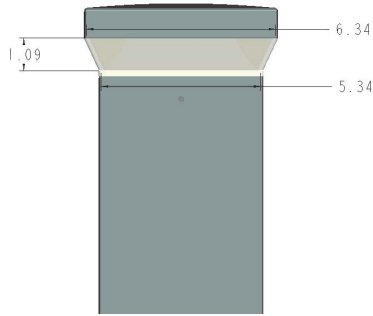


ISOFOOTCANDLE LINES OF HORIZONTAL ILLUMINATION

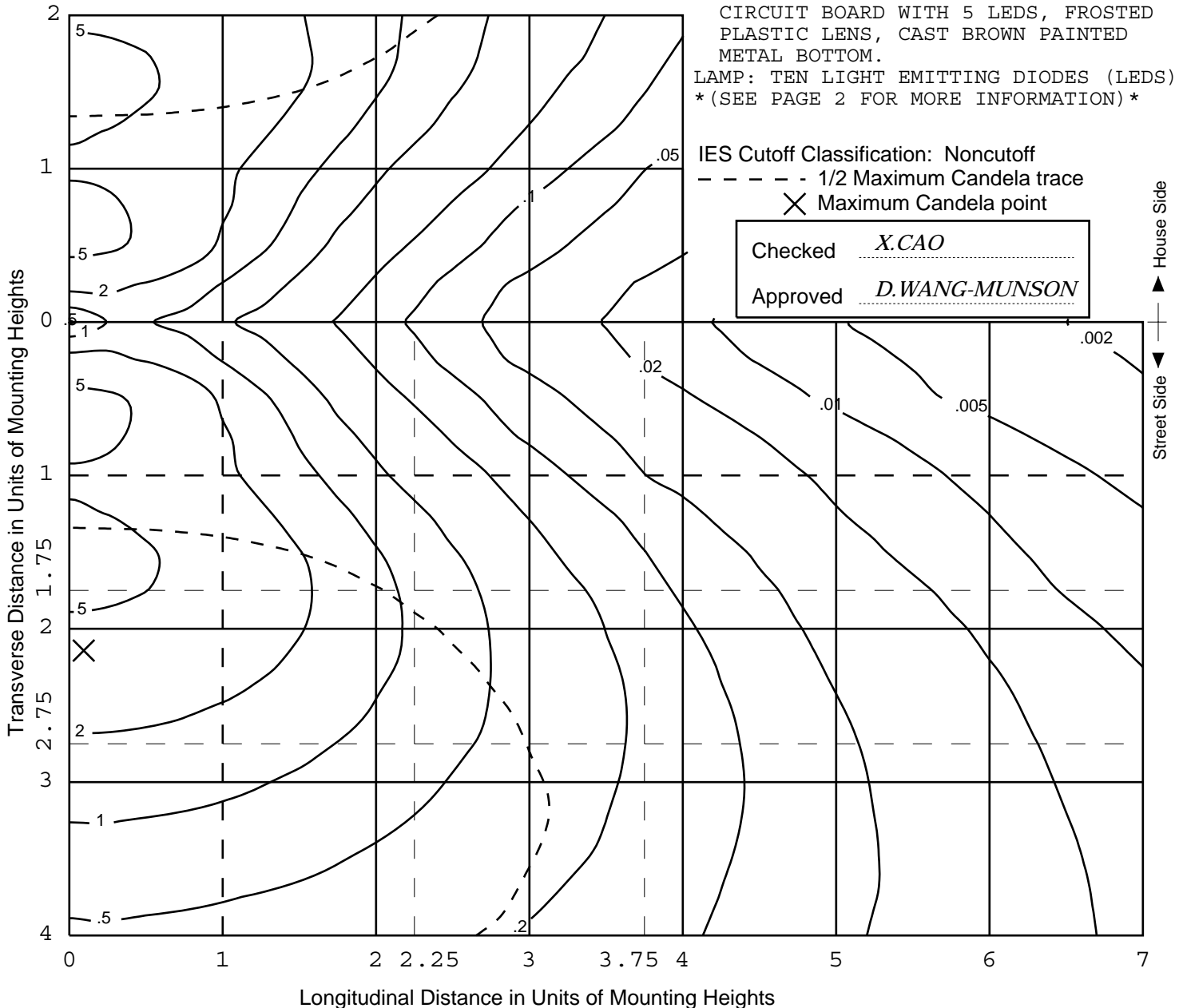
Values based on 3.5 foot mounting height.



REPORT NUMBER: RAB03701
 ISSUE DATE: 08/14/17 PAGE: 1 OF 9
 DATE SAMPLE TESTED: 08/14/17
 PREPARED FOR: RAB LIGHTING INC. RC LIGHTING
 CATALOG NUMBER: BLED12Y-180,
 BLED12Y-180/D10 (42" SQUARE BOLLARD)
 LUMINAIRE: EXTRUDED BROWN PAINTED
 SQUARE METAL LOWER HOUSING, CAST
 METAL TOP, CAST FINNED METAL HEAT
 SINK WITH WHITE PAINTED INTERIOR,
 MOLDED SPECULAR FINISHED PLASTIC
 REFLECTOR WITH WHITE CORNER DIVIDERS
 CREATING 4 OPTICAL COMPARTMENTS, 2
 OPTICAL COMPARTMENT CONTAINS 1 WHITE
 CIRCUIT BOARD WITH 5 LEDS, FROSTED
 PLASTIC LENS, CAST BROWN PAINTED
 METAL BOTTOM.
 LAMP: TEN LIGHT EMITTING DIODES (LEDs).
 (SEE PAGE 2 FOR MORE INFORMATION)

IES Cutoff Classification: Noncutoff

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



REPORT NUMBER: RAB03701

PAGE: 2 OF 9

ISSUE DATE: 08/14/17

DATE SAMPLE TESTED: 08/14/17

PREPARED FOR: RAB LIGHTING INC. RC LIGHTING

ADDITIONAL INFORMATION

NOTE: THIS REPORT WITH THE USE OF THE NVLAP LOGO SHALL NOT BE USED BY THE CLIENT TO CLAIM PRODUCT CERTIFICATION, APPROVAL, OR ENDORSEMENT BY NVLAP, NIST, OR ANY AGENCY OF THE FEDERAL GOVERNMENT.

