

REPORT NUMBER: RAB00841

ISSUE DATE: 05/07/15

PREPARED FOR: RAB LIGHTING INC.

CATALOG NUMBER: RAIL225YNW

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

LAMPS: FIVE HUNDRED AND SEVENTY SIX LIGHT EMITTING DIODES (LEDs), DATA SHOWN IS ABSOLUTE FOR THE SAMPLE PROVIDED AT RATED INPUT LED

(SEE PAGE 2 FOR MORE INFORMATION)

PAGE: 1 OF 8

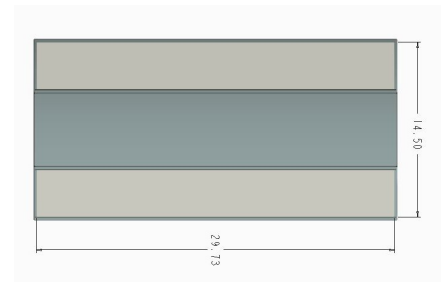
DATE SAMPLE TESTED: 05/07/15

CANDELA DISTRIBUTION

	0.0	45.0	90.0	135.0	180.0
0	10076	10076	10076	10076	10076
5	9977	10016	10065	10017	9976
15	9540	9511	9471	9498	9526
25	8665	8517	8341	8488	8646
35	7424	7137	6866	7103	7391
45	5923	5562	5203	5516	5888
55	4334	3973	3656	3964	4338
65	2804	2516	2280	2509	2801
75	1398	1236	1110	1236	1394
85	263	310	336	305	263
90	9	89	130	89	11
95	1	4	20	7	4
105	2	3	4	5	5
115	2	3	4	5	5
125	2	3	4	5	5
135	3	4	5	6	6
145	4	5	6	7	7
155	5	6	7	8	8
165	5	6	8	9	9
175	6	7	9	9	9
180	9	9	9	9	9

FLUX

951
2678
3913
4458
4290
3572
2516
1335
372
23
4
4
3
4
4
3
2
1



ZONAL LUMEN SUMMARY

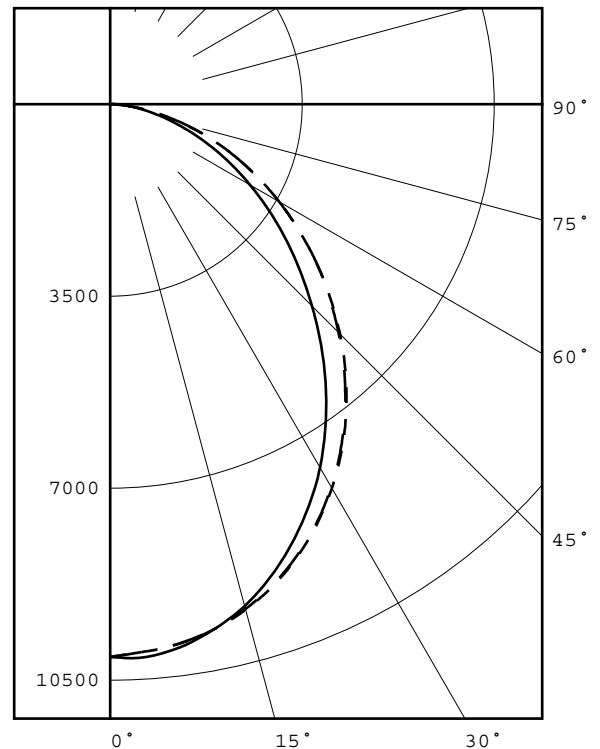
ZONE	LUMENS	%FIXT
0- 30	7542	31.3
0- 40	12000	49.7
0- 60	19861	82.3
0- 90	24084	99.8
90-120	31	0.1
90-130	34	0.1
90-150	42	0.2
90-180	47	0.2
0-180	24131	100.0

TOTAL INPUT WATTS = 224.9

EFFICACY = 107.3 Lm/W

CIE TYPE - DIRECT

PLANE : 0-DEG 90-DEG 180-DEG
SPACING CRITERIA : 1.2 1.1 1.2



LEGEND:

0-deg: - - - - -
90-deg: _____
180-deg: - - - - -

Checked X.CAO
Approved D.WANG-MUNSON

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ADDITIONAL INFORMATION

DRIVER: RD-144-Q0700-R + RD-075-A1400
NOTE: DATA SHOWN IS ABSOLUTE FOR THE SAMPLE PROVIDED.

