



Report of Test

LLIA001417-002

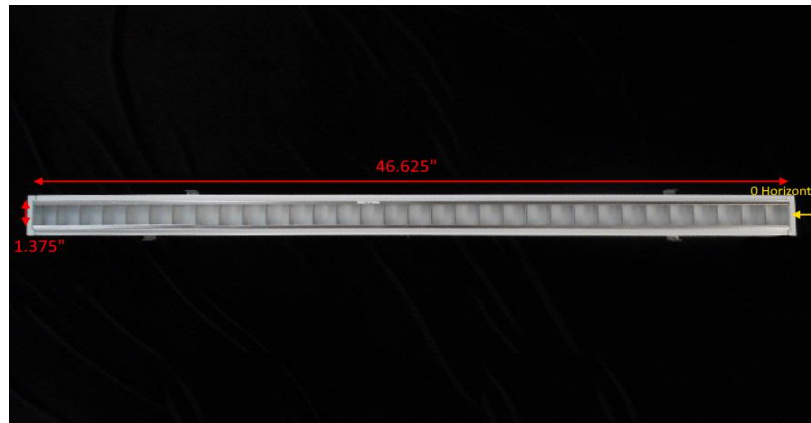
Indoor Distribution Photometry Test Report

Catalog Number: QR2-HO-K40-80-4-XX-PB 600G2-UNV-DIM1

Recessed mounted, extruded aluminum housing, white enamel aluminum LED tray,
formed semi-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 labeled as 1240mA



Prepared For:

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

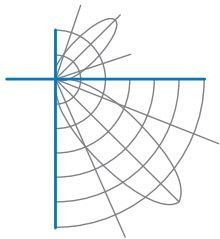
Performance Summary			
Input Voltage	120.0 V	Luminous Flux	2517.9 Lumens
Input Current	0.2765 A	Total Efficacy	77.2 Lm/W
Input Power	32.62 W	Downward Flux	2517.9 Lumens
Frequency	60.00 Hz	Downward Flux	100.0 % of Total
Power Factor	0.983		
Current THD	8.1 %		

