

REPORT NUMBER: RAB03401

ISSUE DATE: 05/18/17

PAGE: 1 OF 9
DATE SAMPLE TESTED: 05/18/17

CATALOG NUMBER: RAIL185NW/D10, RAILP185NW/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.

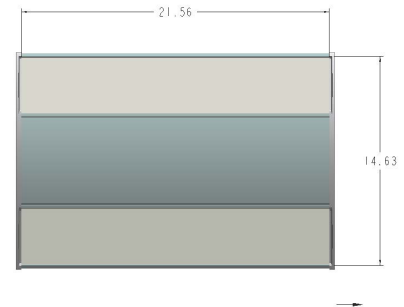
LAMPS: FIVE HUNDRED AND FOUR LIGHT EMITTING DIODES (LEDs).

(SEE PAGE 2 FOR MORE INFORMATION)

CANDELA DISTRIBUTION

	0.0	45.0	90.0	135.0	180.0	
0	8925	8925	8925	8925	8925	
5	8882	8881	8881	8870	8866	842
15	8497	8431	8367	8384	8417	2367
25	7692	7548	7375	7456	7556	3450
35	6562	6331	6090	6230	6418	3926
45	5234	4943	4661	4837	5079	3779
55	3850	3570	3316	3477	3709	3158
65	2512	2284	2090	2203	2370	2232
75	1253	1138	1028	1070	1140	1185
85	247	343	392	306	174	366
90	9	130	183	105	1	
95	0	16	42	6	1	34
105	1	2	3	2	2	2
115	2	2	3	3	3	2
125	2	2	3	3	3	2
135	3	3	4	3	3	3
145	4	4	5	5	5	3
155	5	5	6	6	5	2
165	6	6	7	6	6	2
175	6	7	8	7	7	1
180	8	8	8	8	8	

FLUX



ZONAL LUMEN SUMMARY

ZONE	LUMENS	%FIXT
0- 30	6660	31.2
0- 40	10585	49.6
0- 60	17523	82.0
0- 90	21306	99.8
90-120	39	0.2
90-130	41	0.2
90-150	46	0.2
90-180	51	0.2
0-180	21357	100.0

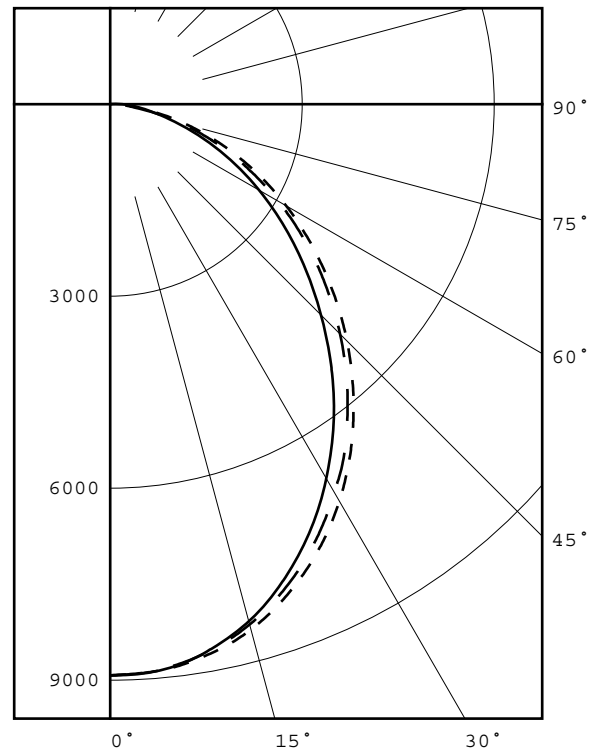
TOTAL INPUT WATTS = 163.3

EFFICACY = 130.8 Lm/W

CIE TYPE - DIRECT

PLANE : 0-DEG 90-DEG 180-DEG

SPACING CRITERIA : 1.2 1.1 1.2



LEGEND:

0-deg: - - - - -
90-deg: - - - - -
180-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 = 163.26 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: 25.0

ACCREDITED LABORATORY CODE 201058-0

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PLANE : 0-DEG 90-DEG

BEAM ANGLE (50%) : 100.0 X 92.8 DEGREES

FIELD ANGLE (10%) : 155.4 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 90-DEG	AVERAGE 180-DEG
45	36361.	32380.	35284.
55	32972.	28399.	31765.
65	29198.	24293.	27547.
75	23781.	19511.	21637.
85	13921.	22094.	9807.

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ZONAL LUMEN SUMMARY

0- 5	213.
5- 10	629.
10- 15	1015.
15- 20	1352.
20- 25	1625.
25- 30	1825.
30- 35	1944.
35- 40	1982.
40- 45	1942.
45- 50	1837.
50- 55	1679.
55- 60	1479.
60- 65	1244.
65- 70	987.
70- 75	720.
75- 80	465.
80- 85	255.
85- 90	111.
90- 95	30.
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	1.
175-180	0.

