

REPORT NUMBER: RAB03430

ISSUE DATE: 05/25/17

PREPARED FOR: RAB LIGHTING INC.

PAGE: 1 OF 9

DATE SAMPLE TESTED: 05/25/17

CATALOG NUMBER: RAIL400NW/480/D10, RAILP400NW/480/D10 (Standard Distribution) (ALSO APPLIES TO 347 RCL)

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

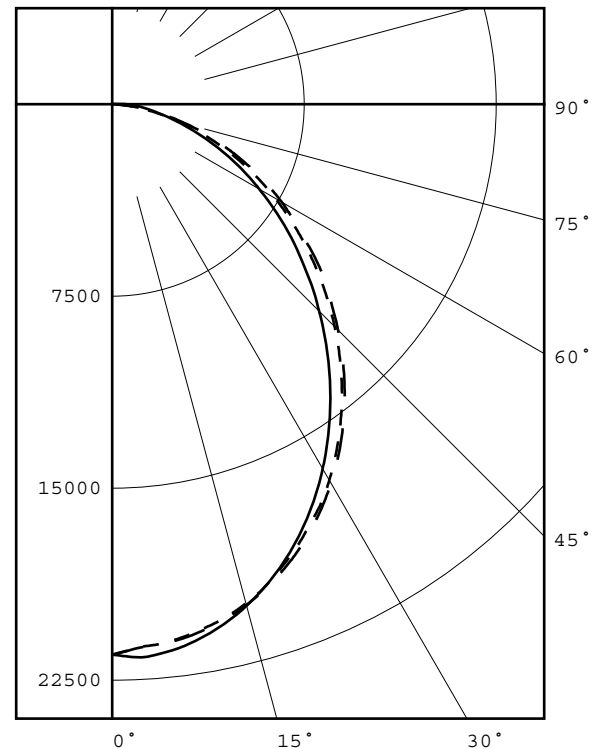
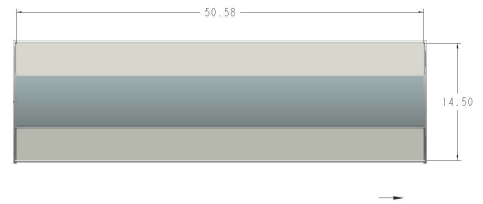
LAMPS: TWELVE HUNDRED LIGHT EMITTING DIODES (LEDS).

\*(SEE PAGE 2 FOR MORE INFORMATION)\*

### CANDELA DISTRIBUTION

	0.0	45.0	90.0	135.0	180.0	
0	21501	21501	21501	21501	21501	
5	21167	21403	21544	21428	21200	2029
15	20186	20270	20283	20329	20249	5715
25	18190	18100	17935	18198	18357	8350
35	15501	15162	14826	15290	15667	9520
45	12286	11842	11431	11984	12478	9205
55	8973	8556	8186	8713	9180	7738
65	5773	5464	5195	5621	6049	5513
75	2797	2699	2635	2829	3034	2971
85	453	839	1074	904	592	974
90	2	326	537	372	17	
95	4	38	149	55	5	111
105	7	7	7	8	8	7
115	8	8	7	9	10	8
125	10	9	8	10	11	9
135	13	12	12	13	14	10
145	17	17	16	18	19	11
155	21	21	21	22	23	10
165	25	25	26	26	26	7
175	27	28	32	29	29	3
180	30	30	30	30	30	

### FLUX



LEGEND:

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

### ZONAL LUMEN SUMMARY

ZONE	LUMENS	%FIXT
0- 30	16094	30.8
0- 40	25614	49.1
0- 60	42557	81.5
0- 90	52015	99.7
90-120	126	0.2
90-130	135	0.3
90-150	155	0.3
90-180	175	0.3
0-180	52191	100.0

TOTAL INPUT WATTS = 398.4

EFFICACY = 131.0 Lm/W

CIE TYPE - DIRECT

PLANE : 0-DEG 90-DEG 180-DEG

SPACING CRITERIA : 1.2 1.1 1.2

Checked X.CAO  
Approved D.WANG-MUNSON

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ADDITIONAL INFORMATION

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.

NOTE: DATA SHOWN IS ABSOLUTE FOR THE SAMPLE PROVIDED.

TOTAL INPUT WATTS = 398.36 W AT 347.0 VAC.

