RAB LIGHTING

NVLAP LAB CODE: 201058-0

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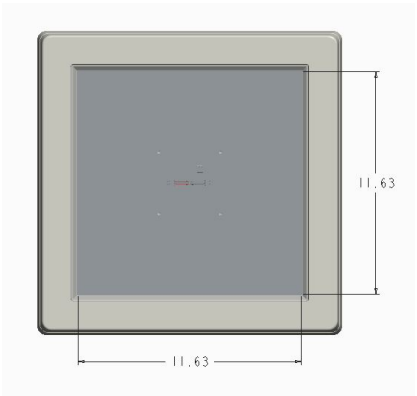
ISOFOOTCANDLE LINES OF HORIZONTAL ILLUMINATION

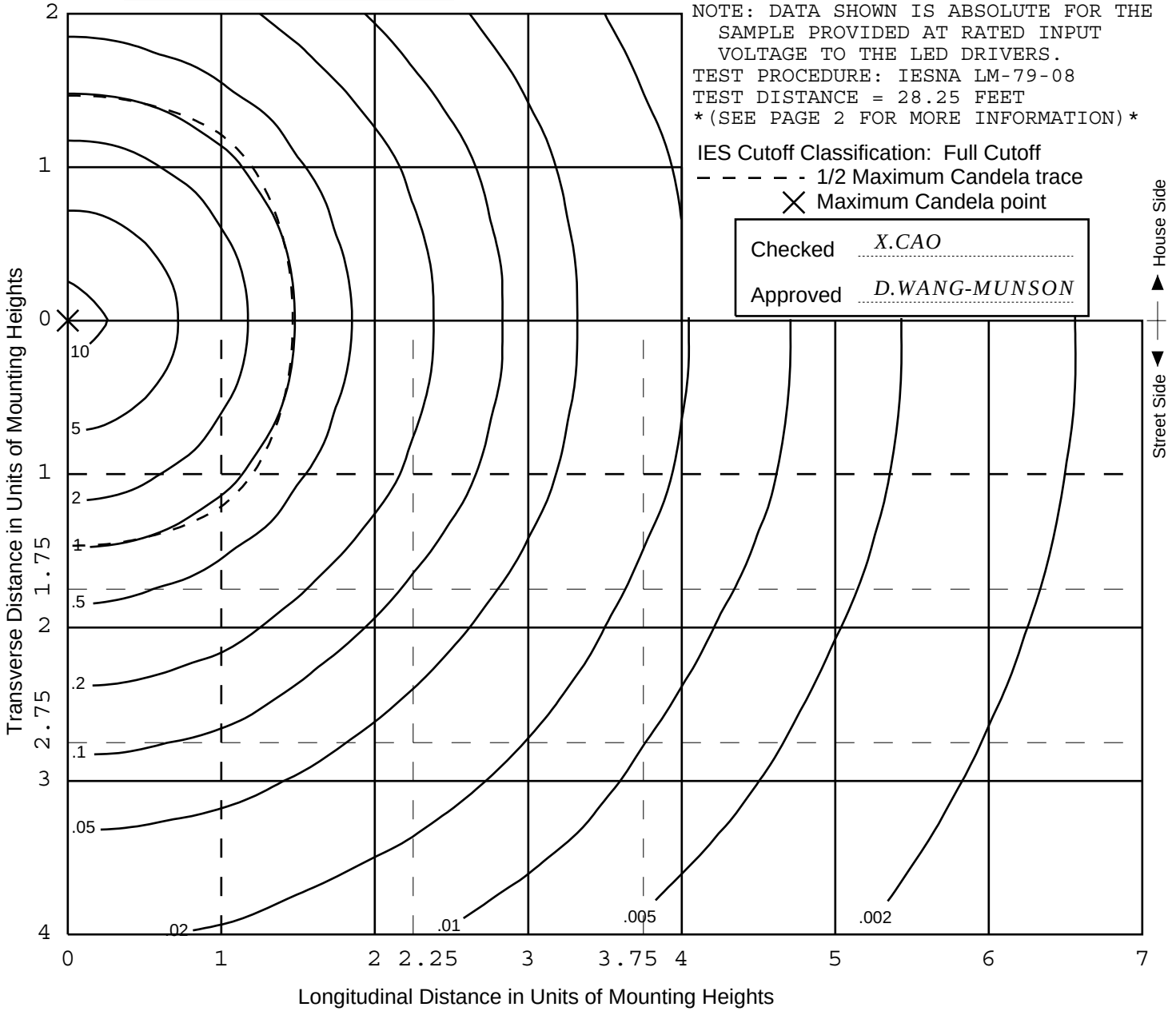
Values based on 14 foot mounting height.



