

REPORT NUMBER: RAB03426

ISSUE DATE: 05/24/17

PREPARED FOR: RAB LIGHTING INC.

PAGE: 1 OF 9

DATE SAMPLE TESTED: 05/24/17

CATALOG NUMBER: RAIL400YNW/480/D10, RAILP400YNW/480/D10 (Standard Distribution) (ALSO APPLIES TO 347 RCL)

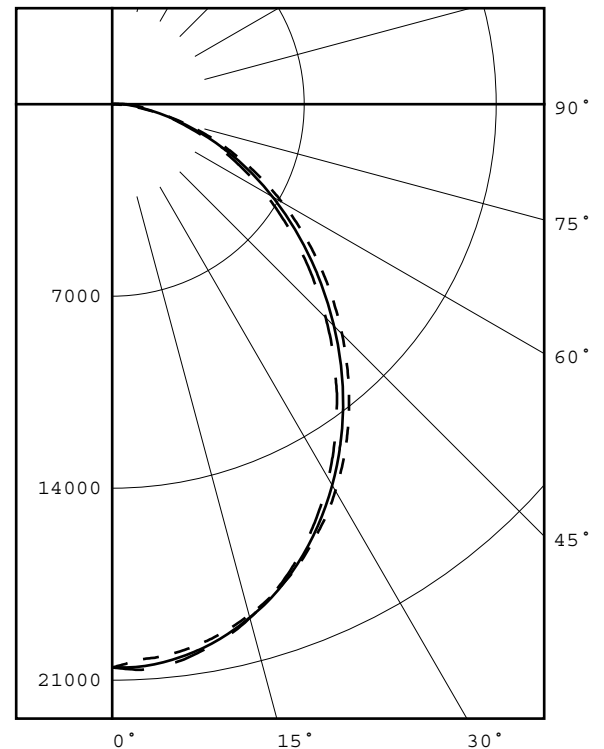
LUMINAIRE: EXTRUDED METAL HOUSING WITH HEAT SINK FINS, FOUR WHITE CIRCUIT BOARD WITH THREE HUNDRED LEDS ON EACH BOARD, METAL REFLECTOR WITH SPECULAR FINISH, FLAT TRANSLUCENT LENS WITH FROSTED SIDE IN.

LAMPS: TWELVE HUNDRED LIGHT EMITTING DIODES (LEDs).

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

### CANDELA DISTRIBUTION

	0.0	22.5	45.0	67.5	90.0	FLUX
0	20536	20536	20536	20536	20536	
5	20219	20319	20440	20527	20559	1937
15	19281	19357	19377	19387	19395	5454
25	17467	17469	17352	17213	17168	7975
35	14911	14808	14597	14329	14222	9108
45	11851	11709	11433	11091	11008	8808
55	8697	8542	8253	7917	7846	7382
65	5636	5493	5298	5016	4963	5233
75	2775	2701	2626	2524	2510	2808
85	508	604	824	971	1018	918
90	10	132	335	462	513	
95	4	4	44	115	146	103
105	7	7	7	7	6	7
115	8	8	8	7	7	8
125	10	9	9	8	8	8
135	13	13	12	11	11	9
145	17	17	16	16	15	10
155	21	21	21	21	20	10
165	24	24	25	25	25	7
175	27	27	28	29	30	3
180	29	29	29	29	29	



LEGEND:  
 0-deg: - - - - -  
 45-deg: \_\_\_\_\_  
 90-deg: - - - - -

### ZONAL LUMEN SUMMARY

ZONE	LUMENS	%FIXT
0- 30	15366	30.9
0- 40	24474	49.2
0- 60	40663	81.7
0- 90	49621	99.7
90-120	118	0.2
90-130	126	0.3
90-150	145	0.3
90-180	165	0.3
0-180	49786	100.0

TOTAL INPUT WATTS = 398.9

EFFICACY = 124.8 Lm/W

CIE TYPE - DIRECT

PLANE : 0-DEG 90-DEG

SPACING CRITERIA : 1.2 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 = 398.91 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 94.2 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 45-DEG	AVERAGE 90-DEG
45	35408.	34159.	32889.
55	32034.	30398.	28899.
65	28174.	26485.	24810.
75	22651.	21435.	20488.
85	12314.	19974.	24676.