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

Test date: 02/26/2020

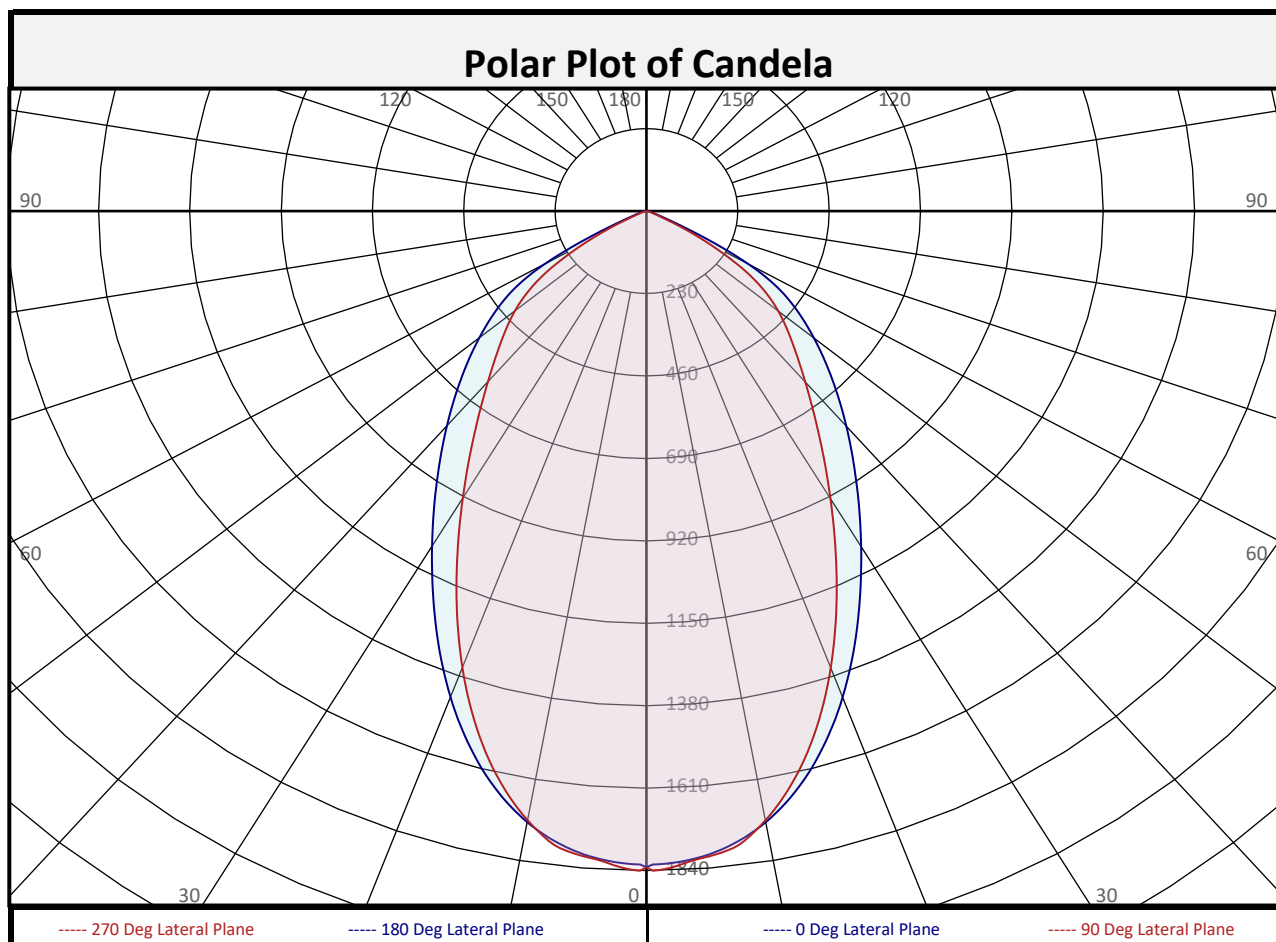
Report date: 03/01/2021

Signed: _____



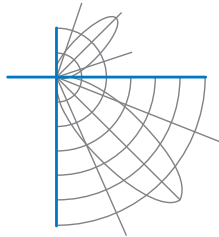
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Zonal Flux Summary

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	169.8	6.7%	90-100	0.0	0.0%	0-20	613.8	24.4%
10-20	444.0	17.6%	100-110	0.0	0.0%	0-30	1164	46.2%
20-30	550.7	21.9%	110-120	0.0	0.0%	0-40	1680	66.7%
30-40	515.6	20.5%	120-130	0.0	0.0%	0-60	2418	96.0%
40-50	429.5	17.1%	130-140	0.0	0.0%	0-80	2517	100.0%
50-60	308.1	12.2%	140-150	0.0	0.0%	10-90	2348	93.3%
60-70	88.4	3.5%	150-160	0.0	0.0%	20-50	1496	59.4%
70-80	10.4	0.4%	160-170	0.0	0.0%	40-90	837.9	33.3%
80-90	1.4	0.1%	170-180	0.0	0.0%	60-90	100.2	4.0%
0-90	2518	100.0%	90-180	0.0	0.0%	0-180	2518	100.0%

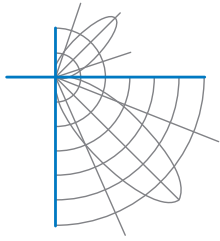


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Luminous Intensity (Candela) Table

