

Report of Test

LLIA001357-002A

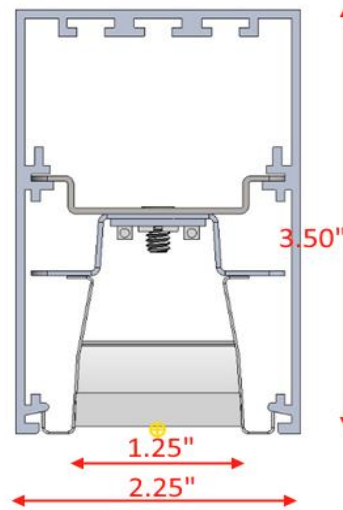
Indoor Distribution Photometry Test Report

Catalog Number: QS2-D-MO-K40-80-4-XX-PBF01M-FXXX-UNV-DIM1

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

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

One Osram Optotronic OTi 30/120-277/1A0 DIM-1 L G2 LED driver labeled as 730mA



Prepared For:

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

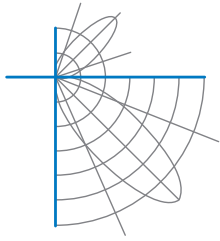
Performance Summary			
Input Voltage	120.0 V	Luminous Flux	1659.6 Lumens
Input Current	0.1627 A	Total Efficacy	87.1 Lm/W
Input Power	19.05 W	Downward Flux	1659.6 Lumens
Frequency	60.00 Hz	Downward Flux	100.0 % of Total
Power Factor	0.976		
Current THD	12.0 %		