NOTE: DATA SHOWN IS ABSOLUTE FOR THE SAMPLE PROVIDED.

TOTAL INPUT WATTS = 11.823 W AT 277.0 VAC.

LED DRIVER: RDD-15W-032SE-A0350

TEST PROCEDURE: IESNA LM-79-08

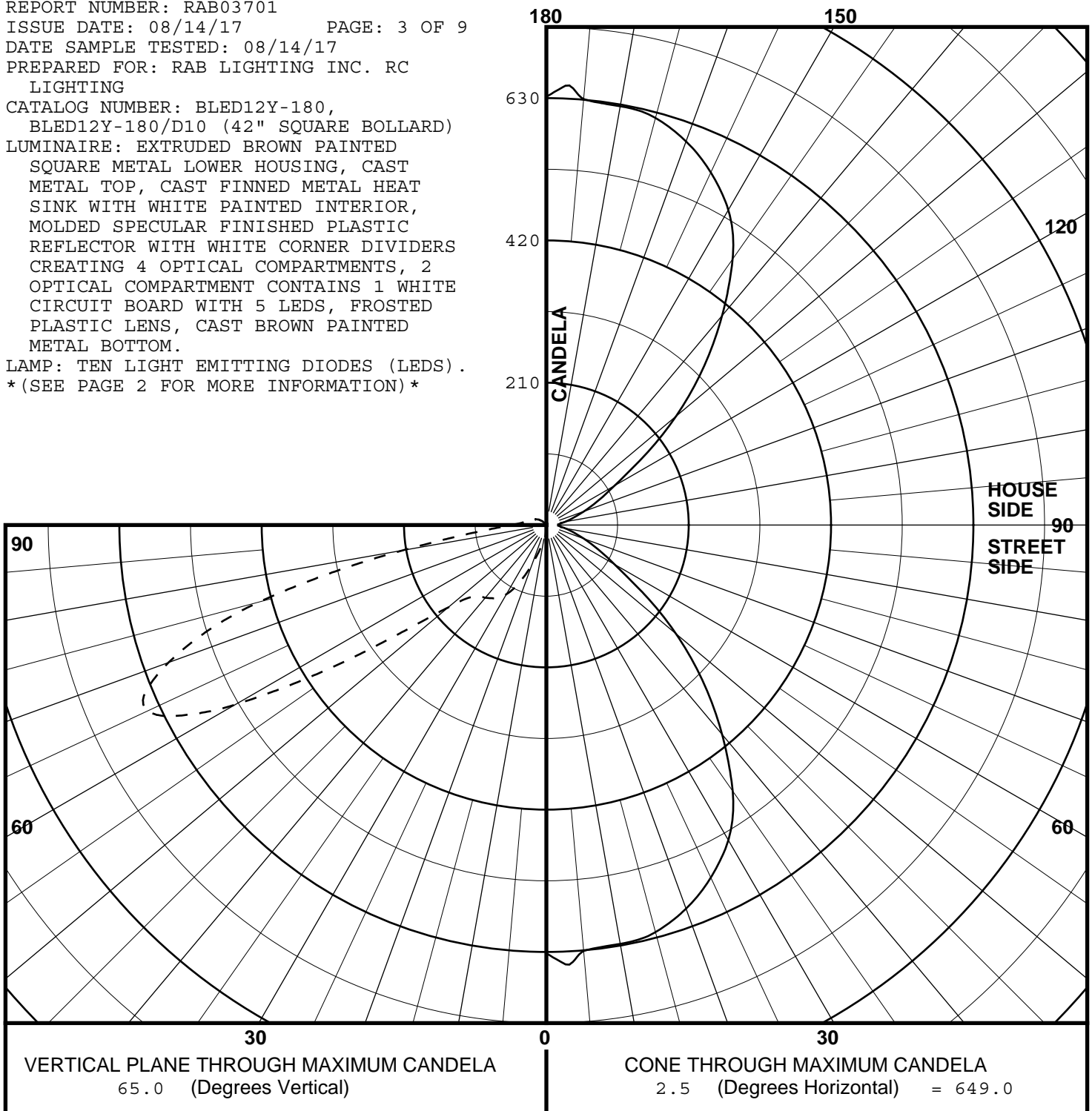
LM-80 DATA AVAILABLE FROM MANUFACTURER FOR SOLID STATE SOURCE

AMBIENT: 24.9

ACCREDITED LABORATORY CODE 201058-0

MAXIMUM PLANE AND MAXIMUM CONE PLOTS OF CANDELA

REPORT NUMBER: RAB03701
 ISSUE DATE: 08/14/17 PAGE: 3 OF 9
 DATE SAMPLE TESTED: 08/14/17
 PREPARED FOR: RAB LIGHTING INC. RC
 LIGHTING
 CATALOG NUMBER: BLED12Y-180,
 BLED12Y-180/D10 (42" SQUARE BOLLARD)
 LUMINAIRE: EXTRUDED BROWN PAINTED
 SQUARE METAL LOWER HOUSING, CAST
 METAL TOP, CAST FINNED METAL HEAT
 SINK WITH WHITE PAINTED INTERIOR,
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 REFLECTOR WITH WHITE CORNER DIVIDERS
 CREATING 4 OPTICAL COMPARTMENTS, 2
 OPTICAL COMPARTMENT CONTAINS 1 WHITE
 CIRCUIT BOARD WITH 5 LEDS, FROSTED
 PLASTIC LENS, CAST BROWN PAINTED
 METAL BOTTOM.
 LAMP: TEN LIGHT EMITTING DIODES (LEDs).
 (SEE PAGE 2 FOR MORE INFORMATION)



