

REPORT NUMBER: RAB02474

ISSUE DATE: 09/16/16

PREPARED FOR: RAB LIGHTING INC.

CATALOG NUMBER: RAIL95NW/480/D10 (ALSO APPLIES TO 347/RCL)

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

LAMPS: TWO HUNDRED AND EIGHTY EIGHT LIGHT EMITTING DIODES (LEDs).

NOTE: DATA SHOWN IS ABSOLUTE FOR THE SAMPLE PROVIDED.

TOTAL INPUT WATTS = 93.801 W AT 347.0 VAC.

(SEE PAGE 2 FOR MORE INFORMATION)

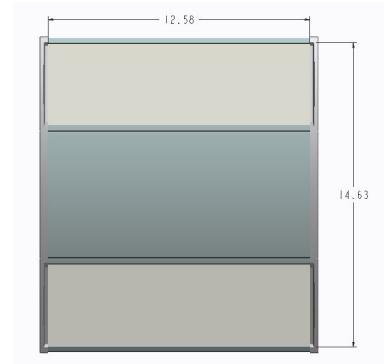
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CANDELA DISTRIBUTION

	0.0	22.5	45.0	67.5	90.0
0	5224	5224	5224	5224	5224
5	5212	5204	5199	5188	5186
15	4969	4951	4929	4900	4893
25	4465	4435	4387	4331	4322
35	3779	3735	3660	3572	3552
45	2972	2918	2828	2726	2697
55	2153	2102	2014	1913	1901
65	1390	1353	1276	1203	1185
75	679	660	629	597	589
85	127	145	186	216	224
90	8	31	71	99	111

FLUX

493
1387
2018
2285
2181
1804
1269
674
211



ZONAL LUMEN SUMMARY

ZONE	LUMENS	%FIXT
0- 30	3898	31.6
0- 40	6183	50.1
0- 60	10168	82.5
0- 90	12331	100.0
90-180	0	0.0
0-180	12331	100.0

TOTAL INPUT WATTS = 93.8

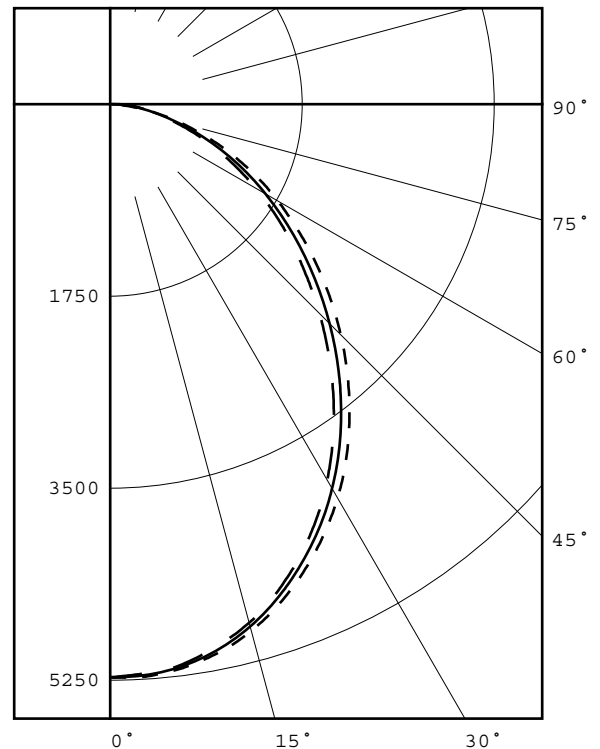
EFFICACY = 131.5 Lm/W

CIE TYPE - DIRECT

PLANE	: 0-DEG	90-DEG
SPACING CRITERIA	: 1.2	1.1
PLANE	: 0-DEG	90-DEG
LUMINOUS LENGTH	: 14.630	12.580
HEIGHT OF SIDE	: 0.520	0.520

LUMINANCE DATA IN CANDELA/SQ METER

ANGLE IN DEG	AVERAGE 0-DEG	AVERAGE 45-DEG	AVERAGE 90-DEG
45	34170.	32424.	30836.
55	30075.	28023.	26347.
65	25728.	23483.	21684.
75	19500.	17893.	16598.
85	8724.	12482.	14695.



LEGEND:

0-deg:	---
45-deg:	---
90-deg:	---

Checked

X.CAO

Approved

D.WANG-MUNSON

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ADDITIONAL INFORMATION

LED DRIVER: RDD-096-A3600-240C
TEST PROCEDURE: IESNA LM-79-08
ACCREDITED LABORATORY CODE 201058-0
TEST DISTANCE : 28.25 FEET

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.