REPORT NUMBER: RAB00895
ISSUE DATE: 06/03/15 PAGE: 1 OF 9
PREPARED FOR: RAB LIGHTING INC.
CATALOG NUMBER: MASI16-52YW/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 = 53.802 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

Checked	X.CAO
Approved	D.WANG-MUNSON



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ADDITIONAL INFORMATION

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

REPORT NUMBER: RAB00895
ISSUE DATE: 06/03/15 PAGE: 3 OF 9
PREPARED FOR: RAB LIGHTING INC.
CATALOG NUMBER: MASI16-52YW/D10
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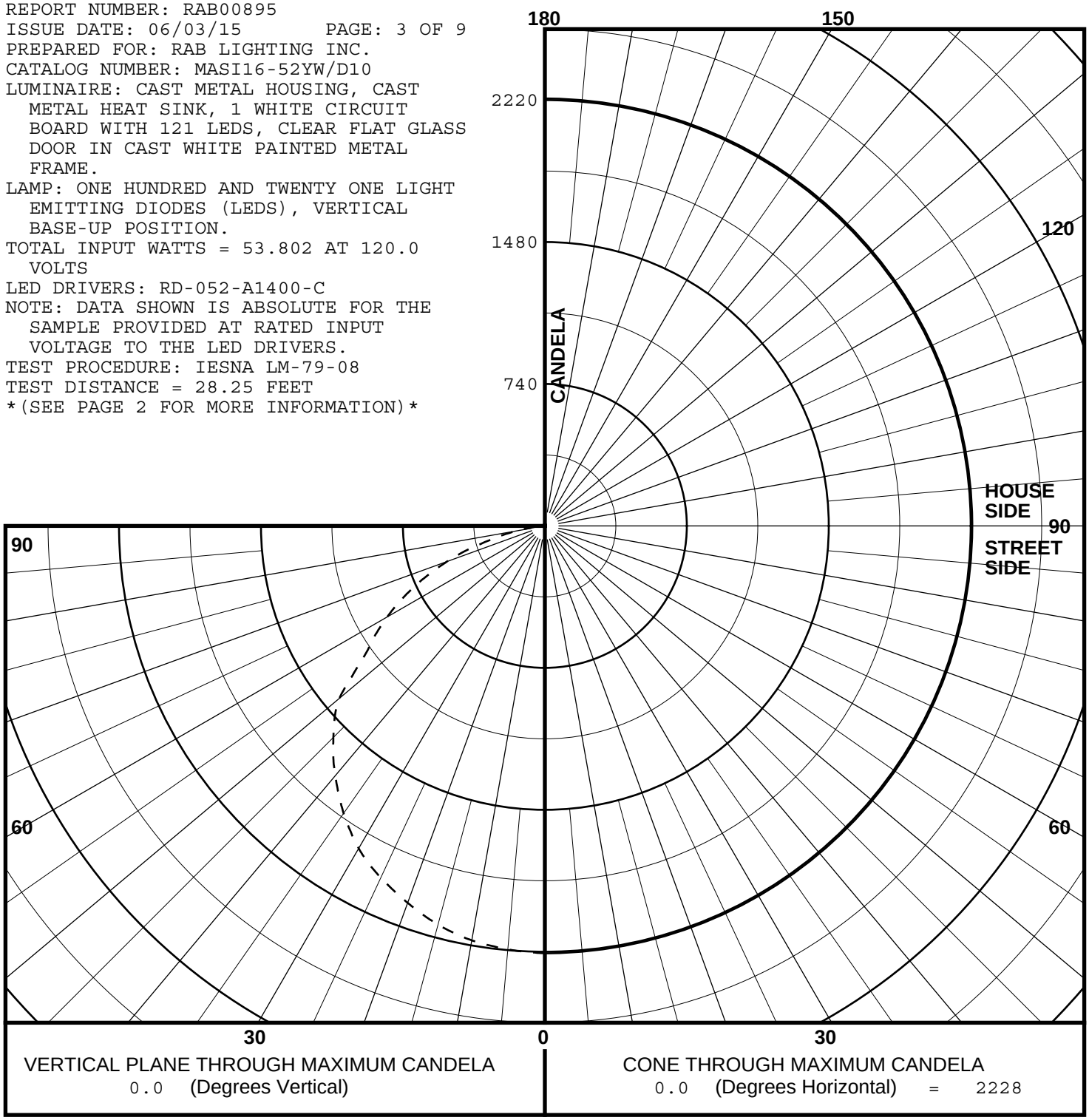
TEST DISTANCE = 28.25 FEET
(SEE PAGE 2 FOR MORE INFORMATION)

