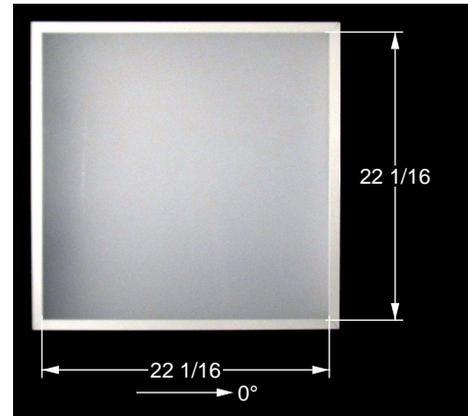


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REPORT NUMBER: ITL80212 PAGE: 1 OF 5
 ISSUE DATE: 12/18/13
 PREPARED FOR: RAB LIGHTING, INC.
 CATALOG NUMBER: PANEL2X2-34N
 LUMINAIRE: FABRICATED WHITE PAINTED METAL HOUSING, 2 WHITE CIRCUIT BOARDS
 EACH WITH 120 LEDS, FROSTED HOLOGRAPHIC PLASTIC DIFFUSER. DIFFUSER
 FROSTED SIDE UP.
 LAMPS: TWO HUNDRED FORTY WHITE LIGHT EMITTING DIODES (LEDS), VERTICAL
 BASE-UP POSITION.
 TOTAL INPUT WATTS = 34.8 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

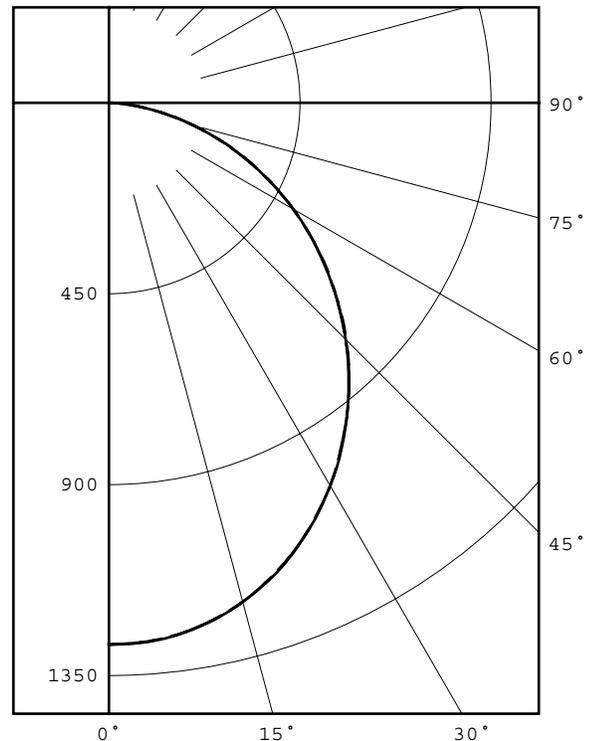


CANDELA DISTRIBUTION						FLUX
	0.0	22.5	45.0	67.5	90.0	
0	1277	1277	1277	1277	1277	
5	1271	1271	1272	1272	1271	121
15	1217	1218	1218	1218	1218	343
25	1111	1112	1112	1112	1111	512
35	963	964	964	964	962	603
45	791	789	788	790	789	609
55	600	598	598	599	599	535
65	403	401	401	401	400	398
75	208	206	207	207	208	220
85	40	41	41	40	42	52
90	0	0	0	0	0	

ZONAL LUMEN SUMMARY		
ZONE	LUMENS	%FIXT
0- 30	976	28.8
0- 40	1579	46.5
0- 60	2723	80.3
0- 90	3392	100.0
90-180	0	0.0
0-180	3392	100.0

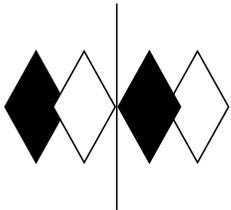
EFFICACY = 97.5 lm/W
 CIE TYPE - DIRECT
 PLANE : 0-DEG 90-DEG
 SPACING CRITERIA : 1.22 1.21
 LUMINOUS LENGTH : 22.063 22.063

LUMINANCE DATA IN CANDELA/SQ M			
ANGLE IN DEG	AVERAGE 0-DEG	AVERAGE 45-DEG	AVERAGE 90-DEG
45	3562.	3549.	3553.
55	3331.	3320.	3326.
65	3037.	3021.	3014.
75	2559.	2547.	2559.
85	1461.	1498.	1535.



