

REPORT NUMBER: RAB03147

ISSUE DATE: 04/05/17

PREPARED FOR: RAB LIGHTING INC.

CATALOG NUMBER: RAIL150YNW/D10, RAILP150YNW/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)

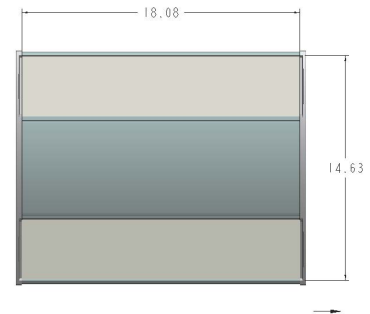
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DATE SAMPLE TESTED: 04/05/17

CANDELA DISTRIBUTION

	0.0	22.5	45.0	67.5	90.0	
0	7026	7026	7026	7026	7026	
5	6986	6993	6989	6978	6985	663
15	6655	6650	6626	6588	6590	1864
25	5984	5961	5905	5833	5812	2714
35	5067	5031	4935	4842	4805	3084
45	3995	3949	3839	3735	3692	2964
55	2901	2856	2755	2659	2620	2470
65	1868	1836	1760	1686	1648	1747
75	913	900	866	834	828	930
85	165	192	255	298	316	289
90	2	39	96	133	151	
95	0	1	9	28	37	27
105	1	1	1	1	2	1
115	1	1	1	1	1	1
125	1	1	1	1	1	1
135	2	1	2	2	2	1
145	2	2	2	2	2	1
155	2	2	2	2	3	1
165	2	2	3	3	3	1
175	3	3	3	4	4	0
180	3	3	3	3	3	

FLUX



ZONAL LUMEN SUMMARY

ZONE	LUMENS	%FIXT
0- 30	5241	31.3
0- 40	8324	49.7
0- 60	13759	82.1
0- 90	16724	99.8
90-120	29	0.2
90-130	30	0.2
90-150	33	0.2
90-180	35	0.2
0-180	16758	100.0

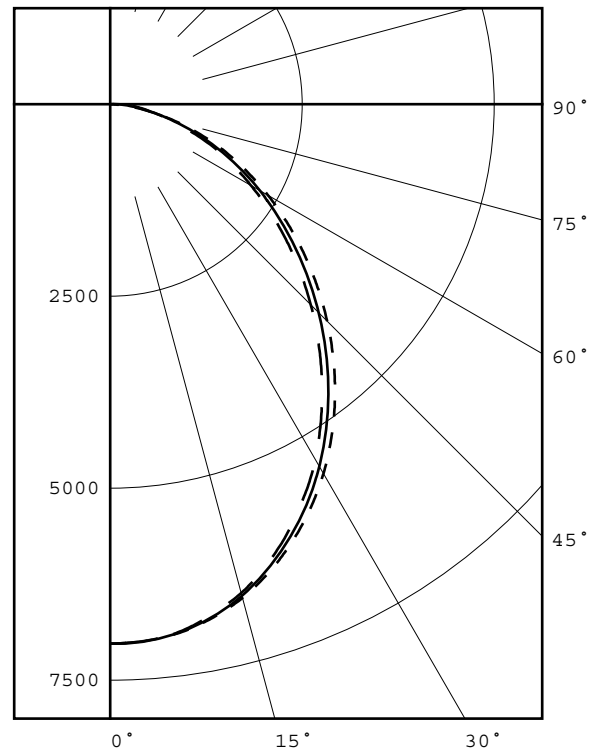
TOTAL INPUT WATTS = 131.8

EFFICACY = 127.1 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 = 131.84 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: 24.9

ACCREDITED LABORATORY CODE 201058-0

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PLANE : 0-DEG 90-DEG
BEAM ANGLE (50%) : 98.7 X 93.3 DEGREES
FIELD ANGLE (10%) : 154.9 X 153.8 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	33095.	31803.	30585.
55	29627.	28136.	26757.
65	25892.	24395.	22842.
75	20664.	19600.	18740.
85	11090.	17139.	21238.

