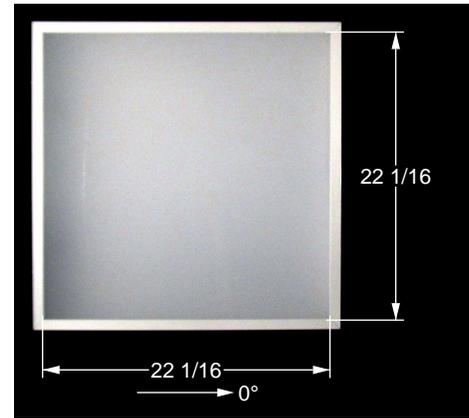


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REPORT NUMBER: ITL80216 PAGE: 1 OF 5  
 ISSUE DATE: 12/18/13  
 PREPARED FOR: RAB LIGHTING, INC.  
 CATALOG NUMBER: PANEL2X2-41Y  
 LUMINAIRE: FABRICATED WHITE PAINTED METAL HOUSING, 2 WHITE CIRCUIT BOARDS  
 EACH WITH 120 LEDS, FROSTED HOLOGRAPHIC PLASTIC DIFFUSER. DIFFUSER  
 FROSTED SIDE UP.  
 LAMPS: TWO HUNDRED FORTY WHITE LIGHT EMITTING DIODES (LEDS), VERTICAL  
 BASE-UP POSITION.  
 TOTAL INPUT WATTS = 39.4 AT 120.0 VOLTS  
 MOUNTING: RECESSED  
 LED DRIVER: RAB RD-052-A1050-R-080C  
 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

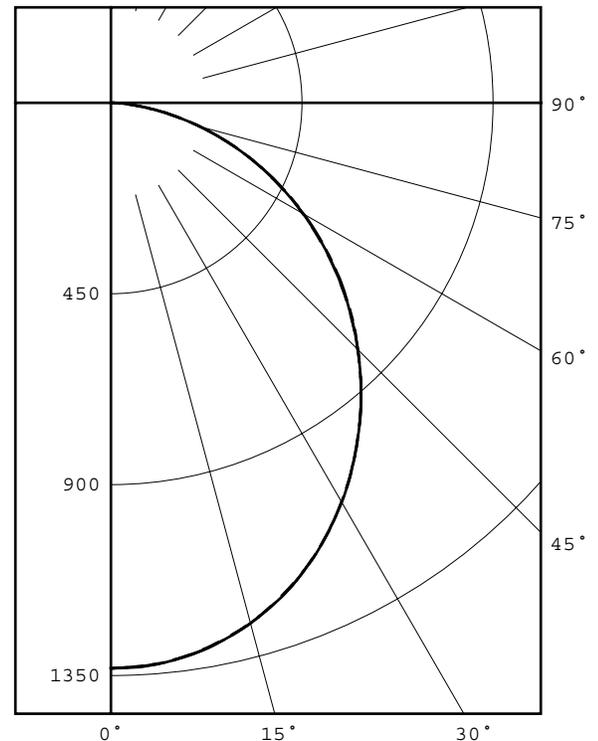


CANDELA DISTRIBUTION						FLUX
	0.0	22.5	45.0	67.5	90.0	
0	1333	1333	1333	1333	1333	
5	1326	1327	1327	1327	1326	126
15	1269	1270	1270	1270	1270	358
25	1159	1159	1160	1160	1159	534
35	1005	1004	1004	1006	1004	628
45	822	823	822	824	822	635
55	623	626	624	625	627	559
65	418	420	420	421	422	416
75	218	217	217	218	218	230
85	43	42	43	43	42	54
90	0	0	0	0	0	

ZONAL LUMEN SUMMARY		
ZONE	LUMENS	% FIXT
0- 30	1018	28.8
0- 40	1646	46.5
0- 60	2840	80.2
0- 90	3540	100.0
90-180	0	0.0
0-180	3540	100.0

EFFICACY = 89.8 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	3702.	3702.	3702.
55	3459.	3464.	3481.
65	3150.	3165.	3180.
75	2682.	2670.	2682.
85	1571.	1571.	1535.



