



## Report of Test

**LLIA001421-001**

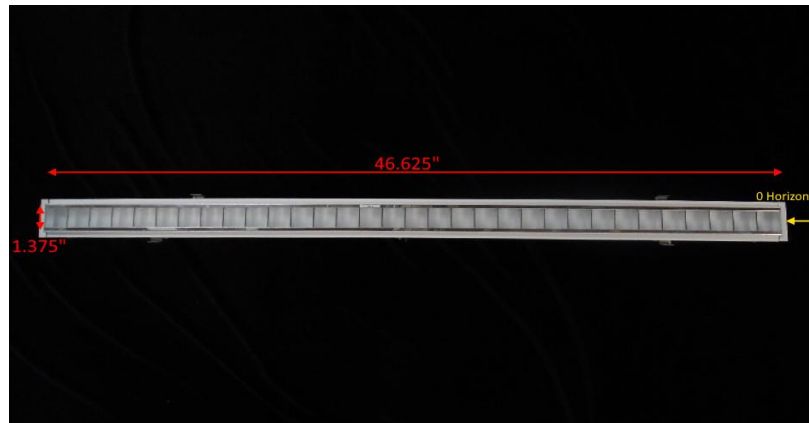
Indoor Distribution Photometry Test Report

Catalog Number: QR2-MO-K40-80-4-XX-PB MIR4-UNV-DIM1

Recessed mounted, extruded aluminum housing, white enamel aluminum LED tray,  
formed specular aluminum baffle with frosted plastic insert.

128 white LEDs, two PAL 6000201 rev1 LED boards with 64 LEDs each.

One Osram Optotronic OTi 50/120-277/1A4 DIM-1 L G2 LED driver programmed at 730mA



Prepared For:

Precision Architectural Lighting  
4830 Timber Creek Drive  
Houston, TX 77017, USA

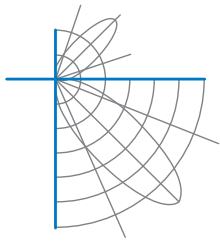
Performance Summary			
Input Voltage	120.0 V	Luminous Flux	1914.3 Lumens
Input Current	0.1682 A	Total Efficacy	101.2 Lm/W
Input Power	18.92 W	Downward Flux	1914.3 Lumens
Frequency	60.00 Hz	Downward Flux	100.0 % of Total
Power Factor	0.937		
Current THD	11.4 %		

This test report was issued by LightLab International Allentown, LLC without alterations or erasures.

