

REPORT NUMBER: RAB03216

ISSUE DATE: 04/18/17

PREPARED FOR: RAB LIGHTING INC.

CATALOG NUMBER: RAIL150NW/D10, RAILP150NW/D10 (Standard Distribution)

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

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

(SEE PAGE 2 FOR MORE INFORMATION)

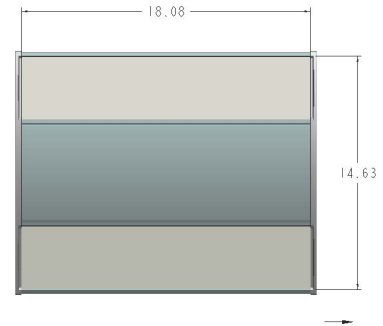
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DATE SAMPLE TESTED: 04/18/17

CANDELA DISTRIBUTION

	0.0	22.5	45.0	67.5	90.0	
0	7433	7433	7433	7433	7433	
5	7390	7398	7392	7382	7387	701
15	7034	7030	7007	6971	6973	1971
25	6335	6316	6254	6186	6172	2876
35	5370	5332	5236	5144	5105	3273
45	4243	4198	4086	3981	3935	3154
55	3085	3049	2944	2841	2797	2635
65	1980	1956	1878	1800	1761	1862
75	980	958	934	895	877	993
85	167	203	276	323	341	309
90	3	39	102	145	163	
95	0	1	10	30	40	29
105	1	1	1	1	2	1
115	1	1	1	1	2	1
125	1	1	1	1	1	1
135	2	1	2	2	2	1
145	2	2	2	3	3	1
155	2	2	3	3	3	1
165	3	3	3	3	3	1
175	3	3	4	4	4	0
180	4	4	4	4	4	

FLUX



ZONAL LUMEN SUMMARY

ZONE	LUMENS	%FIXT
0- 30	5548	31.1
0- 40	8821	49.5
0- 60	14609	82.0
0- 90	17773	99.8
90-120	32	0.2
90-130	33	0.2
90-150	36	0.2
90-180	38	0.2
0-180	17812	100.0

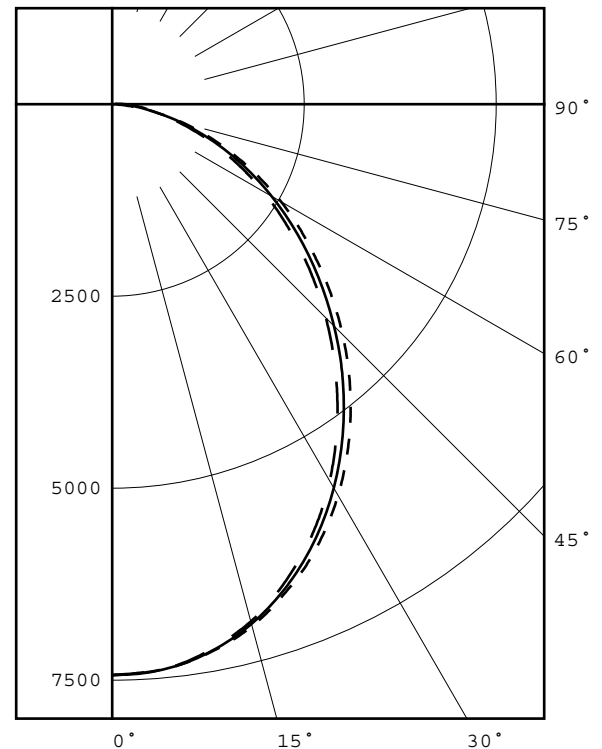
TOTAL INPUT WATTS = 132.1

EFFICACY = 134.8 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 = 132.12 W AT 120.0 VAC.

LED DRIVER: 2 x RDD-FE075-A0142-01

TEST PROCEDURE: IESNA LM-79-08

LM-80 DATA AVAILABLE FROM MANUFACTURER FOR SOLID STATE SOURCE

AMBIENT: 24.4

ACCREDITED LABORATORY CODE 201058-0

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PLANE : 0-DEG 90-DEG
BEAM ANGLE (50%) : 99.0 X 93.8 DEGREES
FIELD ANGLE (10%): 155.1 X 154.1 DEGREES

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PLANE : 0-DEG 90-DEG
LUMINOUS LENGTH :18.080 14.630

LUMINANCE DATA IN CANDELA/SQ METER

ANGLE IN DEG	AVERAGE 0-DEG	AVERAGE 45-DEG	AVERAGE 90-DEG
45	35150.	33849.	32598.
55	31506.	30066.	28565.
65	27444.	26030.	24409.
75	22180.	21139.	19849.
85	11224.	18550.	22919.