REPORT NUMBER: RAB03701

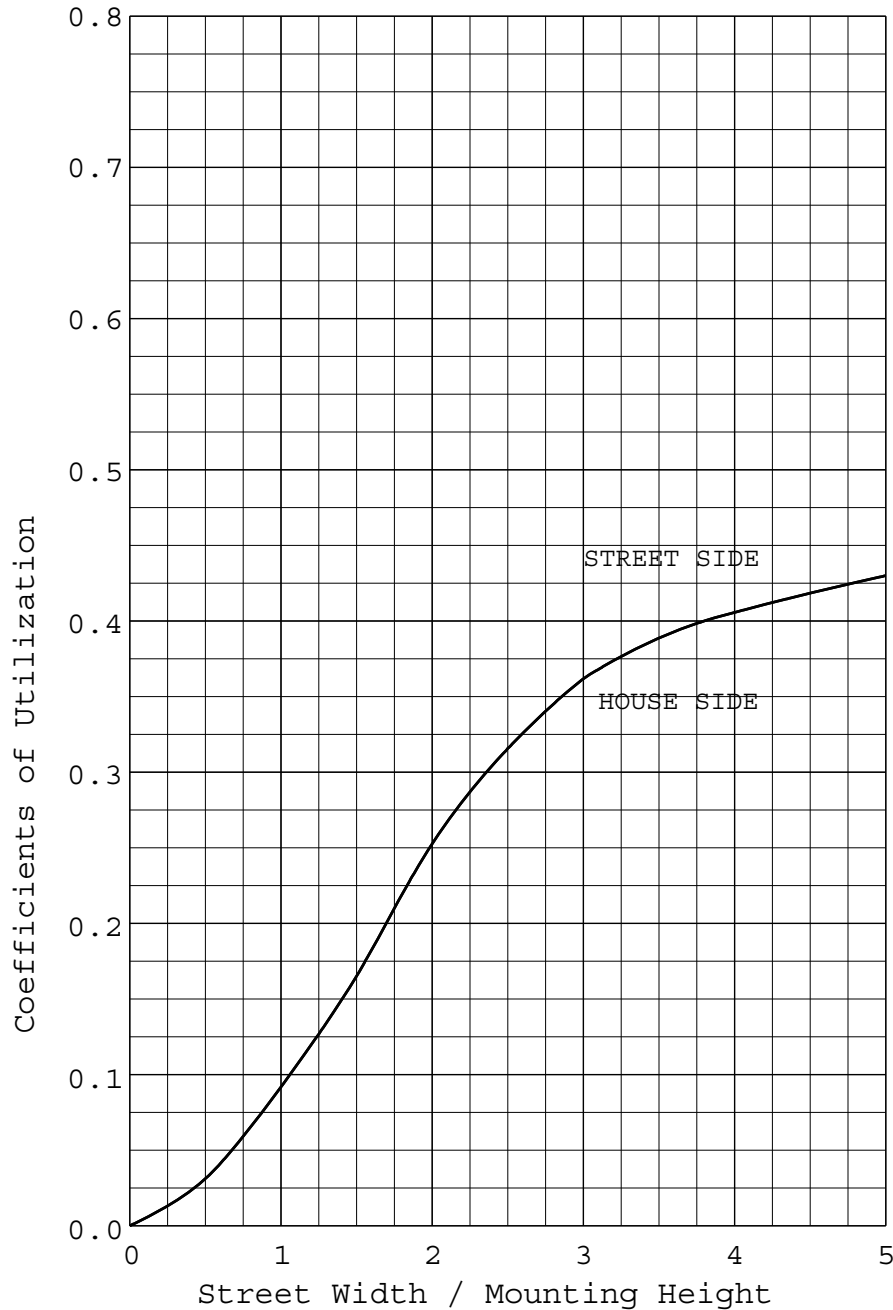
PAGE: 4 OF 9

ISSUE DATE: 08/14/17

DATE SAMPLE TESTED: 08/14/17

PREPARED FOR: RAB LIGHTING INC. RC LIGHTING

COEFFICIENTS OF UTILIZATION AND FLUX DISTRIBUTION



	LUMENS	PERCENT OF FIXTURE
DOWNWARD STREET SIDE	515.	46.7
DOWNWARD HOUSE SIDE	515.	46.7
DOWNWARD TOTAL	1029.	93.4
UPWARD STREET SIDE	36.	3.3
UPWARD HOUSE SIDE	36.	3.3
UPWARD TOTAL	73.	6.6
TOTAL FLUX	1102.	100.0
TOTAL INPUT WATTS = 11.8		
EFFICACY = 93.4 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: RAB03701

ISSUE DATE: 08/14/17

PREPARED FOR: RAB LIGHTING INC. RC LIGHTING

PAGE: 5 OF 9

DATE SAMPLE TESTED: 08/14/17

BUG Rating:

Zonal Summary

Lumens

% of Fixture

B1 U2 G1

Zone Ratings

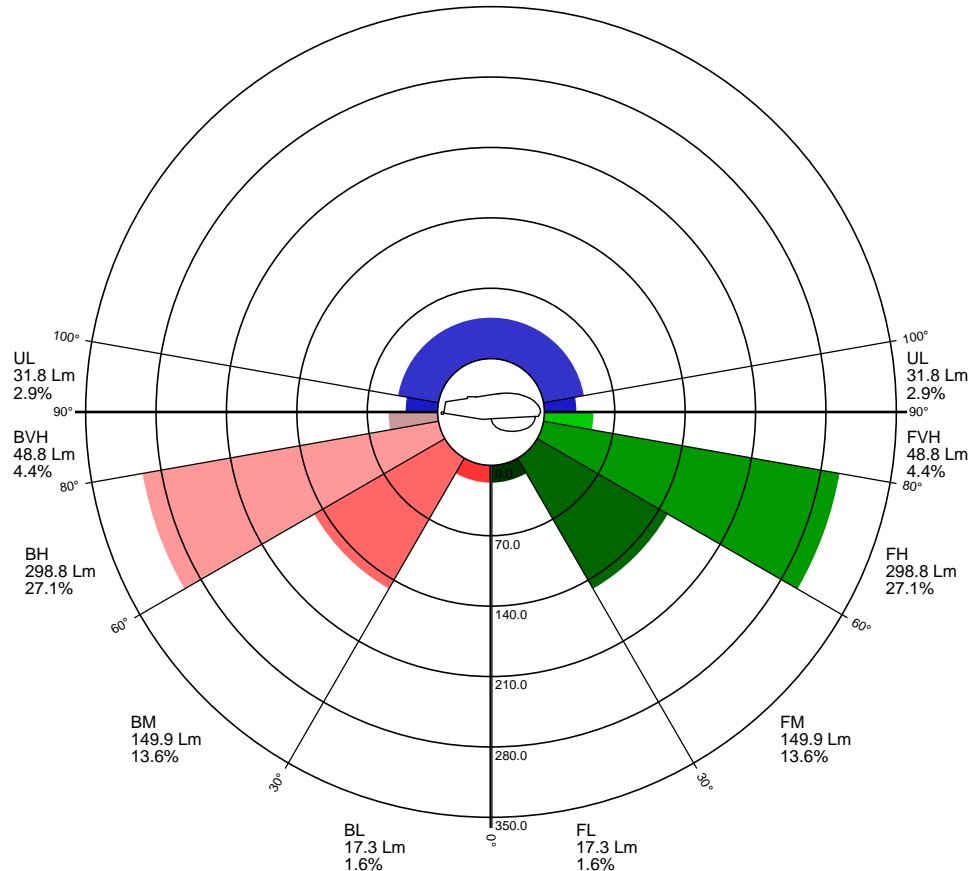
B U G

Forward		515	46.7			
FL	(0° - 30°)	17.3	1.6			
FM	(30° - 60°)	149.9	13.6			
FH	(60° - 80°)	298.8	27.1			G0
FVH	(80° - 90°)	48.8	4.4			G1
Backward		515	46.7			
BL	(0° - 30°)	17.3	1.6	B0		
BM	(30° - 60°)	149.9	13.6	B0		
BH	(60° - 80°)	298.8	27.1	B1		G1
BVH	(80° - 90°)	48.8	4.4			G1
Upward		73	6.6			
UL	(90° - 100°)	31.8	2.9		U2	
UH	(100° - 180°)	40.8	3.7		U2	
Trapped Light		0	0.0			
Total Flux		1102	100.0			

Zonal Lumen Summary

(Linear scale)