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### CANDELA DISTRIBUTION

	0.0	22.5	45.0	67.5	90.0
0.0	20536	20536	20536	20536	20536
5.0	20219	20319	20440	20527	20559
10.0	19870	19953	20045	20093	20114
15.0	19281	19357	19377	19387	19395
20.0	18487	18505	18493	18387	18400
25.0	17467	17469	17352	17213	17168
30.0	16276	16214	16046	15848	15763
35.0	14911	14808	14597	14329	14222
40.0	13416	13292	13046	12728	12617
45.0	11851	11709	11433	11091	11008
50.0	10265	10120	9833	9477	9395
55.0	8697	8542	8253	7917	7846
60.0	7155	6991	6747	6428	6365
65.0	5636	5493	5298	5016	4963
70.0	4171	4054	3903	3702	3656
75.0	2775	2701	2626	2524	2510
80.0	1511	1516	1561	1591	1626
85.0	508	604	824	971	1018
90.0	10	132	335	462	513
95.0	4	4	44	115	146
100.0	5	5	6	5	5
105.0	7	7	7	7	6
110.0	8	8	7	7	6
115.0	8	8	8	7	7
120.0	9	9	8	7	7
125.0	10	9	9	8	8
130.0	11	11	10	10	9
135.0	13	13	12	11	11
140.0	15	15	15	14	14
145.0	17	17	16	16	15
150.0	19	19	19	18	18
155.0	21	21	21	21	20
160.0	23	23	23	23	23
165.0	24	24	25	25	25
170.0	25	26	26	27	27
175.0	27	27	28	29	30
180.0	29	29	29	29	29

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## ZONAL LUMEN SUMMARY

0- 5	490.
5- 10	1447.
10- 15	2336.
15- 20	3118.
20- 25	3754.
25- 30	4221.
30- 35	4505.
35- 40	4603.
40- 45	4522.
45- 50	4286.
50- 55	3923.
55- 60	3459.
60- 65	2916.
65- 70	2317.
70- 75	1697.
75- 80	1111.
80- 85	629.
85- 90	289.
90- 95	90.
95-100	13.
100-105	3.
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	490
5- 10	1447
10- 15	2336
15- 20	3118
20- 25	3754
25- 30	4221
30- 35	4505
35- 40	4603
40- 45	4522
45- 50	4286
50- 55	3923
55- 60	3459
60- 65	2916
65- 70	2317
70- 75	1697
75- 80	1111
80- 85	629
85- 90	289
90- 95	90
95-100	13
100-105	3
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	1937
0- 20	7390
0- 30	15366
0- 40	24474
0- 50	33282
0- 60	40663
0- 70	45896
0- 80	48704
0- 90	49621
0-100	49725
0-110	49732
0-120	49739
0-130	49747
0-140	49756
0-150	49767
0-160	49776
0-170	49783
0-180	49786

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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	77	73	71
3	91	81	73	67	89	80	72	66	77	70	65	74	69	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	50	62	54	49	60	53	48	58	52	48	46
6	72	59	50	44	70	58	50	44	56	49	43	54	48	43	53	47	42	40
7	67	53	45	39	65	53	45	39	51	44	38	50	43	38	48	42	38	36
8	62	49	41	35	61	48	40	35	47	40	35	46	39	34	44	39	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	29	39	33	28	38	32	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.

