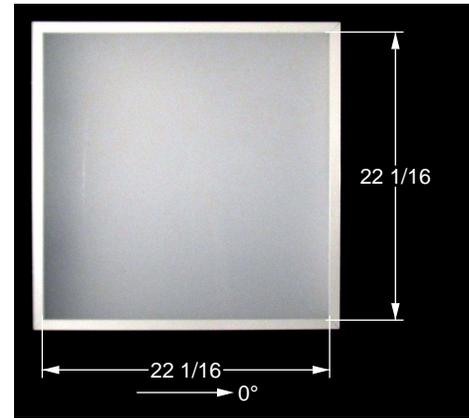


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REPORT NUMBER: ITL80210 PAGE: 1 OF 5
 ISSUE DATE: 12/17/13
 PREPARED FOR: RAB LIGHTING, INC.
 CATALOG NUMBER: PANEL2X2-34Y
 LUMINAIRE: FABRICATED WHITE PAINTED METAL HOUSING, 2 WHITE CIRCUIT BOARDS
 EACH WITH 120 LEDS, FROSTED HOLOGRAPHIC PLASTIC DIFFUSER. DIFFUSER
 FROSTED SIDE UP.
 LAMPS: TWO HUNDRED FORTY WHITE LIGHT EMITTING DIODES (LEDS), VERTICAL
 BASE-UP POSITION.
 TOTAL INPUT WATTS = 34.9 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

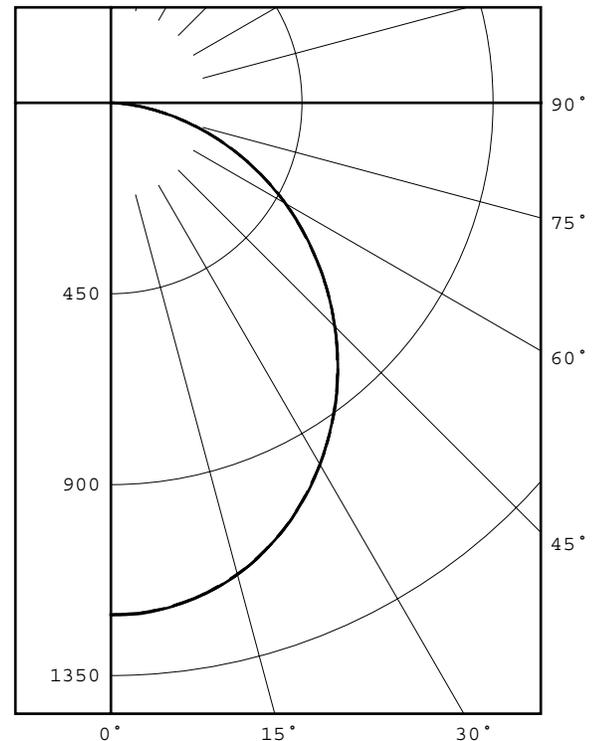


CANDELA DISTRIBUTION						FLUX
	0.0	22.5	45.0	67.5	90.0	
0	1207	1207	1207	1207	1207	
5	1201	1202	1202	1202	1201	114
15	1150	1151	1151	1151	1151	324
25	1049	1050	1050	1050	1050	484
35	910	912	911	913	911	570
45	745	746	746	747	746	576
55	565	566	567	568	566	507
65	381	380	381	383	380	377
75	197	196	196	198	198	209
85	40	40	41	40	40	50
90	0	0	0	0	0	

ZONAL LUMEN SUMMARY		
ZONE	LUMENS	% FIXT
0- 30	922	28.7
0- 40	1492	46.5
0- 60	2574	80.2
0- 90	3211	100.0
90-180	0	0.0
0-180	3211	100.0

EFFICACY = 92.0 lm/w
 CIE TYPE - DIRECT
 PLANE : 0-DEG 90-DEG
 SPACING CRITERIA : 1.21 1.22
 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	3355.	3360.	3360.
55	3137.	3148.	3142.
65	2871.	2871.	2863.
75	2424.	2411.	2436.
85	1461.	1498.	1461.