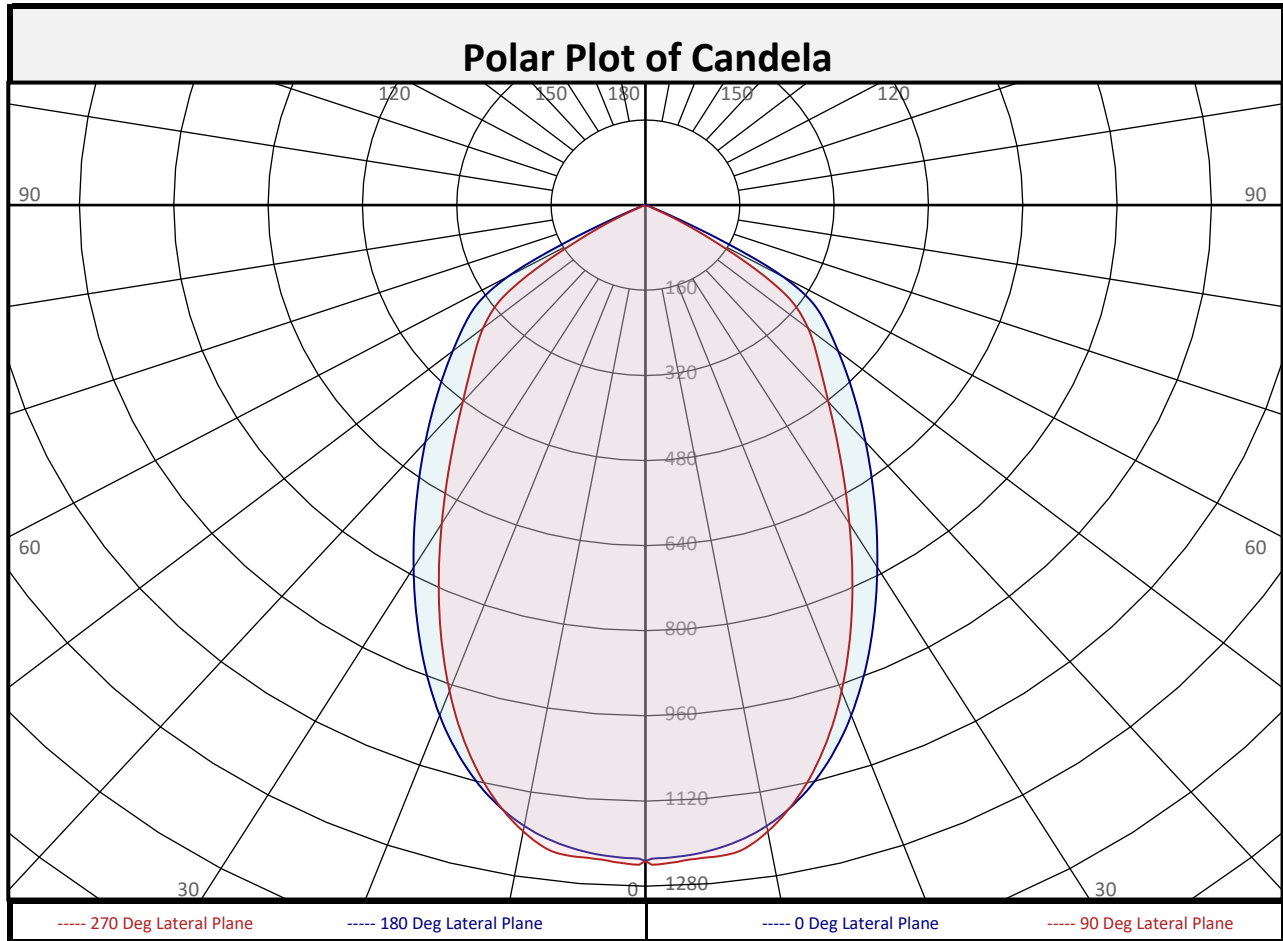
Test date: 03/05/2021

Report date: 03/08/2021

Signed: \_\_\_\_\_

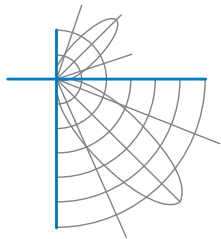


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### Zonal Flux Summary

Zone (Deg Vert)	Flux (Lumens)	Percent of Total	Zone (Deg Vert)	Flux (Lumens)	Percent of Total	Zone (Deg Vert)	Flux (Lumens)	Percent of Total
0-10	115.9	6.1%	90-100	0.0	0.0%	0-20	429.0	22.4%
10-20	313.0	16.4%	100-110	0.0	0.0%	0-30	834.2	43.6%
20-30	405.2	21.2%	110-120	0.0	0.0%	0-40	1230	64.3%
30-40	396.2	20.7%	120-130	0.0	0.0%	0-60	1848	96.5%
40-50	346.7	18.1%	130-140	0.0	0.0%	0-80	1914	100.0%
50-60	271.4	14.2%	140-150	0.0	0.0%	10-90	1798	93.9%
60-70	62.6	3.3%	150-160	0.0	0.0%	20-50	1148	60.0%
70-80	2.8	0.1%	160-170	0.0	0.0%	40-90	683.9	35.7%
80-90	0.4	0.0%	170-180	0.0	0.0%	60-90	65.8	3.4%
0-90	1914	100.0%	90-180	0.0	0.0%	0-180	1914	100.0%

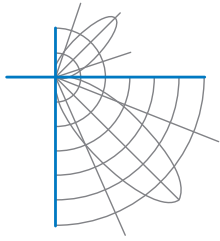


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Luminous Intensity (Candela) Table

