RAB LIGHTING

NVLAP LAB CODE: 201058-0

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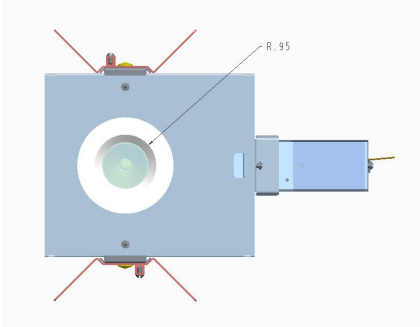
REPORT NUMBER: RAB01205 PAGE: 1 OF 7
ISSUE DATE: 10/15/15 DATE SAMPLE TESTED: 10/15/15
PREPARED FOR: RAB LIGHTING INC.
CATALOG NUMBER: RDLED2R8-WYYHC-TW (2" Round recessed wallwasher - >90 High CRI)
LUMINAIRE: FABRICATED METAL UPPER HOUSING AND BALLAST HOUSING, CAST WHITE PAINTED FINNED METAL HEAT SINK, 1 WHITE CIRCUIT BOARD WITH ONE LED, MOLDED PLASTIC REFLECTOR WITH SPECULAR FINISH, HOLOGRAPHIC FLAT PLASTIC LENS, CAST WHITE PAINTED METAL LOWER HOUSING.
LAMP: ONE WHITE MULTI-CHIP LIGHT EMITTING DIODES (LEDS), VERTICAL BASE-UP POSITION.
NOTE: DATA SHOWN IS ABSOLUTE FOR THE SAMPLE PROVIDED.
TOTAL INPUT WATTS: 8.2433 W AT 120.0 VOLTS
TEST PROCEDURE: IESNA LM-79-08
TEST DISTANCE: 28.25 FEET
PREPARED FOR: RAB LIGHTING INC.
LED DRIVER:RD-008-E1-A0200
ACCREDITED LABORATORY CODE 201085-0



CANDELA DISTRIBUTION

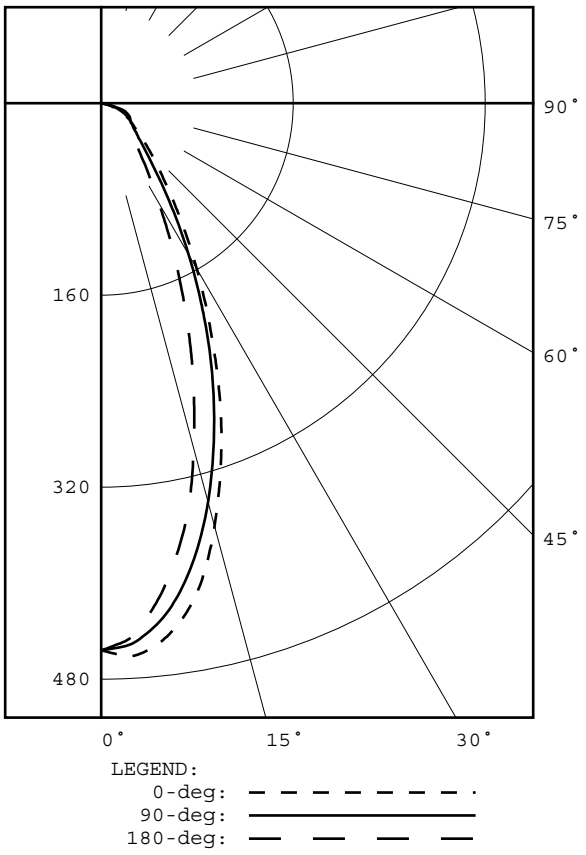
	0.0	45.0	90.0	135.0	180.0	FLUX
0	456	456	456	456	456	
5	457	453	443	434	431	41
15	365	363	344	315	298	93
25	220	224	207	172	148	90
35	112	111	98	80	65	60
45	58	50	48	40	39	37
55	33	29	32	27	32	27
65	20	20	26	18	22	21
75	7	8	13	7	9	10
85	1	1	1	1	1	1
90	0	0	0	0	0	

ZONAL LUMEN SUMMARY

ZONE	LUMENS	%FIXT
0- 30	224	59.1
0- 40	284	74.8
0- 60	348	91.7
0- 90	380	100.0
90-180	0	0.0
0-180	380	100.0

TOTAL INPUT WATTS = 8.2
EFFICACY = 46.3 Lm/W
CIE TYPE - DIRECT

PLANE	0-DEG	90-DEG	180-DEG
SPACING CRITERIA	0.8	0.7	0.6



Checked	X.CAO
Approved	D.WANG-MUNSON

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PLANE	: 0-DEG	90-DEG	
BEAM ANGLE (50%)	: 43.5	X 46.5	DEGREES
FIELD ANGLE (10%)	: 89.3	X 91.6	DEGREES