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

Test date: 12/07/2020

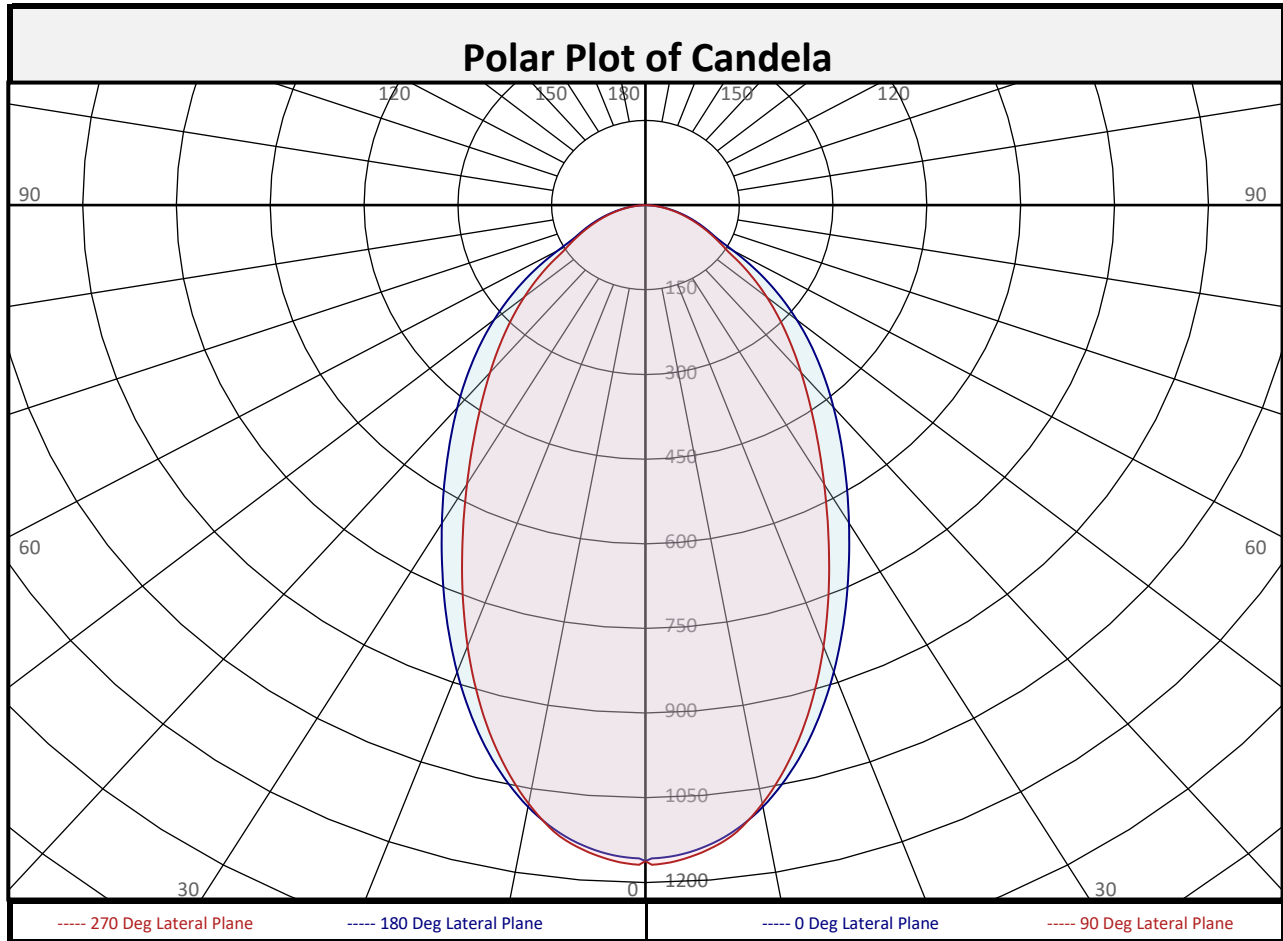
Report date: 12/14/2020

Signed: _____



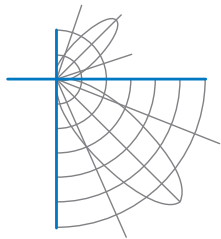
Report of Test

LLIA001357-002A



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	107.1	6.5%	90-100	0.0	0.0%	0-20	380.5	22.9%
10-20	273.3	16.5%	100-110	0.0	0.0%	0-30	713.7	43.0%
20-30	333.3	20.1%	110-120	0.0	0.0%	0-40	1026	61.8%
30-40	312.5	18.8%	120-130	0.0	0.0%	0-60	1473	88.8%
40-50	259.6	15.6%	130-140	0.0	0.0%	0-80	1644	99.1%
50-60	186.8	11.3%	140-150	0.0	0.0%	10-90	1552	93.5%
60-70	111.5	6.7%	150-160	0.0	0.0%	20-50	905.3	54.5%
70-80	60.1	3.6%	160-170	0.0	0.0%	40-90	633.4	38.2%
80-90	15.5	0.9%	170-180	0.0	0.0%	60-90	187.1	11.3%
0-90	1660	100.0%	90-180	0.0	0.0%	0-180	1660	100.0%

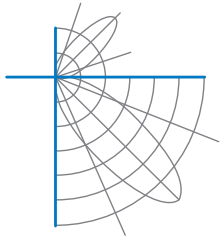


Report of Test

LLIA001357-002A

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	1162	1162	1162	1162	1162	1162	1162	1162	1162
	2.5	1153	1153	1156	1161	1163	1161	1156	1153	1153
	5	1139	1138	1140	1145	1146	1145	1140	1138	1139
	7.5	1115	1114	1116	1120	1120	1120	1116	1114	1115
	10	1082	1080	1082	1079	1077	1079	1082	1080	1082
	12.5	1040	1038	1036	1029	1025	1029	1036	1038	1040
	15	992	990	981	972	966	972	981	990	992
	17.5	937	935	920	909	900	909	920	935	937
	20	880	876	857	841	832	841	857	876	880
	22.5	821	813	791	772	762	772	791	813	821
	25	762	750	725	704	694	704	725	750	762
	27.5	705	688	660	638	630	638	660	688	705
	30	651	630	598	577	571	577	598	630	651
	32.5	600	575	541	521	517	521	541	575	600
	35	553	524	488	470	469	470	488	524	553
	37.5	509	477	440	425	426	425	440	477	509
	40	468	434	397	384	386	384	397	434	468
	42.5	428	394	357	347	350	347	357	394	428
	45	390	356	322	312	316	312	322	356	390
	47.5	353	320	289	281	284	281	289	320	353
50	315	287	258	251	253	251	258	287	315	
52.5	278	254	230	222	222	222	230	254	278	
55	241	222	203	194	192	194	203	222	241	
57.5	203	191	177	167	161	167	177	191	203	
60	163	161	153	142	141	142	153	161	163	
62.5	131	133	131	124	124	124	131	133	131	
65	114	111	111	109	109	109	111	111	114	
67.5	99	97	95	94	94	94	95	97	99	
70	85	83	81	81	80	81	81	83	85	
72.5	72	70	68	68	67	68	68	70	72	
75	59	58	56	56	55	56	56	58	59	
77.5	47	46	44	44	44	44	44	46	47	
80	35	34	33	33	33	33	33	34	35	
82.5	24	24	23	22	23	22	23	24	24	
85	14	13	13	13	13	13	13	13	14	
87.5	4	5	5	5	5	5	5	5	4	
90	0	0	0	0	0	0	0	0	0	