		Lateral (C-Plane) Angles								
		0	22.5	45	67.5	90	112.5	135	157.5	180
Vertical (Gamma) Angles	0	1233	1233	1233	1233	1233	1233	1233	1233	1233
	2.5	1226	1225	1229	1233	1236	1233	1229	1225	1226
	5	1219	1217	1219	1227	1231	1227	1219	1217	1219
	7.5	1206	1203	1212	1222	1225	1222	1212	1203	1206
	10	1185	1184	1199	1199	1195	1199	1199	1184	1185
	12.5	1156	1159	1171	1161	1154	1161	1171	1159	1156
	15	1118	1127	1130	1113	1101	1113	1130	1127	1118
	17.5	1072	1087	1081	1056	1040	1056	1081	1087	1072
	20	1020	1038	1024	993	972	993	1024	1038	1020
	22.5	964	980	962	925	901	925	962	980	964
	25	905	919	896	855	829	855	896	919	905
	27.5	845	855	829	785	759	785	829	855	845
	30	787	792	762	717	692	717	762	792	787
	32.5	731	730	697	654	631	654	697	730	731
	35	677	672	636	596	575	596	636	672	677
	37.5	627	617	579	543	526	543	579	617	627
	40	581	565	527	495	483	495	527	565	581
	42.5	538	518	479	454	446	454	479	518	538
	45	498	475	437	419	415	419	437	475	498
	47.5	461	437	399	389	388	389	399	437	461
50	427	401	366	361	360	361	366	401	427	
52.5	396	369	337	329	329	329	337	369	396	
55	366	338	306	286	284	286	306	338	366	
57.5	330	301	259	224	210	224	259	301	330	
60	271	237	190	149	129	149	190	237	271	
62.5	158	142	109	79	66	79	109	142	158	
65	54	55	41	31	15	31	41	55	54	
67.5	16	16	11	9	8	9	11	16	16	
70	7	6	5	5	5	5	5	6	7	
72.5	3	3	4	4	3	4	4	3	3	
75	2	2	3	3	2	3	3	2	2	
77.5	2	2	2	2	1	2	2	2	2	
80	1	1	1	1	1	1	1	1	1	
82.5	1	1	1	1	0	1	1	1	1	
85	0	0	0	0	0	0	0	0	0	
87.5	0	0	0	0	0	0	0	0	0	
90	0	0	0	0	0	0	0	0	0	



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		Lateral (C-Plane) Angles								
		0	22.5	45	67.5	90	112.5	135	157.5	180
Vertical (Gamma) Angles	90	0	0	0	0	0	0	0	0	0
	92.5	0	0	0	0	0	0	0	0	0
	95	0	0	0	0	0	0	0	0	0
	97.5	0	0	0	0	0	0	0	0	0
	100	0	0	0	0	0	0	0	0	0
	102.5	0	0	0	0	0	0	0	0	0
	105	0	0	0	0	0	0	0	0	0
	107.5	0	0	0	0	0	0	0	0	0
	110	0	0	0	0	0	0	0	0	0
	112.5	0	0	0	0	0	0	0	0	0
	115	0	0	0	0	0	0	0	0	0
	117.5	0	0	0	0	0	0	0	0	0
	120	0	0	0	0	0	0	0	0	0
	122.5	0	0	0	0	0	0	0	0	0
	125	0	0	0	0	0	0	0	0	0
	127.5	0	0	0	0	0	0	0	0	0
	130	0	0	0	0	0	0	0	0	0
	132.5	0	0	0	0	0	0	0	0	0
	135	0	0	0	0	0	0	0	0	0
	137.5	0	0	0	0	0	0	0	0	0
140	0	0	0	0	0	0	0	0	0	
142.5	0	0	0	0	0	0	0	0	0	
145	0	0	0	0	0	0	0	0	0	
147.5	0	0	0	0	0	0	0	0	0	
150	0	0	0	0	0	0	0	0	0	
152.5	0	0	0	0	0	0	0	0	0	
155	0	0	0	0	0	0	0	0	0	
157.5	0	0	0	0	0	0	0	0	0	
160	0	0	0	0	0	0	0	0	0	
162.5	0	0	0	0	0	0	0	0	0	
165	0	0	0	0	0	0	0	0	0	
167.5	0	0	0	0	0	0	0	0	0	
170	0	0	0	0	0	0	0	0	0	
172.5	0	0	0	0	0	0	0	0	0	
175	0	0	0	0	0	0	0	0	0	
177.5	0	0	0	0	0	0	0	0	0	
180	0	0	0	0	0	0	0	0	0	