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

Checked M KLOPF
 Approved R BEATTIE
 Lighting Engineer



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 PREPARED FOR: RAB LIGHTING, INC. PAGE: 2 OF 5

CANDELA DISTRIBUTION
 LATERAL ANGLE

	0.0	22.5	45.0	67.5	90.0
0.0	1277	1277	1277	1277	1277
2.5	1275	1276	1276	1275	1275
5.0	1271	1271	1272	1272	1271
7.5	1263	1263	1264	1263	1263
10.0	1251	1251	1252	1252	1251
12.5	1236	1236	1237	1237	1236
15.0	1217	1218	1218	1218	1218
17.5	1195	1196	1196	1196	1195
20.0	1170	1171	1172	1171	1170
22.5	1142	1143	1143	1143	1142
25.0	1111	1112	1112	1112	1111
27.5	1078	1078	1078	1079	1077
30.0	1042	1043	1042	1042	1042
32.5	1004	1005	1005	1004	1003
35.0	963	964	964	964	962
37.5	922	922	922	923	922
40.0	880	878	878	880	880
42.5	836	835	834	835	835
45.0	791	789	788	790	789
47.5	744	743	741	743	742
50.0	695	696	694	695	695
52.5	649	648	646	648	647
55.0	600	598	598	599	599
57.5	551	549	550	550	550
60.0	502	500	501	501	501
62.5	452	451	452	451	450
65.0	403	401	401	401	400
67.5	354	352	353	352	351
70.0	305	303	304	304	302
72.5	256	254	255	255	253
75.0	208	206	207	207	208
77.5	161	162	161	160	163
80.0	117	118	117	116	119
82.5	76	77	76	76	78
85.0	40	41	41	40	42
87.5	14	15	14	14	15
90.0	0	0	0	0	0



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5-DEGREE
ZONAL LUMEN SUMMARY

0- 5	30
5- 10	90
10- 15	146
15- 20	197
20- 25	239
25- 30	273
30- 35	295
35- 40	307
40- 45	309
45- 50	300
50- 55	281
55- 60	254
60- 65	219
65- 70	178
70- 75	133
75- 80	86
80- 85	42
85- 90	10

10-DEGREE
ZONAL LUMEN SUMMARY

0- 10	121
0- 20	464
0- 30	976
0- 40	1579
0- 50	2187
0- 60	2723
0- 70	3120
0- 80	3340
0- 90	3392



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REPORT NUMBER: ITL80212

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ISSUE DATE: 12/18/13

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	90	88	86	84	84
2	99	91	84	79	97	89	83	78	86	81	76	82	78	74	79	76	73	79	76	73	71	71
3	91	80	72	66	88	79	71	65	76	69	64	73	67	63	70	66	62	70	66	62	60	60
4	83	71	63	56	81	70	62	55	67	60	55	65	59	54	63	58	53	63	58	53	51	51
5	76	64	55	48	74	63	54	48	60	53	47	59	52	47	57	51	46	57	51	46	44	44
6	71	57	49	42	69	56	48	42	55	47	42	53	46	41	51	46	41	51	46	41	39	39
7	66	52	43	37	64	51	43	37	50	42	37	48	42	37	47	41	36	47	41	36	34	34
8	61	48	39	33	60	47	39	33	46	38	33	44	38	33	43	37	33	43	37	33	31	31
9	57	44	36	30	56	43	35	30	42	35	30	41	34	30	40	34	30	40	34	30	28	28
10	54	40	33	27	52	40	32	27	39	32	27	38	32	27	37	31	27	37	31	27	25	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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REPORT NUMBER: ITL80215
DATE: 12/27/13
PREPARED FOR: RAB LIGHTING, INC.
CATALOG NUMBER: PANEL2X2-34N

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)