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

Checked           M KLOPF            
 Approved           R BEATTIE            
 Lighting Engineer



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REPORT NUMBER: ITL80216

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ISSUE DATE: 12/18/13

PREPARED FOR: RAB LIGHTING, INC.

CANDELA DISTRIBUTION  
LATERAL ANGLE

	0.0	22.5	45.0	67.5	90.0
0.0	1333	1333	1333	1333	1333
2.5	1331	1332	1332	1331	1330
5.0	1326	1327	1327	1327	1326
7.5	1317	1318	1318	1318	1317
10.0	1304	1305	1306	1305	1305
12.5	1288	1289	1289	1289	1289
15.0	1269	1270	1270	1270	1270
17.5	1246	1247	1247	1247	1247
20.0	1220	1221	1222	1222	1221
22.5	1191	1191	1192	1193	1192
25.0	1159	1159	1160	1160	1159
27.5	1124	1123	1124	1125	1124
30.0	1086	1086	1087	1087	1086
32.5	1047	1046	1047	1048	1047
35.0	1005	1004	1004	1006	1004
37.5	961	961	961	962	961
40.0	916	916	916	917	917
42.5	870	869	870	871	870
45.0	822	823	822	824	822
47.5	773	776	774	775	777
50.0	724	725	725	726	727
52.5	674	675	674	676	678
55.0	623	626	624	625	627
57.5	572	575	574	575	576
60.0	521	523	523	523	525
62.5	470	472	471	473	473
65.0	418	420	420	421	422
67.5	370	369	369	370	370
70.0	318	318	318	319	319
72.5	267	266	267	268	268
75.0	218	217	217	218	218
77.5	169	168	168	169	169
80.0	123	122	122	123	123
82.5	80	79	79	80	80
85.0	43	42	43	43	42
87.5	15	15	15	16	15
90.0	0	0	0	0	0



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PAGE: 3 OF 5

5-DEGREE  
ZONAL LUMEN SUMMARY

0- 5	32
5- 10	94
10- 15	153
15- 20	205
20- 25	250
25- 30	284
30- 35	308
35- 40	320
40- 45	322
45- 50	313
50- 55	293
55- 60	265
60- 65	229
65- 70	187
70- 75	140
75- 80	91
80- 85	44
85- 90	10

10-DEGREE  
ZONAL LUMEN SUMMARY

0- 10	126
0- 20	484
0- 30	1018
0- 40	1646
0- 50	2281
0- 60	2840
0- 70	3256
0- 80	3486
0- 90	3540



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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	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	62	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	58	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	45	41	51	45	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	59	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	29	40	34	29	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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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: ITL80219  
DATE: 12/27/13  
PREPARED FOR: RAB LIGHTING, INC.  
CATALOG NUMBER: PANEL2X2-41Y

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-052-A1050-R-080C

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)

