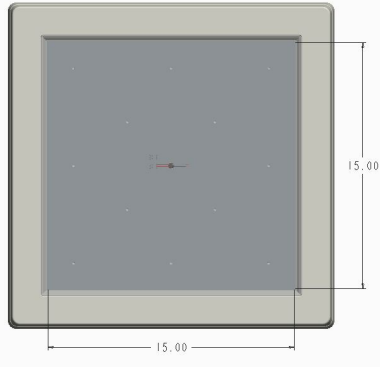


ISOFOOTCANDLE LINES OF HORIZONTAL ILLUMINATION

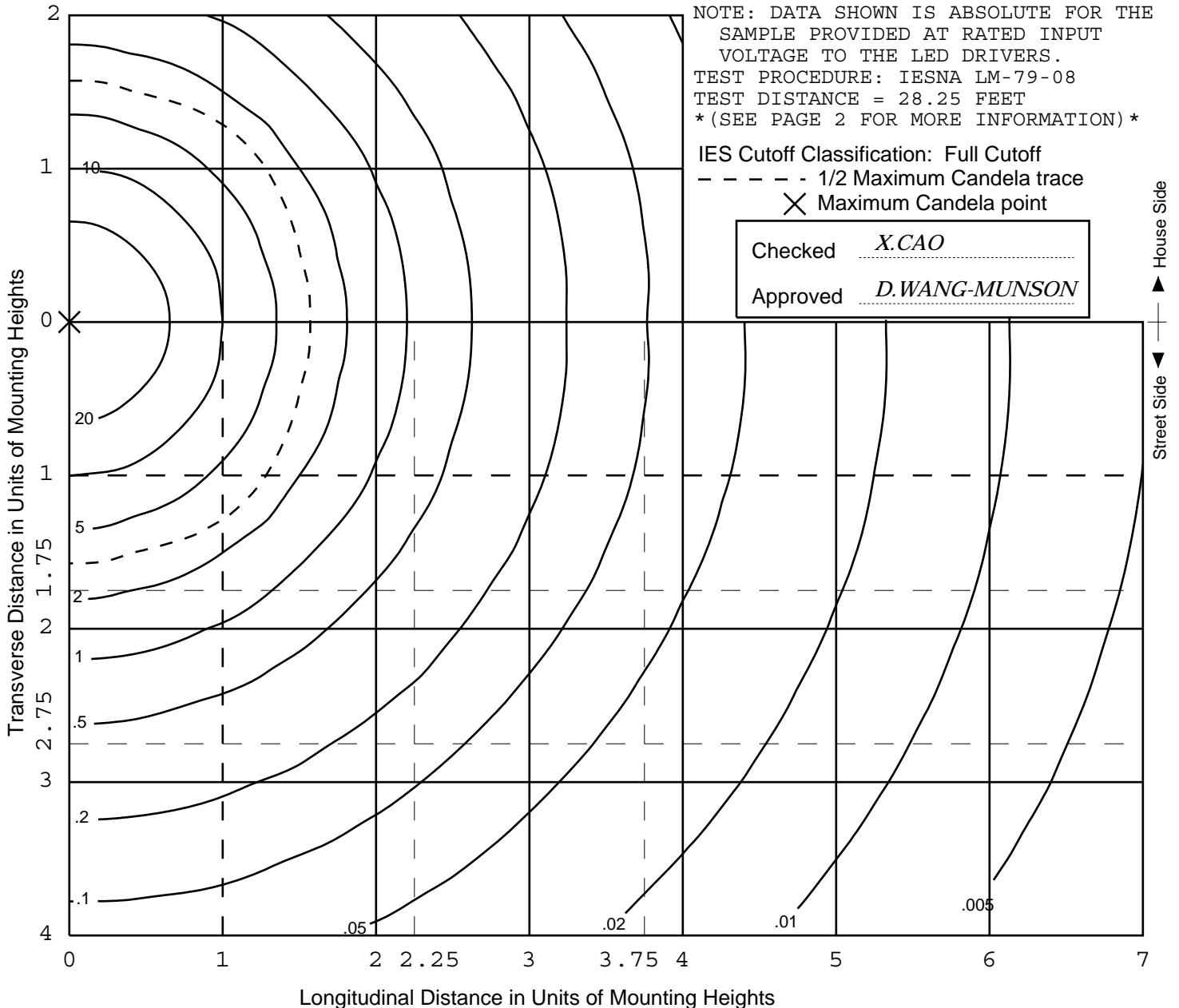
Values based on 14 foot mounting height.