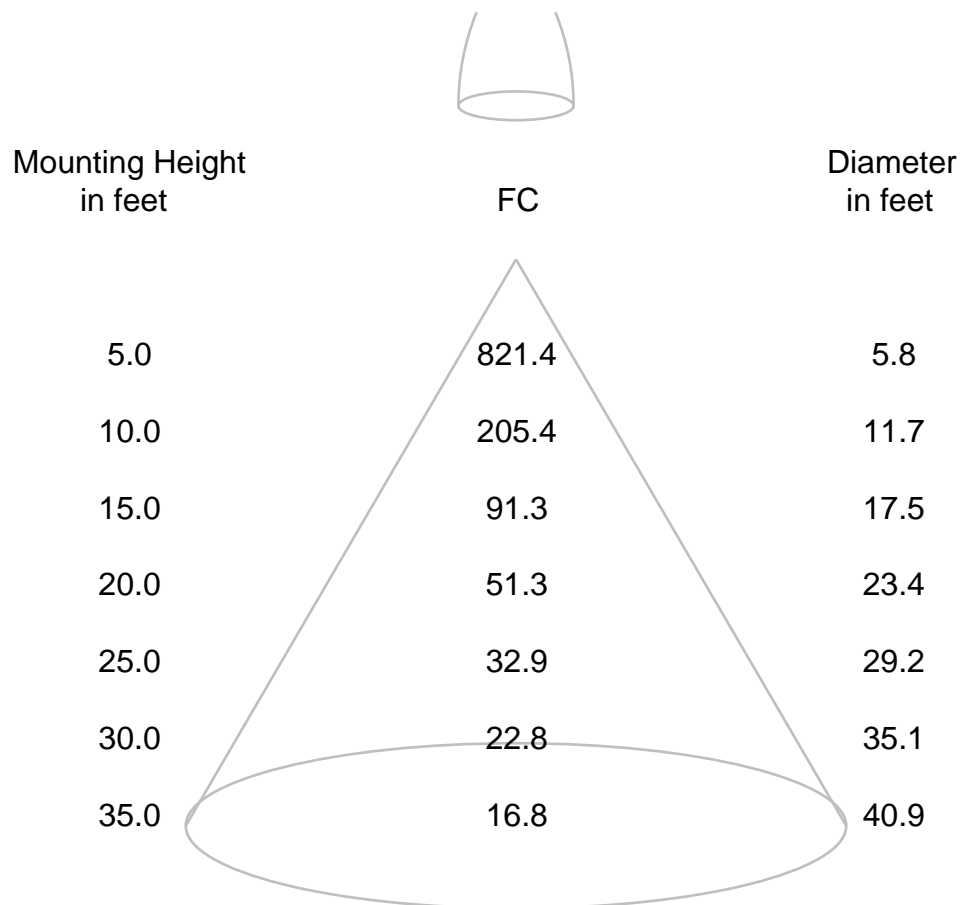


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## CONE OF LIGHT DIAGRAM

(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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PREPARED FOR: RAB LIGHTING INC.  
CATALOG NUMBER: RAIL400YNW/480/D10, RAILP400YNW/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:
	CHROMA PROGRAMMABLE DIGITAL POWER METER MODEL 66202	N/A
	OCEAN OPTICS QE65PRO Spectroradiometer	3/01/18
	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)	49786 *
<b>SPECTRORADIOMETRIC</b>	
Observer	CIE 1931 2 degree
Chromaticity Ordinate x	0.4057
Chromaticity Ordinate y	0.3919
Observer	CIE 1976 2 degree
Chromaticity Ordinate u'	0.2355
Chromaticity Ordinate v'	0.5118
Correlated Color Temp CCT (K)	3499
ANSI C78.377-2008 Duv	0.000
Total Radiant Flux (milliWatts)	151675 *
<b>ELECTRICAL</b>	
Input Voltage (Volts AC)	347.0
Input Current (Amps AC)	1.16
Input Power (Watts)	398.9
Input Power Factor (%)	99.2
Input Current THD (%)	9.7
Input Voltage THD (%)	0.2
<b>EFFICACY (Lumens/Watt)</b>	
	124.8
<b>ELECTRICAL AT MAX NONIMAL INPUT</b>	
Input Voltage (Volts AC)	480.0
Input Current (Amps AC)	0.858
Input Power (Watts)	397.2
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)	83
R1 Light greyish red	81
R2 Dark greyish yellow	89
R3 Strong yellowish green	95
R4 Moderate yellowish green	81
R5 Light bluish green	81
R6 Light blue	85
R7 Light violet	85
R8 Light reddish purple	63
R9 Strong red	11
R10 Strong yellow	74
R11 Strong green	79
R12 Strong blue	63
R13 Light yellowish pink (skin)	82
R14 Moderate olive green (leaf)	97

