

REPORT NUMBER: RAB03164

ISSUE DATE: 04/06/17

PREPARED FOR: RAB LIGHTING INC.

CATALOG NUMBER: RAIL185YNW/D10, RAILP185YNW/D10 (Standard Distribution)

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

LAMPS: FIVE HUNDRED AND FOUR LIGHT EMITTING DIODES (LEDs).

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

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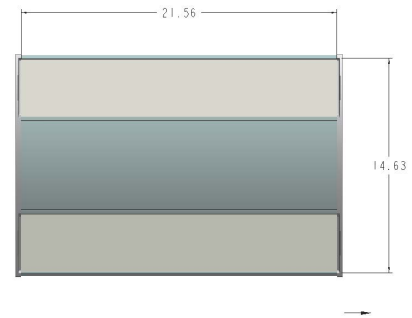
DATE SAMPLE TESTED: 04/06/17

### CANDELA DISTRIBUTION

	0.0	22.5	45.0	67.5	90.0
0	8480	8480	8480	8480	8480
5	8426	8430	8427	8429	8435
15	8026	8011	7972	7946	7940
25	7230	7197	7104	7029	7008
35	6132	6091	5947	5820	5758
45	4863	4801	4626	4485	4415
55	3559	3490	3319	3183	3123
65	2287	2242	2111	2005	1959
75	1111	1104	1035	1000	972
85	188	233	300	357	366
90	3	45	111	159	175
95	0	1	9	33	40
105	1	2	2	2	2
115	2	2	2	2	2
125	2	2	2	2	2
135	3	3	3	3	3
145	4	4	4	4	4
155	5	5	5	5	5
165	6	6	6	6	6
175	7	7	7	8	8
180	7	7	7	7	7

### FLUX

799
2246
3271
3718
3578
2983
2104
1118
343
32
2
2
2
2
2
2
2
2
2
1



### ZONAL LUMEN SUMMARY

ZONE	LUMENS	%FIXT
0- 30	6317	31.3
0- 40	10035	49.7
0- 60	16595	82.1
0- 90	20160	99.8
90-120	35	0.2
90-130	37	0.2
90-150	42	0.2
90-180	46	0.2
0-180	20206	100.0

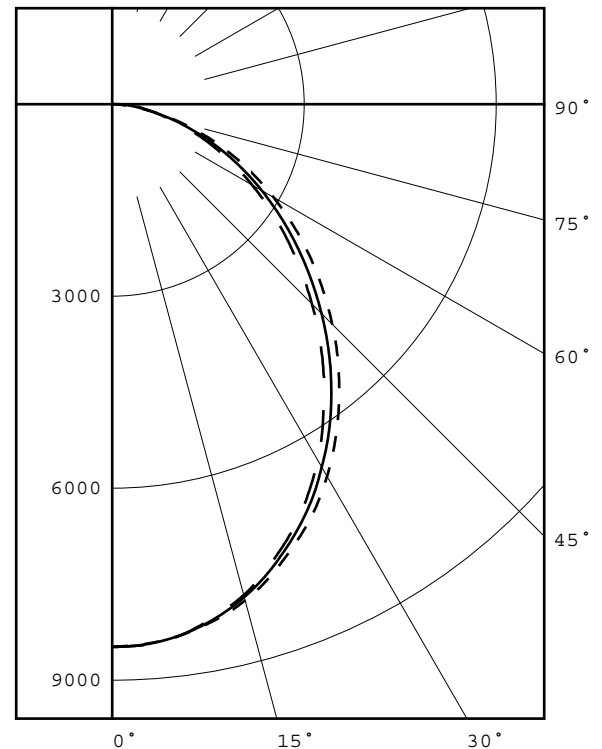
TOTAL INPUT WATTS = 161.7

EFFICACY = 125.0 Lm/W

CIE TYPE - DIRECT

PLANE : 0-DEG 90-DEG

SPACING CRITERIA : 1.2 1.1



#### LEGEND:

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

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 = 161.65 W AT 120.0 VAC.