REPORT NUMBER: RAB00887
 ISSUE DATE: 06/02/15 PAGE: 1 OF 9
 PREPARED FOR: RAB LIGHTING INC.
 CATALOG NUMBER: MASI20-160W/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 WHITE LIGHT EMITTING DIODES (LEDs), VERTICAL BASE-UP POSITION.
 TOTAL INPUT WATTS = 157.65 AT 120.0 VOLTS
 LED DRIVERS: PSDV151101A
 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: RAB00887
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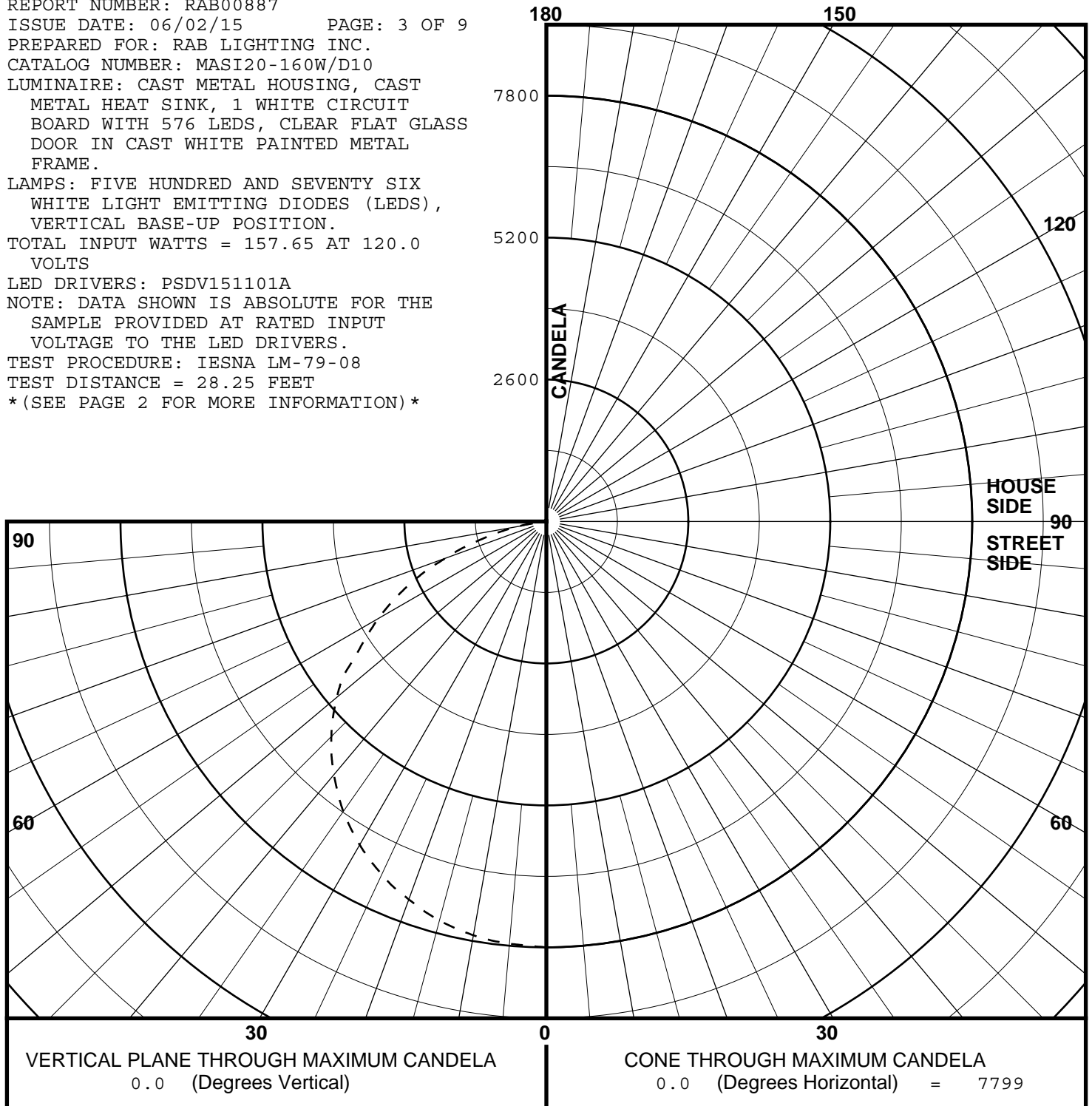
PAGE: 2 OF 9