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PLANE : 0-DEG 90-DEG
BEAM ANGLE (50%) : 101.0 X 91.8 DEGREES
FIELD ANGLE (10%) : 156.0 X 152.0 DEGREES

0.0	22.5	45.0	67.5	90.0	112.5	135.0	157.5	180.0
0.0	10076	10076	10076	10076	10076	10076	10076	10076
5.0	9977	9998	10016	10058	10065	10060	10017	10002
10.0	9813	9823	9834	9850	9834	9852	9826	9824
15.0	9540	9534	9511	9501	9471	9498	9498	9533
20.0	9157	9131	9070	9007	8960	9005	9048	9129
25.0	8665	8616	8517	8413	8341	8405	8488	8615
30.0	8083	8012	7867	7715	7648	7704	7851	8013
35.0	7424	7329	7137	6944	6866	6954	7103	7327
40.0	6695	6587	6354	6151	6037	6143	6324	6617
45.0	5923	5803	5562	5325	5203	5316	5516	5832
50.0	5128	5007	4759	4532	4417	4507	4750	5038
55.0	4334	4256	3973	3756	3656	3735	3964	4245
60.0	3557	3482	3223	3032	2944	3012	3215	3470
65.0	2804	2740	2516	2357	2280	2353	2509	2729
70.0	2084	2032	1852	1727	1662	1723	1847	2024
75.0	1398	1369	1236	1157	1110	1154	1236	1359
80.0	769	768	701	674	650	673	697	760
85.0	263	293	310	337	336	336	305	287
90.0	9	44	89	124	130	124	89	45
95.0	1	1	4	16	20	17	7	4
100.0	1	2	2	3	4	4	5	5
105.0	2	2	3	3	4	5	5	5
110.0	2	2	2	3	4	4	5	5
115.0	2	2	3	3	4	5	5	5
120.0	2	2	2	3	4	4	5	5
125.0	2	2	3	3	4	4	5	5
130.0	2	3	3	4	4	5	5	6
135.0	3	3	4	4	5	5	6	6
140.0	3	4	4	5	5	6	6	7
145.0	4	4	5	5	6	6	7	7
150.0	4	4	5	6	6	7	7	8
155.0	5	5	6	6	7	8	8	8
160.0	5	5	6	7	8	8	8	8
165.0	5	6	6	7	8	8	9	9
170.0	5	6	7	8	9	9	9	9
175.0	6	6	7	8	9	9	9	9
180.0	9	9	9	9	9	9	9	9

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ZONAL LUMEN SUMMARY

0- 5	240.
5- 10	710.
10- 15	1147.
15- 20	1531.
20- 25	1842.
25- 30	2071.
30- 35	2207.
35- 40	2251.
40- 45	2206.
45- 50	2084.
50- 55	1902.
55- 60	1669.
60- 65	1403.
65- 70	1113.
70- 75	813.
75- 80	522.
80- 85	271.
85- 90	101.
90- 95	21.
95-100	3.
100-105	2.
105-110	2.
110-115	2.
115-120	2.
120-125	2.
125-130	2.
130-135	2.
135-140	2.
140-145	2.
145-150	2.
150-155	2.
155-160	1.
160-165	1.
165-170	1.
170-175	1.
175-180	0.

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5-DEGREE ZONAL LUMEN SUMMARY

0- 5	240
5- 10	710
10- 15	1147
15- 20	1531
20- 25	1842
25- 30	2071
30- 35	2207
35- 40	2251
40- 45	2206
45- 50	2084
50- 55	1902
55- 60	1669
60- 65	1403
65- 70	1113
70- 75	813
75- 80	522
80- 85	271
85- 90	101
90- 95	21
95-100	3
100-105	2
105-110	2
110-115	2
115-120	2
120-125	2
125-130	2
130-135	2
135-140	2
140-145	2
145-150	2
150-155	2
155-160	1
160-165	1
165-170	1
170-175	1
175-180	0

10-DEGREE ZONAL LUMEN SUMMARY

0- 10	951
0- 20	3629
0- 30	7542
0- 40	12000
0- 50	16290
0- 60	19861
0- 70	22377
0- 80	23712
0- 90	24084
0-100	24107
0-110	24111
0-120	24114
0-130	24118
0-140	24122
0-150	24125
0-160	24128
0-170	24130
0-180	24131

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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	103	99	96	98	95	93	94	92	90	91	89	87	85
2	100	92	86	80	97	90	84	79	87	82	77	83	79	76	80	77	74	72
3	92	81	74	67	89	80	73	67	77	71	66	74	69	65	72	67	63	61
4	84	73	64	58	82	71	63	57	69	62	57	66	61	56	64	59	55	53
5	78	65	57	50	76	64	56	50	62	55	49	60	54	49	58	53	48	46
6	72	59	50	44	70	58	50	44	56	49	44	55	48	43	53	47	43	41
7	67	54	45	39	65	53	45	39	51	44	39	50	43	39	49	43	38	36
8	62	49	41	35	61	48	41	35	47	40	35	46	39	35	45	39	34	33
9	58	45	37	32	57	45	37	32	44	36	32	42	36	31	41	36	31	29
10	55	42	34	29	53	41	34	29	40	34	29	39	33	29	39	33	29	27