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CANDELA DISTRIBUTION

	0.0	22.5	45.0	67.5	90.0
0.0	7433	7433	7433	7433	7433
5.0	7390	7398	7392	7382	7387
10.0	7255	7263	7250	7226	7228
15.0	7034	7030	7007	6971	6973
20.0	6715	6708	6668	6609	6607
25.0	6335	6316	6254	6186	6172
30.0	5882	5851	5769	5692	5665
35.0	5370	5332	5236	5144	5105
40.0	4819	4776	4669	4568	4522
45.0	4243	4198	4086	3981	3935
50.0	3659	3616	3503	3396	3357
55.0	3085	3049	2944	2841	2797
60.0	2538	2492	2397	2306	2263
65.0	1980	1956	1878	1800	1761
70.0	1467	1445	1387	1324	1296
75.0	980	958	934	895	877
80.0	529	526	539	551	564
85.0	167	203	276	323	341
90.0	3	39	102	145	163
95.0	0	1	10	30	40
100.0	1	1	1	1	2
105.0	1	1	1	1	2
110.0	1	1	1	2	2
115.0	1	1	1	1	2
120.0	1	1	1	1	2
125.0	1	1	1	1	1
130.0	1	1	1	2	2
135.0	2	1	2	2	2
140.0	2	2	2	2	2
145.0	2	2	2	3	3
150.0	3	3	3	3	3
155.0	2	2	3	3	3
160.0	3	3	3	3	3
165.0	3	3	3	3	3
170.0	3	3	3	4	4
175.0	3	3	4	4	4
180.0	4	4	4	4	4

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ZONAL LUMEN SUMMARY

0- 5	177.
5- 10	524.
10- 15	845.
15- 20	1126.
20- 25	1354.
25- 30	1521.
30- 35	1621.
35- 40	1652.
40- 45	1621.
45- 50	1533.
50- 55	1401.
55- 60	1234.
60- 65	1038.
65- 70	824.
70- 75	603.
75- 80	390.
80- 85	215.
85- 90	94.
90- 95	26.
95-100	3.
100-105	1.
105-110	1.
110-115	1.
115-120	1.
120-125	0.
125-130	1.
130-135	1.
135-140	1.
140-145	1.
145-150	1.
150-155	1.
155-160	1.
160-165	0.
165-170	0.
170-175	0.
175-180	0.

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5-DEGREE ZONAL LUMEN SUMMARY

0- 5	177
5- 10	524
10- 15	845
15- 20	1126
20- 25	1354
25- 30	1521
30- 35	1621
35- 40	1652
40- 45	1621
45- 50	1533
50- 55	1401
55- 60	1234
60- 65	1038
65- 70	824
70- 75	603
75- 80	390
80- 85	215
85- 90	94
90- 95	26
95-100	3
100-105	1
105-110	1
110-115	1
115-120	1
120-125	0
125-130	1
130-135	1
135-140	1
140-145	1
145-150	1
150-155	1
155-160	1
160-165	0
165-170	0
170-175	0
175-180	0

10-DEGREE ZONAL LUMEN SUMMARY

0- 10	701
0- 20	2672
0- 30	5548
0- 40	8821
0- 50	11975
0- 60	14609
0- 70	16471
0- 80	17464
0- 90	17773
0-100	17803
0-110	17804
0-120	17805
0-130	17806
0-140	17808
0-150	17809
0-160	17810
0-170	17811
0-180	17812

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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	89	91	89	87	85
2	100	92	85	80	97	90	84	79	87	82	77	83	79	75	80	77	74	72
3	91	81	74	67	89	80	73	67	77	71	65	74	69	64	71	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	56	50	75	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	54	48	43	53	47	43	41
7	67	54	45	39	65	53	45	39	51	44	39	50	43	38	48	43	38	36
8	62	49	41	35	61	48	40	35	47	40	35	46	39	35	45	39	34	32
9	58	45	37	32	57	45	37	32	43	36	31	42	36	31	41	35	31	29
10	55	42	34	29	53	41	34	29	40	33	29	39	33	29	38	33	28	27