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CANDELA DISTRIBUTION

	0.0	22.5	45.0	67.5	90.0
0.0	7026	7026	7026	7026	7026
5.0	6986	6993	6989	6978	6985
10.0	6866	6866	6856	6831	6834
15.0	6655	6650	6626	6588	6590
20.0	6352	6341	6299	6243	6240
25.0	5984	5961	5905	5833	5812
30.0	5553	5525	5444	5357	5339
35.0	5067	5031	4935	4842	4805
40.0	4541	4499	4394	4293	4249
45.0	3995	3949	3839	3735	3692
50.0	3444	3397	3289	3187	3147
55.0	2901	2856	2755	2659	2620
60.0	2372	2344	2252	2159	2118
65.0	1868	1836	1760	1686	1648
70.0	1382	1350	1300	1239	1220
75.0	913	900	866	834	828
80.0	496	496	507	514	519
85.0	165	192	255	298	316
90.0	2	39	96	133	151
95.0	0	1	9	28	37
100.0	0	0	1	1	1
105.0	1	1	1	1	2
110.0	1	1	1	1	2
115.0	1	1	1	1	1
120.0	1	1	1	1	1
125.0	1	1	1	1	1
130.0	1	1	1	1	1
135.0	2	1	2	2	2
140.0	1	1	2	2	2
145.0	2	2	2	2	2
150.0	2	2	2	2	2
155.0	2	2	2	2	3
160.0	2	2	2	3	3
165.0	2	2	3	3	3
170.0	3	3	3	3	3
175.0	3	3	3	4	4
180.0	3	3	3	3	3

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ZONAL LUMEN SUMMARY

0- 5	168.
5- 10	495.
10- 15	799.
15- 20	1064.
20- 25	1279.
25- 30	1436.
30- 35	1528.
35- 40	1556.
40- 45	1524.
45- 50	1440.
50- 55	1314.
55- 60	1156.
60- 65	973.
65- 70	773.
70- 75	565.
75- 80	365.
80- 85	201.
85- 90	88.
90- 95	25.
95-100	3.
100-105	1.
105-110	1.
110-115	1.
115-120	0.
120-125	0.
125-130	0.
130-135	1.
135-140	1.
140-145	1.
145-150	1.
150-155	1.
155-160	0.
160-165	0.
165-170	0.
170-175	0.
175-180	0.

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5-DEGREE ZONAL LUMEN SUMMARY

0- 5	168
5- 10	495
10- 15	799
15- 20	1064
20- 25	1279
25- 30	1436
30- 35	1528
35- 40	1556
40- 45	1524
45- 50	1440
50- 55	1314
55- 60	1156
60- 65	973
65- 70	773
70- 75	565
75- 80	365
80- 85	201
85- 90	88
90- 95	25
95-100	3
100-105	1
105-110	1
110-115	1
115-120	0
120-125	0
125-130	0
130-135	1
135-140	1
140-145	1
145-150	1
150-155	1
155-160	0
160-165	0
165-170	0
170-175	0
175-180	0

10-DEGREE ZONAL LUMEN SUMMARY

0- 10	663
0- 20	2526
0- 30	5241
0- 40	8324
0- 50	11289
0- 60	13759
0- 70	15505
0- 80	16435
0- 90	16724
0-100	16751
0-110	16752
0-120	16753
0-130	16754
0-140	16755
0-150	16756
0-160	16757
0-170	16758
0-180	16758

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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	39	33	29	27

