RAB LIGHTING

NVLAP LAB CODE: 201058-0

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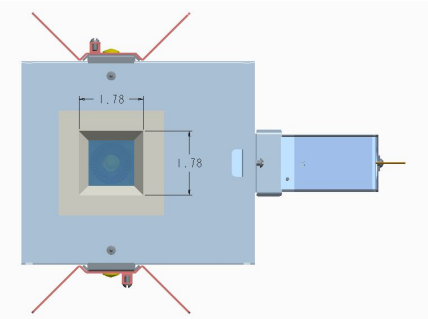
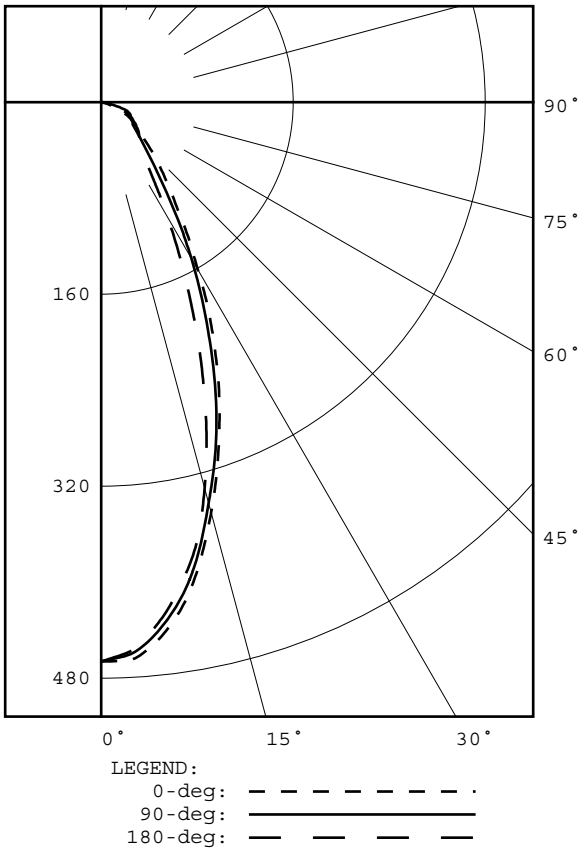
REPORT NUMBER: RAB01217 PAGE: 1 OF 7
ISSUE DATE: 10/16/15 DATE SAMPLE TESTED: 10/16/15
PREPARED FOR: RAB LIGHTING INC.
CATALOG NUMBER: RDLED2S8-WYHC-TW (2" square recessed wallwasher - >90 High CRI)
LUMINAIRE: FABRICATED METAL UPPER HOUSING AND BALLAST HOUSING, CAST WHITE PAINTED FINNED METAL HEAT SINK, 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: 8.3772 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	466	466	466	466	466	
5	457	455	451	448	446	42
15	354	355	346	341	333	96
25	223	222	211	195	170	95
35	114	117	100	91	72	64
45	62	55	50	47	46	40
55	36	33	32	32	36	30
65	21	23	27	21	26	24
75	5	9	15	9	11	11
85	1	1	1	1	1	1
90	0	0	0	0	0	



ZONAL LUMEN SUMMARY

ZONE	LUMENS	%FIXT
0- 30	232	57.7
0- 40	296	73.5
0- 60	367	91.1
0- 90	402	100.0
90-180	0	0.0
0-180	402	100.0

TOTAL INPUT WATTS = 8.3
EFFICACY = 48.4 Lm/W
CIE TYPE - DIRECT

PLANE	0-DEG	90-DEG	180-DEG
SPACING CRITERIA :	0.7	0.7	0.7

Checked	X.CAO
Approved	D.WANG-MUNSON

REPORT NUMBER: RAB01217 PAGE: 2 OF 7
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PLANE	: 0-DEG	90-DEG	
BEAM ANGLE (50%)	: 45.2	X 46.9	DEGREES
FIELD ANGLE (10%)	: 94.3	X 92.8	DEGREES