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PLANE : 0-DEG 90-DEG
BEAM ANGLE (50%) : 98.6 X 92.0 DEGREES
FIELD ANGLE (10%) : 154.9 X 152.8 DEGREES

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CANDELA DISTRIBUTION

	0.0	22.5	45.0	67.5	90.0
0.0	5224	5224	5224	5224	5224
2.5	5230	5224	5219	5209	5205
5.0	5212	5204	5199	5188	5186
7.5	5178	5168	5160	5147	5144
10.0	5125	5115	5102	5080	5072
12.5	5058	5043	5025	4998	4990
15.0	4969	4951	4929	4900	4893
17.5	4864	4843	4815	4780	4777
20.0	4743	4719	4684	4641	4636
22.5	4610	4584	4542	4493	4486
25.0	4465	4435	4387	4331	4322
27.5	4311	4276	4225	4158	4146
30.0	4145	4106	4045	3972	3956
32.5	3968	3925	3858	3776	3758
35.0	3779	3735	3660	3572	3552
37.5	3582	3537	3456	3362	3340
40.0	3382	3334	3249	3151	3126
42.5	3178	3127	3039	2938	2911
45.0	2972	2918	2828	2726	2697
47.5	2765	2710	2619	2516	2487
50.0	2558	2504	2412	2309	2282
52.5	2353	2301	2209	2106	2092
55.0	2153	2102	2014	1913	1901
57.5	1954	1911	1822	1730	1714
60.0	1766	1717	1634	1547	1531
62.5	1580	1535	1455	1374	1353
65.0	1390	1353	1276	1203	1185
67.5	1203	1170	1103	1042	1024
70.0	1022	989	935	884	869
72.5	838	823	779	738	723
75.0	679	660	629	597	589
77.5	521	508	492	473	471
80.0	374	370	367	369	372
82.5	239	245	264	282	291
85.0	127	145	186	216	224
87.5	48	75	124	153	162
90.0	8	31	71	99	111

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ZONAL LUMEN SUMMARY

0- 5	125.
5- 10	368.
10- 15	595.
15- 20	792.
20- 25	951.
25- 30	1067.
30- 35	1134.
35- 40	1151.
40- 45	1124.
45- 50	1057.
50- 55	961.
55- 60	843.
60- 65	708.
65- 70	561.
70- 75	409.
75- 80	265.
80- 85	146.
85- 90	65.

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5-DEGREE ZONAL LUMEN SUMMARY

0- 5	125
5- 10	368
10- 15	595
15- 20	792
20- 25	951
25- 30	1067
30- 35	1134
35- 40	1151
40- 45	1124
45- 50	1057
50- 55	961
55- 60	843
60- 65	708
65- 70	561
70- 75	409
75- 80	265
80- 85	146
85- 90	65
90- 95	9
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	493
0- 20	1880
0- 30	3898
0- 40	6183
0- 50	8364
0- 60	10168
0- 70	11437
0- 80	12111
0- 90	12322
0-100	12331
0-110	12331
0-120	12331
0-130	12331
0-140	12331
0-150	12331
0-160	12331
0-170	12331
0-180	12331

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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	84	79	76	81	77	74	72
3	92	82	74	68	89	80	73	67	77	71	66	74	69	65	72	67	64	61
4	84	73	64	58	82	71	64	58	69	62	57	67	61	56	65	59	55	53
5	78	65	57	50	76	64	56	50	62	55	50	60	54	49	58	53	48	46
6	72	59	51	44	70	58	50	44	56	49	44	55	48	43	53	47	43	41
7	67	54	45	39	65	53	45	39	52	44	39	50	44	39	49	43	38	37
8	62	49	41	35	61	49	41	35	47	40	35	46	40	35	45	39	35	33
9	58	45	37	32	57	45	37	32	44	37	32	43	36	32	42	36	31	30
10	55	42	34	29	54	42	34	29	41	34	29	40	33	29	39	33	29	27