LED DRIVER: 2 x RDD-U85-A1750

TEST PROCEDURE: IESNA LM-79-08

LM-80 DATA AVAILABLE FROM MANUFACTURER FOR SOLID STATE SOURCE

AMBIENT: 24.5

ACCREDITED LABORATORY CODE 201058-0

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PLANE : 0-DEG 90-DEG  
BEAM ANGLE (50%) : 99.5 X 92.6 DEGREES  
FIELD ANGLE (10%): 154.9 X 153.2 DEGREES

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PLANE : 0-DEG 90-DEG  
LUMINOUS LENGTH :21.560 14.630

## LUMINANCE DATA IN CANDELA/SQ METER

ANGLE IN DEG	AVERAGE 0-DEG	AVERAGE 45-DEG	AVERAGE 90-DEG
45	33783.	32137.	30671.
55	30480.	28425.	26746.
65	26583.	24537.	22770.
75	21086.	19644.	18448.
85	10596.	16909.	20628.

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### CANDELA DISTRIBUTION

	0.0	22.5	45.0	67.5	90.0
0.0	8480	8480	8480	8480	8480
5.0	8426	8430	8427	8429	8435
10.0	8271	8276	8260	8251	8239
15.0	8026	8011	7972	7946	7940
20.0	7657	7643	7577	7530	7507
25.0	7230	7197	7104	7029	7008
30.0	6714	6675	6545	6448	6422
35.0	6132	6091	5947	5820	5758
40.0	5511	5458	5297	5152	5097
45.0	4863	4801	4626	4485	4415
50.0	4208	4140	3961	3817	3749
55.0	3559	3490	3319	3183	3123
60.0	2912	2856	2699	2579	2525
65.0	2287	2242	2111	2005	1959
70.0	1684	1659	1550	1472	1442
75.0	1111	1104	1035	1000	972
80.0	593	608	603	612	611
85.0	188	233	300	357	366
90.0	3	45	111	159	175
95.0	0	1	9	33	40
100.0	1	1	2	2	2
105.0	1	2	2	2	2
110.0	2	1	2	2	2
115.0	2	2	2	2	2
120.0	2	2	2	2	2
125.0	2	2	2	2	2
130.0	2	2	2	3	3
135.0	3	3	3	3	3
140.0	3	3	3	4	4
145.0	4	4	4	4	4
150.0	4	4	5	5	5
155.0	5	5	5	5	5
160.0	5	5	6	6	6
165.0	6	6	6	6	6
170.0	6	6	6	7	7
175.0	7	7	7	8	8
180.0	7	7	7	7	7

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ZONAL LUMEN SUMMARY

0- 5	202.
5- 10	597.
10- 15	963.
15- 20	1283.
20- 25	1541.
25- 30	1730.
30- 35	1842.
35- 40	1877.
40- 45	1839.
45- 50	1738.
50- 55	1587.
55- 60	1396.
60- 65	1173.
65- 70	931.
70- 75	679.
75- 80	439.
80- 85	240.
85- 90	103.
90- 95	29.
95-100	3.
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	1.
165-170	1.
170-175	0.
175-180	0.

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### 5-DEGREE ZONAL LUMEN SUMMARY

0- 5	202
5- 10	597
10- 15	963
15- 20	1283
20- 25	1541
25- 30	1730
30- 35	1842
35- 40	1877
40- 45	1839
45- 50	1738
50- 55	1587
55- 60	1396
60- 65	1173
65- 70	931
70- 75	679
75- 80	439
80- 85	240
85- 90	103
90- 95	29
95-100	3
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	1
165-170	1
170-175	0
175-180	0

### 10-DEGREE ZONAL LUMEN SUMMARY

0- 10	799
0- 20	3045
0- 30	6317
0- 40	10035
0- 50	13612
0- 60	16595
0- 70	18699
0- 80	19817
0- 90	20160
0-100	20191
0-110	20193
0-120	20195
0-130	20197
0-140	20199
0-150	20202
0-160	20204
0-170	20206
0-180	20206

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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	92	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	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	43	55	48	43	53	47	43	41
7	67	54	45	39	65	53	45	39	51	44	39	50	43	38	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	43	36	32	42	36	31	41	36	31	29
10	55	42	34	29	53	41	34	29	40	33	29	39	33	29	38	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.