REPORT NUMBER: RAB01217 PAGE: 3 OF 7
ISSUE DATE: 10/16/15 DATE SAMPLE TESTED: 10/16/15
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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	466	466	466	466	466	466	466	466	466
2.5	466	466	465	464	462	462	462	461	460
5.0	457	457	455	453	451	450	448	447	446
7.5	440	440	439	436	433	431	429	427	426
10.0	417	417	416	414	410	406	404	402	401
12.5	387	388	388	387	380	376	374	372	372
15.0	354	355	355	354	346	342	341	335	333
17.5	321	322	320	319	314	307	306	295	292
20.0	288	289	288	285	281	273	269	254	249
22.5	256	258	255	251	246	240	231	213	208
25.0	223	226	222	217	211	206	195	175	170
27.5	192	196	192	184	180	175	163	143	138
30.0	161	167	165	154	150	147	134	116	111
32.5	137	141	140	128	124	122	111	95	89
35.0	114	117	117	104	100	99	91	77	72
37.5	97	98	96	85	82	81	75	64	60
40.0	83	82	79	71	68	67	63	55	53
42.5	72	70	65	60	58	56	54	49	49
45.0	62	60	55	52	50	49	47	45	46
47.5	53	51	47	45	44	42	42	43	43
50.0	46	44	41	40	39	38	37	40	41
52.5	41	39	37	36	35	34	34	38	39
55.0	36	34	33	34	32	31	32	37	36
57.5	32	31	30	32	31	29	29	35	34
60.0	29	27	28	31	29	26	26	32	31
62.5	25	24	25	30	28	24	24	30	29
65.0	21	20	23	30	27	22	21	27	26
67.5	16	16	20	29	26	19	18	24	22
70.0	12	13	16	26	24	17	15	20	19
72.5	8	9	13	22	21	14	12	16	15
75.0	5	6	9	15	15	10	9	12	11
77.5	3	4	5	8	9	6	6	7	7
80.0	2	2	3	3	3	3	3	3	2
82.5	1	1	1	1	1	1	1	1	1
85.0	1	1	1	1	1	1	1	1	1
87.5	0	0	0	0	0	0	0	0	0
90.0	0	0	0	0	0	0	0	0	0

REPORT NUMBER: RAB01217 PAGE: 4 OF 7
ISSUE DATE: 10/16/15 DATE SAMPLE TESTED: 10/16/15
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ZONAL LUMEN SUMMARY

0- 5	11.
5- 10	31.
10- 15	45.
15- 20	51.
20- 25	50.
25- 30	44.
30- 35	36.
35- 40	28.
40- 45	22.
45- 50	18.
50- 55	16.
55- 60	14.
60- 65	13.
65- 70	11.
70- 75	8.
75- 80	3.
80- 85	1.
85- 90	0.

REPORT NUMBER: RAB01217 PAGE: 5 OF 7
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5-DEGREE ZONAL LUMEN SUMMARY

0- 5	11
5- 10	31
10- 15	45
15- 20	51
20- 25	50
25- 30	44
30- 35	36
35- 40	28
40- 45	22
45- 50	18
50- 55	16
55- 60	14
60- 65	13
65- 70	11
70- 75	8
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	42
0- 20	138
0- 30	232
0- 40	296
0- 50	336
0- 60	367
0- 70	390
0- 80	402
0- 90	402
0-100	402
0-110	402
0-120	402
0-130	402
0-140	402
0-150	402
0-160	402
0-170	402
0-180	402

REPORT NUMBER: RAB01217 PAGE: 6 OF 7
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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	105	103	109	106	104	101	102	100	98	98	97	95	95	93	92	90
2	105	99	94	90	102	97	92	89	94	90	87	91	87	85	88	85	83	81
3	98	90	84	79	96	89	83	79	86	81	77	84	80	76	81	78	75	73
4	92	83	77	71	90	82	76	71	80	74	70	78	73	69	76	72	68	67
5	87	77	70	65	85	76	70	65	74	68	64	72	67	63	71	66	63	61
6	82	72	65	60	80	71	64	59	69	63	59	68	63	59	66	62	58	57
7	78	67	60	55	76	66	60	55	65	59	55	64	58	54	62	58	54	52
8	73	63	56	51	72	62	56	51	61	55	51	60	55	51	59	54	50	49
9	70	59	52	48	69	59	52	48	58	52	48	57	51	48	56	51	47	46
10	66	56	49	45	65	55	49	45	54	49	45	54	48	45	53	48	45	43

