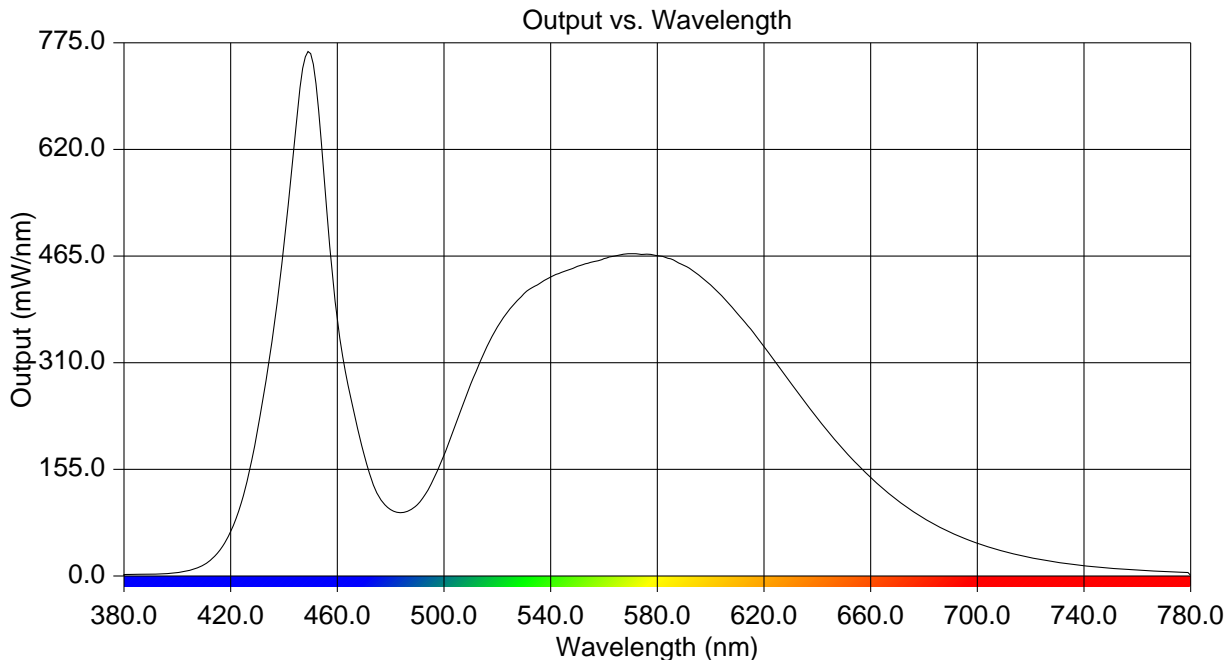
Proper calibration of integrating spheres for measuring total flux output of non-directional samples will produce reliable, repeatable results within the calibration tolerances of the equipment used. However, measurement of test samples with significant self absorption and/or directional output, even 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: RAB00917
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 CATALOG NUMBER: MASI20-200W/D10

Page 3 of 4

RESULTS:

Wavelength	mW per nm	Wavelength	mW per nm	Wavelength	mW per nm
380	2.046	515	323.908	650	183.135
385	2.228	520	361.379	655	162.321
390	2.671	525	389.399	660	143.323
395	3.349	530	410.292	665	125.745
400	4.924	535	422.898	670	110.065
405	8.538	540	434.366	675	96.119
410	16.455	545	442.780	680	83.674
415	32.939	550	449.944	685	72.719
420	64.622	555	455.632	690	63.167
425	120.137	560	461.185	695	54.897
430	210.536	565	465.408	700	47.454
435	328.459	570	468.311	705	41.112
440	479.379	575	467.405	710	35.677
445	674.394	580	465.300	715	30.812
450	759.111	585	460.937	720	26.661
455	581.722	590	451.281	725	23.036
460	372.287	595	438.698	730	19.929
465	259.664	600	422.687	735	17.261
470	176.934	605	403.236	740	14.941
475	119.974	610	381.449	745	13.003
480	96.207	615	358.948	750	11.292
485	92.514	620	333.267	755	9.754
490	103.561	625	307.338	760	8.476
495	131.983	630	280.577	765	7.409
500	175.901	635	254.537	770	6.465
505	226.410	640	229.131	775	5.658
510	278.745	645	205.340	780	0.858



REPORT NUMBER: RAB00917
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CATALOG NUMBER: MASI20-200W/D10

Page 4 of 4

CIE Chromaticity Diagram