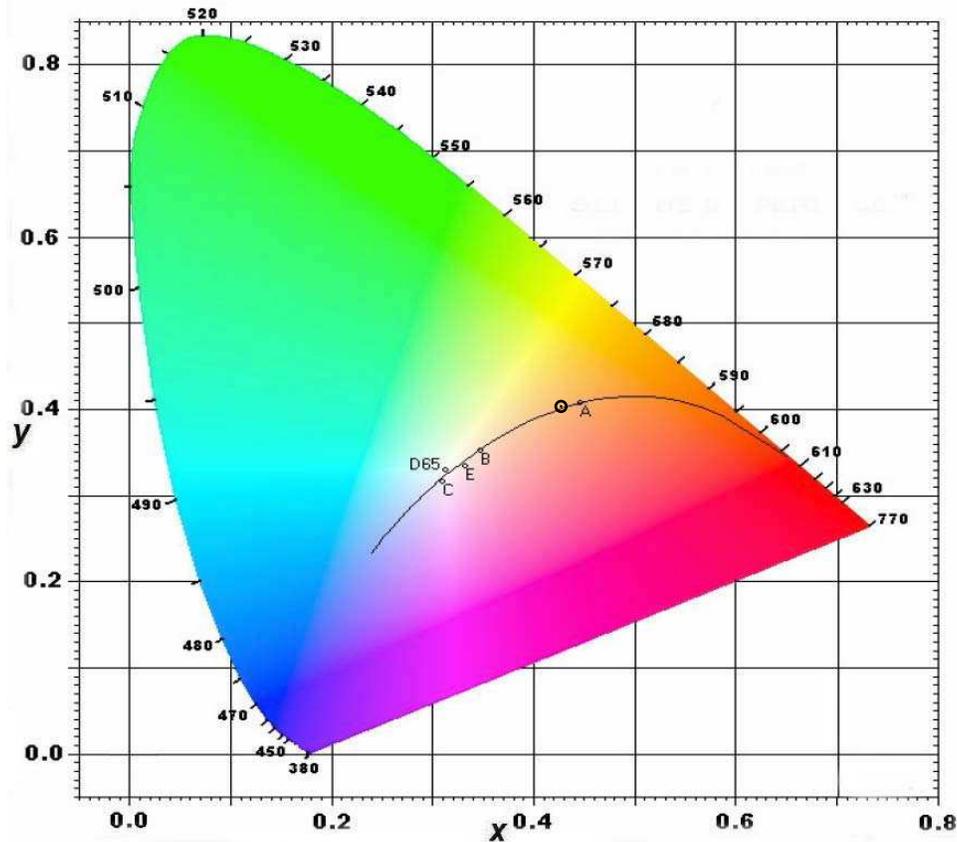
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Checked	<u>N THOMAS</u>
Approved	<u>L GRABA</u> Lighting Engineer



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CIE Chromaticity Diagram





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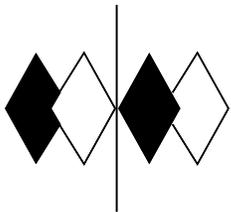
RESULTS:

SPECTRORADIOMETRIC	
Observer	CIE 1931 2 degree
Chromaticity Ordinate x	0.4269
Chromaticity Ordinate y	0.4030
Observer	CIE 1976 2 degree
Chromaticity Ordinate u'	0.2446
Chromaticity Ordinate v'	0.5194
Correlated Color Temp CCT (K)	3166
ANSI C78.377-2008 Duv	0.001
Total Radiant Flux (milliWatts)	11428 *
ELECTRICAL	
Input Voltage (Volts AC)	120.0
Input Current (Amps AC)	0.330
Input Power (Watts)	39.4
Input Power Factor (%)	99.5
Input Current THD (%)	6.5
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)	0.157
Input Power (Watts)	40.3
Input Power Factor (%)	92.7
Input Current THD (%)	8.9
Input Voltage THD (%)	0.1

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	71
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	0.369	515	32.274	650	47.265
385	0.392	520	35.014	655	43.949
390	0.446	525	37.334	660	40.615
395	0.519	530	39.501	665	37.303
400	0.627	535	41.570	670	34.066
405	0.888	540	43.610	675	30.946
410	1.339	545	45.750	680	27.964
415	2.089	550	47.996	685	25.191
420	3.646	555	50.251	690	22.599
425	6.324	560	52.572	695	20.239
430	10.498	565	54.733	700	18.052
435	16.755	570	56.891	705	16.037
440	27.447	575	58.885	710	14.192
445	39.672	580	60.686	715	12.542
450	39.528	585	62.280	720	11.039
455	28.621	590	63.553	725	9.714
460	20.845	595	64.480	730	8.534
465	16.290	600	65.016	735	7.482
470	12.641	605	65.163	740	6.559
475	10.851	610	64.787	745	5.745
480	10.861	615	63.965	750	5.044
485	12.027	620	62.697	755	4.424
490	14.416	625	60.948	760	3.879
495	17.877	630	58.829	765	3.406
500	21.719	635	56.289	770	2.988
505	25.584	640	53.520	775	2.616
510	29.140	645	50.467	780	2.301