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CANDELA DISTRIBUTION

	0.0	22.5	45.0	67.5	90.0	112.5	135.0	157.5	180.0
0.0	456	456	456	456	456	456	456	456	456
2.5	461	460	458	455	453	451	450	448	449
5.0	457	456	453	448	443	438	434	431	431
7.5	445	443	440	433	427	418	412	406	406
10.0	426	424	421	413	404	393	384	376	375
12.5	399	397	395	386	376	362	351	340	340
15.0	365	363	363	354	344	327	315	301	298
17.5	329	328	329	321	310	292	277	261	257
20.0	293	292	294	286	275	257	241	223	218
22.5	256	256	259	252	241	223	205	186	181
25.0	220	221	224	217	207	190	172	153	148
27.5	188	190	192	184	175	161	143	125	120
30.0	159	161	162	154	146	134	118	101	96
32.5	134	136	135	126	120	110	97	82	78
35.0	112	113	111	103	98	89	80	68	65
37.5	94	95	90	84	80	73	66	57	54
40.0	79	79	74	69	66	60	55	49	47
42.5	68	65	60	58	56	51	46	43	42
45.0	58	54	50	49	48	44	40	39	39
47.5	50	46	43	42	42	38	36	36	37
50.0	43	39	37	38	38	34	32	34	36
52.5	38	35	33	34	34	31	29	32	34
55.0	33	31	29	31	32	28	27	31	32
57.5	30	27	27	29	29	25	24	29	30
60.0	27	25	24	28	28	23	22	27	28
62.5	23	21	22	27	27	21	20	24	25
65.0	20	18	20	26	26	19	18	22	22
67.5	17	15	18	25	24	17	15	19	19
70.0	13	13	15	22	22	15	13	15	16
72.5	10	10	12	18	19	12	10	12	13
75.0	7	7	8	12	13	8	7	8	9
77.5	4	4	5	7	8	5	4	5	5
80.0	2	2	2	2	2	2	2	2	2
82.5	2	2	2	2	2	2	1	1	1
85.0	1	1	1	1	1	1	1	1	1
87.5	0	0	1	0	0	0	0	0	0
90.0	0	0	0	0	0	0	0	0	0

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ZONAL LUMEN SUMMARY

0- 5	11.
5- 10	30.
10- 15	44.
15- 20	49.
20- 25	48.
25- 30	42.
30- 35	34.
35- 40	26.
40- 45	20.
45- 50	17.
50- 55	14.
55- 60	13.
60- 65	11.
65- 70	10.
70- 75	7.
75- 80	3.
80- 85	1.
85- 90	0.

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5-DEGREE ZONAL LUMEN SUMMARY

0- 5	11
5- 10	30
10- 15	44
15- 20	49
20- 25	48
25- 30	42
30- 35	34
35- 40	26
40- 45	20
45- 50	17
50- 55	14
55- 60	13
60- 65	11
65- 70	10
70- 75	7
75- 80	3
80- 85	1
85- 90	0
90- 95	0
95-100	0
100-105	0
105-110	0
110-115	0
115-120	0
120-125	0
125-130	0
130-135	0
135-140	0
140-145	0
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	41
0- 20	134
0- 30	224
0- 40	284
0- 50	321
0- 60	348
0- 70	369
0- 80	379
0- 90	380
0-100	380
0-110	380
0-120	380
0-130	380
0-140	380
0-150	380
0-160	380
0-170	380
0-180	380

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COEFFICIENTS OF UTILIZATION - ZONAL CAVITY METHOD

EFFECTIVE FLOOR CAVITY REFLECTANCE 0.20

RC	80				70				50			30			10			0
RW	70	50	30	10	70	50	30	10	50	30	10	50	30	10	50	30	10	0
0	119	119	119	119	116	116	116	116	111	111	111	106	106	106	102	102	102	100
1	112	109	106	103	110	106	104	101	102	100	98	99	97	95	95	94	92	91
2	105	99	94	90	103	97	93	89	94	90	87	91	88	85	88	86	83	82
3	99	91	85	80	96	89	84	79	87	82	78	84	80	77	82	79	76	74
4	93	84	77	72	91	83	77	72	80	75	71	78	74	70	76	72	69	67
5	87	78	71	66	86	77	70	66	75	69	65	73	68	64	71	67	64	62
6	83	72	65	61	81	71	65	60	70	64	60	68	63	59	67	63	59	57
7	78	68	61	56	77	67	60	56	66	60	56	64	59	55	63	58	55	53
8	74	64	57	52	73	63	57	52	62	56	52	61	55	52	60	55	51	50
9	70	60	53	49	69	59	53	49	58	53	49	57	52	48	56	52	48	47
10	67	57	50	46	66	56	50	46	55	50	46	54	49	46	54	49	45	44

ALL CANDELA, LUMENS, LUMINANCE, AND VCP VALUES 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.