LED DRIVER: 4X RDD-096-A3600-240C

TEST PROCEDURE: IESNA LM-79-08

LM-80 DATA AVAILABLE FROM MANUFACTURER FOR SOLID STATE SOURCE

AMBIENT: 25.0

ACCREDITED LABORATORY CODE 201058-0

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PLANE : 0-DEG 90-DEG  
BEAM ANGLE (50%) : 99.7 X 93.8 DEGREES  
FIELD ANGLE (10%): 155.5 X 154.6 DEGREES

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PLANE : 0-DEG 90-DEG  
LUMINOUS LENGTH :50.580 14.500

LUMINANCE DATA IN CANDELA/SQ METER

ANGLE IN DEG	AVERAGE 0-DEG	AVERAGE 90-DEG	AVERAGE 180-DEG
45	36707.	34153.	37281.
55	33050.	30151.	33813.
65	28859.	25970.	30239.
75	22831.	21509.	24766.
85	10981.	26034.	14350.

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[illegible]

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## ZONAL LUMEN SUMMARY

0- 5	513.
5- 10	1516.
10- 15	2449.
15- 20	3266.
20- 25	3931.
25- 30	4419.
30- 35	4711.
35- 40	4809.
40- 45	4724.
45- 50	4481.
50- 55	4108.
55- 60	3630.
60- 65	3070.
65- 70	2443.
70- 75	1793.
75- 80	1178.
80- 85	666.
85- 90	308.
90- 95	96.
95-100	14.
100-105	4.
105-110	4.
110-115	4.
115-120	4.
120-125	4.
125-130	4.
130-135	5.
135-140	5.
140-145	5.
145-150	5.
150-155	5.
155-160	5.
160-165	4.
165-170	3.
170-175	2.
175-180	1.

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### 5-DEGREE ZONAL LUMEN SUMMARY

0- 5	513
5- 10	1516
10- 15	2449
15- 20	3266
20- 25	3931
25- 30	4419
30- 35	4711
35- 40	4809
40- 45	4724
45- 50	4481
50- 55	4108
55- 60	3630
60- 65	3070
65- 70	2443
70- 75	1793
75- 80	1178
80- 85	666
85- 90	308
90- 95	96
95-100	14
100-105	4
105-110	4
110-115	4
115-120	4
120-125	4
125-130	4
130-135	5
135-140	5
140-145	5
145-150	5
150-155	5
155-160	5
160-165	4
165-170	3
170-175	2
175-180	1

### 10-DEGREE ZONAL LUMEN SUMMARY

0- 10	2029
0- 20	7745
0- 30	16094
0- 40	25614
0- 50	34820
0- 60	42557
0- 70	48071
0- 80	51041
0- 90	52015
0-100	52126
0-110	52133
0-120	52142
0-130	52150
0-140	52160
0-150	52171
0-160	52181
0-170	52188
0-180	52191

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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	100	97	106	102	99	95	98	95	92	94	92	89	90	88	87	84
2	100	92	85	80	97	90	84	79	86	81	77	83	79	75	80	76	73	71
3	91	81	73	67	89	80	72	66	77	70	65	74	68	64	71	67	63	61
4	84	72	64	57	82	71	63	57	68	62	56	66	60	55	64	59	55	52
5	77	65	56	50	75	64	56	49	62	54	49	60	53	48	58	52	48	46
6	72	59	50	44	70	58	49	44	56	49	43	54	48	43	53	47	42	40
7	67	53	45	39	65	53	44	39	51	44	38	50	43	38	48	42	38	36
8	62	49	41	35	60	48	40	35	47	40	35	46	39	34	44	38	34	32
9	58	45	37	32	57	44	37	31	43	36	31	42	36	31	41	35	31	29
10	55	42	34	29	53	41	34	29	40	33	28	39	33	28	38	32	28	26

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.