UH
40.8 Lm
3.7%



REPORT NUMBER: RAB03701

ISSUE DATE: 08/14/17

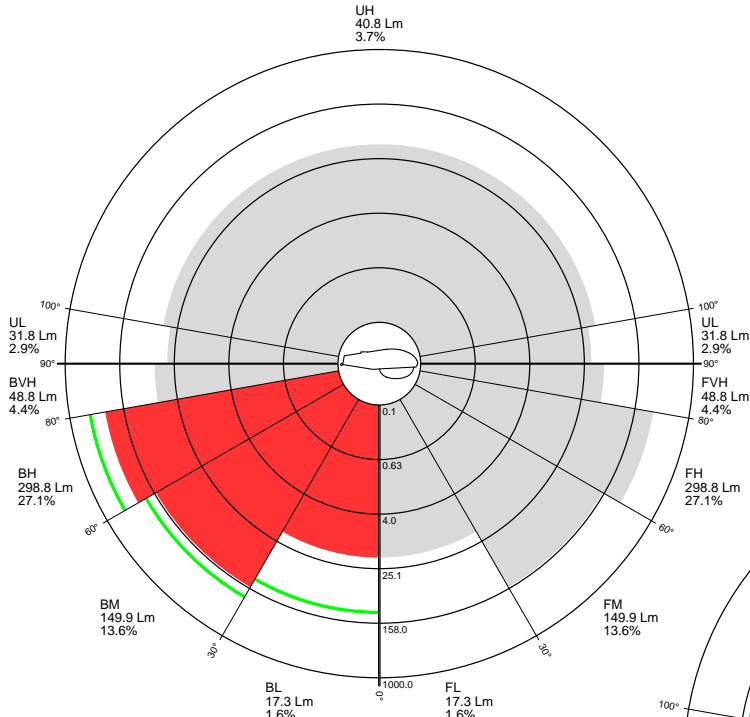
PREPARED FOR: RAB LIGHTING INC. RC LIGHTING

PAGE: 6 OF 9

DATE SAMPLE TESTED: 08/14/17

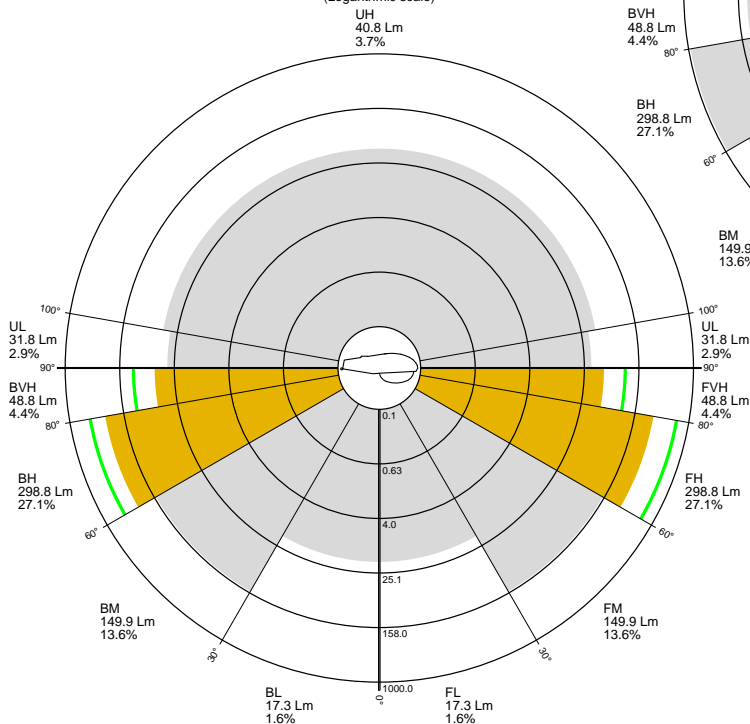
Backlight Rating Details

(Logarithmic scale)



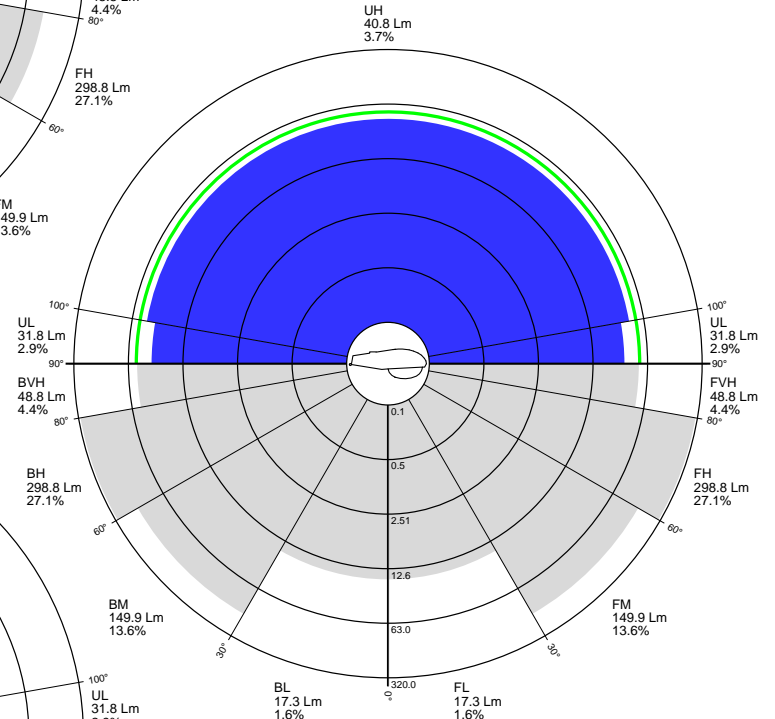
Glare Rating Details

(Logarithmic scale)



Uplight Rating Details

(Logarithmic scale)