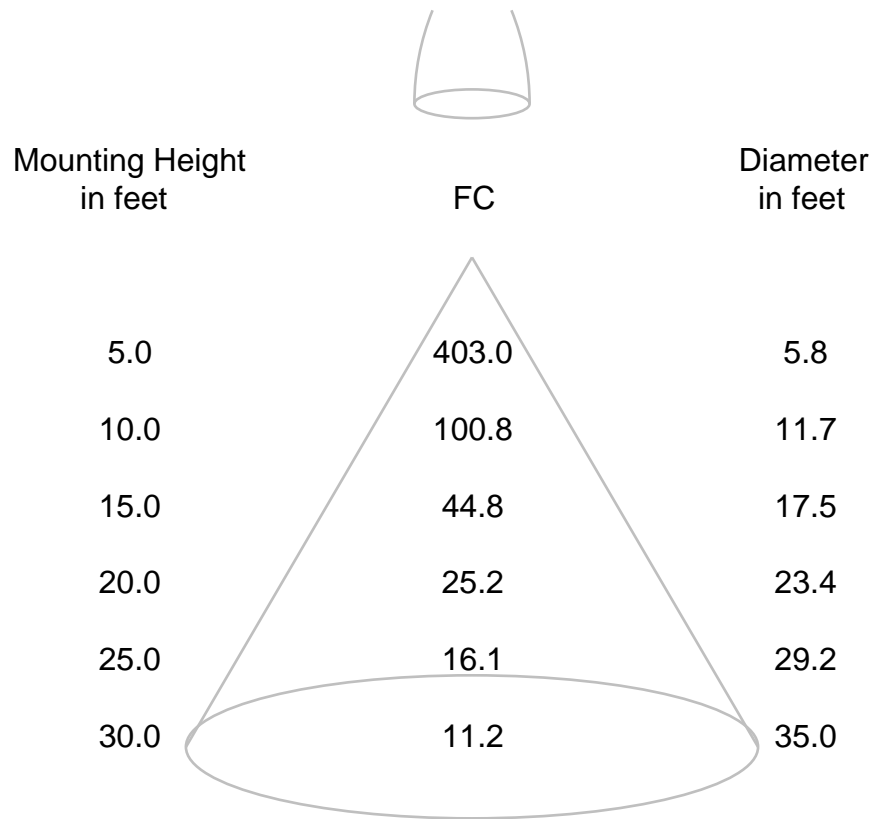
ALL CANDELA, LUMENS, LUMINANCE, AND VCP VALUES IN THIS REPORT ARE BASED ON ABSOLUTE PHOTOMETRY. THE COEFFICIENT OF UTILIZATION VALUES ARE BASED ON THE TOTAL ABSOLUTE LUMEN OUTPUT OF THIS LUMINAIRE SAMPLE.

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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.

REPORT NUMBER: RAB00844
DATE: 5/19/2015
PREPARED FOR: RAB LIGHTING INC.
CATALOG NUMBER: RAIL225YNW

ADDRESS: 170 LUDLOW AVE, NORTHVALE, NJ 07647

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

LAMP: FIVE HUNDRED AND SEVENTY SIX LIGHT EMITTING DIODES (LEDs).

DRIVER: RD-144-Q0700-R + RD-075-A1400

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)	24131 *
SPECTRORADIOMETRIC	
Observer	CIE 1931 2 degree
Chromaticity Ordinate x	0.4054
Chromaticity Ordinate y	0.3873
Observer	CIE 1976 2 degree
Chromaticity Ordinate u'	0.2372
Chromaticity Ordinate v'	0.5098
Correlated Color Temp CCT (K)	3470
ANSI C78.377-2008 Duv	-0.002
Total Radiant Flux (milliWatts)	75649 *
ELECTRICAL	
Input Voltage (Volts AC)	120.0
Input Current (Amps AC)	1.88
Input Power (Watts)	224.9
Input Power Factor (%)	99.7
Input Current THD (%)	4.8
Input Voltage THD (%)	0.2
EFFICACY (Lumens/Watt)	
	107.3
ELECTRICAL AT MAX NONIMAL INPUT	
Input Voltage (Volts AC)	277.0
Input Current (Amps AC)	0.839
Input Power (Watts)	220.7
Input Power Factor (%)	95.0
Input Current THD (%)	10.3
Input Voltage THD (%)	0.2
Off-State Power (Watts)	0.0