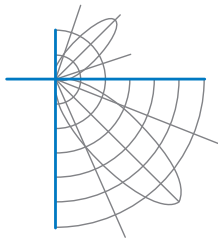


Report of Test

LLIA001357-002A

Luminous Intensity (Candela) Table

		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	



Report of Test

LLIA001357-002A

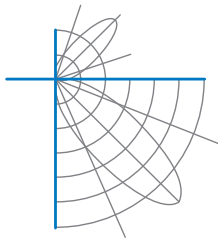
Coefficients of Utilization/Room Utilization - Zonal Cavity Method																		
Effective Floor Cavity Reflectance 0.20																		
RC	80				70				50			30			10			0
RW	70	50	30	10	70	50	30	10	50	30	10	50	30	10	50	30	10	0
RCR																		
0	119	119	119	119	116	116	116	116	111	111	111	106	106	106	102	102	102	100
1	111	107	103	100	108	105	101	99	100	98	95	97	95	93	93	91	90	88
2	103	96	90	85	100	94	89	84	91	86	82	87	84	81	84	81	79	77
3	95	86	79	74	93	85	78	73	82	76	72	79	75	71	77	73	70	68
4	88	78	71	65	86	77	70	64	74	68	64	72	67	63	70	66	62	60
5	82	71	63	58	80	70	63	57	68	62	57	66	61	56	65	60	56	54
6	77	65	57	52	75	64	57	52	63	56	51	61	55	51	60	54	50	49
7	72	60	52	47	70	59	52	47	58	51	47	57	51	46	55	50	46	44
8	68	56	48	43	66	55	48	43	54	47	43	53	47	42	51	46	42	40
9	64	52	44	39	62	51	44	39	50	44	39	49	43	39	48	43	39	37
10	60	48	41	36	59	48	41	36	47	41	36	46	40	36	45	40	36	34

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	32.3	5.48	5.11	
8.0	18.2	7.31	6.82	
10.0	11.6	9.14	8.52	
12.0	8.1	10.97	10.23	
14.0	5.9	12.80	11.93	
16.0	4.5	14.63	13.63	

Average Luminance (cd/m ²)			
	0 deg Plane	45 deg Plane	90 deg Plane
0	30828	30828	30828
45	14626	12062	11855
55	11142	9373	8877
65	7125	6972	6818
75	6071	5741	5677
85	4160	3947	4017