ADDITIONAL INFORMATION

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

MAXIMUM PLANE AND MAXIMUM CONE PLOTS OF CANDELA

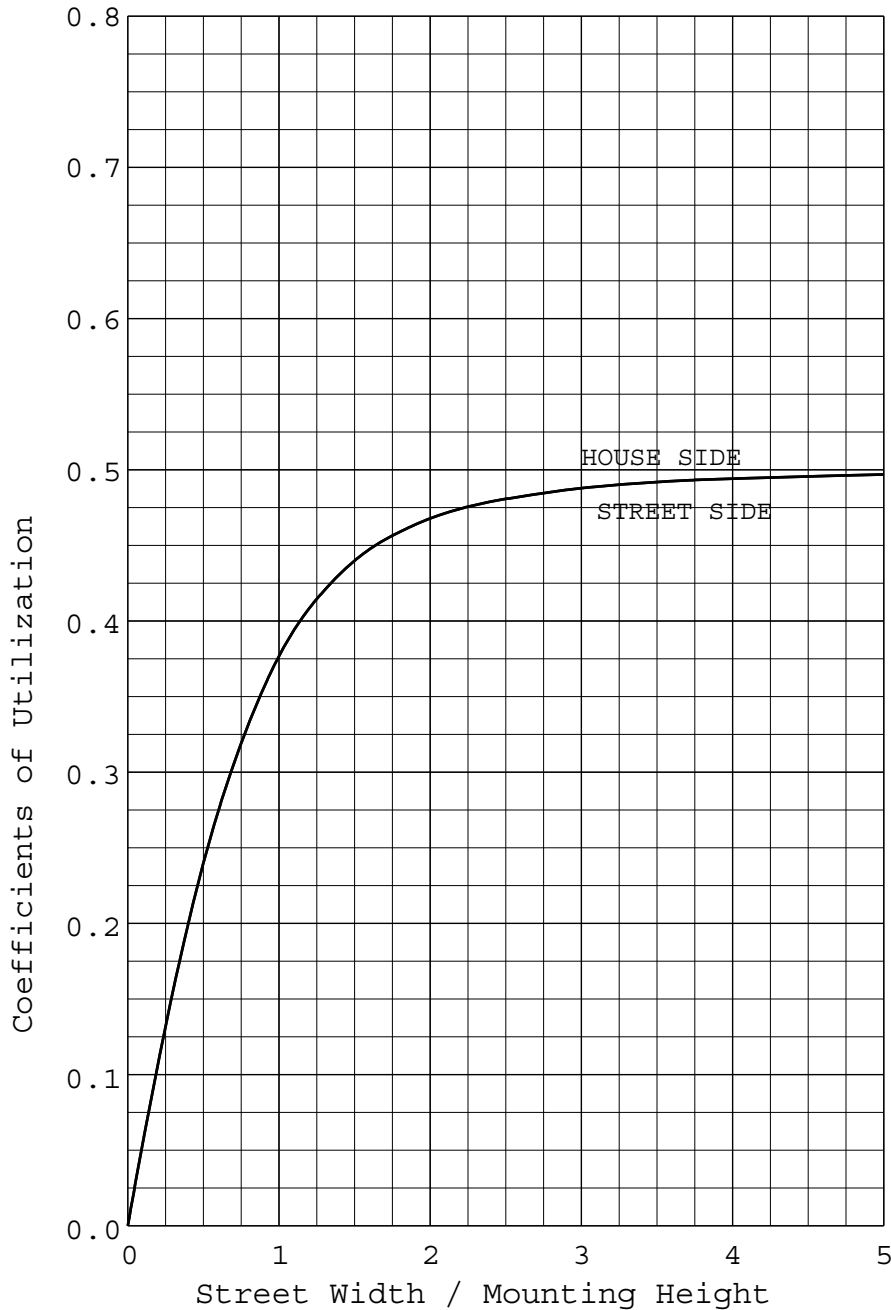
REPORT NUMBER: RAB00887
 ISSUE DATE: 06/02/15 PAGE: 3 OF 9
 PREPARED FOR: RAB LIGHTING INC.
 CATALOG NUMBER: MASI20-160W/D10
 LUMINAIRE: CAST METAL HOUSING, CAST
 METAL HEAT SINK, 1 WHITE CIRCUIT
 BOARD WITH 576 LEDS, CLEAR FLAT GLASS
 DOOR IN CAST WHITE PAINTED METAL
 FRAME.
 LAMPS: FIVE HUNDRED AND SEVENTY SIX
 WHITE LIGHT EMITTING DIODES (LEDS),
 VERTICAL BASE-UP POSITION.
 TOTAL INPUT WATTS = 157.65 AT 120.0