		Lateral (C-Plane) Angles								
		0	22.5	45	67.5	90	112.5	135	157.5	180
Vertical (Gamma) Angles	0	1831	1831	1831	1831	1831	1831	1831	1831	1831
	2.5	1818	1817	1819	1825	1828	1825	1819	1817	1818
	5	1802	1797	1795	1803	1807	1803	1795	1797	1802
	7.5	1773	1763	1769	1782	1784	1782	1769	1763	1773
	10	1731	1720	1734	1730	1726	1730	1734	1720	1731
	12.5	1676	1667	1674	1660	1652	1660	1674	1667	1676
	15	1608	1605	1598	1577	1564	1577	1598	1605	1608
	17.5	1529	1530	1511	1481	1464	1481	1511	1530	1529
	20	1443	1443	1414	1378	1356	1378	1414	1443	1443
	22.5	1352	1347	1312	1268	1244	1268	1312	1347	1352
	25	1259	1248	1206	1158	1133	1158	1206	1248	1259
	27.5	1168	1149	1100	1050	1025	1050	1100	1149	1168
	30	1080	1052	997	947	925	947	997	1052	1080
	32.5	998	961	900	852	836	852	900	961	998
	35	920	875	810	767	755	767	810	875	920
	37.5	849	796	728	690	684	690	728	796	849
	40	782	723	653	622	621	622	653	723	782
	42.5	719	656	586	562	567	562	586	656	719
	45	660	594	526	509	519	509	526	594	660
	47.5	604	536	472	462	476	462	472	536	604
50	549	482	422	416	432	416	422	482	549	
52.5	497	429	374	369	384	369	374	429	497	
55	443	377	325	315	328	315	325	377	443	
57.5	382	320	270	253	257	253	270	320	382	
60	298	249	205	183	181	183	205	249	298	
62.5	186	161	133	116	110	116	133	161	186	
65	92	83	71	63	51	63	71	83	92	
67.5	47	41	34	30	26	30	34	41	47	
70	28	25	20	17	16	17	20	25	28	
72.5	18	16	13	11	10	11	13	16	18	
75	12	11	8	7	6	7	8	11	12	
77.5	8	7	6	5	4	5	6	7	8	
80	5	4	3	3	2	3	3	4	5	
82.5	3	3	2	1	1	1	2	3	3	
85	1	1	1	1	1	1	1	1	1	
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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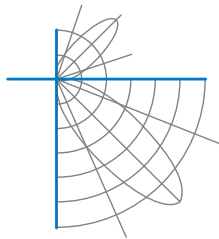
Coefficients of Utilization/Room Utilization - Zonal Cavity Method																						
Effective Floor Cavity Reflectance 0.20																						
RC	80					70					50				30				10			0
RW	70	50	30	10		70	50	30	10		50	30	10		50	30	10		50	30	10	0
RCR																						
0	119	119	119	119		116	116	116	116		111	111	111		106	106	106		102	102	102	100
1	112	109	106	103		109	106	104	101		102	100	98		98	97	95		95	94	92	90
2	105	98	93	89		102	97	92	88		93	89	86		90	87	84		87	85	82	81
3	97	89	83	78		95	88	82	77		85	80	76		82	78	75		80	77	74	72
4	91	81	74	69		89	80	74	69		78	72	68		76	71	67		74	69	66	64
5	85	74	67	62		83	73	66	61		71	65	61		69	64	60		68	63	59	58
6	79	68	61	55		78	67	60	55		66	59	55		64	59	54		63	58	54	52
7	74	63	55	50		73	62	55	50		61	54	50		59	54	49		58	53	49	47
8	70	58	51	46		68	58	51	46		56	50	46		55	49	45		54	49	45	43
9	66	54	47	42		64	54	47	42		52	46	42		51	46	42		51	45	42	40
10	62	50	44	39		61	50	43	39		49	43	39		48	43	39		47	42	38	37

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	50.8	5.71	5.26	
8.0	28.6	7.61	7.01	
10.0	18.3	9.51	8.77	
12.0	12.7	11.42	10.52	
14.0	9.3	13.32	12.27	
16.0	7.2	15.22	14.03	

Average Luminance (cd/m ²)			
	0 deg Plane	45 deg Plane	90 deg Plane
0	44257	44257	44257
45	22555	17997	17748
55	18688	13704	13837
65	5286	4053	2932
75	1148	791	599
85	409	233	153

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



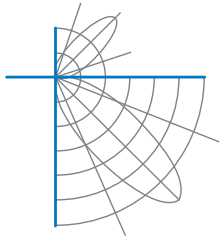
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UGR TABLE - CORRECTED