MAXIMUM PLANE AND MAXIMUM CONE PLOTS OF CANDELA



VERTICAL PLANE THROUGH MAXIMUM CANDELA
0.0 (Degrees Vertical)

CONE THROUGH MAXIMUM CANDELA
0.0 (Degrees Horizontal) = 2228

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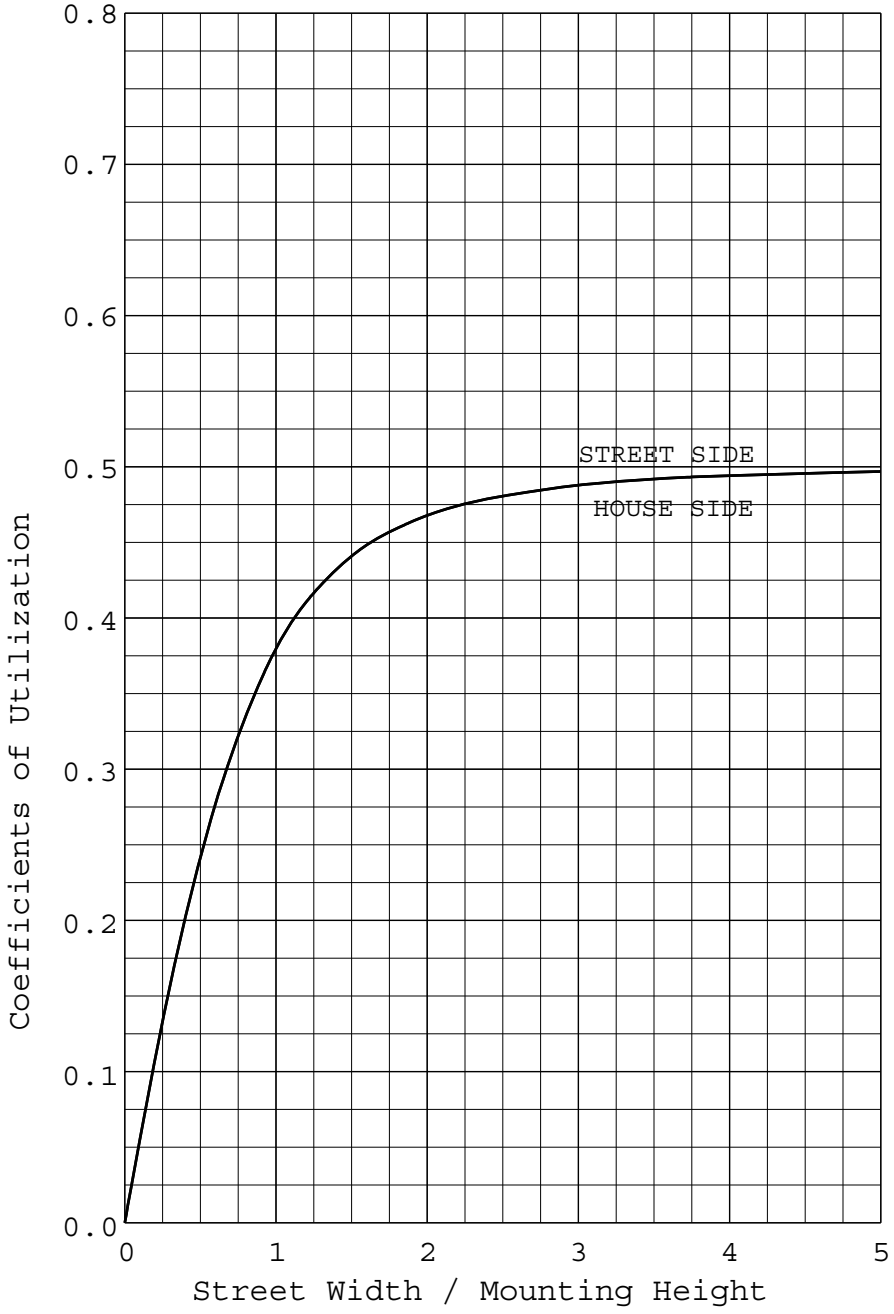
PREPARED FOR: RAB LIGHTING INC.