 VOLTS
 LED DRIVERS: PSDV151101A
 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: RAB00887
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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	11316.	50.0
DOWNWARD HOUSE SIDE	11316.	50.0
DOWNWARD TOTAL	22632.	100.0
UPWARD STREET SIDE	0.	0.0
UPWARD HOUSE SIDE	0.	0.0
UPWARD TOTAL	0.	0.0
TOTAL FLUX	22632.	100.0
TOTAL INPUT WATTS = 157.6		
EFFICACY = 143.6 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: RAB00887
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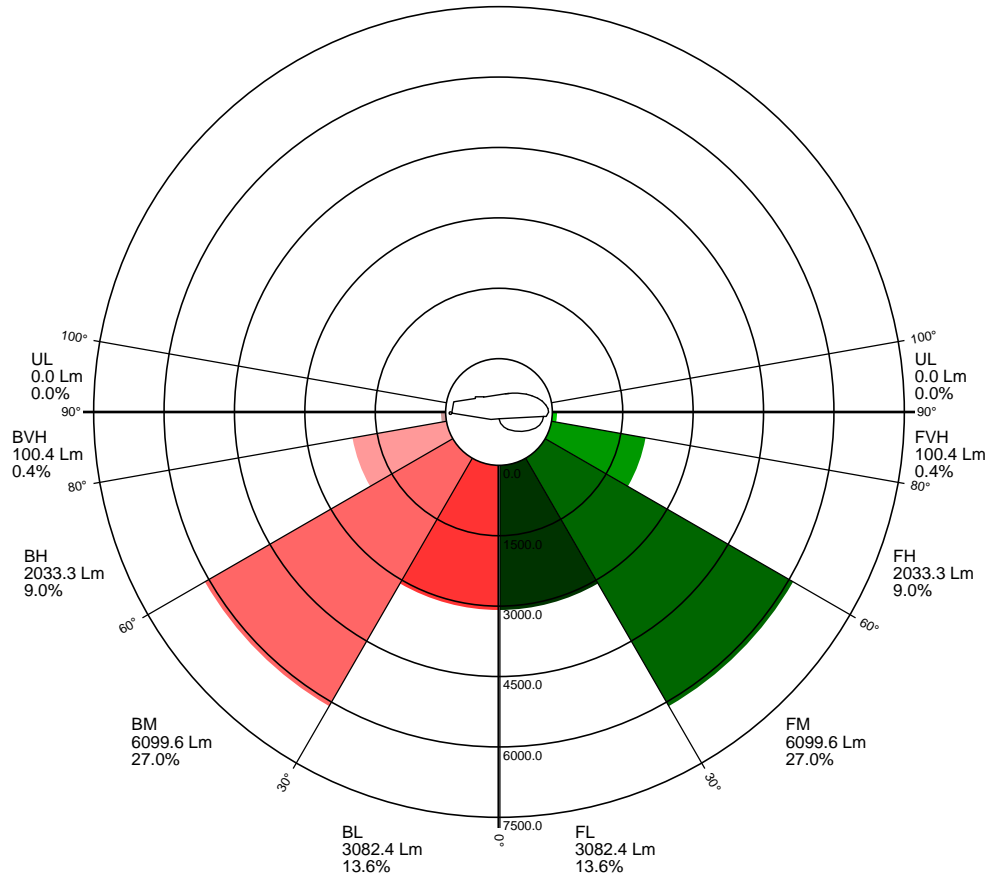
PAGE: 5 OF 9

