

REPORT NUMBER: RAB00845

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ISSUE DATE: 05/04/15

PREPARED FOR: RAB LIGHTING INC.

CATALOG NUMBER: RAIL95W

LUMINAIRE: EXTRUDED METAL HOUSING WITH HEAT SINK FINS, FOUR WHITE  
CIRCUIT BOARD WITH SIXTY FOUR LEDS ON EACH BOARD, METAL REFLECTOR  
WITH SPECULAR FINISH, FLAT TRANSLUCENT LENS WITH FROSTED SIDE IN.

LAMPS: TWO HUNDRED AND FIFTY SIX LIGHT EMITTING DIODES (LEDs).

NOTE: DATA SHOWN IS ABSOLUTE FOR THE SAMPLE PROVIDED.

TOTAL INPUT WATTS = 92.833 W AT 120.0 VAC.

LED DRIVER: RD-085-A1750

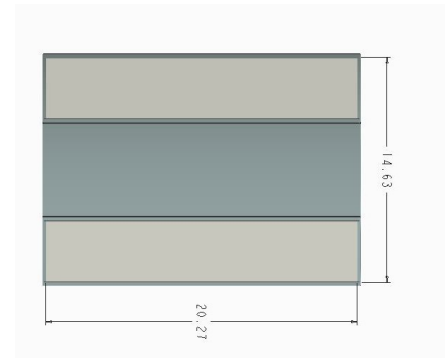
TEST PROCEDURE: IESNA LM-79-08

### CANDELA DISTRIBUTION

	0.0	45.0	90.0	135.0	180.0
0	4791	4791	4791	4791	4791
5	4767	4765	4767	4767	4768
15	4566	4545	4523	4543	4564
25	4152	4097	4028	4087	4151
35	3556	3456	3327	3445	3545
45	2831	2706	2555	2690	2803
55	2071	1940	1801	1921	2033
65	1338	1233	1128	1212	1303
75	684	617	553	592	638
85	142	166	181	152	115
90	13	53	74	47	0
95	4	4	11	2	0
105	4	3	1	1	0
115	4	2	1	1	1
125	3	2	1	1	1
135	3	2	2	1	1
145	3	3	2	2	2
155	3	3	3	2	2
165	4	3	3	3	3
175	3	4	4	3	3
180	4	4	4	4	4

### FLUX

452
1280
1882
2154
2079
1730
1219
649
189
14
2
2
1
1
1
1
1
0



### ZONAL LUMEN SUMMARY

ZONE	LUMENS	%FIXT
0- 30	3614	31.0
0- 40	5767	49.5
0- 60	9577	82.2
0- 90	11633	99.8
90-120	17	0.1
90-130	18	0.2
90-150	21	0.2
90-180	24	0.2
0-180	11657	100.0

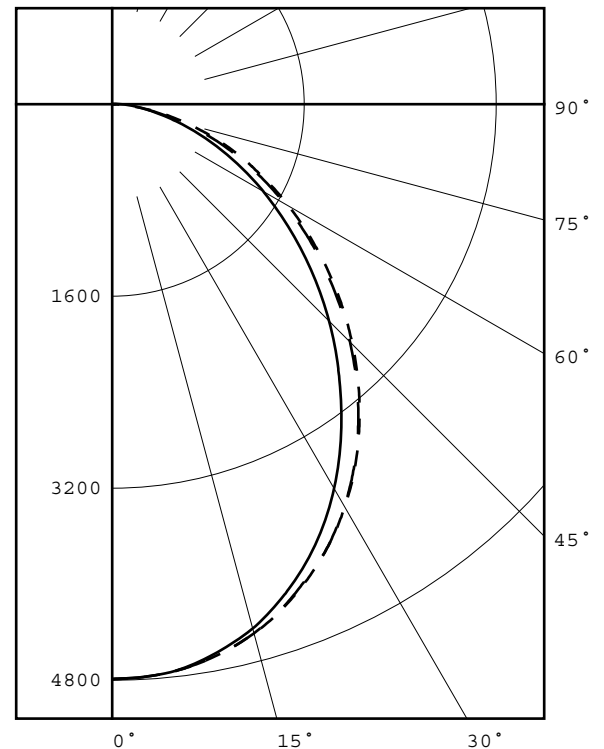
TOTAL INPUT WATTS = 92.8

EFFICACY = 125.6 Lm/W

CIE TYPE - DIRECT

PLANE : 0-DEG 90-DEG 180-DEG

SPACING CRITERIA : 1.2 1.2 1.2



#### LEGEND:

0-deg: - - - - -  
90-deg: \_\_\_\_\_  
180-deg: - - - - -

Checked X.CAO  
Approved D.WANG-MUNSON

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PLANE : 0-DEG 90-DEG  
BEAM ANGLE (50%) : 101.0 X 94.1 DEGREES  
FIELD ANGLE (10%) : 156.1 X 153.2 DEGREES