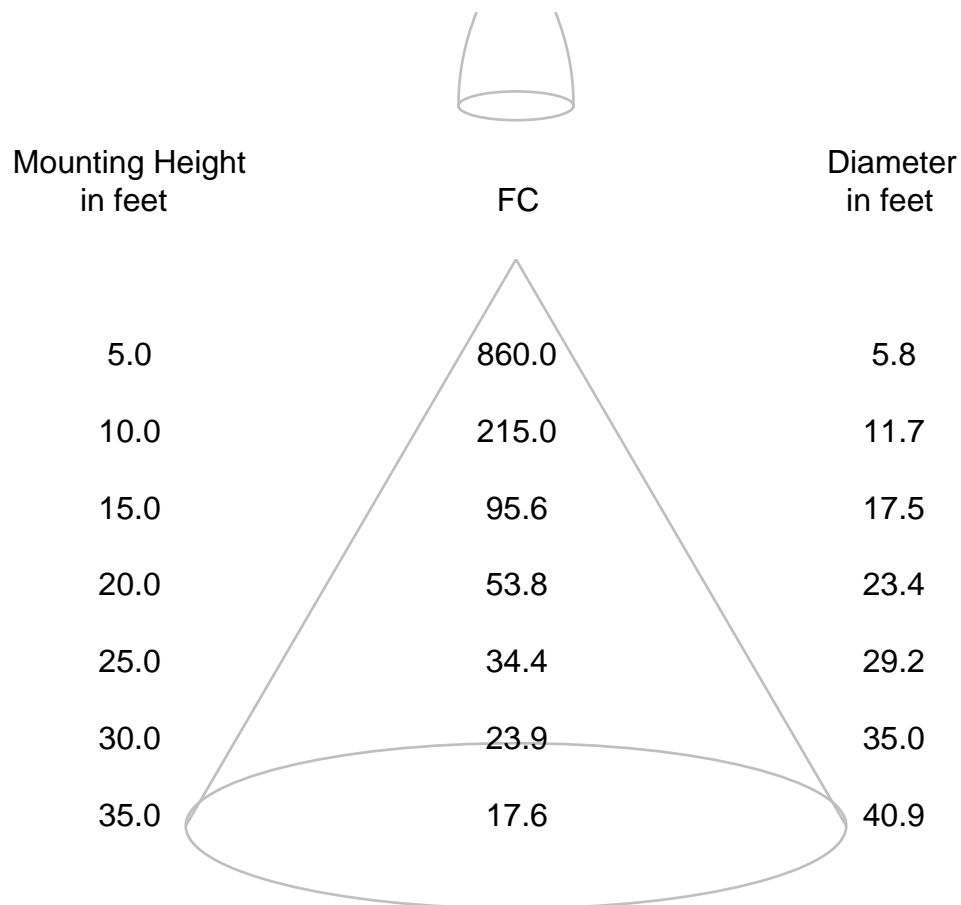


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## CONE OF LIGHT DIAGRAM

(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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PREPARED FOR: RAB LIGHTING INC.  
CATALOG NUMBER: RAIL400NW/480/D10, RAILP400NW/480/D10 (Standard Distribution) (ALSO APPLIES TO 347 RCL)

ADDRESS: 170 LUDLOW AVE, NORTHVALE, NJ 07647

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

LAMP: TWELVE HUNDRED LIGHT EMITTING DIODES (LEDS).

DRIVER: 4X 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	3/01/18
	OCEAN OPTICS QE65PRO Spectroradiometer	05/19/18
	RAB 2.0 meter Diameter Integrating Sphere, 4PI Geometry	05/19/18

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:

<b>PHOTOMETRIC</b>	
Total Integrated Flux (lumens)	52191 *
<b>SPECTRORADIOMETRIC</b>	
Observer	CIE 1931 2 degree
Chromaticity Ordinate x	0.3768
Chromaticity Ordinate y	0.3696
Observer	CIE 1976 2 degree
Chromaticity Ordinate u'	0.2256
Chromaticity Ordinate v'	0.4979
Correlated Color Temp CCT (K)	4047
ANSI C78.377-2008 Duv	-0.002
Total Radiant Flux (milliWatts)	154638 *
<b>ELECTRICAL</b>	
Input Voltage (Volts AC)	347.0
Input Current (Amps AC)	1.16
Input Power (Watts)	398.4
Input Power Factor (%)	99.2
Input Current THD (%)	9.7
Input Voltage THD (%)	0.2
<b>EFFICACY (Lumens/Watt)</b>	
	131.0
<b>ELECTRICAL AT MAX NONIMAL INPUT</b>	
Input Voltage (Volts AC)	480.0
Input Current (Amps AC)	0.857
Input Power (Watts)	396.6
Input Power Factor (%)	96.4
Input Current THD (%)	12.4
Input Voltage THD (%)	0.2
<b>Off-State Power (Watts)</b>	
	0.0