BUG Rating:				B4	U0	G2
Zonal Summary		Lumens	% of Fixture	Zone Ratings		
				B	U	G
Forward		11316	50.0			
FL	(0° – 30°)	3082.4	13.6			
FM	(30° – 60°)	6099.6	27.0			
FH	(60° – 80°)	2033.3	9.0			G2
FVH	(80° – 90°)	100.4	0.4			G2
Backward		11316	50.0			
BL	(0° – 30°)	3082.4	13.6	B4		
BM	(30° – 60°)	6099.6	27.0	B4		
BH	(60° – 80°)	2033.3	9.0	B3		G2
BVH	(80° – 90°)	100.4	0.4			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		22632	100.0			

Zonal Lumen Summary

(Linear scale)

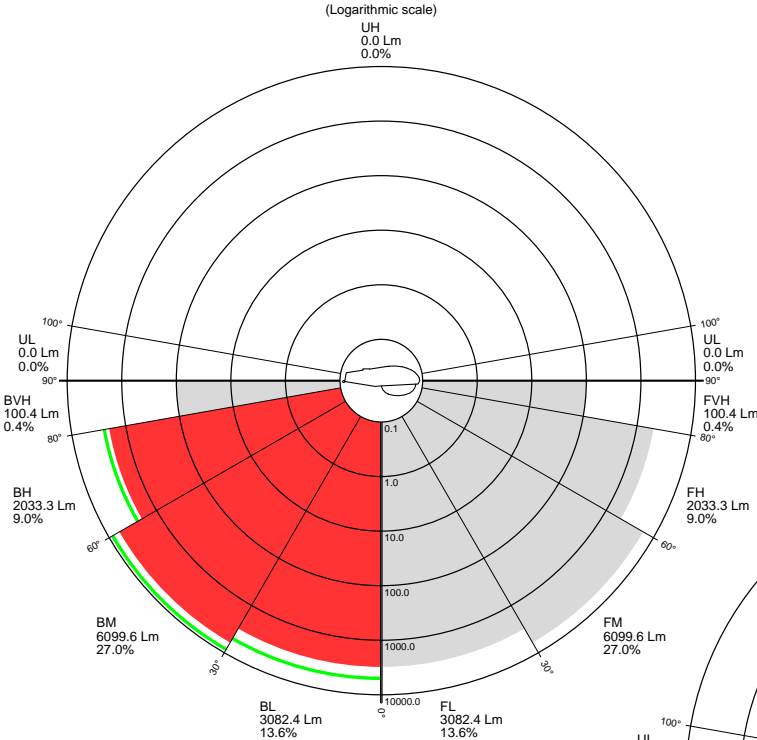
UH
0.0 Lm
0.0%



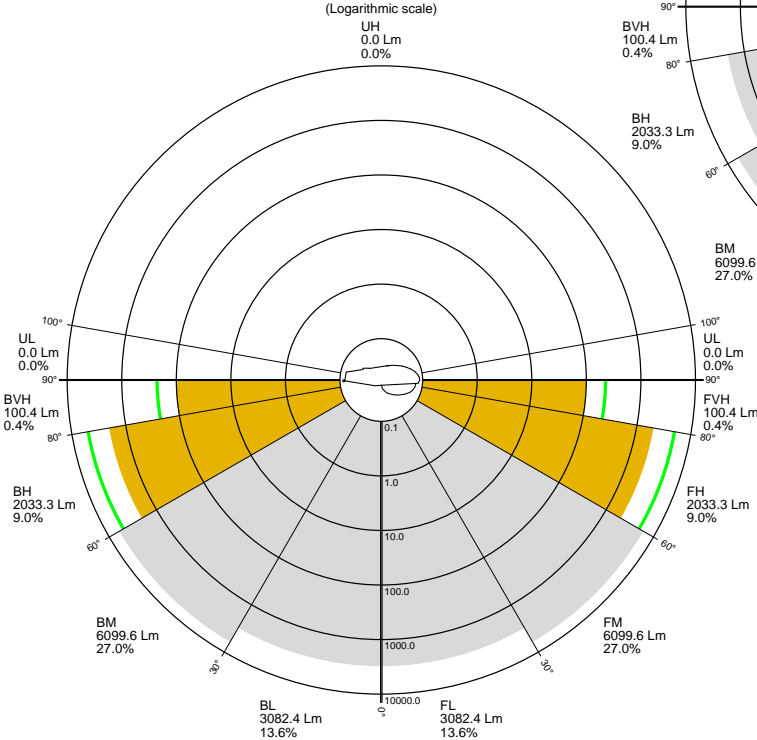
REPORT NUMBER: RAB00887
ISSUE DATE: 06/02/15
PREPARED FOR: RAB LIGHTING INC.

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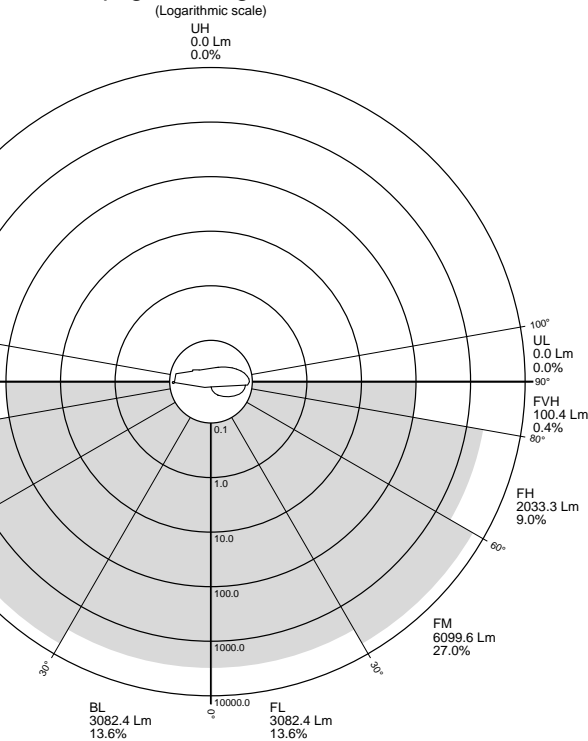
Backlight Rating Details