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## ZONAL LUMEN SUMMARY

0- 5	114.
5- 10	338.
10- 15	547.
15- 20	732.
20- 25	884.
25- 30	997.
30- 35	1066.
35- 40	1088.
40- 45	1069.
45- 50	1010.
50- 55	921.
55- 60	809.
60- 65	679.
65- 70	539.
70- 75	394.
75- 80	255.
80- 85	135.
85- 90	53.
90- 95	12.
95-100	1.
100-105	1.
105-110	1.
110-115	1.
115-120	1.
120-125	1.
125-130	1.
130-135	1.
135-140	1.
140-145	1.
145-150	1.
150-155	1.
155-160	1.
160-165	0.
165-170	0.
170-175	0.
175-180	0.

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### 5-DEGREE ZONAL LUMEN SUMMARY

0- 5	114
5- 10	338
10- 15	547
15- 20	732
20- 25	884
25- 30	997
30- 35	1066
35- 40	1088
40- 45	1069
45- 50	1010
50- 55	921
55- 60	809
60- 65	679
65- 70	539
70- 75	394
75- 80	255
80- 85	135
85- 90	53
90- 95	12
95-100	1
100-105	1
105-110	1
110-115	1
115-120	1
120-125	1
125-130	1
130-135	1
135-140	1
140-145	1
145-150	1
150-155	1
155-160	1
160-165	0
165-170	0
170-175	0
175-180	0

### 10-DEGREE ZONAL LUMEN SUMMARY

0- 10	452
0- 20	1732
0- 30	3614
0- 40	5767
0- 50	7846
0- 60	9577
0- 70	10795
0- 80	11444
0- 90	11633
0-100	11646
0-110	11648
0-120	11650
0-130	11651
0-140	11653
0-150	11654
0-160	11655
0-170	11656
0-180	11657

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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	109	105	101	97	107	102	99	95	98	95	92	94	92	90	91	89	87	85
2	100	92	86	80	97	90	84	79	87	82	77	83	79	75	80	77	74	72
3	91	81	74	67	89	80	73	67	77	71	66	74	69	64	72	67	63	61
4	84	73	64	58	82	71	63	57	69	62	56	66	60	56	64	59	55	53
5	78	65	56	50	75	64	56	50	62	55	49	60	54	49	58	53	48	46
6	72	59	50	44	70	58	50	44	56	49	43	54	48	43	53	47	43	41
7	67	54	45	39	65	53	45	39	51	44	39	50	43	38	48	43	38	36
8	62	49	41	35	61	48	40	35	47	40	35	46	39	34	45	39	34	32
9	58	45	37	32	57	45	37	32	43	36	31	42	36	31	41	35	31	29
10	55	42	34	29	53	41	34	29	40	33	29	39	33	28	38	33	28	27