COLOR RENDERING INDICES	CRI
Ra (Average 1-8)	78
R1 Light greyish red	75
R2 Dark greyish yellow	87
R3 Strong yellowish green	93
R4 Moderate yellowish green	74
R5 Light bluish green	76
R6 Light blue	81
R7 Light violet	81
R8 Light reddish purple	55
R9 Strong red	-16
R10 Strong yellow	68
R11 Strong green	71
R12 Strong blue	54
R13 Light yellowish pink (skin)	78
R14 Moderate olive green (leaf)	97

### \*NOTE:

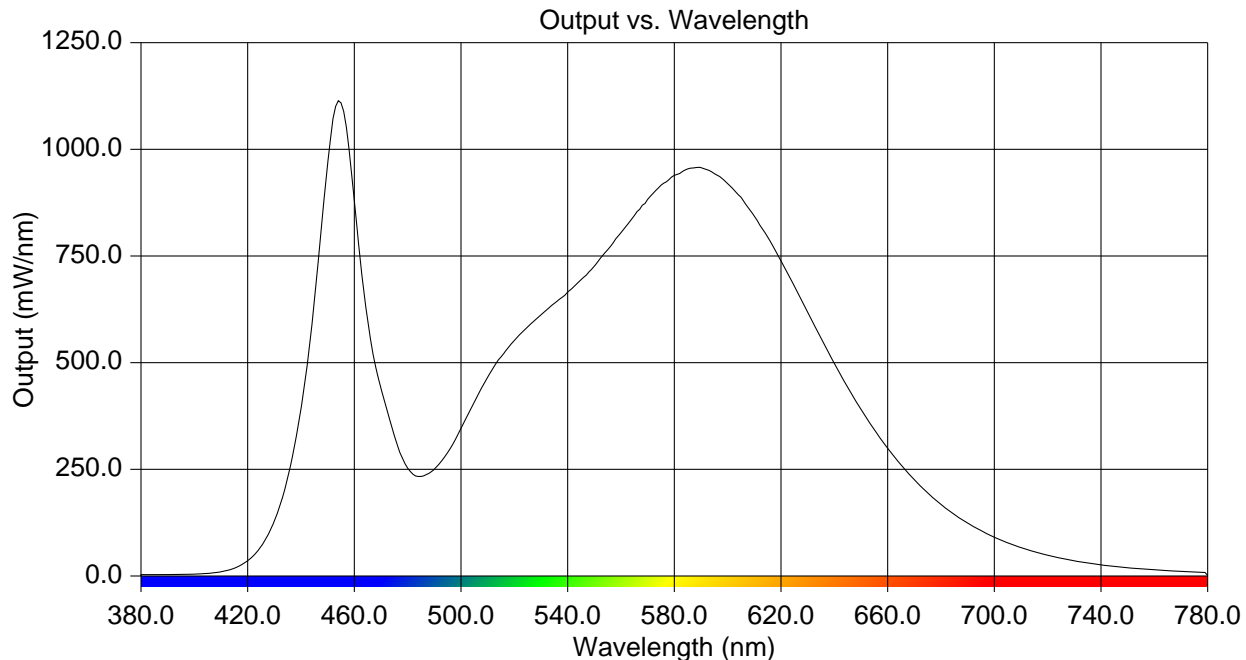
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### RESULTS:

Wavelength	mW per nm	Wavelength	mW per nm	Wavelength	mW per nm
380	3.094	515	513.350	650	390.319
385	3.326	520	552.127	655	343.449
390	3.347	525	584.956	660	299.145
395	3.603	530	611.985	665	260.491
400	4.379	535	639.026	670	225.560
405	5.931	540	665.463	675	194.528
410	9.900	545	694.554	680	167.534
415	18.199	550	725.574	685	143.934
420	35.986	555	764.598	690	123.776
425	68.631	560	804.266	695	106.563
430	128.472	565	844.736	700	90.877
435	230.668	570	882.814	705	77.737
440	391.904	575	915.836	710	66.382
445	645.215	580	939.013	715	56.611
450	966.880	585	954.090	720	48.721
455	1109.033	590	957.368	725	41.577
460	879.698	595	943.064	730	35.708
465	598.731	600	919.262	735	30.479
470	438.795	605	887.833	740	26.120
475	328.976	610	843.869	745	22.434
480	252.770	615	794.499	750	19.301
485	233.304	620	738.497	755	16.558
490	250.092	625	679.143	760	14.284
495	289.397	630	618.686	765	12.418
500	346.136	635	557.590	770	10.775
505	408.623	640	497.854	775	9.308
510	465.634	645	442.214	780	1.404



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## CIE Chromaticity Diagram