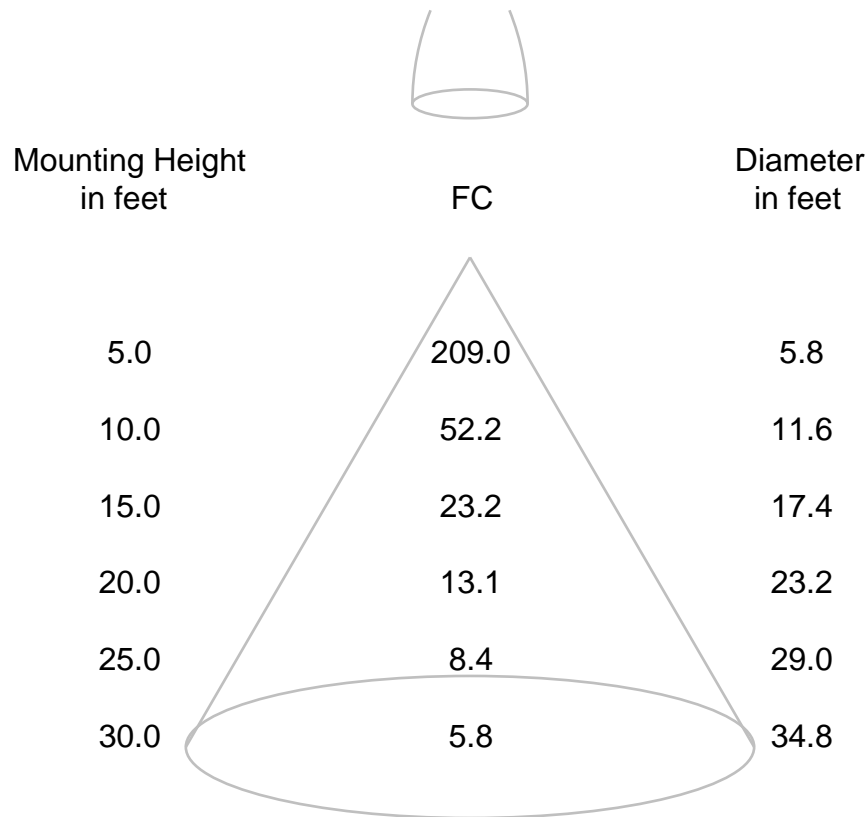
ALL CANDELA, LUMENS, LUMINANCE, AND VCP VALUES IN THIS REPORT ARE BASED ON ABSOLUTE PHOTOMETRY. THE COEFFICIENT OF UTILIZATION VALUES ARE BASED ON THE TOTAL ABSOLUTE LUMEN OUTPUT OF THIS LUMINAIRE SAMPLE.

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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.

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 CATALOG NUMBER: RAIL95NW/480/D10 (ALSO APPLIES TO 347/RCL)

ADDRESS: 170 LUDLOW AVE, NORTHVALE, NJ 07647

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

LAMP: TWO HUNDRED AND EIGHTY EIGHT LIGHT EMITTING DIODES (LEDs).

DRIVER: RDD-096-A3600-240C

OBJECT OF TEST: DATA SHOWN IS ABSOLUTE FOR THE SAMPLE PROVIDED AT THE RATED INPUT VOLTAGES (347.0 AND 480.0 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	2/26/17
	OCEAN OPTICS QE65PRO Spectroradiometer	8/11/17
	RAB 2.0 meter Diameter Integrating Sphere, 4PI Geometry	8/11/17

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 (480.0 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)	12331 *
SPECTRORADIOMETRIC	
Observer	CIE 1931 2 degree
Chromaticity Ordinate x	0.3779
Chromaticity Ordinate y	0.3702
Observer	CIE 1976 2 degree
Chromaticity Ordinate u'	0.2261
Chromaticity Ordinate v'	0.4983
Correlated Color Temp CCT (K)	4020
ANSI C78.377-2008 Duv	-0.002
Total Radiant Flux (milliWatts)	36332 *
ELECTRICAL	
Input Voltage (Volts AC)	347.0
Input Current (Amps AC)	0.273
Input Power (Watts)	93.8
Input Power Factor (%)	99.1
Input Current THD (%)	10.2
Input Voltage THD (%)	0.2
EFFICACY (Lumens/Watt)	
	131.5
ELECTRICAL AT MAX NONIMAL INPUT	
Input Voltage (Volts AC)	480.0
Input Current (Amps AC)	0.203
Input Power (Watts)	93.6
Input Power Factor (%)	95.9
Input Current THD (%)	12.4
Input Voltage THD (%)	0.2
Off-State Power (Watts)	0.0

