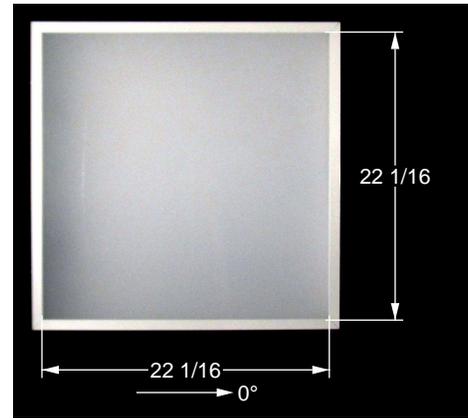


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REPORT NUMBER: ITL80211 PAGE: 1 OF 5
 ISSUE DATE: 12/17/13
 PREPARED FOR: RAB LIGHTING, INC.
 CATALOG NUMBER: PANEL2X2-34YN
 LUMINAIRE: FABRICATED WHITE PAINTED METAL HOUSING, 2 WHITE CIRCUIT BOARDS
 EACH WITH 120 LEDS, FROSTED HOLOGRAPHIC PLASTIC DIFFUSER. DIFFUSER
 FROSTED SIDE UP.
 LAMPS: TWO HUNDRED FORTY WHITE LIGHT EMITTING DIODES (LEDS), VERTICAL
 BASE-UP POSITION.
 TOTAL INPUT WATTS = 34.3 AT 120.0 VOLTS
 MOUNTING: RECESSED
 LED DRIVER: RAB RD-042-A0700N
 NOTE: DATA SHOWN IS ABSOLUTE FOR THE SAMPLE
 PROVIDED AT RATED INPUT VOLTAGE
 (120VAC, 60Hz) TO THE LED DRIVER.
 TEST PROCEDURE: IESNA LM-79-08
 TEST DISTANCE = 35.0 FEET

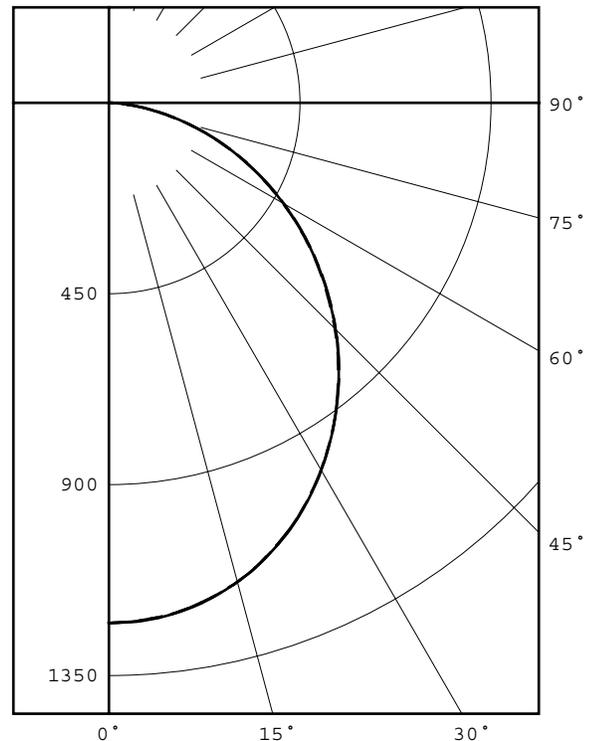
CANDELA DISTRIBUTION						FLUX
	0.0	22.5	45.0	67.5	90.0	
0	1226	1226	1226	1226	1226	
5	1219	1220	1221	1220	1219	116
15	1169	1169	1169	1169	1169	330
25	1067	1067	1068	1068	1067	491
35	924	923	924	924	924	577
45	752	753	755	754	756	581
55	568	569	570	569	571	509
65	379	380	380	379	381	376
75	196	195	195	196	196	207
85	38	38	38	39	38	49
90	0	0	0	0	0	



ZONAL LUMEN SUMMARY		
ZONE	LUMENS	%FIXT
0- 30	937	28.9
0- 40	1514	46.8
0- 60	2605	80.5
0- 90	3237	100.0
90-180	0	0.0
0-180	3237	100.0