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5-DEGREE

ZONAL LUMEN SUMMARY

0- 5	213
5- 10	629
10- 15	1015
15- 20	1352
20- 25	1625
25- 30	1825
30- 35	1944
35- 40	1982
40- 45	1942
45- 50	1837
50- 55	1679
55- 60	1479
60- 65	1244
65- 70	987
70- 75	720
75- 80	465
80- 85	255
85- 90	111
90- 95	30
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	1
175-180	0

10-DEGREE

ZONAL LUMEN SUMMARY

0- 10	842
0- 20	3209
0- 30	6660
0- 40	10585
0- 50	14364
0- 60	17523
0- 70	19754
0- 80	20940
0- 90	21306
0-100	21339
0-110	21342
0-120	21344
0-130	21347
0-140	21349
0-150	21352
0-160	21355
0-170	21356
0-180	21357

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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	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

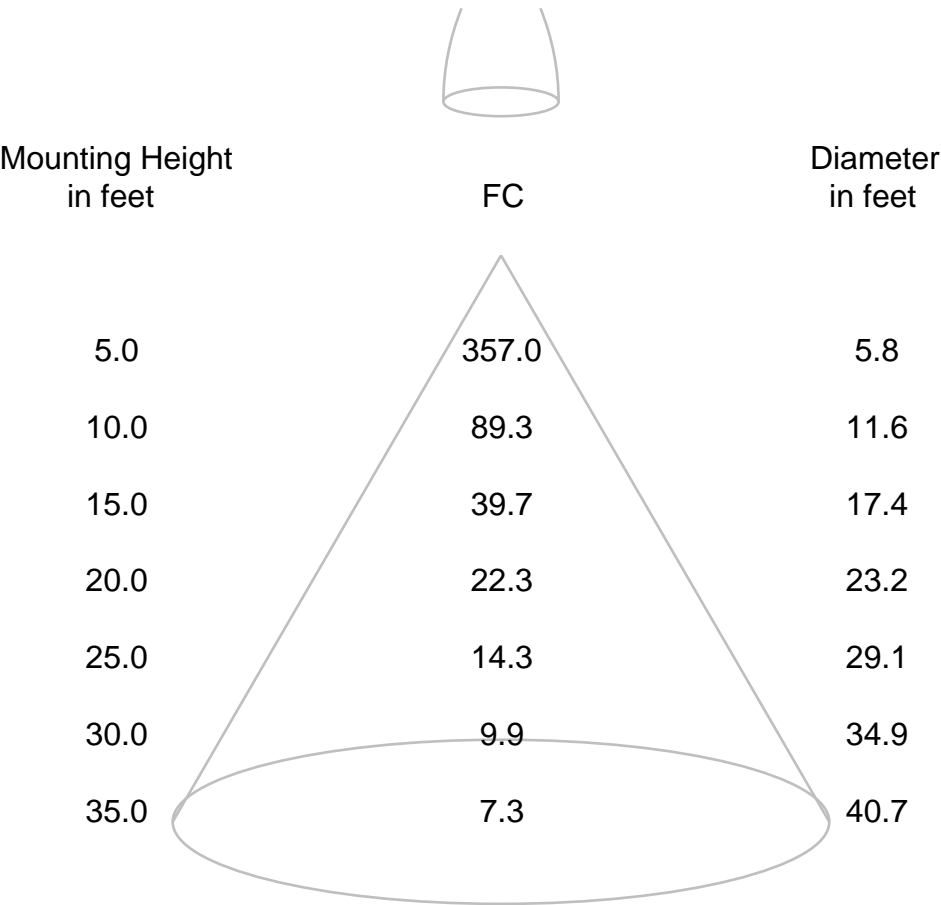
ALL CANDELA, LUMENS, LUMINANCE, AND VCP VALUES IN THIS REPORT ARE BASED ON ABSOLUTE PHOTOMETRY. THE COEFFICIENT OF UTILIZATION VALUES ARE BASED ON THE TOTAL ABSOLUTE LUMEN OUTPUT OF THIS LUMINAIRE SAMPLE.

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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: RAIL185NW/D10, RAILP185NW/D10 (Standard Distribution)

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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:	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	<u>X.CAO</u>
Approved	<u>D.WANG-MUNSON</u> Lighting Engineer

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RESULTS:

PHOTOMETRIC	
Total Integrated Flux (lumens)	21357 *
SPECTRORADIOMETRIC	
Observer	CIE 1931 2 degree
Chromaticity Ordinate x	0.3776
Chromaticity Ordinate y	0.3696
Observer	CIE 1976 2 degree
Chromaticity Ordinate u'	0.2261
Chromaticity Ordinate v'	0.4979
Correlated Color Temp CCT (K)	4026
ANSI C78.377-2008 Duv	-0.003
Total Radiant Flux (milliWatts)	63156 *
ELECTRICAL	
Input Voltage (Volts AC)	120.0
Input Current (Amps AC)	1.36
Input Power (Watts)	163.3
Input Power Factor (%)	99.8
Input Current THD (%)	5.4
Input Voltage THD (%)	0.3
EFFICACY (Lumens/Watt)	
	130.8
ELECTRICAL AT MAX NONIMAL INPUT	
Input Voltage (Volts AC)	277.0
Input Current (Amps AC)	0.596
Input Power (Watts)	159.6
Input Power Factor (%)	96.6
Input Current THD (%)	7.5
Input Voltage THD (%)	0.2
Off-State Power (Watts)	0.0