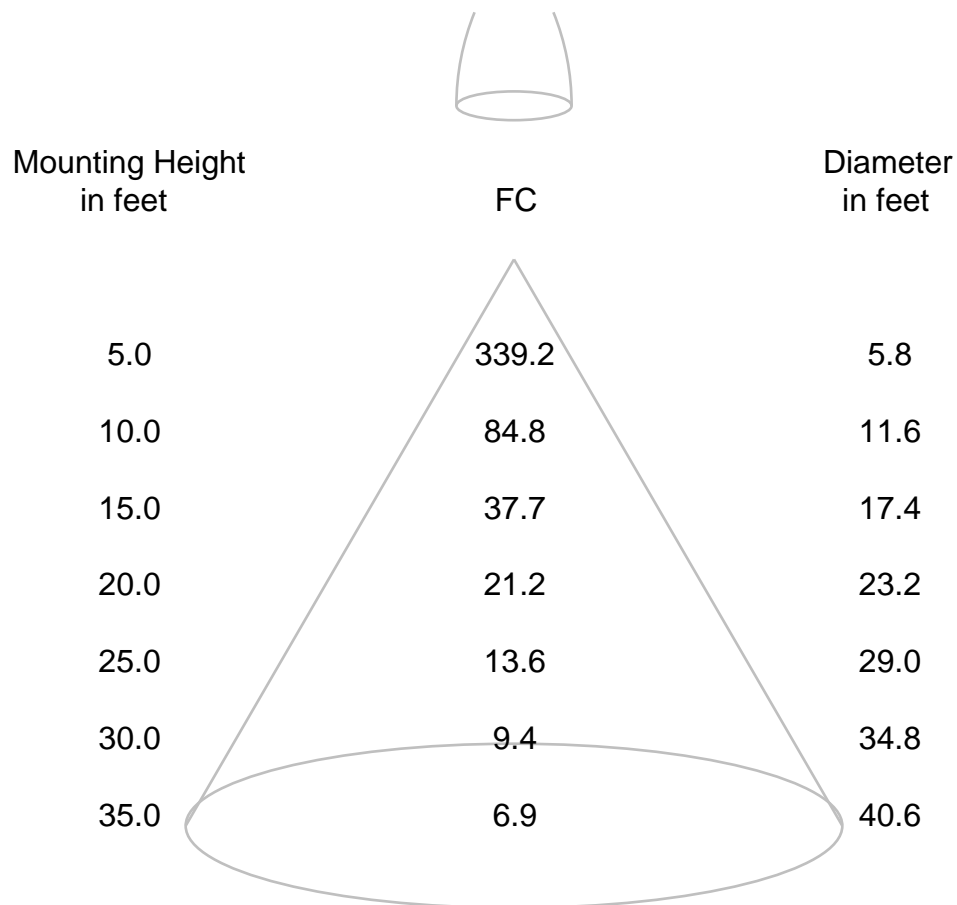


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## CONE OF LIGHT DIAGRAM

(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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 DATE: 5/18/2017  
 PREPARED FOR: RAB LIGHTING INC.  
 CATALOG NUMBER: RAIL185YNW/D10, RAILP185YNW/D10 (Standard Distribution)

ADDRESS: 170 LUDLOW AVE, NORTHVALE, NJ 07647

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

LAMP: FIVE HUNDRED AND FOUR LIGHT EMITTING DIODES (LEDS).

DRIVER: 2 x RDD-U85-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: Calibration Due:  
 GWINSTEK PROGRAMMABLE AC POWER SOURCE APS-7100 N/A  
 CHROMA PROGRAMMABLE DIGITAL POWER METER MODEL 66202 3/01/18  
 OCEAN OPTICS QE65PRO Spectroradiometer 05/03/18  
 RAB 2.0 meter Diameter Integrating Sphere, 4PI Geometry 05/03/18

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 (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)	20206 *
SPECTRORADIOMETRIC	
Observer	CIE 1931 2 degree
Chromaticity Ordinate x	0.4045
Chromaticity Ordinate y	0.3905
Observer	CIE 1976 2 degree
Chromaticity Ordinate u'	0.2352
Chromaticity Ordinate v'	0.5111
Correlated Color Temp CCT (K)	3517
ANSI C78.377-2008 Duv	0.000
Total Radiant Flux (milliWatts)	61658 *
ELECTRICAL	
Input Voltage (Volts AC)	120.0
Input Current (Amps AC)	1.35
Input Power (Watts)	161.7
Input Power Factor (%)	99.8
Input Current THD (%)	5.2
Input Voltage THD (%)	0.3
EFFICACY (Lumens/Watt)	
	125.0
ELECTRICAL AT MAX NONIMAL INPUT	
Input Voltage (Volts AC)	277.0
Input Current (Amps AC)	0.591
Input Power (Watts)	158.1
Input Power Factor (%)	96.6
Input Current THD (%)	7.3
Input Voltage THD (%)	0.2
Off-State Power (Watts)	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	86
R8 Light reddish purple	64
R9 Strong red	11
R10 Strong yellow	74
R11 Strong green	80
R12 Strong blue	63
R13 Light yellowish pink (skin)	82
R14 Moderate olive green (leaf)	97