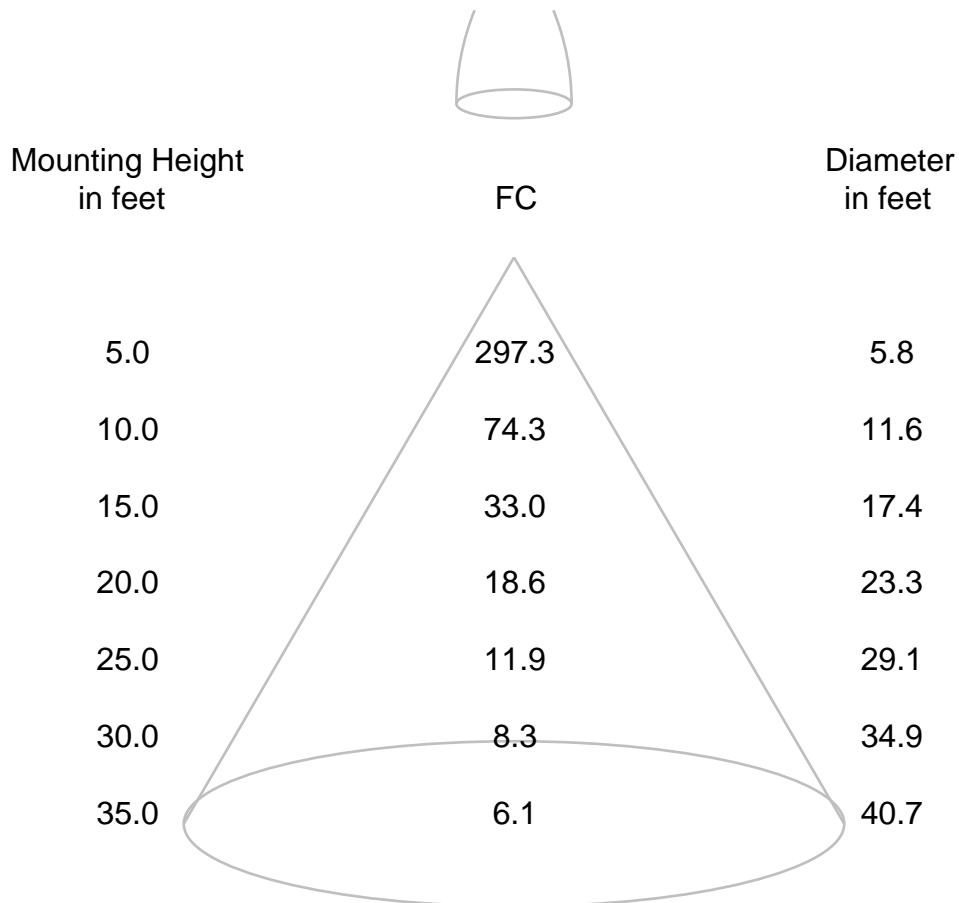
ALL CANDELA, LUMENS, LUMINANCE, AND VCP VALUES IN THIS REPORT ARE BASED ON ABSOLUTE PHOTOMETRY. THE COEFFICIENT OF UTILIZATION VALUES ARE BASED ON THE TOTAL ABSOLUTE LUMEN OUTPUT OF THIS LUMINAIRE SAMPLE.

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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.

REPORT NUMBER: RAB03400
 DATE: 05/18/2017
 PREPARED FOR: RAB LIGHTING INC.
 CATALOG NUMBER: RAIL150NW/D10, RAILP150NW/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 TEN LEDS ON EACH BOARD, METAL REFLECTOR WITH SPECULAR FINISH, FLAT TRANSLUCENT LENS WITH FROSTED SIDE IN.

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

DRIVER: 2 x RDD-FE075-A0142-01

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:	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	05/03/18
	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 X.CAO

Approved D.WANG-MUNSON
 Lighting Engineer

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RESULTS:

PHOTOMETRIC	
Total Integrated Flux (lumens)	17812 *
SPECTRORADIOMETRIC	
Observer	CIE 1931 2 degree
Chromaticity Ordinate x	0.3777
Chromaticity Ordinate y	0.3696
Observer	CIE 1976 2 degree
Chromaticity Ordinate u'	0.2262
Chromaticity Ordinate v'	0.4980
Correlated Color Temp CCT (K)	4023
ANSI C78.377-2008 Duv	-0.003
Total Radiant Flux (milliWatts)	52600 *
ELECTRICAL	
Input Voltage (Volts AC)	120.0
Input Current (Amps AC)	1.11
Input Power (Watts)	132.1
Input Power Factor (%)	98.7
Input Current THD (%)	13.4
Input Voltage THD (%)	0.2
EFFICACY (Lumens/Watt)	
	134.8
ELECTRICAL AT MAX NONIMAL INPUT	
Input Voltage (Volts AC)	277.0
Input Current (Amps AC)	0.510
Input Power (Watts)	129.4
Input Power Factor (%)	91.5
Input Current THD (%)	20.6
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	85
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	-17
R10 Strong yellow	63
R11 Strong green	72
R12 Strong blue	53
R13 Light yellowish pink (skin)	76
R14 Moderate olive green (leaf)	96