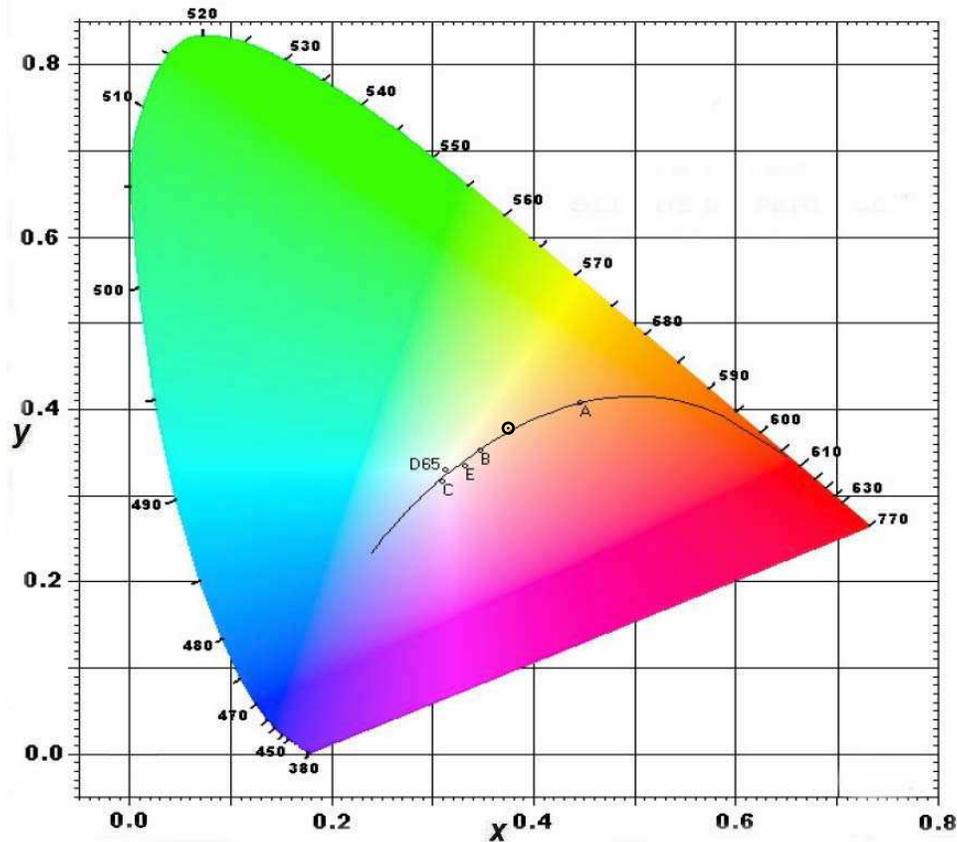
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Checked	<u>N THOMAS</u>
Approved	<u>L GRABA</u> Lighting Engineer



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CIE Chromaticity Diagram





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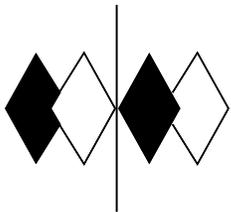
RESULTS:

SPECTRORADIOMETRIC	
Observer	CIE 1931 2 degree
Chromaticity Ordinate x	0.3746
Chromaticity Ordinate y	0.3778
Observer	CIE 1976 2 degree
Chromaticity Ordinate u'	0.2208
Chromaticity Ordinate v'	0.5012
Correlated Color Temp CCT (K)	4170
ANSI C78.377-2008 Duv	0.002
Total Radiant Flux (milliWatts)	10832 *
ELECTRICAL	
Input Voltage (Volts AC)	120.0
Input Current (Amps AC)	0.293
Input Power (Watts)	34.8
Input Power Factor (%)	99.0
Input Current THD (%)	8.5
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)	0.133
Input Power (Watts)	35.2
Input Power Factor (%)	95.5
Input Current THD (%)	7.5
Input Voltage THD (%)	0.2

COLOR RENDERING INDICES	CRI
Ra (Average 1-8)	83
R1 Light greyish red	81
R2 Dark greyish yellow	86
R3 Strong yellowish green	89
R4 Moderate yellowish green	83
R5 Light bluish green	81
R6 Light blue	80
R7 Light violet	89
R8 Light reddish purple	72
R9 Strong red	23
R10 Strong yellow	66
R11 Strong green	82
R12 Strong blue	60
R13 Light yellowish pink (skin)	82
R14 Moderate olive green (leaf)	94

*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	0.435	515	38.582	650	34.542
385	0.486	520	41.166	655	31.934
390	0.568	525	43.134	660	29.336
395	0.688	530	44.773	665	26.754
400	0.861	535	46.188	670	24.231
405	1.259	540	47.487	675	21.849
410	1.932	545	48.726	680	19.681
415	3.011	550	49.926	685	17.731
420	5.280	555	51.024	690	15.961
425	9.280	560	52.066	695	14.325
430	15.694	565	52.849	700	12.787
435	25.595	570	53.554	705	11.349
440	42.817	575	54.050	710	10.040
445	62.604	580	54.347	715	8.875
450	61.784	585	54.433	720	7.800
455	43.689	590	54.268	725	6.863
460	31.092	595	53.852	730	6.030
465	23.669	600	53.180	735	5.290
470	17.727	605	52.345	740	4.641
475	14.798	610	51.202	745	4.068
480	14.473	615	49.883	750	3.573
485	15.724	620	48.279	755	3.139
490	18.567	625	46.429	760	2.754
495	22.732	630	44.417	765	2.422
500	27.237	635	42.123	770	2.128
505	31.583	640	39.660	775	1.869
510	35.400	645	37.125	780	1.638