REPORT NUMBER: RAB03701

PAGE: 7 OF 9

ISSUE DATE: 08/14/17

DATE SAMPLE TESTED: 08/14/17

PREPARED FOR: RAB LIGHTING INC. RC LIGHTING

CANDELA TABULATION

	STREET SIDE	LATERAL ANGLE										
		0.0	2.5	5.0	15.0	25.0	35.0	45.0	55.0	65.0	75.0	85.0
	180.0	2.	2.	2.	2.	2.	2.	2.	2.	2.	2.	2.
	175.0	0.	0.	0.	0.	0.	1.	1.	2.	3.	3.	3.
	165.0	0.	0.	0.	0.	0.	1.	1.	1.	2.	2.	2.
	155.0	0.	0.	0.	0.	1.	0.	1.	1.	1.	1.	1.
	145.0	3.	3.	3.	3.	2.	2.	1.	1.	1.	1.	1.
	135.0	7.	7.	7.	7.	6.	4.	3.	2.	1.	1.	1.
	125.0	14.	14.	14.	13.	11.	9.	7.	5.	2.	1.	1.
	115.0	20.	20.	20.	19.	18.	16.	13.	9.	5.	2.	2.
	105.0	26.	26.	26.	25.	24.	22.	19.	16.	11.	5.	2.
	95.0	37.	37.	37.	37.	37.	36.	34.	30.	22.	12.	4.
	90.0	50.	52.	50.	52.	55.	55.	55.	50.	39.	21.	6.
	87.5	63.	67.	64.	67.	72.	74.	77.	71.	52.	26.	7.
	85.0	85.	93.	87.	92.	102.	109.	115.	104.	68.	31.	9.
V	82.5	125.	138.	127.	139.	156.	170.	176.	147.	86.	35.	10.
E	80.0	199.	215.	200.	218.	243.	259.	252.	192.	101.	39.	12.
R	77.5	306.	324.	311.	327.	349.	353.	321.	228.	111.	40.	13.
T	75.0	417.	439.	421.	429.	441.	428.	373.	251.	113.	40.	14.
I	72.5	501.	528.	503.	506.	506.	484.	403.	253.	107.	40.	16.
C	70.0	561.	593.	562.	566.	560.	519.	405.	237.	99.	40.	17.
A	67.5	609.	639.	610.	611.	587.	518.	378.	207.	90.	41.	19.
L	65.0<<	632.	649.	631.	622.	574.	479.	327.	173.	84.	41.	20.
	62.5	613.	609.	612.	592.	524.	412.	266.	144.	80.	42.	21.
A	60.0	557.	530.	555.	529.	447.	335.	210.	125.	78.	43.	22.
N	57.5	474.	425.	472.	440.	362.	261.	169.	115.	77.	43.	23.
G	55.0	383.	322.	380.	349.	282.	203.	145.	109.	75.	42.	23.
L	52.5	295.	239.	290.	266.	216.	167.	132.	105.	74.	41.	23.
E	50.0	226.	189.	224.	205.	176.	148.	126.	103.	71.	40.	23.
	47.5	182.	161.	181.	171.	156.	139.	122.	100.	68.	38.	22.
	45.0	160.	149.	160.	154.	145.	134.	119.	96.	64.	36.	22.
	42.5	150.	143.	149.	146.	140.	131.	116.	91.	59.	33.	21.
	40.0	144.	140.	144.	142.	137.	127.	111.	84.	53.	31.	21.
	37.5	141.	136.	140.	139.	133.	123.	104.	76.	48.	30.	20.
	35.0	137.	132.	137.	134.	128.	116.	95.	68.	43.	28.	20.
	30.0	123.	118.	123.	120.	111.	94.	72.	51.	34.	25.	19.
	25.0	94.	93.	94.	89.	79.	65.	50.	38.	29.	22.	18.
	20.0	59.	62.	59.	56.	50.	43.	35.	29.	24.	21.	18.
	15.0	36.	38.	36.	35.	32.	30.	26.	24.	21.	20.	16.
	10.0	24.	26.	24.	24.	23.	22.	20.	17.	15.	12.	9.
	5.0	15.	14.	13.	11.	9.	7.	5.	4.	3.	3.	2.
	0.0	1.	1.	1.	1.	1.	1.	1.	1.	1.	1.	1.

||
PLANE OF MAXIMUM CANDELA

CONE OF MAXIMUM CANDELA

REPORT NUMBER: RAB03701

PAGE: 8 OF 9

ISSUE DATE: 08/14/17

DATE SAMPLE TESTED: 08/14/17

PREPARED FOR: RAB LIGHTING INC. RC LIGHTING

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
V E R T I C A L A N G L E	180.0	2.	2.	2.	2.	2.	2.	2.	2.	2.	2.	2.
	175.0	3.	3.	3.	3.	2.	1.	1.	0.	0.	0.	0.
	165.0	2.	2.	2.	2.	1.	1.	1.	0.	0.	0.	0.
	155.0	1.	1.	1.	1.	1.	1.	0.	1.	0.	0.	0.
	145.0	1.	1.	1.	1.	1.	1.	2.	2.	3.	3.	3.
	135.0	1.	1.	1.	1.	2.	3.	4.	6.	7.	7.	7.
	125.0	1.	1.	1.	2.	5.	7.	9.	11.	13.	14.	14.
	115.0	1.	2.	2.	5.	9.	13.	16.	18.	19.	20.	20.
	105.0	2.	2.	5.	11.	16.	19.	22.	24.	25.	26.	26.
	95.0	3.	4.	12.	22.	30.	34.	36.	37.	37.	37.	37.
	90.0	4.	6.	21.	39.	50.	55.	55.	55.	52.	50.	50.
	87.5	4.	7.	26.	52.	71.	77.	74.	72.	67.	64.	63.
	85.0	5.	9.	31.	68.	104.	115.	109.	102.	92.	87.	85.
	82.5	6.	10.	35.	86.	147.	176.	170.	156.	139.	127.	125.
	80.0	8.	12.	39.	101.	192.	252.	259.	243.	218.	200.	199.
	77.5	9.	13.	40.	111.	228.	321.	353.	349.	327.	311.	306.
	75.0	11.	14.	40.	113.	251.	373.	428.	441.	429.	421.	417.
	72.5	12.	16.	40.	107.	253.	403.	484.	506.	506.	503.	501.
	70.0	14.	17.	40.	99.	237.	405.	519.	560.	566.	562.	561.
	67.5	16.	19.	41.	90.	207.	378.	518.	587.	611.	610.	609.
	65.0<<	17.	20.	41.	84.	173.	327.	479.	574.	622.	631.	632.
	62.5	18.	21.	42.	80.	144.	266.	412.	524.	592.	612.	613.
	60.0	19.	22.	43.	78.	125.	210.	335.	447.	529.	555.	557.
	57.5	20.	23.	43.	77.	115.	169.	261.	362.	440.	472.	474.
	55.0	20.	23.	42.	75.	109.	145.	203.	282.	349.	380.	383.
	52.5	20.	23.	41.	74.	105.	132.	167.	216.	266.	290.	295.
	50.0	20.	23.	40.	71.	103.	126.	148.	176.	205.	224.	226.
	47.5	19.	22.	38.	68.	100.	122.	139.	156.	171.	181.	182.
	45.0	19.	22.	36.	64.	96.	119.	134.	145.	154.	160.	160.
	42.5	19.	21.	33.	59.	91.	116.	131.	140.	146.	149.	150.
	40.0	19.	21.	31.	53.	84.	111.	127.	137.	142.	144.	144.
	37.5	19.	20.	30.	48.	76.	104.	123.	133.	139.	140.	141.
35.0	19.	20.	28.	43.	68.	95.	116.	128.	134.	137.	137.	
30.0	18.	19.	25.	34.	51.	72.	94.	111.	120.	123.	123.	
25.0	18.	18.	22.	29.	38.	50.	65.	79.	89.	94.	94.	
20.0	17.	18.	21.	24.	29.	35.	43.	50.	56.	59.	59.	
15.0	15.	16.	20.	21.	24.	26.	30.	32.	35.	36.	36.	
10.0	8.	9.	12.	15.	17.	20.	22.	23.	24.	24.	24.	
5.0	2.	2.	3.	3.	4.	5.	7.	9.	11.	13.	15.	
0.0	1.	1.	1.	1.	1.	1.	1.	1.	1.	1.	1.	