Glare Rating Details



Uplight Rating Details



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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	41.	42.	46.	48.	49.	50.	49.	50.	48. 47.
	85.0	123.	125.	127.	128.	128.	128.	129.	135.	128. 132.
	82.5	290.	291.	295.	292.	297.	290.	292.	303.	300. 300.
	80.0	536.	541.	546.	532.	541.	519.	531.	541.	552. 547.
	77.5	854.	865.	867.	836.	851.	839.	841.	845.	876. 873.
	75.0	1187.	1200.	1217.	1207.	1194.	1172.	1192.	1222.	1224. 1209.
	72.5	1598.	1601.	1592.	1596.	1558.	1602.	1553.	1602.	1603. 1609.
V	70.0	1970.	1971.	1962.	2011.	1978.	1980.	1983.	2008.	1971. 1984.
E	67.5	2419.	2420.	2433.	2447.	2428.	2361.	2437.	2457.	2430. 2414.
R	65.0	2811.	2816.	2816.	2829.	2825.	2731.	2830.	2841.	2820. 2829.
T	62.5	3190.	3191.	3189.	3198.	3210.	3285.	3206.	3211.	3204. 3201.
I	60.0	3552.	3555.	3552.	3551.	3617.	3693.	3592.	3555.	3550. 3561.
C	57.5	3894.	3893.	3897.	3925.	4062.	4063.	4054.	3912.	3903. 3898.
A	55.0	4242.	4248.	4312.	4377.	4386.	4395.	4389.	4361.	4271. 4232.
L	52.5	4700.	4703.	4719.	4698.	4716.	4720.	4721.	4703.	4708. 4680.
	50.0	5010.	5011.	5018.	5013.	5018.	5022.	4998.	5020.	5015. 5004.
A	47.5	5299.	5298.	5305.	5297.	5297.	5294.	5288.	5299.	5311. 5299.
N	45.0	5569.	5563.	5570.	5569.	5555.	5561.	5553.	5567.	5563. 5565.
G	42.5	5824.	5815.	5825.	5825.	5817.	5808.	5805.	5824.	5819. 5818.
L	40.0	6054.	6050.	6057.	6059.	6043.	6043.	6035.	6049.	6045. 6056.
E	37.5	6273.	6266.	6275.	6280.	6264.	6266.	6255.	6272.	6264. 6266.
	35.0	6485.	6469.	6470.	6484.	6464.	6468.	6468.	6474.	6471. 6467.
	30.0	6838.	6833.	6832.	6836.	6832.	6831.	6829.	6835.	6829. 6829.
	25.0	7134.	7127.	7130.	7124.	7135.	7138.	7134.	7130.	7125. 7122.
	20.0	7366.	7375.	7372.	7368.	7375.	7379.	7373.	7376.	7373. 7371.
	15.0	7566.	7570.	7571.	7570.	7567.	7569.	7568.	7570.	7573. 7571.
	10.0	7695.	7701.	7702.	7704.	7703.	7705.	7704.	7703.	7701. 7697.
	5.0	7762.	7772.	7770.	7771.	7771.	7770.	7772.	7771.	7770. 7770.
	0.0<<	7799.	7799.	7799.	7799.	7799.	7799.	7799.	7799.	7799. 7799.