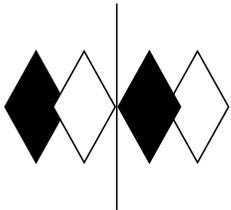
EFFICACY = 94.4 lm/W
 CIE TYPE - DIRECT
 PLANE : 0-DEG 90-DEG
 SPACING CRITERIA : 1.21 1.21
 LUMINOUS LENGTH : 22.063 22.063

LUMINANCE DATA IN CANDELA/SQ M			
ANGLE IN DEG	AVERAGE 0-DEG	AVERAGE 45-DEG	AVERAGE 90-DEG
45	3387.	3400.	3405.
55	3153.	3165.	3170.
65	2856.	2863.	2871.
75	2411.	2399.	2411.
85	1388.	1388.	1388.



LEGEND:
 0-deg -----
 45-deg -----
 90-deg -----

Checked M KLOPF
 Approved R BEATTIE
 Lighting Engineer



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REPORT NUMBER: ITL80211

PAGE: 2 OF 5

ISSUE DATE: 12/17/13

PREPARED FOR: RAB LIGHTING, INC.

CANDELA DISTRIBUTION
 LATERAL ANGLE

	0.0	22.5	45.0	67.5	90.0
0.0	1226	1226	1226	1226	1226
2.5	1224	1225	1225	1225	1224
5.0	1219	1220	1221	1220	1219
7.5	1212	1213	1213	1213	1212
10.0	1200	1201	1202	1201	1200
12.5	1186	1187	1187	1187	1186
15.0	1169	1169	1169	1169	1169
17.5	1148	1148	1149	1148	1148
20.0	1123	1123	1124	1124	1123
22.5	1097	1097	1098	1097	1096
25.0	1067	1067	1068	1068	1067
27.5	1034	1035	1035	1035	1034
30.0	1000	1000	1000	1001	999
32.5	962	962	963	962	962
35.0	924	923	924	924	924
37.5	882	883	884	882	883
40.0	840	840	842	841	843
42.5	797	797	799	798	800
45.0	752	753	755	754	756
47.5	706	707	709	708	710
50.0	661	662	663	663	665
52.5	615	616	616	617	618
55.0	568	569	570	569	571
57.5	521	521	522	522	524
60.0	473	474	474	474	476
62.5	426	427	427	428	429
65.0	379	380	380	379	381
67.5	332	333	333	334	335
70.0	285	286	287	287	288
72.5	241	240	240	240	241
75.0	196	195	195	196	196
77.5	152	151	152	153	152
80.0	110	109	110	111	110
82.5	71	71	71	72	71
85.0	38	38	38	39	38
87.5	14	14	14	15	14
90.0	0	0	0	0	0



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ISSUE DATE: 12/17/13
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PAGE: 3 OF 5

5-DEGREE
ZONAL LUMEN SUMMARY

0- 5	29
5- 10	87
10- 15	141
15- 20	189
20- 25	230
25- 30	262
30- 35	283
35- 40	294
40- 45	295
45- 50	286
50- 55	268
55- 60	241
60- 65	208
65- 70	169
70- 75	126
75- 80	81
80- 85	39
85- 90	9

10-DEGREE
ZONAL LUMEN SUMMARY

0- 10	116
0- 20	445
0- 30	937
0- 40	1514
0- 50	2096
0- 60	2605
0- 70	2981
0- 80	3188
0- 90	3237



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PAGE: 4 OF 5

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PREPARED FOR: RAB LIGHTING, INC.

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	119	116	116	116	116	111	111	111	111	111	111	106	106	106	102	102	102	100
1	109	104	100	96	106	102	98	95	98	95	92	94	91	89	90	88	86	84	90	88	86	84
2	99	91	85	79	97	89	83	78	86	81	76	83	78	74	80	76	73	71	80	76	73	71
3	91	80	72	66	88	79	71	65	76	69	64	73	68	63	70	66	62	60	70	66	62	60
4	83	71	63	56	81	70	62	56	67	60	55	65	59	54	63	58	53	51	63	58	53	51
5	77	64	55	48	74	63	54	48	61	53	48	59	52	47	57	51	47	44	57	51	47	44
6	71	58	49	42	69	57	48	42	55	47	42	53	46	41	52	46	41	39	52	46	41	39
7	66	52	44	37	64	51	43	37	50	42	37	48	42	37	47	41	37	35	47	41	37	35
8	61	48	39	34	60	47	39	33	46	38	33	44	38	33	43	37	33	31	43	37	33	31
9	57	44	36	30	56	43	35	30	42	35	30	41	34	30	40	34	30	28	40	34	30	28
10	54	41	33	27	52	40	32	27	39	32	27	38	32	27	37	31	27	25	37	31	27	25

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 TEST SAMPLE.