CONE OF MAXIMUM CANDELA

REPORT NUMBER: RAB03701

PAGE: 9 OF 9

ISSUE DATE: 08/14/17

DATE SAMPLE TESTED: 08/14/17

PREPARED FOR: RAB LIGHTING INC. RC LIGHTING

5-DEGREE

ZONAL LUMEN SUMMARY

0- 5	0
5- 10	1
10- 15	3
15- 20	5
20- 25	10
25- 30	16
30- 35	23
35- 40	30
40- 45	36
45- 50	45
50- 55	64
55- 60	101
60- 65	144
65- 70	170
70- 75	162
75- 80	121
80- 85	65
85- 90	32
90- 95	19
95-100	13
100-105	10
105-110	8
110-115	6
115-120	5
120-125	4
125-130	3
130-135	2
135-140	1
140-145	1
145-150	0
150-155	0
155-160	0
160-165	0
165-170	0
170-175	0
175-180	0

10-DEGREE

ZONAL LUMEN SUMMARY

0- 10	1
0- 20	9
0- 30	35
0- 40	88
0- 50	169
0- 60	334
0- 70	649
0- 80	932
0- 90	1029
0-100	1061
0-110	1079
0-120	1091
0-130	1097
0-140	1100
0-150	1101
0-160	1102
0-170	1102
0-180	1102

REPORT NUMBER: RAB03702
 DATE: 8/11/2017
 PREPARED FOR: RAB LIGHTING INC. RC LIGHTING
 CATALOG NUMBER: BLED12Y-180, BLED12Y-180/D10 (42" SQUARE BOLLARD)

ADDRESS: 170 LUDLOW AVE, NORTHVALE, NJ 07647

LUMINAIRE: EXTRUDED BROWN PAINTED SQUARE METAL LOWER HOUSING, CAST METAL TOP, CAST FINNED METAL HEAT SINK WITH WHITE PAINTED INTERIOR, MOLDED SPECULAR FINISHED PLASTIC REFLECTOR WITH WHITE CORNER DIVIDERS CREATING 4 OPTICAL COMPARTMENTS, 2 OPTICAL COMPARTMENT CONTAINS 1 WHITE CIRCUIT BOARD WITH 5 LEDS, FROSTED PLASTIC LENS, CAST BROWN PAINTED METAL BOTTOM.

LAMP: TEN LIGHT EMITTING DIODES (LEDS).

DRIVER: RDD-15W-032SE-A0350

OBJECT OF TEST: DATA SHOWN IS ABSOLUTE FOR THE SAMPLE PROVIDED AT THE RATED INPUT VOLTAGES (277.0 AND 120.0 VAC, 60Hz) TO THE TEST SAMPLE.

INSTRUMENTS:	GWINSTEK PROGRAMMABLE AC POWER SOURCE APS-7100	Calibration Due: N/A
	CHROMA PROGRAMMABLE DIGITAL POWER METER MODEL 66202	3/01/18
	OCEAN OPTICS QE65PRO Spectroradiometer	06/22/18
	RAB 2.0 meter Diameter Integrating Sphere, 4PI Geometry	06/22/18

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 (120.0 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: RAB03702
 DATE: 8/11/2017
 PREPARED FOR: RAB LIGHTING INC. RC LIGHTING
 CATALOG NUMBER: BLED12Y-180, BLED12Y-180/D10 (42" SQUARE BOLLARD)

Page 2 of 4

RESULTS:

PHOTOMETRIC	
Total Integrated Flux (lumens)	1102 *
SPECTRORADIOMETRIC	
Observer	CIE 1931 2 degree
Chromaticity Ordinate x	0.4395
Chromaticity Ordinate y	0.4085
Observer	CIE 1976 2 degree
Chromaticity Ordinate u'	0.2503
Chromaticity Ordinate v'	0.5235
Correlated Color Temp CCT (K)	2993
ANSI C78.377-2008 Duv	0.001
Total Radiant Flux (milliWatts)	3357 *
ELECTRICAL	
Input Voltage (Volts AC)	277.0
Input Current (Amps AC)	0.048
Input Power (Watts)	11.8
Input Power Factor (%)	89.5
Input Current THD (%)	22.6
Input Voltage THD (%)	0.2
EFFICACY (Lumens/Watt)	
	93.4
ELECTRICAL AT MAX NONIMAL INPUT	
Input Voltage (Volts AC)	120.0
Input Current (Amps AC)	0.097
Input Power (Watts)	11.3
Input Power Factor (%)	97.6
Input Current THD (%)	12.4
Input Voltage THD (%)	0.2
Off-State Power (Watts)	
	0.0