||
 PLANE OF MAXIMUM CANDELA
 |
 CONE OF MAXIMUM CANDELA

REPORT NUMBER: RAB00887
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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	44.	47.	48.	50.	49.	50.	49.	48.	46.	42.
	85.0	127.	132.	128.	135.	129.	128.	128.	127.	125.	123.
	82.5	294.	300.	300.	303.	292.	290.	297.	292.	295.	291.
	80.0	539.	547.	552.	541.	531.	519.	541.	532.	546.	541.
	77.5	856.	873.	876.	845.	841.	839.	851.	836.	867.	865.
	75.0	1174.	1209.	1224.	1222.	1192.	1172.	1194.	1207.	1217.	1200.
	72.5	1585.	1609.	1603.	1602.	1553.	1602.	1558.	1596.	1592.	1601.
V	70.0	1976.	1984.	1971.	2008.	1983.	1980.	1978.	2011.	1962.	1971.
E	67.5	2408.	2414.	2430.	2457.	2437.	2361.	2428.	2447.	2433.	2420.
R	65.0	2819.	2829.	2820.	2841.	2830.	2731.	2825.	2829.	2816.	2816.
T	62.5	3196.	3201.	3204.	3211.	3206.	3285.	3210.	3198.	3189.	3191.
I	60.0	3559.	3561.	3550.	3555.	3592.	3693.	3617.	3551.	3552.	3555.
C	57.5	3897.	3898.	3903.	3912.	4054.	4063.	4062.	3925.	3897.	3893.
A	55.0	4214.	4232.	4271.	4361.	4389.	4395.	4386.	4377.	4312.	4248.
L	52.5	4658.	4680.	4708.	4703.	4721.	4720.	4716.	4698.	4719.	4703.
	50.0	4998.	5004.	5015.	5020.	4998.	5022.	5018.	5013.	5018.	5011.
A	47.5	5280.	5299.	5311.	5299.	5288.	5294.	5297.	5297.	5305.	5298.
N	45.0	5549.	5565.	5563.	5567.	5553.	5561.	5555.	5569.	5570.	5563.
G	42.5	5801.	5818.	5819.	5824.	5805.	5808.	5817.	5825.	5825.	5815.
L	40.0	6037.	6056.	6045.	6049.	6035.	6043.	6043.	6059.	6057.	6050.
E	37.5	6265.	6266.	6264.	6272.	6255.	6266.	6264.	6280.	6275.	6266.
	35.0	6467.	6467.	6471.	6474.	6468.	6468.	6464.	6484.	6470.	6469.
	30.0	6825.	6829.	6829.	6835.	6829.	6831.	6832.	6836.	6832.	6833.
	25.0	7123.	7122.	7125.	7130.	7134.	7138.	7135.	7124.	7130.	7127.
	20.0	7369.	7371.	7373.	7376.	7373.	7379.	7375.	7368.	7372.	7375.
	15.0	7566.	7571.	7573.	7570.	7568.	7569.	7567.	7570.	7571.	7570.
	10.0	7694.	7697.	7701.	7703.	7704.	7705.	7703.	7704.	7702.	7701.
	5.0	7763.	7770.	7770.	7771.	7772.	7770.	7771.	7771.	7770.	7772.
	0.0<<	7799.	7799.	7799.	7799.	7799.	7799.	7799.	7799.	7799.	7799.

CONE OF MAXIMUM CANDELA

REPORT NUMBER: RAB00887
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5-DEGREE
ZONAL LUMEN SUMMARY

0- 5	186
5- 10	554
10- 15	906
15- 20	1231
20- 25	1521
25- 30	1767
30- 35	1959
35- 40	2089
40- 45	2151
45- 50	2137
50- 55	2037
55- 60	1826
60- 65	1556
65- 70	1220
70- 75	831
75- 80	460
80- 85	170
85- 90	31

10-DEGREE
ZONAL LUMEN SUMMARY

0- 10	740
0- 20	2877
0- 30	6165
0- 40	10213
0- 50	14501
0- 60	18364
0- 70	21140
0- 80	22431
0- 90	22632

REPORT NUMBER: RAB00920
 DATE: 6/2/2015
 PREPARED FOR: RAB LIGHTING INC.
 CATALOG NUMBER: MASI20-160W/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: PSDV151101A

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: RAB00920
 DATE: 6/2/2015
 PREPARED FOR: RAB LIGHTING INC.
 CATALOG NUMBER: MASI20-160W/D10

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RESULTS:

PHOTOMETRIC	
Total Integrated Flux (lumens)	22632 *
SPECTRORADIOMETRIC	
Observer	CIE 1931 2 degree
Chromaticity Ordinate x	0.3423
Chromaticity Ordinate y	0.3507
Observer	CIE 1976 2 degree
Chromaticity Ordinate u'	0.2099
Chromaticity Ordinate v'	0.4838
Correlated Color Temp CCT (K)	5106
ANSI C78.377-2008 Duv	0.001
Total Radiant Flux (milliWatts)	68581 *
ELECTRICAL	
Input Voltage (Volts AC)	120.0
Input Current (Amps AC)	1.32
Input Power (Watts)	157.7
Input Power Factor (%)	99.6
Input Current THD (%)	5.6
Input Voltage THD (%)	0.2
EFFICACY (Lumens/Watt)	
	143.5
ELECTRICAL AT MAX NONIMAL INPUT	
Input Voltage (Volts AC)	277.0
Input Current (Amps AC)	0.579
Input Power (Watts)	154.6
Input Power Factor (%)	96.4
Input Current THD (%)	11.6
Input Voltage THD (%)	0.2
Off-State Power (Watts)	
	0.0

