

REPORT NUMBER: RAB03405

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ISSUE DATE: 05/19/17

DATE SAMPLE TESTED: 05/19/17

CATALOG NUMBER: RAIL185YNW/480/D10, RAILP185YNW/480/D10 (Standard Distribution) (ALSO APPLIES TO 347 RCL)

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.

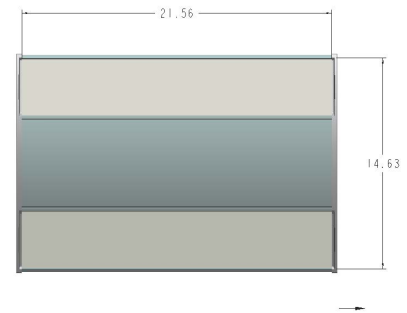
LAMPS: FIVE HUNDRED AND FOUR LIGHT EMITTING DIODES (LEDs).

(SEE PAGE 2 FOR MORE INFORMATION)

CANDELA DISTRIBUTION

	0.0	22.5	45.0	67.5	90.0	
0	8632	8632	8632	8632	8632	
5	8584	8586	8584	8584	8589	814
15	8183	8166	8132	8101	8101	2290
25	7375	7332	7257	7164	7141	3336
35	6263	6212	6064	5940	5879	3795
45	4969	4916	4734	4580	4503	3658
55	3651	3581	3410	3254	3199	3058
65	2361	2305	2167	2054	2012	2160
75	1150	1131	1069	1017	997	1146
85	202	237	307	356	371	349
90	4	43	108	157	171	
95	0	0	8	30	39	30
105	0	0	1	1	1	1
115	1	1	1	1	1	1
125	1	1	1	1	1	1
135	2	2	2	2	2	2
145	3	3	3	3	3	2
155	3	3	3	4	4	2
165	4	4	4	5	5	1
175	4	5	5	6	6	0
180	5	5	5	5	5	

FLUX



ZONAL LUMEN SUMMARY

ZONE	LUMENS	%FIXT
0- 30	6440	31.2
0- 40	10235	49.6
0- 60	16952	82.1
0- 90	20607	99.8
90-120	32	0.2
90-130	33	0.2
90-150	36	0.2
90-180	39	0.2
0-180	20646	100.0

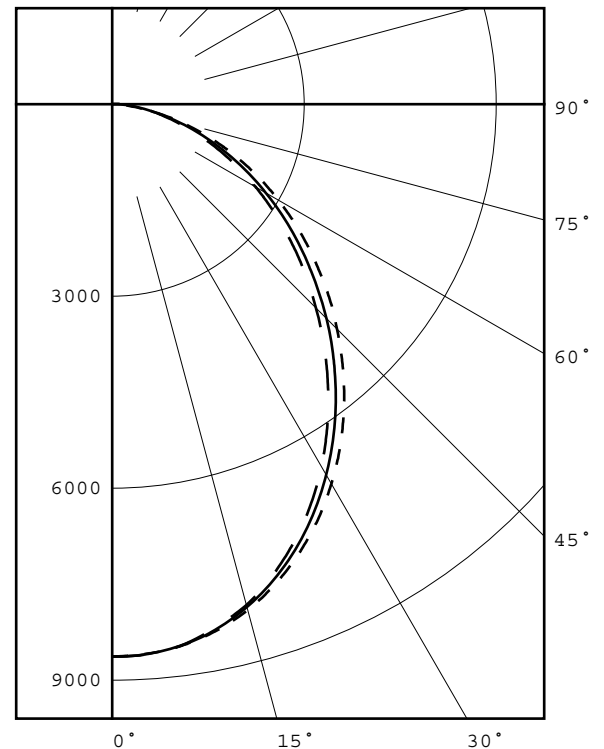
TOTAL INPUT WATTS = 169.0

EFFICACY = 122.2 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 = 168.98 W AT 347.0 VAC.

LED DRIVER: 2 x 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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Distribution)

PLANE : 0-DEG 90-DEG

BEAM ANGLE (50%) : 99.9 X 92.8 DEGREES

FIELD ANGLE (10%): 155.3 X 153.3 DEGREES

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CATALOG NUMBER: RAIL185YNW/480/D10, RAILP185YNW/480/D10 (Standard

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	34520.	32887.	31282.
55	31268.	29204.	27397.
65	27443.	25188.	23386.
75	21826.	20289.	18923.
85	11385.	17303.	20910.