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

Checked M KLOPF
 Approved R BEATTIE
 Lighting Engineer



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REPORT NUMBER: ITL80210

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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	1207	1207	1207	1207	1207
2.5	1205	1206	1207	1206	1205
5.0	1201	1202	1202	1202	1201
7.5	1193	1194	1194	1194	1193
10.0	1182	1182	1183	1182	1182
12.5	1167	1168	1169	1168	1168
15.0	1150	1151	1151	1151	1151
17.5	1129	1130	1131	1130	1130
20.0	1105	1106	1106	1106	1106
22.5	1079	1080	1080	1080	1080
25.0	1049	1050	1050	1050	1050
27.5	1017	1019	1019	1019	1018
30.0	984	985	984	985	985
32.5	948	949	948	949	949
35.0	910	912	911	913	911
37.5	871	872	873	874	872
40.0	830	831	831	832	831
42.5	788	789	789	791	789
45.0	745	746	746	747	746
47.5	702	702	702	704	702
50.0	657	657	658	660	658
52.5	611	612	612	614	612
55.0	565	566	567	568	566
57.5	519	520	520	522	522
60.0	475	473	474	476	476
62.5	428	426	427	429	428
65.0	381	380	381	383	380
67.5	335	334	334	336	334
70.0	288	287	288	289	289
72.5	242	241	242	243	243
75.0	197	196	196	198	198
77.5	153	153	154	154	154
80.0	111	111	112	112	112
82.5	73	73	74	74	74
85.0	40	40	41	40	40
87.5	15	15	15	15	14
90.0	0	0	0	0	0



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5-DEGREE
ZONAL LUMEN SUMMARY

0- 5	29
5- 10	85
10- 15	138
15- 20	186
20- 25	226
25- 30	257
30- 35	279
35- 40	291
40- 45	292
45- 50	284
50- 55	266
55- 60	241
60- 65	208
65- 70	169
70- 75	127
75- 80	82
80- 85	41
85- 90	10

10-DEGREE
ZONAL LUMEN SUMMARY

0- 10	114
0- 20	438
0- 30	922
0- 40	1492
0- 50	2068
0- 60	2574
0- 70	2951
0- 80	3160
0- 90	3211



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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	96	106	102	98	95	98	95	92	94	91	89	90	88	86	90	88	86	84
2	99	91	84	79	79	97	89	83	78	86	81	76	82	78	74	79	76	73	79	76	73	70
3	91	80	72	66	66	88	79	71	65	76	69	64	73	67	63	70	66	62	70	66	62	60
4	83	71	62	56	56	81	70	62	55	67	60	55	65	59	54	63	58	53	63	58	53	51
5	76	64	55	48	48	74	63	54	48	60	53	47	58	52	47	57	51	46	57	51	46	44
6	71	57	49	42	42	69	56	48	42	55	47	42	53	46	41	51	45	41	51	45	41	39
7	66	52	43	37	37	64	51	43	37	50	42	37	48	42	37	47	41	36	47	41	36	34
8	61	48	39	33	33	59	47	39	33	46	38	33	44	38	33	43	37	33	43	37	33	31
9	57	44	36	30	30	56	43	35	30	42	35	30	41	34	30	40	34	29	40	34	29	28
10	54	40	33	27	27	52	40	32	27	39	32	27	38	31	27	37	31	27	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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ADDRESS: 170 LUDLOW AVE
NORTHVALE, NJ 07647

THIS ITL 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.



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REPORT NUMBER: ITL80213
DATE: 12/27/13
PREPARED FOR: RAB LIGHTING, INC.
CATALOG NUMBER: PANEL2X2-34Y

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)