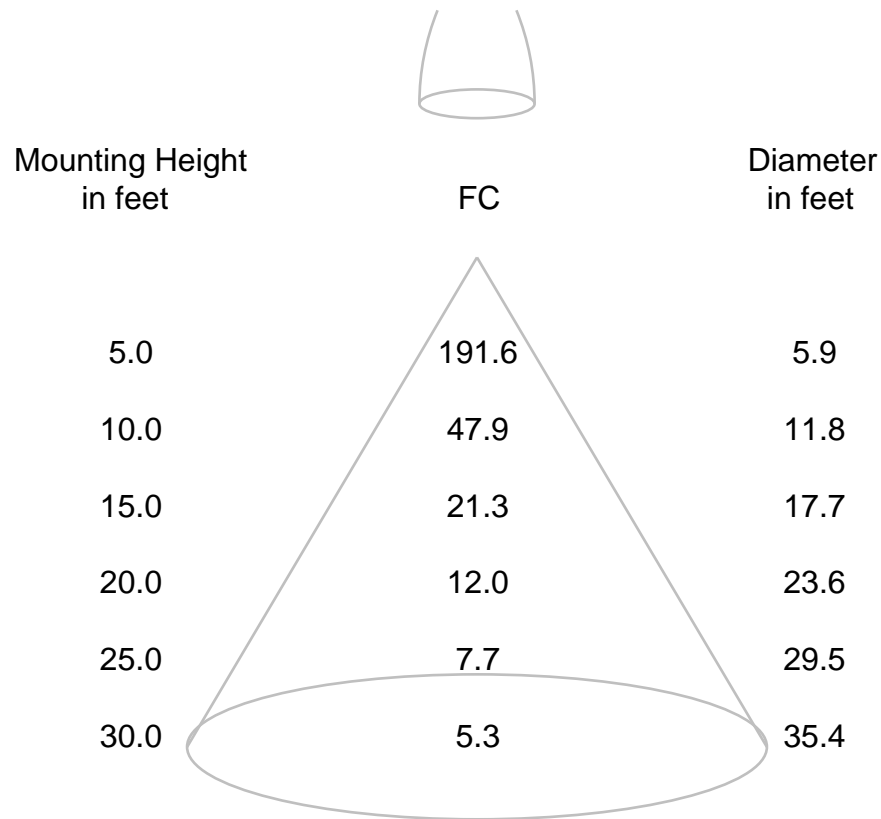
ALL CANDELA, LUMENS, LUMINANCE, AND VCP VALUES IN THIS REPORT ARE BASED ON ABSOLUTE PHOTOMETRY. THE COEFFICIENT OF UTILIZATION VALUES ARE BASED ON THE TOTAL ABSOLUTE LUMEN OUTPUT OF THIS LUMINAIRE SAMPLE.

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## CONE OF LIGHT DIAGRAM

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



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

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ADDRESS: 170 LUDLOW AVE, NORTHVALE, NJ 07647

LUMINAIRE: EXTRUDED METAL HOUSING WITH HEAT SINK FINS, FOUR WHITE CIRCUIT BOARD WITH SIXTY FOUR LEDS ON EACH BOARD, METAL REFLECTOR WITH SPECULAR FINISH, FLAT TRANSLUCENT LENS WITH FROSTED SIDE IN.

LAMP: TWO HUNDRED AND FIFTY SIX LIGHT EMITTING DIODES (LEDs).

DRIVER: RD-085-A1750

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	5/15/16
	RAB 2.0 meter Diameter Integrating Sphere, 4PI Geometry	5/15/16

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	<u>X.CAO</u>
Approved	<u>D.WANG-MUNSON</u> Lighting Engineer



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### RESULTS:

PHOTOMETRIC	
Total Integrated Flux (lumens)	11657 *
SPECTRORADIOMETRIC	
Observer	CIE 1931 2 degree
Chromaticity Ordinate x	0.3451
Chromaticity Ordinate y	0.3536
Observer	CIE 1976 2 degree
Chromaticity Ordinate u'	0.2106
Chromaticity Ordinate v'	0.4856
Correlated Color Temp CCT (K)	5006
ANSI C78.377-2008 Duv	0.001
Total Radiant Flux (milliWatts)	35206 *
ELECTRICAL	
Input Voltage (Volts AC)	120.0
Input Current (Amps AC)	0.777
Input Power (Watts)	92.8
Input Power Factor (%)	99.5
Input Current THD (%)	4.7
Input Voltage THD (%)	0.2
EFFICACY (Lumens/Watt)	
	125.6
ELECTRICAL AT MAX NONIMAL INPUT	
Input Voltage (Volts AC)	277.0
Input Current (Amps AC)	0.343
Input Power (Watts)	90.6
Input Power Factor (%)	95.4
Input Current THD (%)	11.2
Input Voltage THD (%)	0.2
Off-State Power (Watts)	0.0

COLOR RENDERING INDICES	CRI
Ra (Average 1-8)	74
R1 Light greyish red	73
R2 Dark greyish yellow	78
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	60
R9 Strong red	-18
R10 Strong yellow	48
R11 Strong green	74
R12 Strong blue	48
R13 Light yellowish pink (skin)	73
R14 Moderate olive green (leaf)	90