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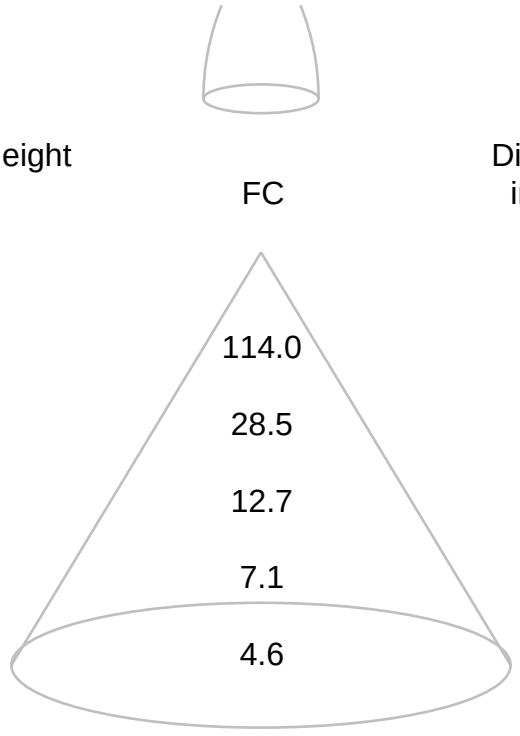
CONE OF LIGHT DIAGRAM

(diameter shown is where fc value is half the fc at nadir)



Mounting Height in feet	FC	Diameter in feet
2.0	114.0	1.4
4.0	28.5	2.8
6.0	12.7	4.3
8.0	7.1	5.7
10.0	4.6	7.1

Note: The candela values used to generate this diagram were obtained by averaging the photometric data into a single plane.

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DATE: 9/29/2015
PREPARED FOR: RAB LIGHTING INC.
CATALOG NUMBER: RDLED2R8-WYYHC-TW (2" Round recessed wallwasher - >90 High CRI)

ADDRESS: 170 LUDLOW AVE, NORTHVALE, NJ 07647

LUMINAIRE: FABRICATED METAL UPPER HOUSING AND BALLAST HOUSING, CAST WHITE PAINTED FINNED METAL HEAT SINK, 1 WHITE CIRCUIT BOARD WITH ONE LED, MOLDED PLASTIC REFLECTOR WITH SPECULAR FINISH, HOLOGRAPHIC FLAT PLASTIC LENS, CAST WHITE PAINTED METAL LOWER HOUSING.

LAMP: ONE WHITE MULTI-CHIP LIGHT EMITTING DIODES (LEDS), VERTICAL BASE-UP POSITION.

DRIVER: RD-008-E1-A0200

NOTE: DATA SHOWN IS ABSOLUTE FOR THE SAMPLE PROVIDED AT RATED INPUT VOLTAGE (120.0 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	8/21/16
	RAB 2.0 meter Diameter Integrating Sphere, 4PI Geometry	8/21/16

OBJECT OF TEST: Measure the 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. Report Off-State Power.

PROCEDURE: The test sample was provided by the customer and had an unknown number of burn hours. The test sample was mounted inside the integrating sphere 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 120.0 VAC input in a 25 +/-1 degree Celsius free air ambient and in accordance with IESNA LM-79-08. 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

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CATALOG NUMBER: RDLED2R8-WYYHC-TW (2" Round recessed wallwasher - >90 High CRI)

RESULTS:

SPECTRORADIOMETRIC	
Observer	CIE 1931 2 degree
Chromaticity Ordinate x	0.4627
Chromaticity Ordinate y	0.4156
Observer	CIE 1976 2 degree
Chromaticity Ordinate u'	0.2621
Chromaticity Ordinate v'	0.5297
Correlated Color Temp CCT (K)	2698
Color Rendering Index (CRIa)	91
Color Rendering Index 1 (Light greyish red)	91
Color Rendering Index 2 (Dark greyish yellow)	97
Color Rendering Index 3 (Strong yellowish green)	98
Color Rendering Index 4 (Moderate yellowish green)	89
Color Rendering Index 5 (Light bluish green)	91
Color Rendering Index 6 (Light blue)	97
Color Rendering Index 7 (Light violet)	89
Color Rendering Index 8 (Light reddish purple)	77
Color Rendering Index 9 (Strong red)	53
Color Rendering Index 10 (Strong yellow)	92
Color Rendering Index 11 (Strong green)	89
Color Rendering Index 12 (Strong blue)	82
Color Rendering Index 13 (Light yellowish pink (skin))	93
Color Rendering Index 14 (Moderate olive green (leaf))	100
ANSI C78.377-2008 Duv	0.002
Total Radiant Flux (milliWatts)	1326 *
ELECTRICAL FOR SPECTRORADIOMETRIC TEST	
Input Voltage (Volts AC)	120.0
Input Current (Amps AC)	0.071
Input Power (Watts)	8.24
Input Power Factor (%)	96.7
Input Current THD (%)	0.2
Input Voltage THD (%)	22.6
Off-State Power (Watts)	0.0