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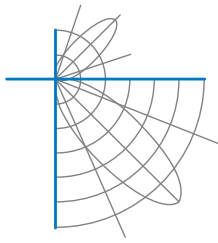
Coefficients of Utilization/Room Utilization - Zonal Cavity Method																						
Effective Floor Cavity Reflectance 0.20																						
RC	80					70					50				30				10			0
RW	70	50	30	10		70	50	30	10		50	30	10		50	30	10		50	30	10	0
RCR																						
0	119	119	119	119		116	116	116	116		111	111	111		106	106	106		102	102	102	100
1	112	108	105	103		109	106	103	101		102	100	98		98	97	95		95	93	92	90
2	104	98	93	89		102	96	92	88		93	89	86		90	87	84		87	84	82	80
3	97	89	82	77		95	87	81	77		84	79	75		82	78	74		79	76	73	71
4	90	80	73	68		88	79	73	67		77	71	67		75	70	66		73	68	65	63
5	84	73	66	60		82	72	65	60		70	64	59		68	63	59		67	62	58	56
6	78	67	59	54		77	66	59	54		64	58	53		63	57	53		61	56	53	51
7	73	62	54	49		72	61	54	49		59	53	48		58	52	48		57	52	48	46
8	69	57	49	44		67	56	49	44		55	49	44		54	48	44		53	48	44	42
9	65	53	45	41		63	52	45	41		51	45	40		50	44	40		49	44	40	38
10	61	49	42	37		60	49	42	37		48	41	37		47	41	37		46	41	37	35

For absolute test reports, RUs are expressed as a percentage of total lumen output. For relative test reports, CUs are expressed as a percentage of total lamp output. Calculations were based on published IES procedures, and are based on the zonal cavity method. Basic assumptions: 1) Room surfaces are lambertian reflectors. 2) Incident flux on each surface is uniformly distributed. 3) The room is spectrally neutral. When luminaires are not evenly distributed throughout the room, or do not exhibit lateral symmetry, CU values may differ from actual performance.

Circle of Light Plot				
Height(ft)	Illuminance at Nadir (fc)	Ground-level distance to half-of-nadir illuminance (ft)		
		0-180 deg	90-270 deg	
6.0	34.2	6.03	5.60	
8.0	19.3	8.04	7.47	
10.0	12.3	10.06	9.34	
12.0	8.6	12.07	11.20	
14.0	6.3	14.08	13.07	
16.0	4.8	16.09	14.94	

Average Luminance (cd/m <sup>2</sup> )			
	0 deg Plane	45 deg Plane	90 deg Plane
0	29809	29809	29809
45	17019	14939	14189
55	15426	12885	11965
65	3064	2366	880
75	206	236	217
85	104	73	37

Spacing Criterion	
0 degree plane:	1.0
90 degree plane:	0.9
180 degree plane:	1.0
270 degree plane:	0.9



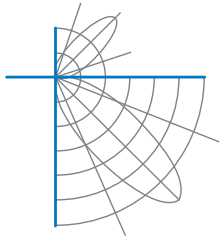
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#### UGR TABLE - CORRECTED