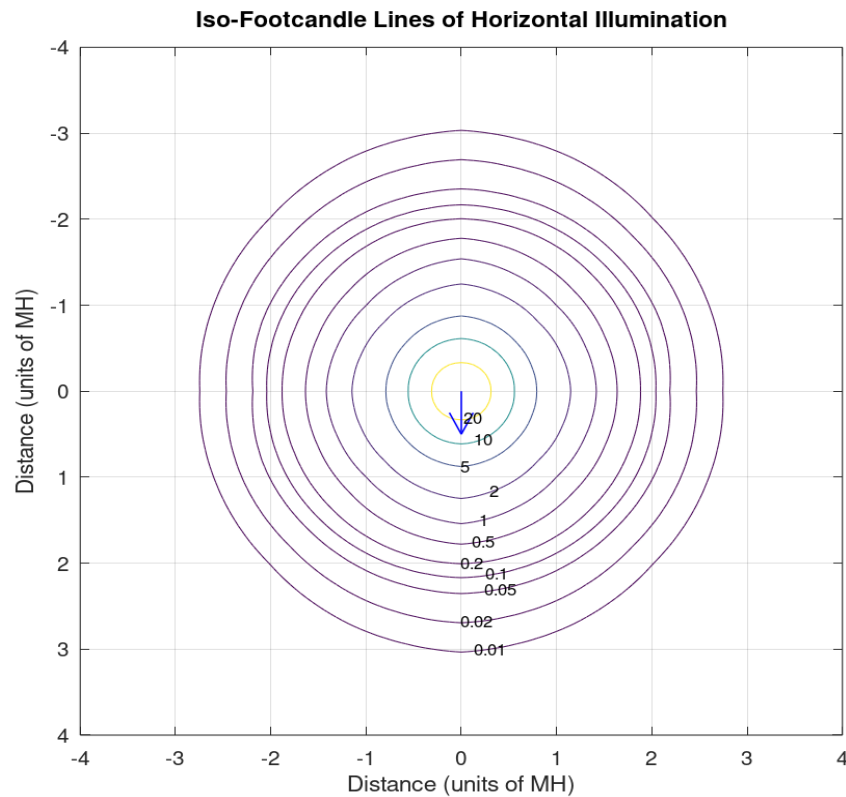
Reflectances											
Ceiling Cavity		70	70	50	50	30	70	70	50	50	30
Walls		50	30	50	30	30	50	30	50	30	30
Floor Cavity		20	20	20	20	20	20	20	20	20	20
Room Size		UGR Viewed Crosswise					UGR Viewed Endwise				
X=2H	Y=2H	21.0	22.4	21.4	22.7	23.0	19.2	20.5	19.5	20.8	21.1
	3H	21.0	22.2	21.4	22.5	22.9	19.1	20.2	19.5	20.6	20.9
	4H	20.9	22.0	21.3	22.4	22.7	19.0	20.1	19.4	20.4	20.8
	6H	20.8	21.8	21.3	22.2	22.6	18.9	19.9	19.3	20.3	20.7
	8H	20.8	21.7	21.2	22.1	22.5	18.9	19.8	19.3	20.2	20.6
	12H	20.8	21.7	21.2	22.0	22.5	18.8	19.7	19.3	20.1	20.6
4H	2H	20.9	22.0	21.3	22.4	22.7	19.1	20.2	19.5	20.5	20.9
	3H	20.9	21.7	21.3	22.2	22.6	19.0	19.9	19.4	20.3	20.7
	4H	20.8	21.6	21.2	22.0	22.4	18.9	19.7	19.4	20.1	20.6
	6H	20.7	21.4	21.2	21.8	22.3	18.9	19.5	19.3	20.0	20.5
	8H	20.7	21.3	21.1	21.7	22.2	18.8	19.4	19.3	19.9	20.4
	12H	20.6	21.2	21.1	21.7	22.1	18.7	19.3	19.2	19.8	20.3
8H	4H	20.6	21.3	21.1	21.7	22.2	18.8	19.4	19.3	19.9	20.4
	6H	20.6	21.1	21.1	21.6	22.1	18.7	19.2	19.2	19.7	20.2
	8H	20.5	21.0	21.0	21.5	22.0	18.7	19.1	19.2	19.6	20.1
	12H	20.4	20.9	21.0	21.4	21.9	18.6	19.0	19.1	19.5	20.1
12H	4H	20.6	21.2	21.1	21.6	22.1	18.7	19.3	19.2	19.8	20.3
	6H	20.5	21.0	21.0	21.4	22.0	18.7	19.1	19.2	19.6	20.1
	8H	20.4	20.9	21.0	21.4	21.9	18.6	19.0	19.1	19.5	20.1

Maximum UGR = 23.0

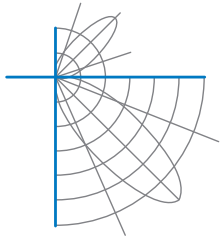


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Iso-Illuminance Plot



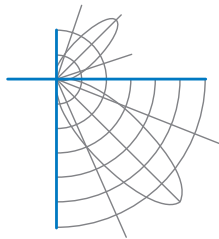
The isofootcandle values shown in the plot above are based on a mounting height of $h = 8.0$ feet. Grid values show multiples of mounting height. The isoilluminance contour lines are expressed in units of footcandles. The values expressed are based on the direct light from a single unit without the contribution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



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Additional Pictures of Test Subject





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Test Distance 9.5 m
Ambient Temperature 25.0 °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.