COEFFICIENTS OF UTILIZATION AND FLUX DISTRIBUTION



	LUMENS	PERCENT OF FIXTURE
DOWNWARD STREET SIDE	3156.	50.0
DOWNWARD HOUSE SIDE	3156.	50.0
DOWNWARD TOTAL	6312.	100.0
UPWARD STREET SIDE	0.	0.0
UPWARD HOUSE SIDE	0.	0.0
UPWARD TOTAL	0.	0.0
TOTAL FLUX	6312.	100.0

TOTAL INPUT WATTS = 53.8
EFFICACY = 117.3 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: RAB00895 PAGE: 5 OF 9
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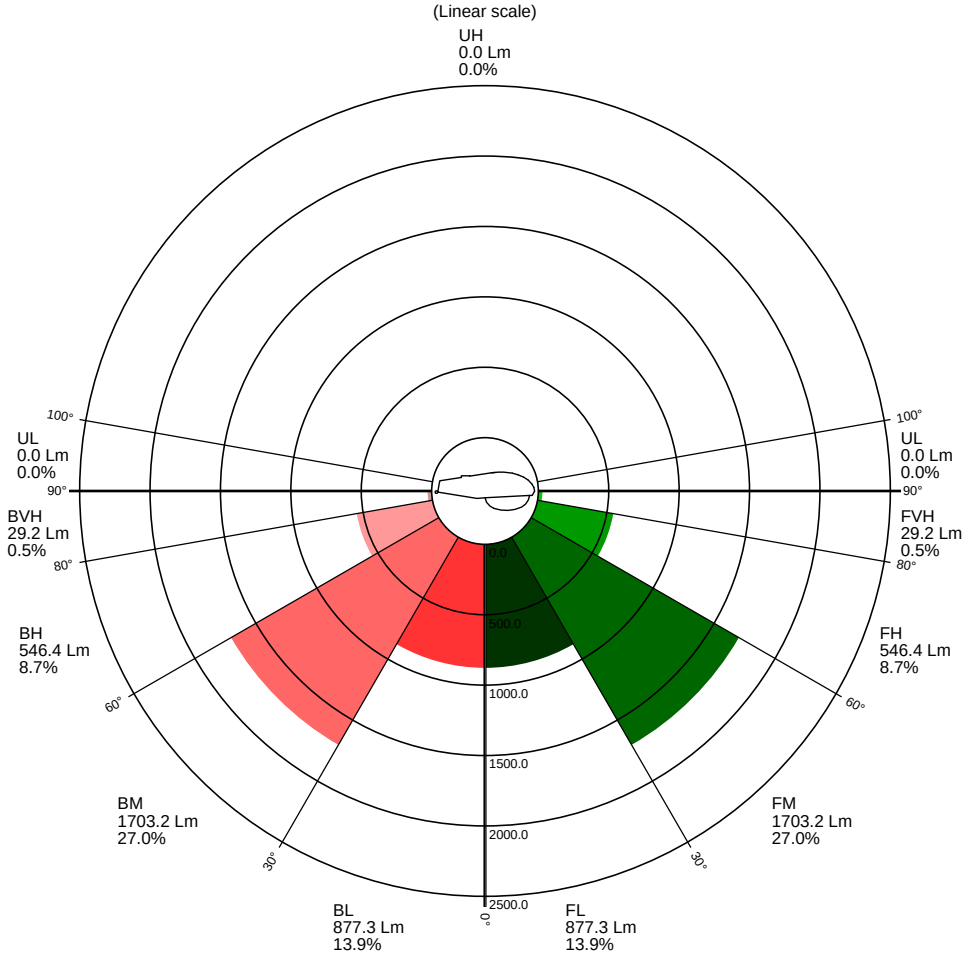
PREPARED FOR: RAB LIGHTING INC.

BUG Rating: B2 U0 G1

Zonal Summary		Lumens	% of Fixture	Zone Ratings B	U	G
Forward		3156	50.0			
FL	(0° – 30°)	877.3	13.9			
FM	(30° – 60°)	1703.2	27.0			
FH	(60° – 80°)	546.4	8.7			G0
FVH	(80° – 90°)	29.2	0.5			G1
Backward		3156	50.0			
BL	(0° – 30°)	877.3	13.9	B2		
BM	(30° – 60°)	1703.2	27.0	B2		
BH	(60° – 80°)	546.4	8.7	B2		G0
BVH	(80° – 90°)	29.2	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		6312	100.0			

Zonal Lumen Summary

(Linear scale)