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NVLAP LAB CODE: 200925-0

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PAGE: 5 OF 5

ADDRESS: 170 LUDLOW AVE
NORTHVALE, NJ 07647

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Page 1 of 4

REPORT NUMBER: ITL80214
DATE: 12/27/13
PREPARED FOR: RAB LIGHTING, INC.
CATALOG NUMBER: PANEL2X2-34YN

ADDRESS: 170 LUDLOW AVE
NORTHVALE, NJ 07647

LUMINAIRE: FABRICATED WHITE PAINTED METAL HOUSING, 2 WHITE CIRCUIT BOARDS EACH WITH 120 LEDS, FROSTED HOLOGRAPHIC PLASTIC DIFFUSER. DIFFUSER FROSTED SIDE UP.

LAMP: TWO HUNDRED FORTY WHITE LIGHT EMITTING DIODES (LEDS), VERTICAL BASE-UP POSITION.

DRIVER: RAB RD-042-A0700N

NOTE: DATA SHOWN IS ABSOLUTE FOR THE SAMPLE PROVIDED AT RATED INPUT VOLTAGE (120.0 AND 277.0 VAC, 60Hz) TO THE LED DRIVER.

		Calibration Due:
INSTRUMENTS:	Associated Power Technologies APT5010 AC Power Source	N/A
	Yokogawa WT210 Digital Power Meter #6	10/31/14
	Ocean Optics QE65000 Spectroradiometer	10/17/14
	ITL 1.5m Diameter Integrating Sphere S15-2, 4PI Geometry	10/17/14

OBJECT OF TEST: Measure the 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. Report Off-State Power. Measure electrical data including Total Harmonic Distortion (THD) at maximum rated voltage.

PROCEDURE: The test sample was provided by the customer and had an unknown number of operating hours. The test sample was mounted inside the integrating sphere 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 120.0 VAC input. Electrical data was also recorded at maximum nominal rated input voltage (277.0 VAC). All testing performed in a 25 +/-1 degree Celsius free air ambient and in accordance with IESNA LM-79-08. 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)

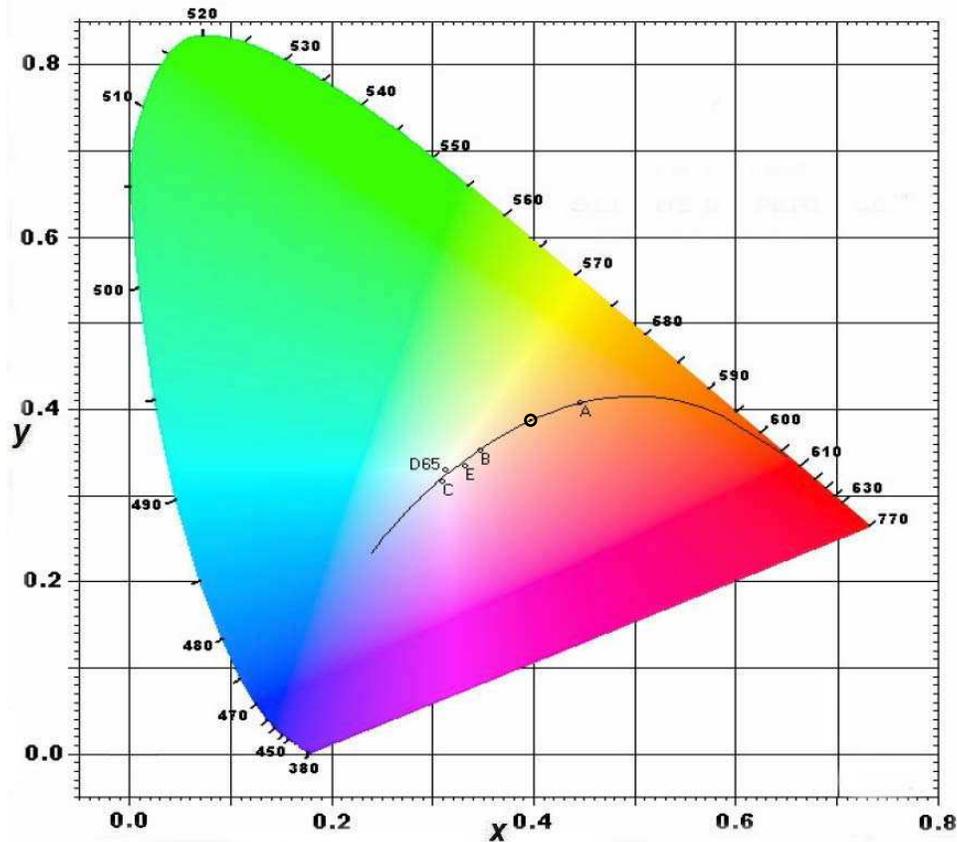
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Checked	<u>N THOMAS</u>
Approved	<u>L GRABA</u> Lighting Engineer