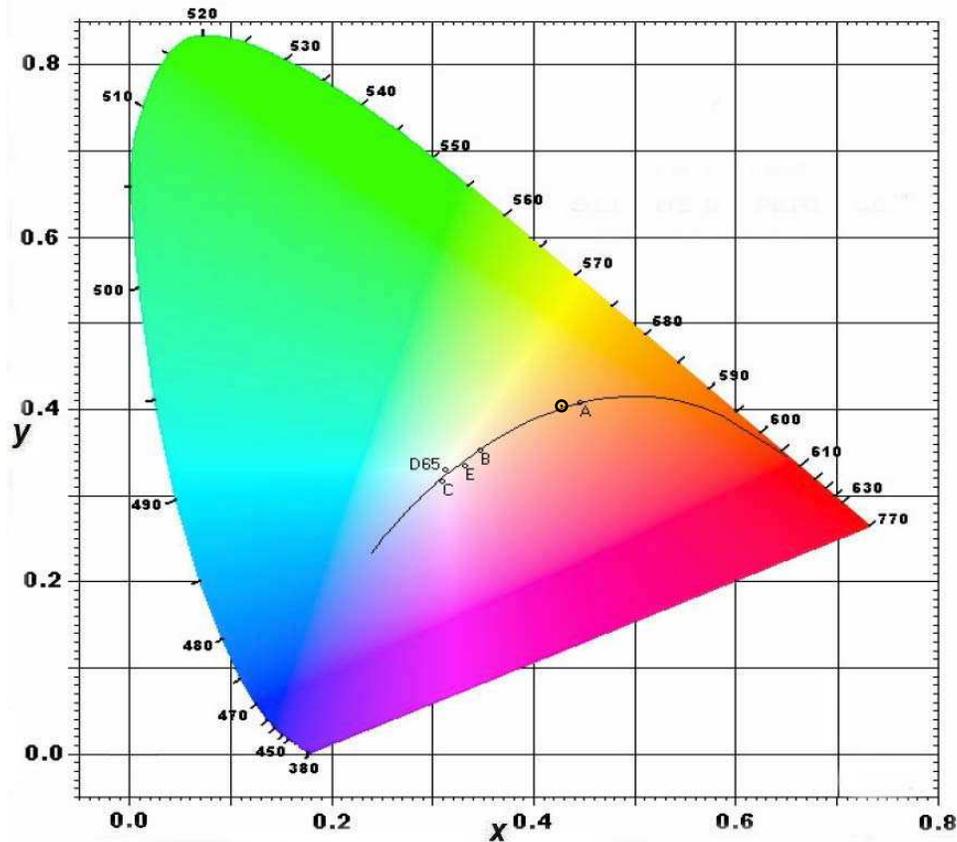
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Checked	<u>N THOMAS</u>
Approved	<u>L GRABA</u> Lighting Engineer



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CIE Chromaticity Diagram





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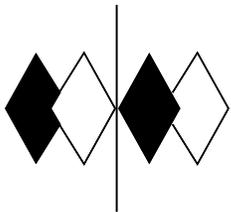
RESULTS:

SPECTRORADIOMETRIC	
Observer	CIE 1931 2 degree
Chromaticity Ordinate x	0.4274
Chromaticity Ordinate y	0.4036
Observer	CIE 1976 2 degree
Chromaticity Ordinate u'	0.2446
Chromaticity Ordinate v'	0.5198
Correlated Color Temp CCT (K)	3163
ANSI C78.377-2008 Duv	0.001
Total Radiant Flux (milliWatts)	10353 *
ELECTRICAL	
Input Voltage (Volts AC)	120.0
Input Current (Amps AC)	0.293
Input Power (Watts)	34.9
Input Power Factor (%)	99.3
Input Current THD (%)	6.3
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)	0.134
Input Power (Watts)	35.4
Input Power Factor (%)	95.4
Input Current THD (%)	9.2
Input Voltage THD (%)	0.2

COLOR RENDERING INDICES	CRI
Ra (Average 1-8)	83
R1 Light greyish red	81
R2 Dark greyish yellow	87
R3 Strong yellowish green	93
R4 Moderate yellowish green	83
R5 Light bluish green	81
R6 Light blue	83
R7 Light violet	88
R8 Light reddish purple	68
R9 Strong red	23
R10 Strong yellow	70
R11 Strong green	81
R12 Strong blue	64
R13 Light yellowish pink (skin)	82
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	0.331	515	29.311	650	42.848
385	0.353	520	31.770	655	39.834
390	0.395	525	33.866	660	36.810
395	0.469	530	35.820	665	33.786
400	0.572	535	37.682	670	30.853
405	0.801	540	39.543	675	28.042
410	1.208	545	41.502	680	25.340
415	1.887	550	43.530	685	22.815
420	3.277	555	45.596	690	20.459
425	5.708	560	47.680	695	18.318
430	9.484	565	49.643	700	16.333
435	15.221	570	51.605	705	14.495
440	25.138	575	53.405	710	12.825
445	36.062	580	55.043	715	11.346
450	35.230	585	56.465	720	9.982
455	25.303	590	57.647	725	8.771
460	18.525	595	58.482	730	7.707
465	14.480	600	58.989	735	6.756
470	11.243	605	59.141	740	5.923
475	9.727	610	58.823	745	5.182
480	9.797	615	58.038	750	4.550
485	10.905	620	56.840	755	3.994
490	13.116	625	55.244	760	3.504
495	16.294	630	53.387	765	3.076
500	19.811	635	51.105	770	2.702
505	23.289	640	48.547	775	2.368
510	26.473	645	45.756	780	2.083