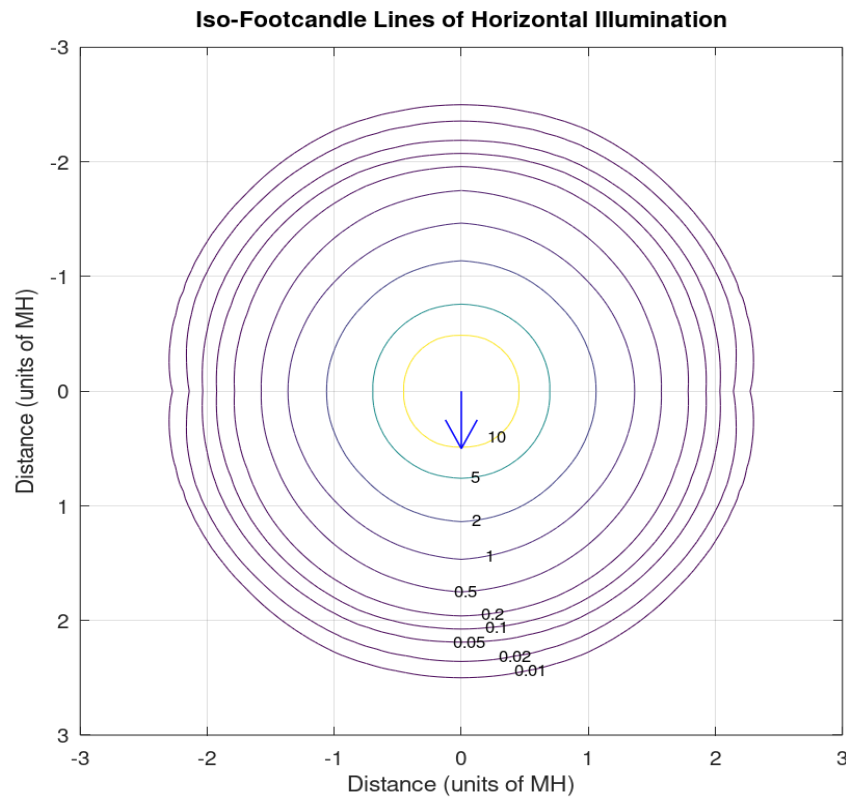
Reflectances											
Ceiling Cavity		70	70	50	50	30	70	70	50	50	30
Walls		50	30	50	30	30	50	30	50	30	30
Floor Cavity		20	20	20	20	20	20	20	20	20	20
Room Size		UGR Viewed Crosswise					UGR Viewed Endwise				
X=2H	Y=2H	21.5	22.9	21.9	23.2	23.5	19.1	20.5	19.5	20.8	21.1
	3H	21.4	22.6	21.8	22.9	23.3	19.0	20.2	19.4	20.5	20.9
	4H	21.3	22.4	21.7	22.8	23.1	18.9	20.1	19.3	20.4	20.8
	6H	21.2	22.2	21.6	22.6	23.0	18.9	19.9	19.3	20.3	20.7
	8H	21.2	22.1	21.6	22.5	22.9	18.8	19.8	19.3	20.2	20.6
	12H	21.1	22.1	21.6	22.4	22.9	18.8	19.7	19.2	20.1	20.5
4H	2H	21.3	22.4	21.7	22.8	23.2	19.0	20.1	19.4	20.5	20.9
	3H	21.2	22.1	21.6	22.5	22.9	18.9	19.8	19.3	20.2	20.6
	4H	21.1	21.9	21.5	22.3	22.8	18.8	19.6	19.2	20.0	20.5
	6H	21.0	21.7	21.5	22.2	22.6	18.7	19.4	19.2	19.9	20.3
	8H	21.0	21.6	21.5	22.1	22.5	18.7	19.3	19.1	19.8	20.2
	12H	20.9	21.5	21.4	22.0	22.5	18.6	19.2	19.1	19.7	20.1
8H	4H	21.0	21.6	21.5	22.1	22.5	18.7	19.3	19.1	19.8	20.2
	6H	20.9	21.4	21.4	21.9	22.4	18.6	19.1	19.1	19.6	20.1
	8H	20.8	21.3	21.3	21.8	22.3	18.5	19.0	19.0	19.5	20.0
	12H	20.8	21.2	21.3	21.7	22.3	18.5	18.9	19.0	19.4	19.9
12H	4H	20.9	21.5	21.4	22.0	22.5	18.6	19.2	19.1	19.7	20.1
	6H	20.8	21.3	21.3	21.8	22.3	18.5	19.0	19.0	19.5	20.0
	8H	20.8	21.2	21.3	21.7	22.3	18.5	18.9	19.0	19.4	19.9

Maximum UGR = 23.5

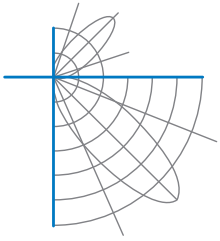


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### Iso-Illuminance Plot



The isofootcandle values shown in the plot above are based on a mounting height of  $h = 8.0$  feet. Grid values show multiples of mounting height. The isoilluminance contour lines are expressed in units of footcandles. The values expressed are based on the direct light from a single unit without the contribution of room reflections.



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**Additional Pictures of Test Subject**







## Report of Test

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Test Distance                    9.5 m  
Ambient Temperature        25.2 °C

#### Notes

The laboratory has not participated in the selection of samples to be tested. All testing is performed on the understanding that the significance of the report is limited to the extent that the test sample is representative of production units.

Tested in accordance with the applicable sections of IES LM-79-19. Format of reports and angular increments based on IES LM-41-14 and LM-46-04.

The luminous intensity values, and other derived quantities, contained in this report are based on the absolute data, as measured.

Prorating the performance of the sample for the use of other component combinations (such as lamp / LED / Ballast / driver), or for use in different environmental conditions than that tested, may produce erroneous results.

This report is free of erasures and corrections.

Photometric intensity values are reported using the CIE C-Gamma coordinate system as defined in CIE publication number 121.

This report may contain data that are not covered by the NVLAP accreditation. Quantities marked with ‡ are not covered.

This report must not be used by the customer to claim product certification, approval or endorsement by NVLAP, NIST, or any agency of the Federal Government.