### \*NOTE:

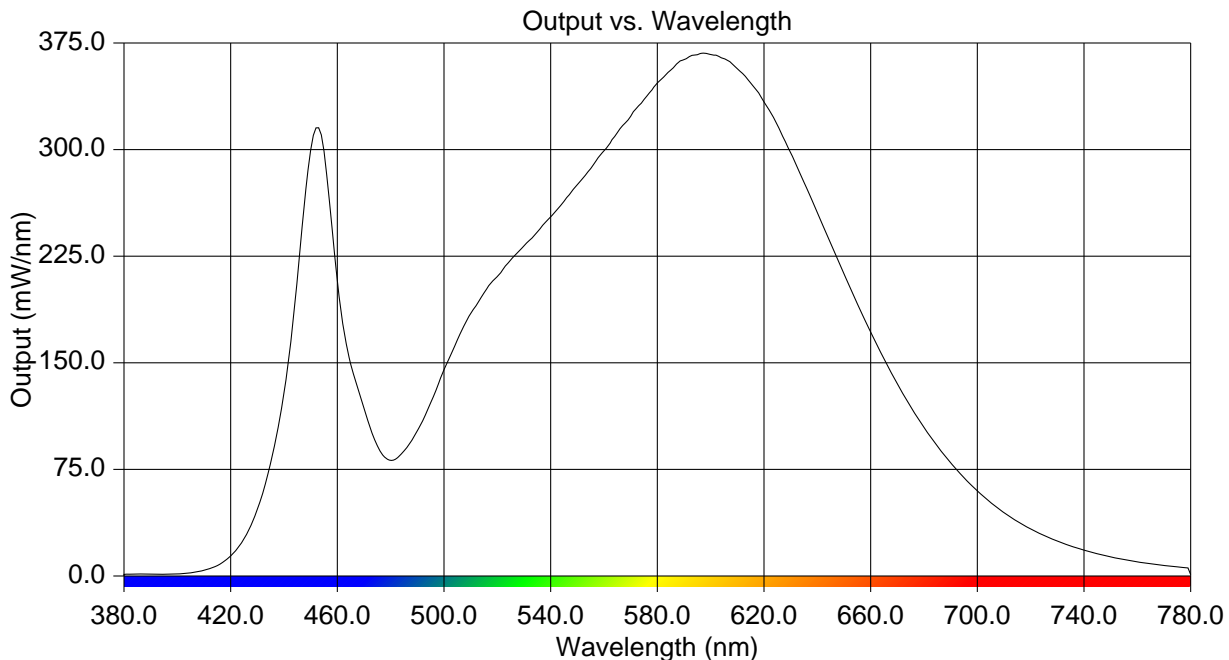
Proper calibration of integrating spheres for measuring total flux output of non-directional samples will produce reliable, repeatable results within the calibration tolerances of the equipment used. However, measurement of test samples with significant self absorption and/or directional output, even 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	1.128	515	199.021	650	212.460
385	1.201	520	210.460	655	191.414
390	1.213	525	222.211	660	171.378
395	1.291	530	232.234	665	152.703
400	1.551	535	241.895	670	134.904
405	2.195	540	252.482	675	119.062
410	3.832	545	263.440	680	104.427
415	7.301	550	275.327	685	91.245
420	14.101	555	286.415	690	79.478
425	26.185	560	299.120	695	69.130
430	46.847	565	311.724	700	59.866
435	79.522	570	323.186	705	51.743
440	128.485	575	335.013	710	44.566
445	208.628	580	346.717	715	38.303
450	299.470	585	355.654	720	33.037
455	298.830	590	363.055	725	28.539
460	207.549	595	366.516	730	24.586
465	148.985	600	366.629	735	21.084
470	117.881	605	363.651	740	18.129
475	91.600	610	356.558	745	15.667
480	81.281	615	346.649	750	13.448
485	87.925	620	333.323	755	11.541
490	102.066	625	317.239	760	9.941
495	121.808	630	297.271	765	8.538
500	145.039	635	276.804	770	7.397
505	165.969	640	255.414	775	6.427
510	184.631	645	233.606	780	0.959



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## CIE Chromaticity Diagram