### \*NOTE:

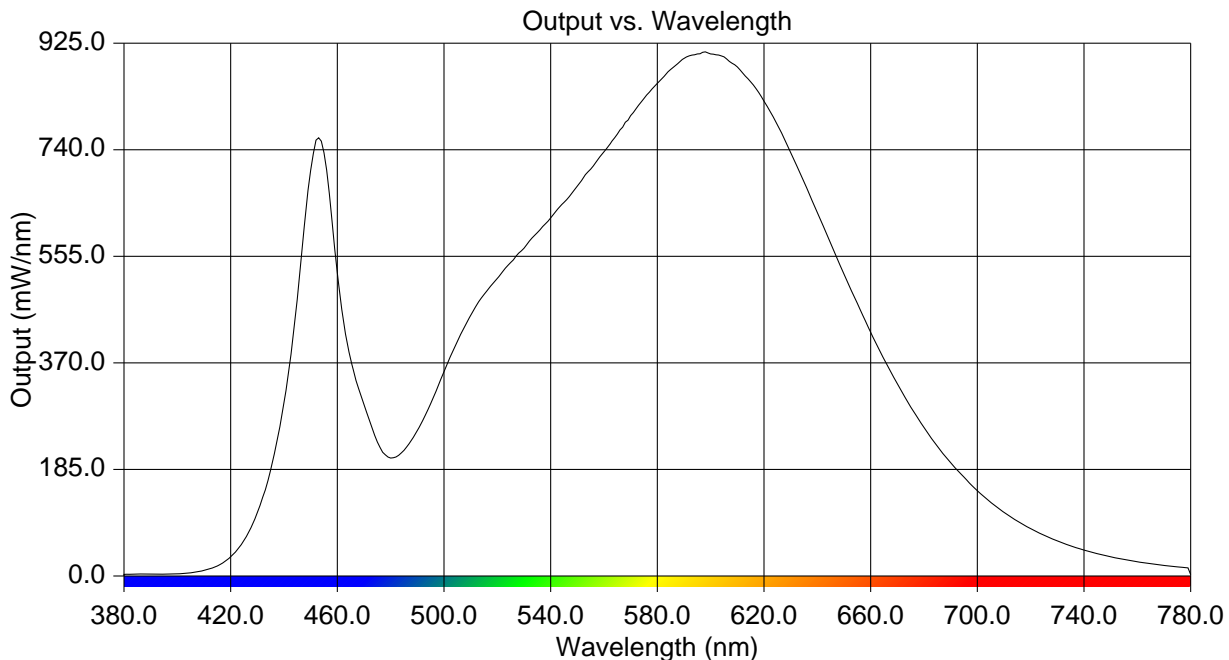
Proper calibration of integrating spheres for measuring total flux output of non-directional samples will produce reliable, repeatable results within the calibration tolerances of the equipment used. However, measurement of test samples with significant self absorption and/or directional output, even 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	2.786	515	488.163	650	523.741
385	3.125	520	516.207	655	472.948
390	3.043	525	543.692	660	422.684
395	3.377	530	568.445	665	376.211
400	3.964	535	595.512	670	333.524
405	5.591	540	620.895	675	293.212
410	9.292	545	647.967	680	257.617
415	17.376	550	675.969	685	224.518
420	33.241	555	705.583	690	196.362
425	61.531	560	735.711	695	171.517
430	109.505	565	766.370	700	147.945
435	184.591	570	798.506	705	128.164
440	299.433	575	828.228	710	110.249
445	483.127	580	854.301	715	94.868
450	703.653	585	878.543	720	82.355
455	733.939	590	897.950	725	70.661
460	525.564	595	905.430	730	60.922
465	375.742	600	905.412	735	52.305
470	296.899	605	900.434	740	44.935
475	232.493	610	882.936	745	38.689
480	204.545	615	857.057	750	33.236
485	217.941	620	823.488	755	28.649
490	252.253	625	783.874	760	24.627
495	298.906	630	735.066	765	21.223
500	354.827	635	683.516	770	18.422
505	407.464	640	630.693	775	15.817
510	451.726	645	576.558	780	2.386



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## CIE Chromaticity Diagram