COLOR RENDERING INDICES	CRI
Ra (Average 1-8)	84
R1 Light greyish red	82
R2 Dark greyish yellow	93
R3 Strong yellowish green	96
R4 Moderate yellowish green	82
R5 Light bluish green	83
R6 Light blue	92
R7 Light violet	83
R8 Light reddish purple	61
R9 Strong red	12
R10 Strong yellow	83
R11 Strong green	81
R12 Strong blue	74
R13 Light yellowish pink (skin)	85
R14 Moderate olive green (leaf)	98

*NOTE:

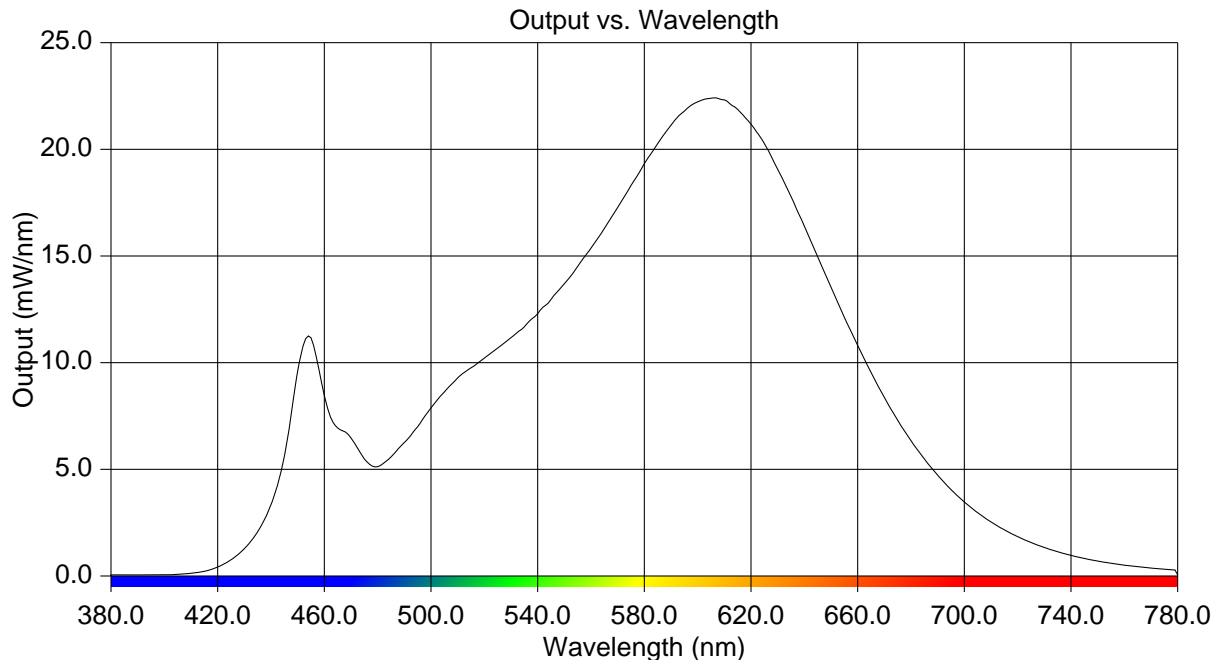
Proper calibration of integrating spheres for measuring total flux output of non-directional samples will produce reliable, repeatable results within the calibration tolerances of the equipment used. However, measurement of test samples with significant self absorption and/or directional output, even 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: RAB03702
 DATE: 8/11/2017
 PREPARED FOR: RAB LIGHTING INC. RC LIGHTING
 CATALOG NUMBER: BLED12Y-180, BLED12Y-180/D10 (42" SQUARE BOLLARD)

Page 3 of 4

RESULTS:

Wavelength	mW per nm	Wavelength	mW per nm	Wavelength	mW per nm
380	0.048	515	9.758	650	13.542
385	0.049	520	10.209	655	12.125
390	0.046	525	10.689	660	10.816
395	0.050	530	11.157	665	9.534
400	0.058	535	11.682	670	8.371
405	0.073	540	12.299	675	7.308
410	0.121	545	12.963	680	6.343
415	0.219	550	13.694	685	5.477
420	0.415	555	14.514	690	4.721
425	0.746	560	15.358	695	4.051
430	1.282	565	16.283	700	3.473
435	2.094	570	17.297	705	2.964
440	3.315	575	18.306	710	2.535
445	5.650	580	19.313	715	2.162
450	9.554	585	20.268	720	1.842
455	11.168	590	21.135	725	1.565
460	8.451	595	21.790	730	1.333
465	6.945	600	22.224	735	1.135
470	6.461	605	22.396	740	0.966
475	5.487	610	22.321	745	0.822
480	5.124	615	21.873	750	0.701
485	5.581	620	21.178	755	0.594
490	6.253	625	20.273	760	0.510
495	6.997	630	19.065	765	0.434
500	7.882	635	17.800	770	0.371
505	8.625	640	16.420	775	0.321
510	9.294	645	14.972	780	0.048



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CATALOG NUMBER: BLED12Y-180, BLED12Y-180/D10 (42" SQUARE BOLLARD)

Page 4 of 4

CIE Chromaticity Diagram