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



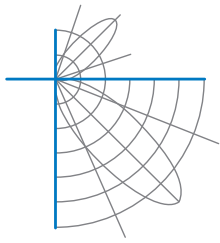
Report of Test

LLIA001357-002A

UGR TABLE - CORRECTED

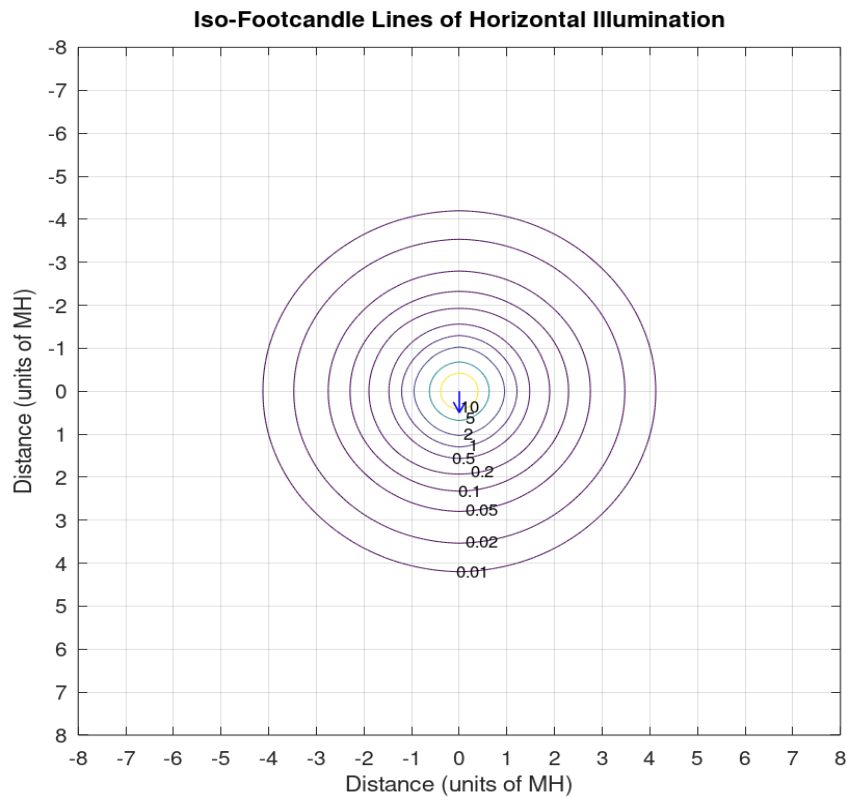
Reflectances											
Ceiling Cavity	70	70	50	50	30	70	70	50	50	30	
Walls	50	30	50	30	30	50	30	50	30	30	
Floor Cavity	20	20	20	20	20	20	20	20	20	20	
Room Size		UGR Viewed Crosswise					UGR Viewed Endwise				
X=2H	Y=2H	19.0	20.5	19.4	20.8	21.1	18.0	19.4	18.3	19.7	20.0
	3H	20.2	21.5	20.6	21.8	22.2	19.4	20.7	19.8	21.0	21.4
	4H	20.7	21.8	21.1	22.2	22.6	19.9	21.1	20.3	21.5	21.8
	6H	21.0	22.1	21.4	22.5	22.9	20.3	21.4	20.7	21.8	22.2
	8H	21.1	22.1	21.5	22.5	22.9	20.4	21.5	20.8	21.8	22.2
	12H	21.2	22.2	21.6	22.5	23.0	20.5	21.5	20.9	21.9	22.3
4H	2H	19.4	20.5	19.8	20.9	21.3	18.5	19.7	18.9	20.0	20.4
	3H	20.7	21.7	21.1	22.1	22.5	20.1	21.1	20.5	21.5	21.9
	4H	21.3	22.2	21.7	22.6	23.1	20.7	21.6	21.2	22.0	22.5
	6H	21.8	22.6	22.3	23.0	23.5	21.3	22.0	21.7	22.5	22.9
	8H	21.9	22.7	22.4	23.1	23.6	21.4	22.1	21.9	22.6	23.0
	12H	22.0	22.7	22.5	23.2	23.6	21.5	22.1	22.0	22.6	23.1
8H	4H	21.5	22.2	22.0	22.7	23.1	21.0	21.7	21.4	22.1	22.6
	6H	22.1	22.7	22.6	23.2	23.7	21.6	22.2	22.1	22.7	23.2
	8H	22.3	22.8	22.8	23.3	23.8	21.8	22.3	22.3	22.9	23.3
	12H	22.4	22.9	23.0	23.4	24.0	22.0	22.4	22.5	22.9	23.5
12H	4H	21.5	22.1	22.0	22.6	23.1	21.0	21.6	21.5	22.1	22.6
	6H	22.1	22.7	22.6	23.1	23.7	21.6	22.2	22.2	22.6	23.2
	8H	22.4	22.8	22.9	23.3	23.9	21.9	22.4	22.4	22.9	23.4