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CANDELA DISTRIBUTION

	0.0	22.5	45.0	67.5	90.0
0.0	8632	8632	8632	8632	8632
5.0	8584	8586	8584	8584	8589
10.0	8437	8433	8423	8404	8398
15.0	8183	8166	8132	8101	8101
20.0	7821	7796	7741	7672	7662
25.0	7375	7332	7257	7164	7141
30.0	6850	6803	6687	6579	6539
35.0	6263	6212	6064	5940	5879
40.0	5628	5583	5406	5265	5193
45.0	4969	4916	4734	4580	4503
50.0	4310	4240	4057	3900	3845
55.0	3651	3581	3410	3254	3199
60.0	3001	2935	2772	2640	2590
65.0	2361	2305	2167	2054	2012
70.0	1742	1700	1592	1508	1473
75.0	1150	1131	1069	1017	997
80.0	620	624	619	620	623
85.0	202	237	307	356	371
90.0	4	43	108	157	171
95.0	0	0	8	30	39
100.0	0	0	0	1	1
105.0	0	0	1	1	1
110.0	0	1	1	1	1
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	2	2	2
135.0	2	2	2	2	2
140.0	2	2	2	3	3
145.0	3	3	3	3	3
150.0	3	3	3	4	4
155.0	3	3	3	4	4
160.0	4	4	4	4	4
165.0	4	4	4	5	5
170.0	4	4	5	5	5
175.0	4	5	5	6	6
180.0	5	5	5	5	5

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CATALOG NUMBER: RAIL185YNW/480/D10, RAILP185YNW/480/D10 (Standard

ZONAL LUMEN SUMMARY

0- 5	206.
5- 10	608.
10- 15	982.
15- 20	1308.
20- 25	1572.
25- 30	1764.
30- 35	1878.
35- 40	1916.
40- 45	1879.
45- 50	1779.
50- 55	1626.
55- 60	1432.
60- 65	1205.
65- 70	955.
70- 75	697.
75- 80	450.
80- 85	244.
85- 90	104.
90- 95	28.
95-100	2.
100-105	0.
105-110	0.
110-115	1.
115-120	0.
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	1.
165-170	1.
170-175	0.
175-180	0.

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5-DEGREE

ZONAL LUMEN SUMMARY

0- 5	206
5- 10	608
10- 15	982
15- 20	1308
20- 25	1572
25- 30	1764
30- 35	1878
35- 40	1916
40- 45	1879
45- 50	1779
50- 55	1626
55- 60	1432
60- 65	1205
65- 70	955
70- 75	697
75- 80	450
80- 85	244
85- 90	104
90- 95	28
95-100	2
100-105	0
105-110	0
110-115	1
115-120	0
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	1
165-170	1
170-175	0
175-180	0

10-DEGREE

ZONAL LUMEN SUMMARY

0- 10	814
0- 20	3104
0- 30	6440
0- 40	10235
0- 50	13893
0- 60	16952
0- 70	19112
0- 80	20258
0- 90	20607
0-100	20637
0-110	20637
0-120	20638
0-130	20639
0-140	20641
0-150	20643
0-160	20644
0-170	20645
0-180	20646

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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	91	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	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	41	35	47	40	35	46	39	35	45	39	34	32
9	58	45	37	32	57	45	37	32	43	36	32	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