COLOR RENDERING INDICES	CRI
Ra (Average 1-8)	82
R1 Light greyish red	81
R2 Dark greyish yellow	87
R3 Strong yellowish green	92
R4 Moderate yellowish green	82
R5 Light bluish green	81
R6 Light blue	83
R7 Light violet	86
R8 Light reddish purple	66
R9 Strong red	17
R10 Strong yellow	70
R11 Strong green	80
R12 Strong blue	63
R13 Light yellowish pink (skin)	82
R14 Moderate olive green (leaf)	95

*NOTE:

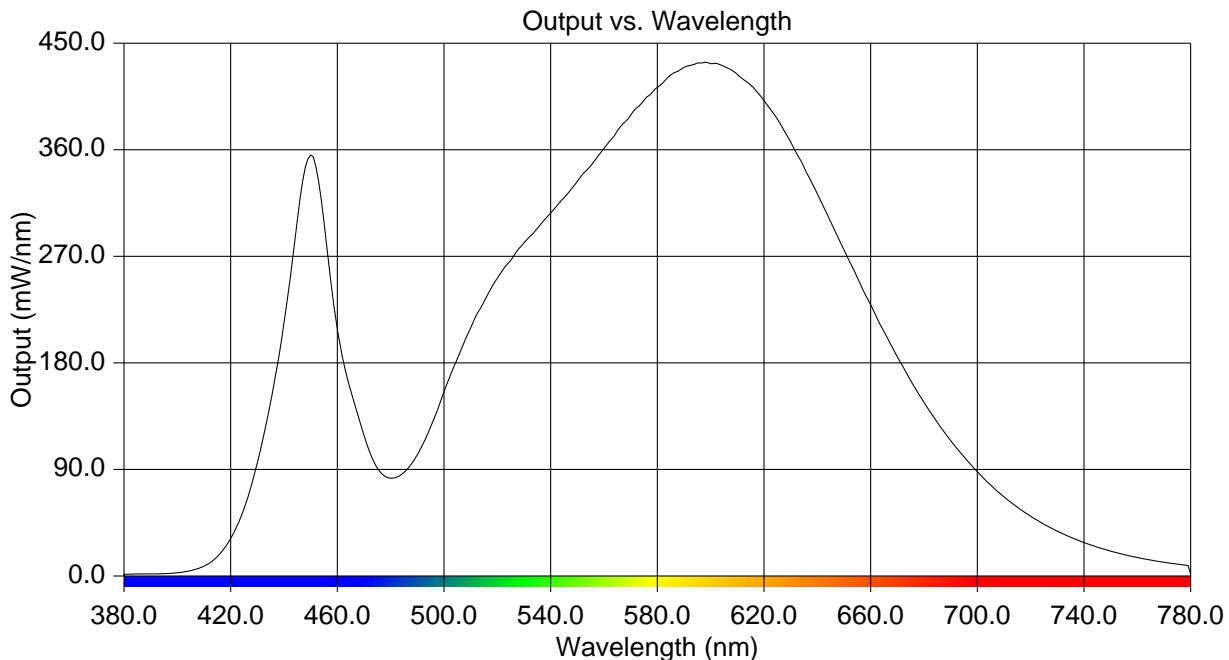
Proper calibration of integrating spheres for measuring total flux output of non-directional samples will produce reliable, repeatable results within the calibration tolerances of the equipment used. However, measurement of test samples with significant self absorption and/or directional output, even 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	1.363	515	231.243	650	275.404
385	1.605	520	251.207	655	251.760
390	1.705	525	266.128	660	229.081
395	1.954	530	281.009	665	206.264
400	2.752	535	293.290	670	185.001
405	4.376	540	306.318	675	164.915
410	8.210	545	319.064	680	146.408
415	16.393	550	332.721	685	129.716
420	31.497	555	345.951	690	114.142
425	56.993	560	360.516	695	100.548
430	95.346	565	375.702	700	87.981
435	147.039	570	388.728	705	76.810
440	213.693	575	401.428	710	66.817
445	300.288	580	412.267	715	58.034
450	355.261	585	422.697	720	50.338
455	298.692	590	429.141	725	43.633
460	208.561	595	432.868	730	37.817
465	156.614	600	432.261	735	32.693
470	118.467	605	430.214	740	28.220
475	91.110	610	423.198	745	24.353
480	82.500	615	414.264	750	21.003
485	87.478	620	401.063	755	18.053
490	102.220	625	385.424	760	15.576
495	125.974	630	366.185	765	13.441
500	155.469	635	344.930	770	11.625
505	183.357	640	322.324	775	10.006
510	209.348	645	298.638	780	1.505



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CIE Chromaticity Diagram