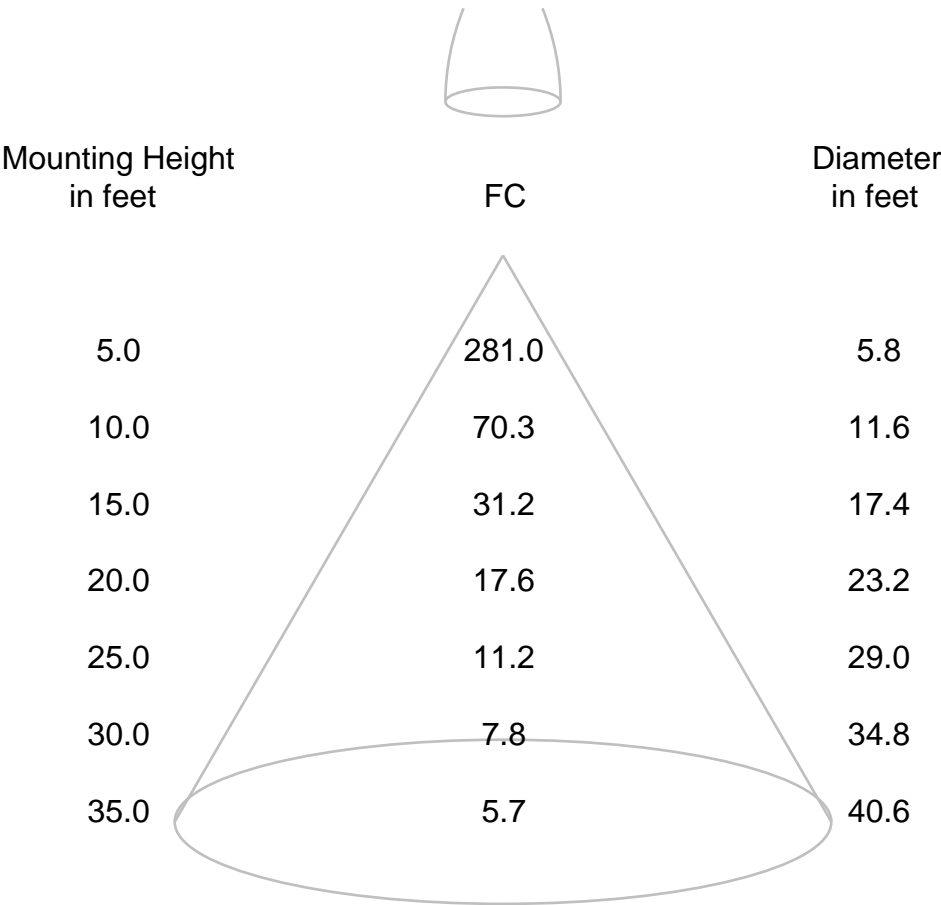
ALL CANDELA, LUMENS, LUMINANCE, AND VCP VALUES IN THIS REPORT ARE
BASED ON ABSOLUTE PHOTOMETRY. THE COEFFICIENT OF UTILIZATION VALUES
ARE BASED ON THE TOTAL ABSOLUTE LUMEN OUTPUT OF THIS LUMINAIRE SAMPLE.

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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: RAIL150YNW/D10, RAILP150YNW/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	03/07/18
	RAB 2.0 meter Diameter Integrating Sphere, 4PI Geometry	03/07/18

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)	16758 *
SPECTRORADIOMETRIC	
Observer	CIE 1931 2 degree
Chromaticity Ordinate x	0.4056
Chromaticity Ordinate y	0.3917
Observer	CIE 1976 2 degree
Chromaticity Ordinate u'	0.2355
Chromaticity Ordinate v'	0.5117
Correlated Color Temp CCT (K)	3501
ANSI C78.377-2008 Duv	0.000
Total Radiant Flux (milliWatts)	51067 *
ELECTRICAL	
Input Voltage (Volts AC)	120.0
Input Current (Amps AC)	1.11
Input Power (Watts)	131.8
Input Power Factor (%)	98.7
Input Current THD (%)	13.4
Input Voltage THD (%)	0.2
EFFICACY (Lumens/Watt)	
	127.1
ELECTRICAL AT MAX NONIMAL INPUT	
Input Voltage (Volts AC)	277.0
Input Current (Amps AC)	0.508
Input Power (Watts)	129.1
Input Power Factor (%)	91.7
Input Current THD (%)	20.7
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	86
R7 Light violet	85
R8 Light reddish purple	64
R9 Strong red	11
R10 Strong yellow	74
R11 Strong green	79
R12 Strong blue	63
R13 Light yellowish pink (skin)	83
R14 Moderate olive green (leaf)	97

*NOTE:

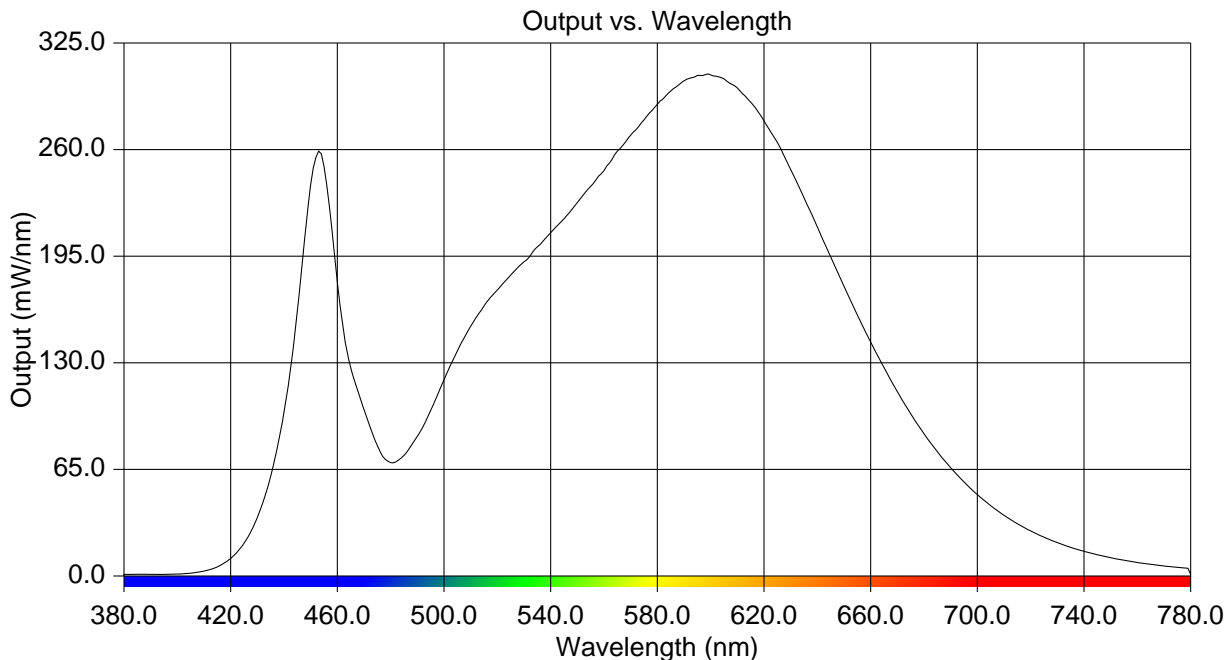
Proper calibration of integrating spheres for measuring total flux output of non-directional samples will produce reliable, repeatable results within the calibration tolerances of the equipment used. However, measurement of test samples with significant self absorption and/or directional output, even 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	0.904	515	164.515	650	176.427
385	0.972	520	174.327	655	159.049
390	0.957	525	183.444	660	142.594
395	1.042	530	191.396	665	127.091
400	1.203	535	200.578	670	112.209
405	1.694	540	209.127	675	98.838
410	2.906	545	217.671	680	86.722
415	5.544	550	227.399	685	75.811
420	10.684	555	237.394	690	65.872
425	19.892	560	247.038	695	57.328
430	35.652	565	258.915	700	49.652
435	60.671	570	268.874	705	42.911
440	99.604	575	277.934	710	36.945
445	160.959	580	287.414	715	31.800
450	238.518	585	295.452	720	27.432
455	249.690	590	301.739	725	23.632
460	179.177	595	305.036	730	20.335
465	126.832	600	305.348	735	17.446
470	101.379	605	302.978	740	15.065
475	79.503	610	297.423	745	12.970
480	69.090	615	288.742	750	11.126
485	73.493	620	277.363	755	9.531
490	85.085	625	264.343	760	8.212
495	100.898	630	247.790	765	7.069
500	119.774	635	230.541	770	6.133
505	137.206	640	212.676	775	5.277
510	152.119	645	194.607	780	0.793



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CIE Chromaticity Diagram