COLOR RENDERING INDICES	CRI
Ra (Average 1-8)	77
R1 Light greyish red	75
R2 Dark greyish yellow	85
R3 Strong yellowish green	92
R4 Moderate yellowish green	75
R5 Light bluish green	75
R6 Light blue	79
R7 Light violet	82
R8 Light reddish purple	55
R9 Strong red	-17
R10 Strong yellow	65
R11 Strong green	72
R12 Strong blue	53
R13 Light yellowish pink (skin)	77
R14 Moderate olive green (leaf)	96

*NOTE:

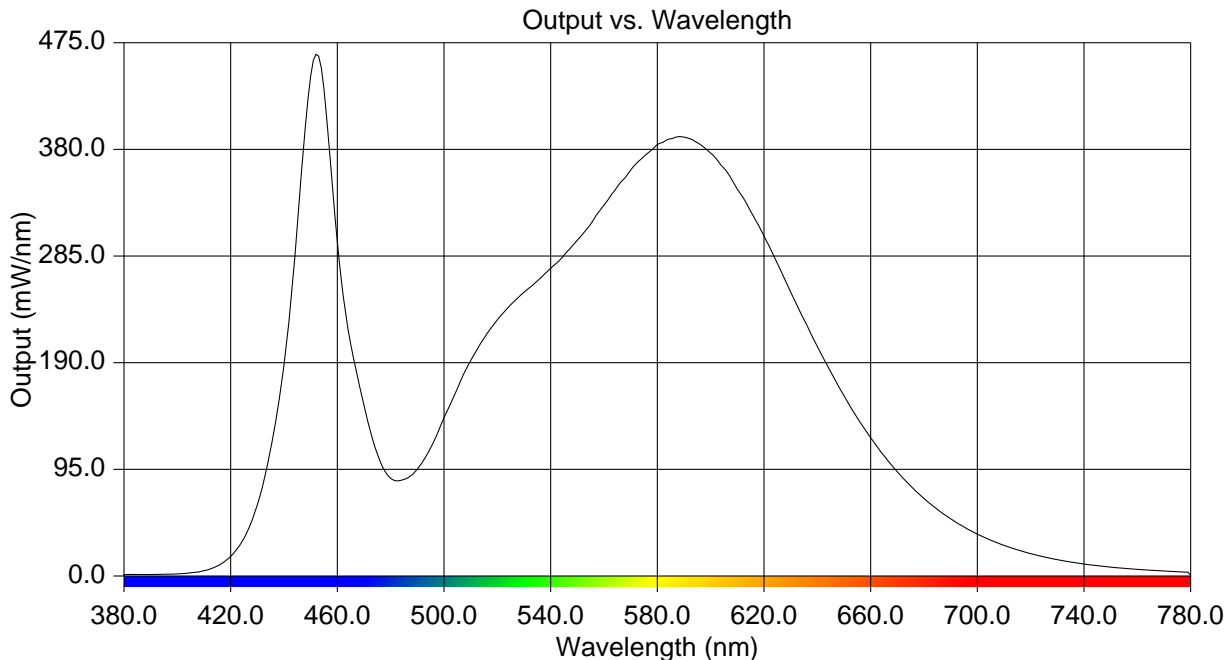
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RESULTS:

Wavelength	mW per nm	Wavelength	mW per nm	Wavelength	mW per nm
380	1.227	515	211.756	650	160.377
385	1.319	520	228.166	655	140.740
390	1.375	525	241.795	660	123.174
395	1.519	530	252.549	665	106.976
400	1.844	535	262.805	670	92.742
405	2.703	540	274.111	675	80.051
410	4.620	545	285.739	680	68.906
415	8.928	550	299.087	685	59.238
420	17.445	555	313.295	690	50.854
425	33.678	560	330.538	695	43.727
430	63.417	565	346.583	700	37.316
435	113.070	570	361.496	705	31.845
440	188.180	575	373.780	710	27.224
445	310.909	580	384.231	715	23.191
450	445.148	585	389.379	720	19.883
455	433.446	590	391.001	725	16.972
460	297.393	595	385.919	730	14.554
465	206.604	600	376.718	735	12.464
470	151.415	605	362.861	740	10.740
475	108.699	610	344.561	745	9.189
480	86.999	615	324.794	750	7.905
485	86.052	620	302.738	755	6.776
490	95.187	625	278.613	760	5.860
495	114.108	630	253.016	765	5.066
500	140.945	635	228.284	770	4.385
505	166.770	640	204.338	775	3.794
510	191.930	645	181.702	780	0.576



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CIE Chromaticity Diagram