*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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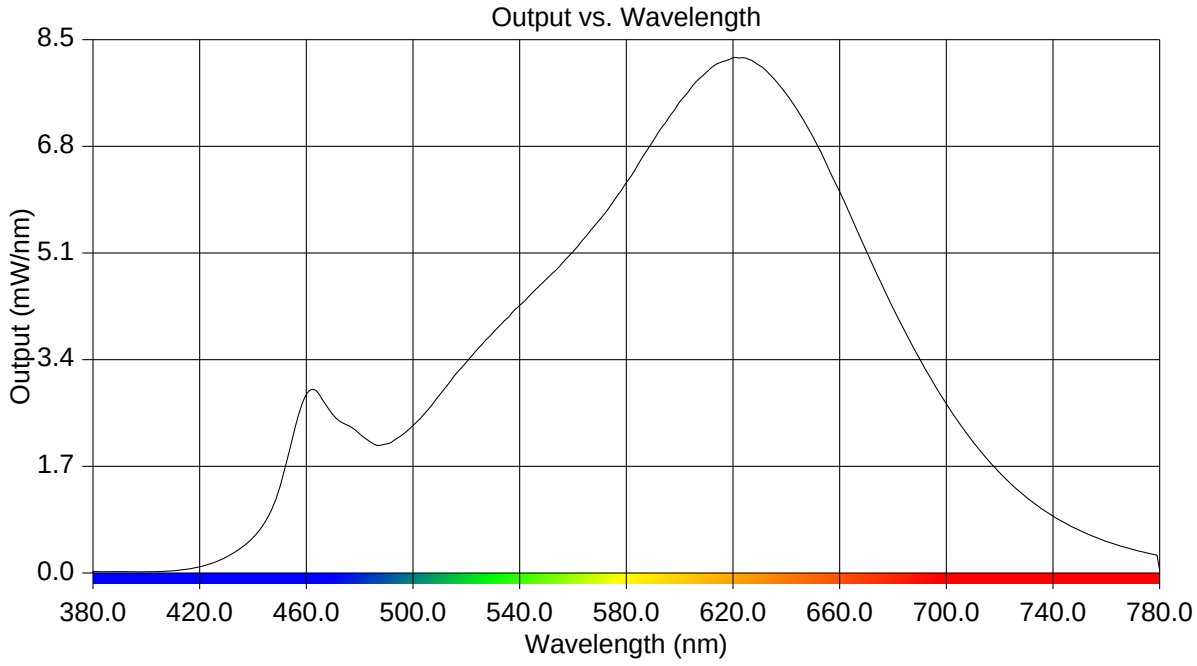
RESULTS:

Wavelength	mW per nm	Wavelength	mW per nm	Wavelength	mW per nm
380	0.020	515	3.112	650	6.951
385	0.022	520	3.355	655	6.522
390	0.019	525	3.603	660	6.080
395	0.018	530	3.830	665	5.607
400	0.019	535	4.047	670	5.136
405	0.025	540	4.265	675	4.671
410	0.035	545	4.477	680	4.222
415	0.057	550	4.680	685	3.800
420	0.097	555	4.889	690	3.410
425	0.162	560	5.120	695	3.043
430	0.254	565	5.372	700	2.695
435	0.384	570	5.623	705	2.377
440	0.561	575	5.914	710	2.092
445	0.845	580	6.224	715	1.828
450	1.363	585	6.552	720	1.597
455	2.182	590	6.883	725	1.391
460	2.841	595	7.195	730	1.209
465	2.835	600	7.508	735	1.046
470	2.518	605	7.774	740	0.905
475	2.363	610	7.981	745	0.785
480	2.217	615	8.130	750	0.677
485	2.062	620	8.214	755	0.585
490	2.057	625	8.204	760	0.504
495	2.170	630	8.087	765	0.434
500	2.353	635	7.896	770	0.375
505	2.572	640	7.639	775	0.322
510	2.839	645	7.316	780	0.048



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CIE Chromaticity Diagram