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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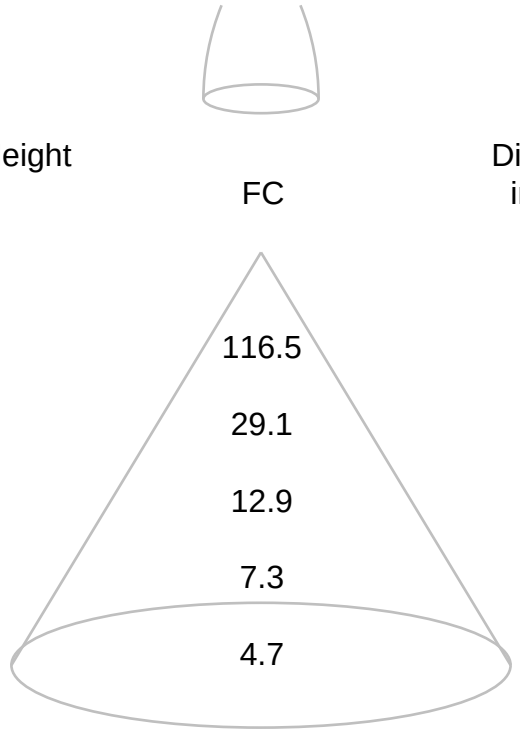
CONE OF LIGHT DIAGRAM

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



Mounting Height in feet	FC	Diameter in feet
2.0	116.5	1.4
4.0	29.1	2.9
6.0	12.9	4.3
8.0	7.3	5.7
10.0	4.7	7.2

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

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REPORT NUMBER: RAB01214
DATE: 9/29/2015
PREPARED FOR: RAB LIGHTING INC.
CATALOG NUMBER: RDLED2S8-WYHC-TW (2" square 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

REPORT NUMBER: RAB01214 Page 2 of 4
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CATALOG NUMBER: RDLED2S8-WYHC-TW (2" square recessed wallwasher - >90 High CRI)

RESULTS:

SPECTRORADIOMETRIC	
Observer	CIE 1931 2 degree
Chromaticity Ordinate x	0.4387
Chromaticity Ordinate y	0.4043
Observer	CIE 1976 2 degree
Chromaticity Ordinate u'	0.2516
Chromaticity Ordinate v'	0.5217
Correlated Color Temp CCT (K)	2973
Color Rendering Index (CRIa)	92
Color Rendering Index 1 (Light greyish red)	92
Color Rendering Index 2 (Dark greyish yellow)	95
Color Rendering Index 3 (Strong yellowish green)	97
Color Rendering Index 4 (Moderate yellowish green)	92
Color Rendering Index 5 (Light bluish green)	91
Color Rendering Index 6 (Light blue)	94
Color Rendering Index 7 (Light violet)	92
Color Rendering Index 8 (Light reddish purple)	81
Color Rendering Index 9 (Strong red)	58
Color Rendering Index 10 (Strong yellow)	87
Color Rendering Index 11 (Strong green)	92
Color Rendering Index 12 (Strong blue)	81
Color Rendering Index 13 (Light yellowish pink (skin))	92
Color Rendering Index 14 (Moderate olive green (leaf))	97
ANSI C78.377-2008 Duv	0.000
Total Radiant Flux (milliWatts)	1394 *
ELECTRICAL FOR SPECTRORADIOMETRIC TEST	
Input Voltage (Volts AC)	120.0
Input Current (Amps AC)	0.071
Input Power (Watts)	8.30
Input Power Factor (%)	97.4
Input Current THD (%)	0.2
Input Voltage THD (%)	19.2
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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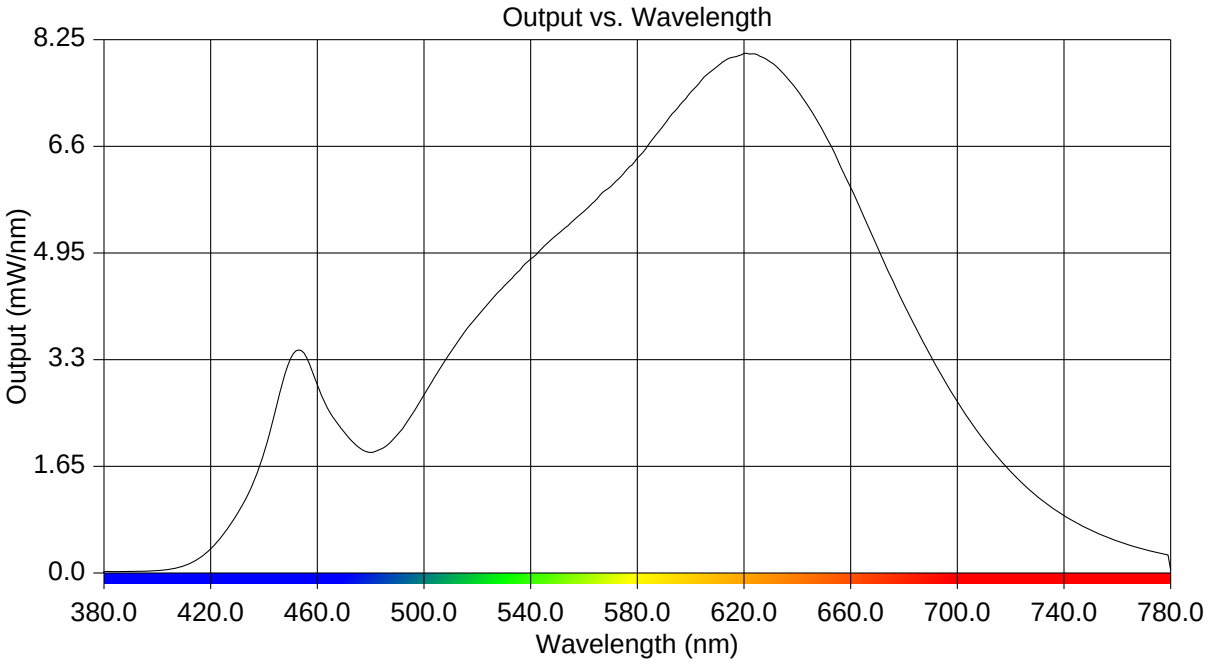
RESULTS:

Wavelength	mW per nm	Wavelength	mW per nm	Wavelength	mW per nm
380	0.022	515	3.716	650	6.806
385	0.023	520	3.968	655	6.401
390	0.023	525	4.211	660	5.965
395	0.027	530	4.436	665	5.506
400	0.038	535	4.649	670	5.050
405	0.059	540	4.859	675	4.590
410	0.110	545	5.056	680	4.154
415	0.211	550	5.240	685	3.743
420	0.373	555	5.415	690	3.358
425	0.614	560	5.594	695	2.993
430	0.917	565	5.792	700	2.647
435	1.307	570	5.977	705	2.338
440	1.860	575	6.187	710	2.056
445	2.634	580	6.417	715	1.797
450	3.321	585	6.674	720	1.569
455	3.403	590	6.931	725	1.366
460	2.907	595	7.186	730	1.182
465	2.465	600	7.438	735	1.026
470	2.178	605	7.671	740	0.886
475	1.958	610	7.839	745	0.769
480	1.864	615	7.970	750	0.663
485	1.941	620	8.037	755	0.571
490	2.140	625	8.018	760	0.493
495	2.419	630	7.902	765	0.425
500	2.759	635	7.718	770	0.367
505	3.095	640	7.468	775	0.316
510	3.414	645	7.164	780	0.047



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CIE Chromaticity Diagram