REPORT NUMBER: RAB00895
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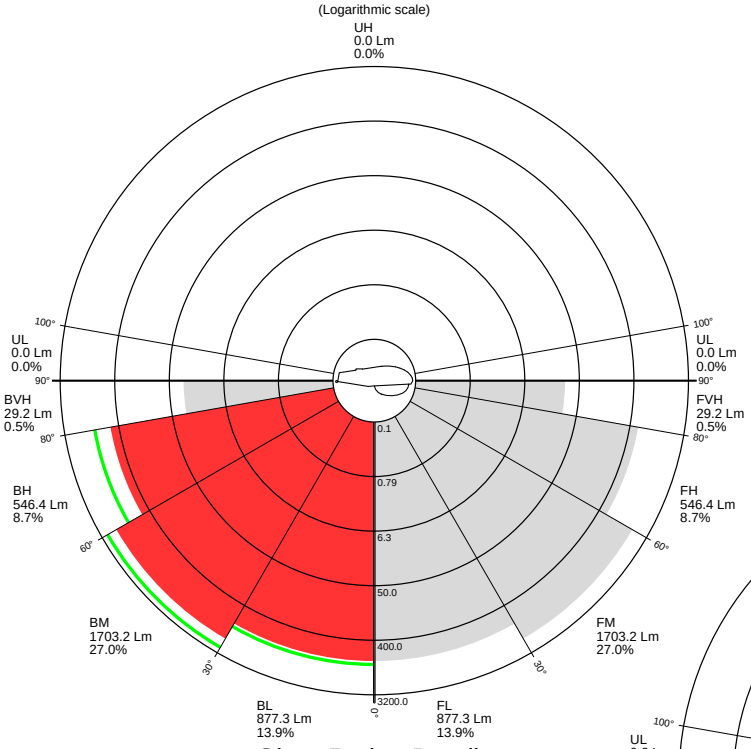
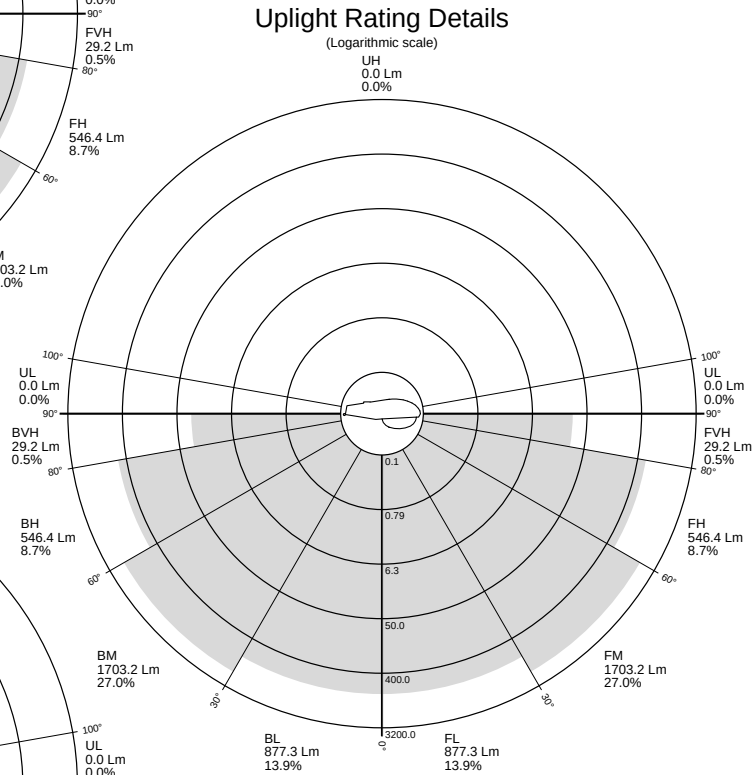
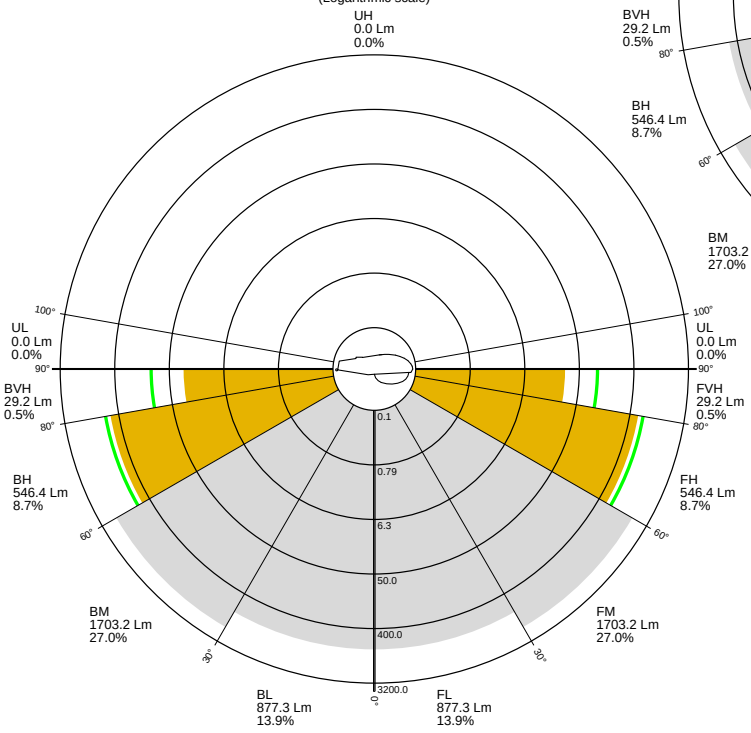
Backlight Rating Details