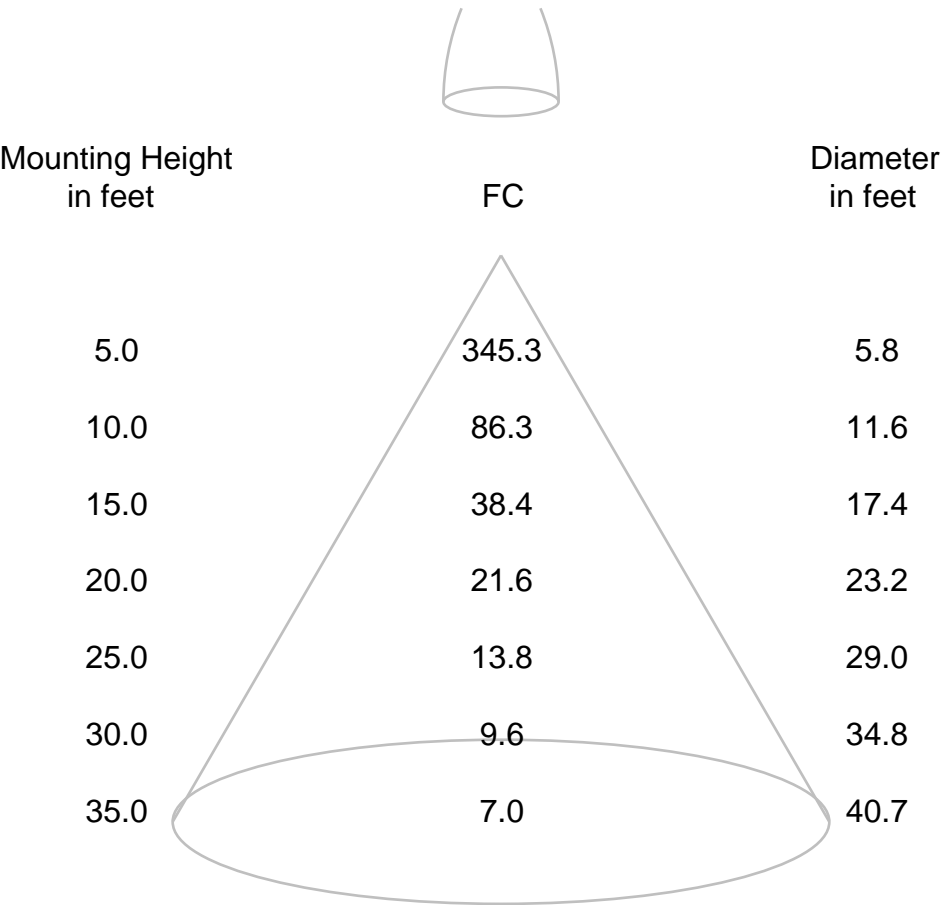
ALL CANDELA, LUMENS, LUMINANCE, AND VCP VALUES IN THIS REPORT ARE BASED ON ABSOLUTE PHOTOMETRY. THE COEFFICIENT OF UTILIZATION VALUES ARE BASED ON THE TOTAL ABSOLUTE LUMEN OUTPUT OF THIS LUMINAIRE SAMPLE.

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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.

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 PREPARED FOR: RAB LIGHTING INC.
 CATALOG NUMBER: RAIL185YNW/D10, RAILP185YNW/D10 (Standard Distribution) (ALSO APPLIES TO 347 RCL)
 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-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
 CHROMA PROGRAMMABLE DIGITAL POWER METER MODEL 66202
 OCEAN OPTICS QE65PRO Spectroradiometer
 RAB 2.0 meter Diameter Integrating Sphere, 4PI Geometry

Calibration Due:
 N/A
 3/01/18
 05/19/18
 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:

PHOTOMETRIC	
Total Integrated Flux (lumens)	20646 *
SPECTRORADIOMETRIC	
Observer	CIE 1931 2 degree
Chromaticity Ordinate x	0.4050
Chromaticity Ordinate y	0.3913
Observer	CIE 1976 2 degree
Chromaticity Ordinate u'	0.2352
Chromaticity Ordinate v'	0.5115
Correlated Color Temp CCT (K)	3512
ANSI C78.377-2008 Duv	0.000
Total Radiant Flux (milliWatts)	62897 *
ELECTRICAL	
Input Voltage (Volts AC)	347.0
Input Current (Amps AC)	0.492
Input Power (Watts)	169.0
Input Power Factor (%)	98.9
Input Current THD (%)	9.8
Input Voltage THD (%)	0.2
EFFICACY (Lumens/Watt)	
	122.2
ELECTRICAL AT MAX NONIMAL INPUT	
Input Voltage (Volts AC)	480.0
Input Current (Amps AC)	0.370
Input Power (Watts)	168.6
Input Power Factor (%)	94.9
Input Current THD (%)	11.4
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	79
R12 Strong blue	63
R13 Light yellowish pink (skin)	82
R14 Moderate olive green (leaf)	97