COLOR RENDERING INDICES	CRI
Ra (Average 1-8)	75
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	61
R9 Strong red	-18
R10 Strong yellow	49
R11 Strong green	74
R12 Strong blue	47
R13 Light yellowish pink (skin)	73
R14 Moderate olive green (leaf)	90

*NOTE:

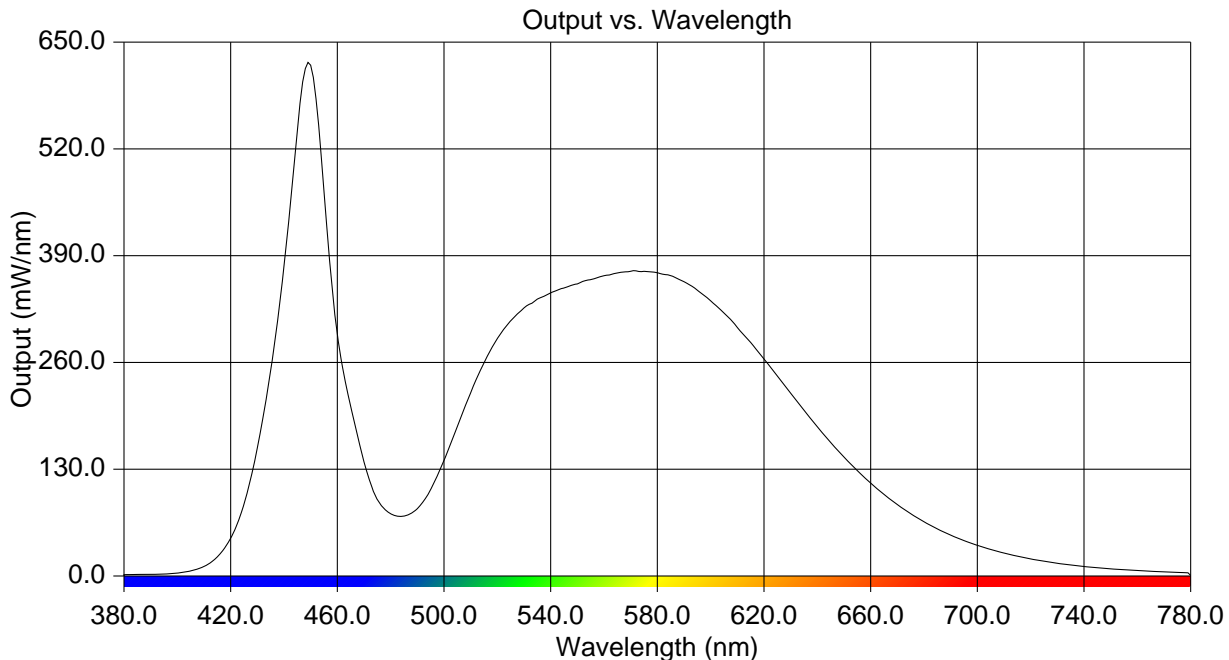
Proper calibration of integrating spheres for measuring total flux output of non-directional samples will produce reliable, repeatable results within the calibration tolerances of the equipment used. However, measurement of test samples with significant self absorption and/or directional output, even 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: RAB00920
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RESULTS:

Wavelength	mW per nm	Wavelength	mW per nm	Wavelength	mW per nm
380	1.545	515	259.477	650	144.999
385	1.751	520	289.502	655	128.437
390	1.905	525	310.611	660	113.352
395	2.469	530	326.738	665	99.427
400	3.630	535	337.474	670	87.054
405	6.102	540	345.070	675	75.970
410	11.701	545	351.231	680	66.077
415	23.320	550	355.944	685	57.404
420	46.047	555	361.209	690	49.784
425	87.582	560	365.967	695	43.150
430	156.180	565	369.711	700	37.263
435	251.158	570	371.358	705	32.257
440	376.637	575	371.318	710	27.934
445	544.571	580	369.515	715	24.072
450	622.531	585	366.225	720	20.807
455	468.624	590	358.692	725	17.935
460	294.491	595	348.451	730	15.527
465	206.847	600	335.356	735	13.422
470	138.982	605	320.737	740	11.613
475	93.581	610	302.857	745	10.056
480	75.750	615	284.660	750	8.740
485	73.118	620	264.514	755	7.568
490	82.023	625	244.084	760	6.558
495	105.220	630	222.972	765	5.713
500	141.197	635	202.282	770	4.978
505	182.122	640	181.625	775	4.360
510	223.239	645	162.811	780	0.656



REPORT NUMBER: RAB00920
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CIE Chromaticity Diagram