COLOR RENDERING INDICES	CRI
Ra (Average 1-8)	77
R1 Light greyish red	74
R2 Dark greyish yellow	84
R3 Strong yellowish green	92
R4 Moderate yellowish green	75
R5 Light bluish green	75
R6 Light blue	78
R7 Light violet	82
R8 Light reddish purple	55
R9 Strong red	-18
R10 Strong yellow	63
R11 Strong green	72
R12 Strong blue	52
R13 Light yellowish pink (skin)	76
R14 Moderate olive green (leaf)	96

*NOTE:

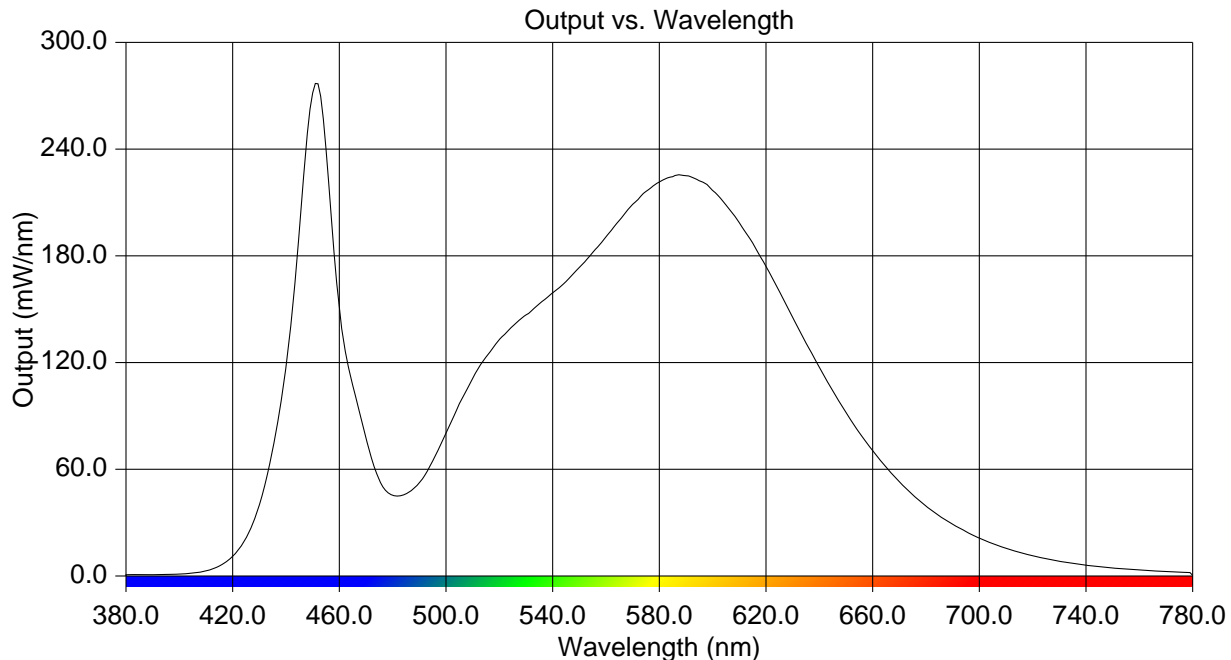
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RESULTS:

Wavelength	mW per nm	Wavelength	mW per nm	Wavelength	mW per nm
380	0.691	515	123.159	650	92.012
385	0.725	520	132.988	655	80.606
390	0.789	525	140.596	660	70.622
395	0.893	530	146.866	665	61.153
400	1.099	535	153.119	670	53.047
405	1.591	540	159.266	675	45.728
410	2.847	545	165.620	680	39.271
415	5.628	550	173.720	685	33.881
420	11.067	555	181.954	690	29.035
425	21.377	560	190.798	695	24.982
430	40.046	565	199.981	700	21.259
435	71.019	570	209.067	705	18.223
440	117.999	575	216.334	710	15.557
445	194.156	580	221.716	715	13.265
450	271.712	585	224.606	720	11.388
455	240.242	590	225.120	725	9.715
460	150.488	595	222.309	730	8.329
465	107.363	600	216.904	735	7.147
470	77.646	605	208.668	740	6.125
475	54.050	610	198.695	745	5.264
480	45.419	615	187.345	750	4.504
485	46.230	620	174.329	755	3.876
490	52.464	625	160.132	760	3.314
495	64.676	630	145.442	765	2.864
500	80.477	635	131.057	770	2.481
505	96.905	640	117.262	775	2.167
510	111.180	645	104.215	780	0.326



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CIE Chromaticity Diagram