Uplight Rating Details



Glare Rating Details



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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.	0.
87.5	16.	16.	17.	18.	18.	19.	18.	18.	18.	17.
85.0	39.	39.	40.	40.	39.	38.	39.	40.	40.	39.
82.5	84.	84.	85.	85.	82.	80.	81.	84.	83.	85.
80.0	149.	149.	153.	148.	150.	138.	150.	148.	152.	151.
77.5	234.	236.	238.	222.	225.	238.	222.	223.	238.	237.
75.0	319.	322.	325.	315.	328.	325.	328.	319.	326.	324.
72.5	438.	442.	448.	443.	418.	417.	420.	446.	449.	442.
V 70.0	542.	549.	552.	552.	511.	513.	514.	551.	554.	555.
E 67.5	649.	654.	654.	656.	628.	609.	635.	657.	656.	659.
R 65.0	753.	755.	756.	758.	761.	699.	757.	759.	756.	757.
T 62.5	854.	855.	855.	856.	860.	834.	860.	855.	855.	855.
I 60.0	949.	951.	951.	953.	960.	1025.	955.	951.	952.	949.
C 57.5	1042.	1041.	1042.	1044.	1111.	1131.	1101.	1043.	1043.	1038.
A 55.0	1127.	1129.	1139.	1189.	1227.	1228.	1231.	1174.	1135.	1127.
L 52.5	1250.	1260.	1299.	1317.	1322.	1321.	1321.	1317.	1285.	1251.
50.0	1398.	1401.	1407.	1407.	1402.	1407.	1408.	1406.	1409.	1397.
A 47.5	1487.	1487.	1492.	1489.	1486.	1489.	1489.	1486.	1490.	1487.
N 45.0	1559.	1564.	1565.	1567.	1562.	1563.	1564.	1563.	1566.	1564.
G 42.5	1633.	1638.	1641.	1640.	1636.	1637.	1637.	1638.	1643.	1636.
L 40.0	1700.	1706.	1708.	1707.	1703.	1705.	1705.	1704.	1708.	1702.
E 37.5	1765.	1771.	1774.	1770.	1768.	1768.	1768.	1769.	1772.	1768.
35.0	1829.	1831.	1832.	1831.	1829.	1830.	1828.	1829.	1831.	1830.
30.0	1941.	1938.	1939.	1936.	1937.	1933.	1937.	1938.	1936.	1937.
25.0	2024.	2025.	2026.	2025.	2027.	2026.	2027.	2025.	2023.	2024.
20.0	2091.	2096.	2098.	2098.	2100.	2101.	2101.	2097.	2097.	2099.
15.0	2152.	2159.	2160.	2161.	2160.	2159.	2159.	2158.	2159.	2161.
10.0	2194.	2198.	2199.	2199.	2200.	2198.	2200.	2200.	2201.	2202.
5.0	2216.	2217.	2218.	2218.	2218.	2218.	2218.	2218.	2219.	2220.
0.0<<	2228.	2228.	2228.	2228.	2228.	2228.	2228.	2228.	2228.	2228.
|	||									

PLANE OF MAXIMUM CANDELA
|
CONE OF MAXIMUM CANDELA

REPORT NUMBER: RAB00895 PAGE: 8 OF 9
ISSUE DATE: 06/03/15
PREPARED FOR: RAB LIGHTING INC.