*NOTE:

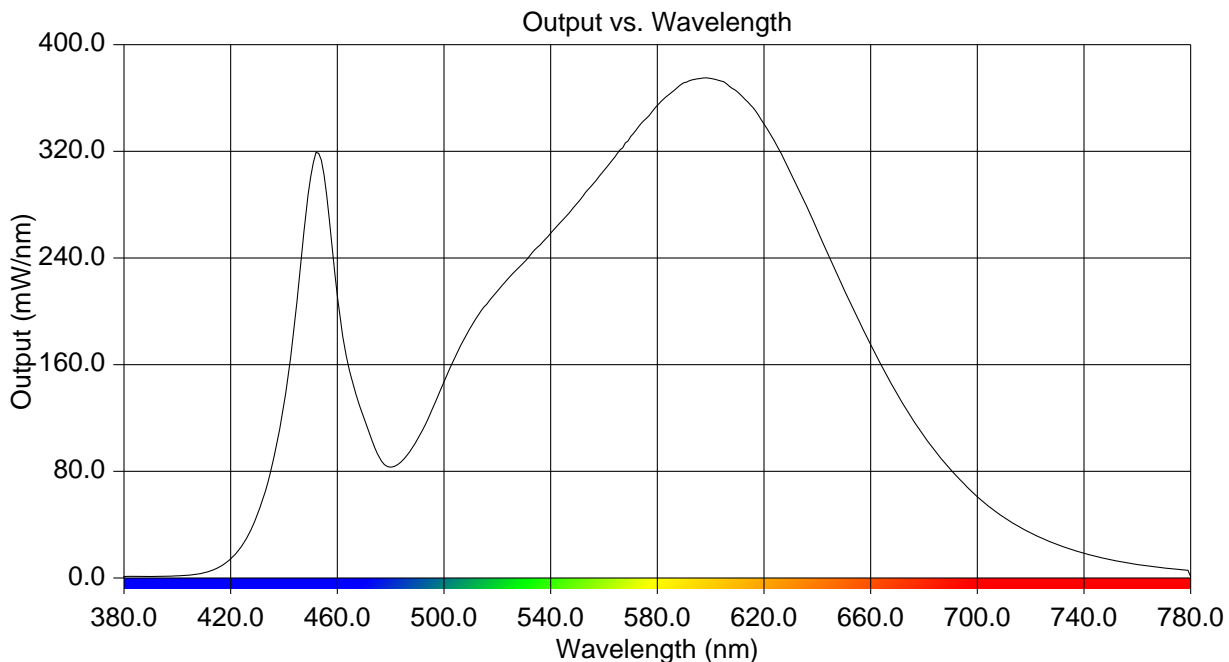
Proper calibration of integrating spheres for measuring total flux output of non-directional samples will produce reliable, repeatable results within the calibration tolerances of the equipment used. However, measurement of test samples with significant self absorption and/or directional output, even 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	1.131	515	203.293	650	216.391
385	1.177	520	215.130	655	195.477
390	1.181	525	226.673	660	174.650
395	1.283	530	236.444	665	155.826
400	1.659	535	248.000	670	137.895
405	2.250	540	258.479	675	121.191
410	3.866	545	269.499	680	106.679
415	7.438	550	280.928	685	92.943
420	14.303	555	293.409	690	81.033
425	26.554	560	305.506	695	70.740
430	47.515	565	318.466	700	60.981
435	79.996	570	331.057	705	52.681
440	130.691	575	343.128	710	45.539
445	211.268	580	354.407	715	39.056
450	300.726	585	363.617	720	33.838
455	302.630	590	371.469	725	29.104
460	211.779	595	374.379	730	25.033
465	152.106	600	374.649	735	21.586
470	119.492	605	372.116	740	18.500
475	93.304	610	364.700	745	15.931
480	83.185	615	354.627	750	13.731
485	89.337	620	340.507	755	11.774
490	103.707	625	323.794	760	10.178
495	123.857	630	303.787	765	8.746
500	147.386	635	282.989	770	7.577
505	169.152	640	260.702	775	6.519
510	188.087	645	238.782	780	0.979



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CIE Chromaticity Diagram