### \*NOTE:

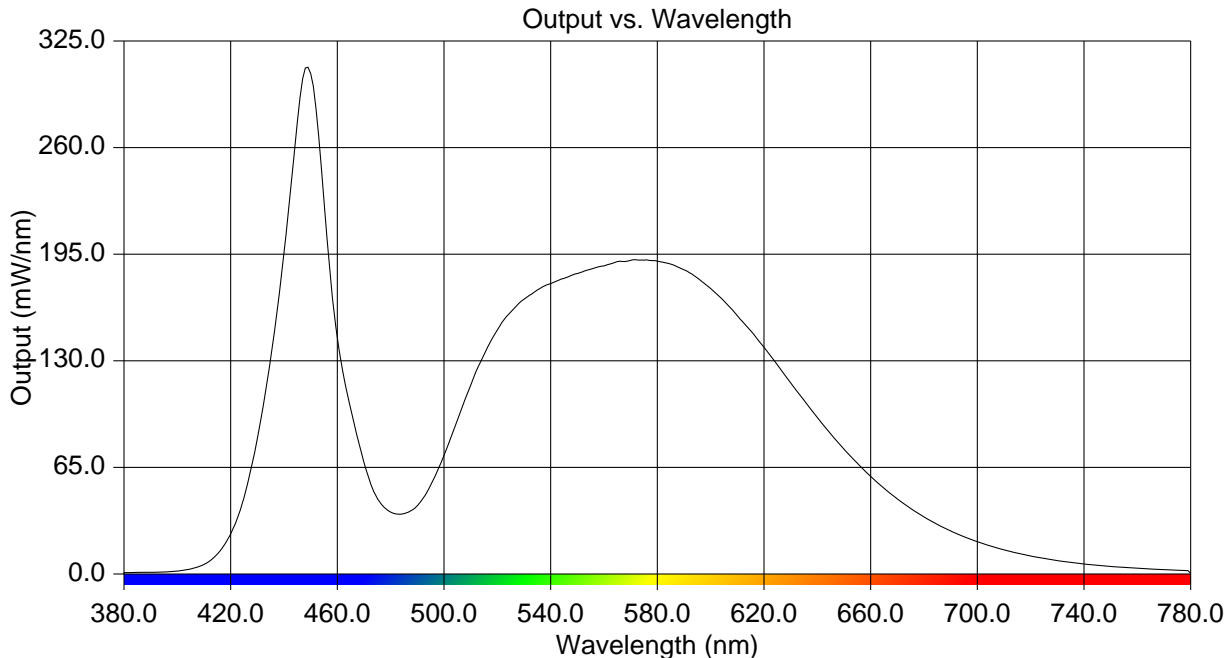
Proper calibration of integrating spheres for measuring total flux output of non-directional samples will produce reliable, repeatable results within the calibration tolerances of the equipment used. However, measurement of test samples with significant self absorption and/or directional output, even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

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### RESULTS:

Wavelength	mW per nm	Wavelength	mW per nm	Wavelength	mW per nm
380	0.808	515	133.534	650	75.993
385	0.909	520	148.690	655	67.531
390	0.995	525	159.563	660	59.586
395	1.267	530	167.431	665	52.254
400	1.823	535	173.045	670	45.772
405	3.029	540	176.942	675	39.909
410	5.802	545	180.240	680	34.775
415	12.127	550	183.102	685	30.243
420	24.435	555	185.655	690	26.199
425	46.712	560	187.735	695	22.716
430	82.524	565	190.389	700	19.663
435	131.871	570	191.140	705	16.991
440	195.805	575	191.255	710	14.678
445	275.445	580	190.669	715	12.644
450	305.008	585	188.866	720	10.965
455	227.354	590	185.369	725	9.436
460	143.777	595	180.436	730	8.213
465	100.668	600	173.856	735	7.073
470	67.866	605	166.401	740	6.116
475	46.078	610	157.397	745	5.322
480	37.744	615	148.252	750	4.592
485	36.726	620	137.867	755	3.971
490	41.615	625	127.678	760	3.466
495	53.906	630	116.404	765	2.996
500	72.492	635	105.919	770	2.622
505	93.503	640	95.249	775	2.289
510	114.940	645	85.487	780	0.347



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## CIE Chromaticity Diagram