*NOTE:

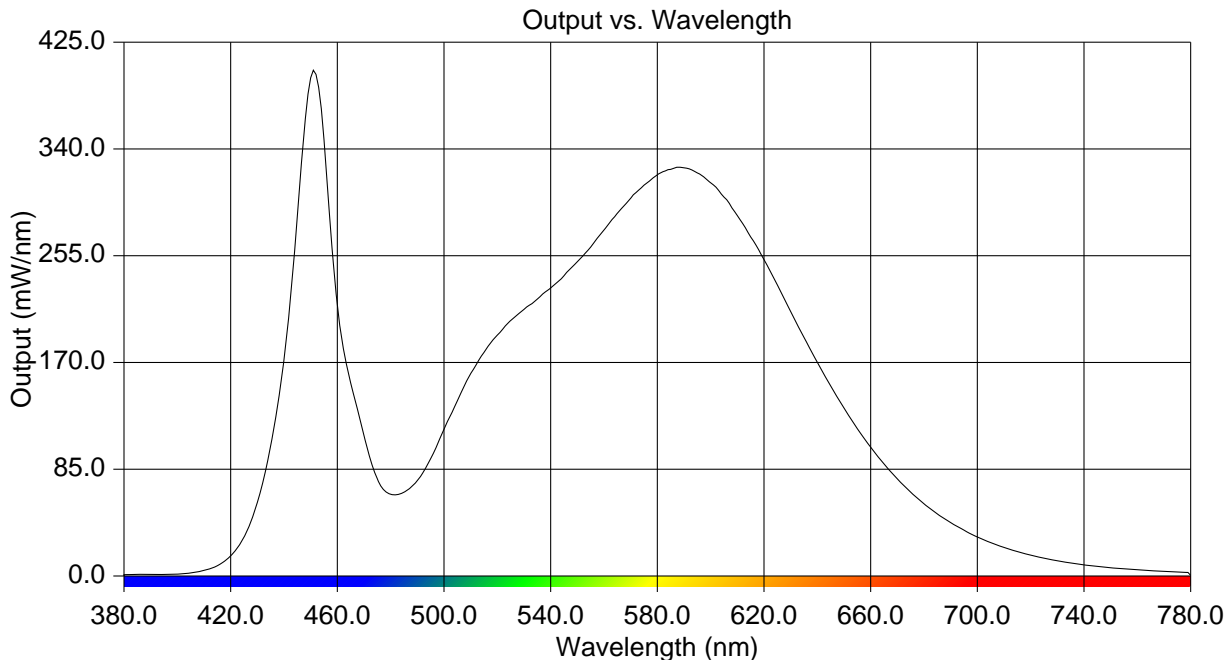
Proper calibration of integrating spheres for measuring total flux output of non-directional samples will produce reliable, repeatable results within the calibration tolerances of the equipment used. However, measurement of test samples with significant self absorption and/or directional output, even 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	1.009	515	178.172	650	133.851
385	1.142	520	191.786	655	117.387
390	1.179	525	203.533	660	102.657
395	1.267	530	212.462	665	89.292
400	1.646	535	220.674	670	77.237
405	2.402	540	229.522	675	66.851
410	4.204	545	239.270	680	57.477
415	8.172	550	250.423	685	49.446
420	16.055	555	262.074	690	42.453
425	31.012	560	275.845	695	36.541
430	58.601	565	289.097	700	31.157
435	103.839	570	301.283	705	26.615
440	172.312	575	311.431	710	22.678
445	285.861	580	319.909	715	19.385
450	396.987	585	324.026	720	16.537
455	347.728	590	325.369	725	14.202
460	216.135	595	321.196	730	12.147
465	153.858	600	313.588	735	10.384
470	111.891	605	301.924	740	8.941
475	77.474	610	287.210	745	7.658
480	65.044	615	270.191	750	6.540
485	66.919	620	251.958	755	5.668
490	76.055	625	232.097	760	4.871
495	93.520	630	210.733	765	4.202
500	117.184	635	190.136	770	3.656
505	139.554	640	170.274	775	3.183
510	161.214	645	151.021	780	0.478



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CIE Chromaticity Diagram