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	16.	17.	18.	18.	18.	19.	18.	18.	17.	16.	16.
85.0	39.	39.	40.	40.	39.	38.	39.	40.	40.	39.	39.
82.5	84.	85.	83.	84.	81.	80.	82.	85.	85.	84.	84.
80.0	149.	151.	152.	148.	150.	138.	150.	148.	153.	149.	149.
77.5	235.	237.	238.	223.	222.	238.	225.	222.	238.	236.	234.
75.0	320.	324.	326.	319.	328.	325.	328.	315.	325.	322.	319.
72.5	438.	442.	449.	446.	420.	417.	418.	443.	448.	442.	438.
VERTICAL ANGLE 70.0	546.	555.	554.	551.	514.	513.	511.	552.	552.	549.	542.
67.5	651.	659.	656.	657.	635.	609.	628.	656.	654.	654.	649.
65.0	755.	757.	756.	759.	757.	699.	761.	758.	756.	755.	753.
62.5	856.	855.	855.	855.	860.	834.	860.	856.	855.	855.	854.
60.0	952.	949.	952.	951.	955.	1025.	960.	953.	951.	951.	949.
57.5	1040.	1038.	1043.	1043.	1101.	1131.	1111.	1044.	1042.	1041.	1042.
55.0	1127.	1127.	1135.	1174.	1231.	1228.	1227.	1189.	1139.	1129.	1127.
52.5	1245.	1251.	1285.	1317.	1321.	1321.	1322.	1317.	1299.	1260.	1250.
50.0	1404.	1397.	1409.	1406.	1408.	1407.	1402.	1407.	1407.	1401.	1398.
47.5	1488.	1487.	1490.	1486.	1489.	1489.	1486.	1489.	1492.	1487.	1487.
45.0	1565.	1564.	1566.	1563.	1564.	1563.	1562.	1567.	1565.	1564.	1559.
42.5	1637.	1636.	1643.	1638.	1637.	1637.	1636.	1640.	1641.	1638.	1633.
40.0	1707.	1702.	1708.	1704.	1705.	1705.	1703.	1707.	1708.	1706.	1700.
37.5	1771.	1768.	1772.	1769.	1768.	1768.	1768.	1770.	1774.	1771.	1765.
35.0	1828.	1830.	1831.	1829.	1828.	1830.	1829.	1831.	1832.	1831.	1829.
30.0	1935.	1937.	1936.	1938.	1937.	1933.	1937.	1936.	1939.	1938.	1941.
25.0	2026.	2024.	2023.	2025.	2027.	2026.	2027.	2025.	2026.	2025.	2024.
20.0	2100.	2099.	2097.	2097.	2101.	2101.	2100.	2098.	2098.	2096.	2091.
15.0	2162.	2161.	2159.	2158.	2159.	2159.	2160.	2161.	2160.	2159.	2152.
10.0	2203.	2202.	2201.	2200.	2200.	2198.	2200.	2199.	2199.	2198.	2194.
5.0	2222.	2220.	2219.	2218.	2218.	2218.	2218.	2218.	2218.	2217.	2216.
0.0<<	2228.	2228.	2228.	2228.	2228.	2228.	2228.	2228.	2228.	2228.	2228.

CONE OF MAXIMUM CANDELA

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5-DEGREE ZONAL LUMEN SUMMARY

0- 5	53
5- 10	158
10- 15	259
15- 20	351
20- 25	432
25- 30	501
30- 35	555
35- 40	590
40- 45	606
45- 50	600
50- 55	563
55- 60	493
60- 65	415
65- 70	326
70- 75	226
75- 80	125
80- 85	48
85- 90	10

10-DEGREE ZONAL LUMEN SUMMARY

0- 10	211
0- 20	821
0- 30	1755
0- 40	2899
0- 50	4106
0- 60	5161
0- 70	5903
0- 80	6254
0- 90	6312

NVLAP LAB CODE: 201058-0

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REPORT NUMBER: RAB00928
DATE: 6/3/2015
PREPARED FOR: RAB LIGHTING INC.
CATALOG NUMBER: MASI16-52YW/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:	Calibration Due:
CHROMA PROGRAMMABLE AC POWER SOURCE MODEL 61602	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

RAB LIGHTING

NVLAP LAB CODE: 201058-0

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CATALOG NUMBER: MASI16-52YW/D10

RESULTS:

PHOTOMETRIC	
Total Integrated Flux (lumens)	6312 *
SPECTRORADIOMETRIC	
Observer	CIE 1931 2 degree
Chromaticity Ordinate x	0.4337
Chromaticity Ordinate y	0.4005
Observer	CIE 1976 2 degree
Chromaticity Ordinate u'	0.2500
Chromaticity Ordinate v'	0.5195
Correlated Color Temp CCT (K)	3026
ANSI C78.377-2008 Duv	-0.001
Total Radiant Flux (milliWatts)	18222 *
ELECTRICAL	
Input Voltage (Volts AC)	120.0
Input Current (Amps AC)	0.452
Input Power (Watts)	53.8
Input Power Factor (%)	99.2
Input Current THD (%)	6.9
Input Voltage THD (%)	0.2
EFFICACY (Lumens/Watt)	117.3
ELECTRICAL AT MAX NONIMAL INPUT	
Input Voltage (Volts AC)	277.0
Input Current (Amps AC)	0.200
Input Power (Watts)	53.7
Input Power Factor (%)	96.9
Input Current THD (%)	8.9
Input Voltage THD (%)	0.2
Off-State Power (Watts)	0.0