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CIE Chromaticity Diagram





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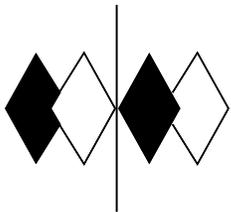
RESULTS:

SPECTRORADIOMETRIC	
Observer	CIE 1931 2 degree
Chromaticity Ordinate x	0.3968
Chromaticity Ordinate y	0.3870
Observer	CIE 1976 2 degree
Chromaticity Ordinate u'	0.2317
Chromaticity Ordinate v'	0.5085
Correlated Color Temp CCT (K)	3663
ANSI C78.377-2008 Duv	0.000
Total Radiant Flux (milliWatts)	10451 *
ELECTRICAL	
Input Voltage (Volts AC)	120.0
Input Current (Amps AC)	0.289
Input Power (Watts)	34.3
Input Power Factor (%)	98.9
Input Current THD (%)	8.0
Input Voltage THD (%)	0.2
Off-State Power (Watts)	
	0.0
ELECTRICAL AT MAX NONIMAL INPUT	
Input Voltage (Volts AC)	277.0
Input Current (Amps AC)	0.132
Input Power (Watts)	34.8
Input Power Factor (%)	95.2
Input Current THD (%)	7.8
Input Voltage THD (%)	0.2

COLOR RENDERING INDICES	CRI
Ra (Average 1-8)	84
R1 Light greyish red	83
R2 Dark greyish yellow	89
R3 Strong yellowish green	92
R4 Moderate yellowish green	84
R5 Light bluish green	83
R6 Light blue	84
R7 Light violet	89
R8 Light reddish purple	72
R9 Strong red	29
R10 Strong yellow	72
R11 Strong green	82
R12 Strong blue	63
R13 Light yellowish pink (skin)	84
R14 Moderate olive green (leaf)	95

*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	0.360	515	33.137	650	38.077
385	0.383	520	35.576	655	35.337
390	0.428	525	37.544	660	32.571
395	0.501	530	39.306	665	29.841
400	0.606	535	40.892	670	27.181
405	0.895	540	42.444	675	24.654
410	1.309	545	44.010	680	22.253
415	1.989	550	45.610	685	20.018
420	3.416	555	47.157	690	17.965
425	5.880	560	48.698	695	16.076
430	9.957	565	50.058	700	14.327
435	16.128	570	51.356	705	12.712
440	26.841	575	52.500	710	11.234
445	43.334	580	53.451	715	9.931
450	51.622	585	54.228	720	8.739
455	41.707	590	54.750	725	7.680
460	29.971	595	54.991	730	6.745
465	23.536	600	54.955	735	5.918
470	18.330	605	54.668	740	5.180
475	14.860	610	54.009	745	4.545
480	13.941	615	52.977	750	3.988
485	14.589	620	51.620	755	3.499
490	16.506	625	49.933	760	3.070
495	19.651	630	48.055	765	2.698
500	23.292	635	45.836	770	2.365
505	26.958	640	43.389	775	2.074
510	30.250	645	40.770	780	1.821