COLOR RENDERING INDICES	CRI
Ra (Average 1-8)	71
R1 Light greyish red	68
R2 Dark greyish yellow	80
R3 Strong yellowish green	89
R4 Moderate yellowish green	68
R5 Light bluish green	67
R6 Light blue	72
R7 Light violet	79
R8 Light reddish purple	47
R9 Strong red	-27
R10 Strong yellow	53
R11 Strong green	62
R12 Strong blue	44
R13 Light yellowish pink (skin)	70
R14 Moderate olive green (leaf)	94

*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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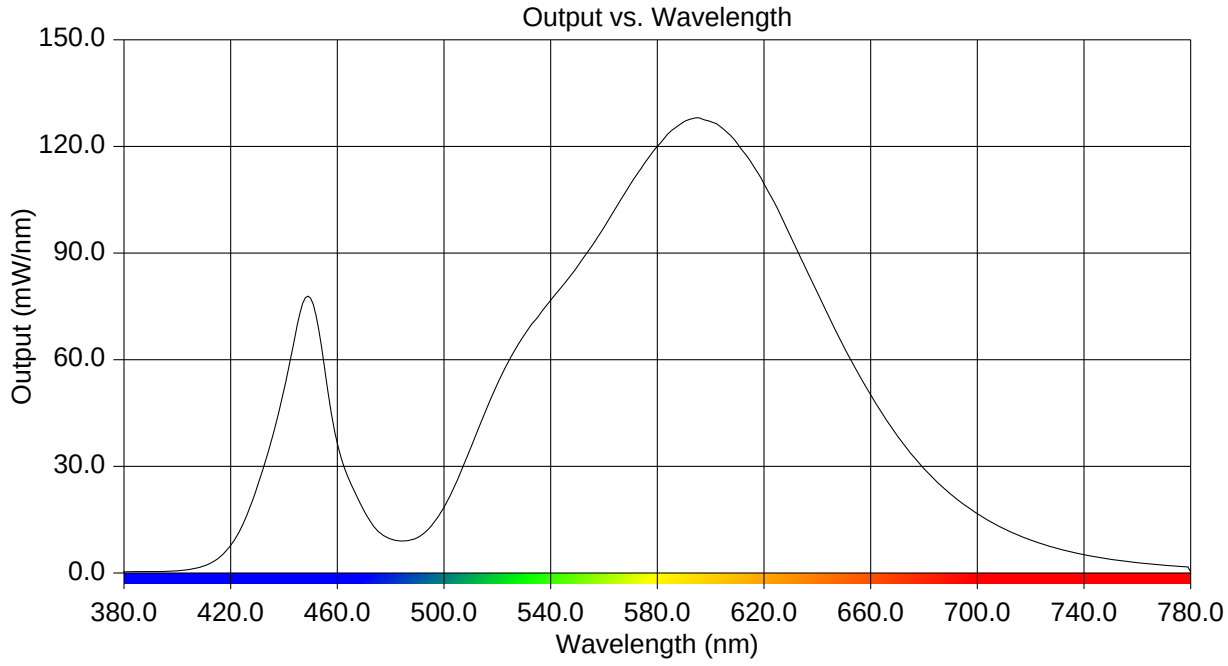
CATALOG NUMBER: MASI16-52YW/D10

RESULTS:

Wavelength	mW per nm	Wavelength	mW per nm	Wavelength	mW per nm
380	0.313	515	44.420	650	63.564
385	0.356	520	53.210	655	56.596
390	0.377	525	60.649	660	50.149
395	0.460	530	66.823	665	44.070
400	0.636	535	71.797	670	38.561
405	1.010	540	76.640	675	33.702
410	1.959	545	81.201	680	29.329
415	3.919	550	86.209	685	25.549
420	7.772	555	91.473	690	22.187
425	14.362	560	97.280	695	19.249
430	24.372	565	103.361	700	16.608
435	36.688	570	109.441	705	14.406
440	51.305	575	115.024	710	12.467
445	69.888	580	120.008	715	10.722
450	77.265	585	124.223	720	9.253
455	58.809	590	126.932	725	7.989
460	36.433	595	128.049	730	6.912
465	25.222	600	126.954	735	5.936
470	17.505	605	124.739	740	5.136
475	11.972	610	120.784	745	4.462
480	9.561	615	115.717	750	3.860
485	9.023	620	109.561	755	3.347
490	9.922	625	102.586	760	2.903
495	13.043	630	94.617	765	2.528
500	18.537	635	86.724	770	2.174
505	26.178	640	78.888	775	1.893
510	35.155	645	71.039	780	0.288



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CIE Chromaticity Diagram