Maximum UGR = 24.0

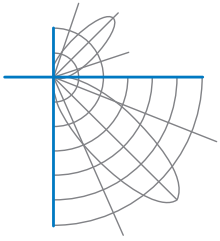


Report of Test
LLIA001357-002A

Iso-Illuminance Plot

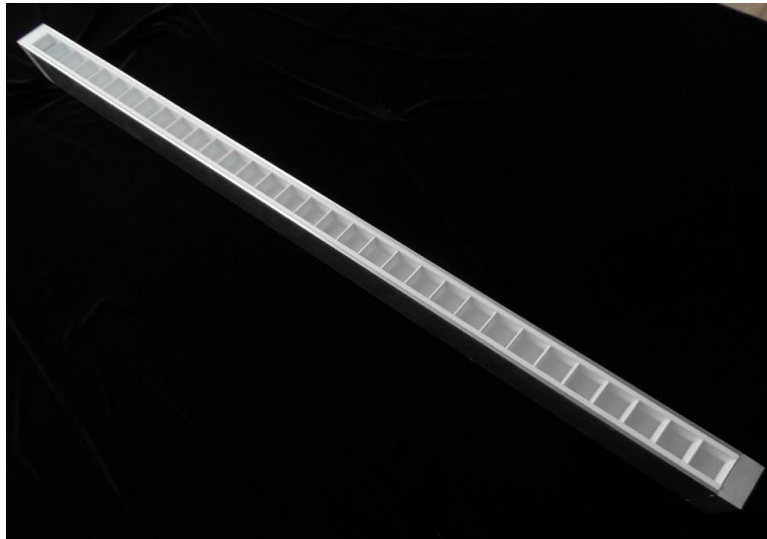
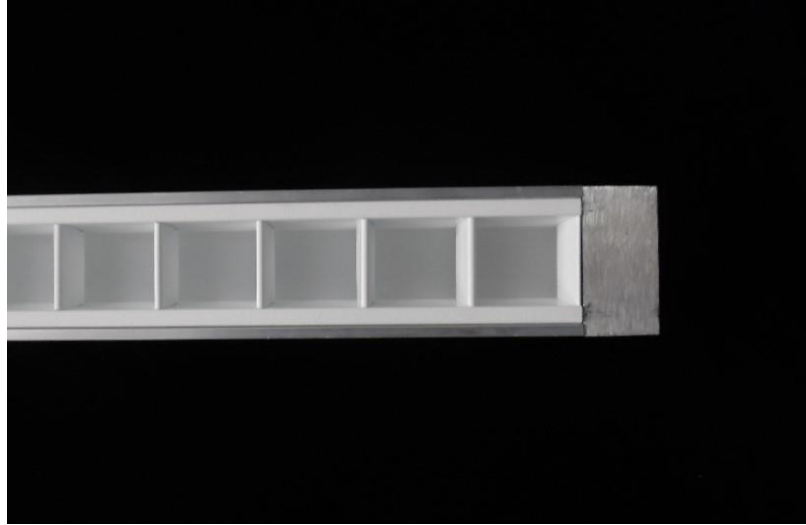


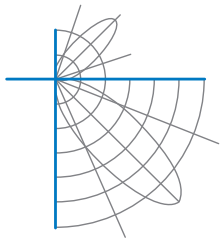
The isofootcandle values shown in the plot above are based on a mounting height of $h = 8.0$ feet. Grid values show multiples of mounting height. The isoilluminance contour lines are expressed in units of footcandles. The values expressed are based on the direct light from a single unit without the contribution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



Report of Test
LLIA001357-002A

Additional Pictures of Test Subject





Report of Test

LLIA001357-002A

Test Distance 9.5 m
Ambient Temperature 25.1 °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.

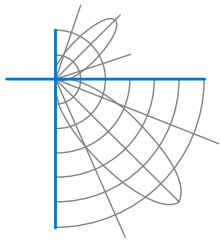
Prorating the performance of the sample for the use of other component combinations (such as lamp / LED / Ballast / driver), or for use in different environmental conditions than that tested, may produce erroneous results.

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.



Report of Test

LLIA001357-002B

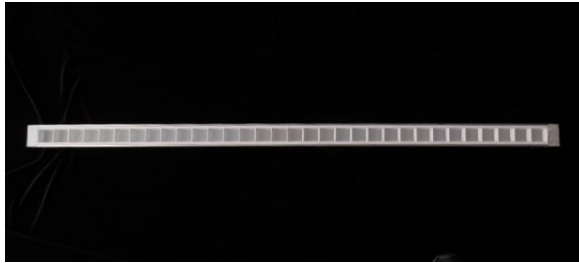
Integrating Sphere Report

Catalog Number: QS2-D-MO-K40-80-4-XX-PBF01M-FXXX-UNV-DIM1

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

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

One Osram Optotronic OTi 30/120-277/1A0 DIM-1 L G2 LED driver labeled as 730mA



Performance Summary

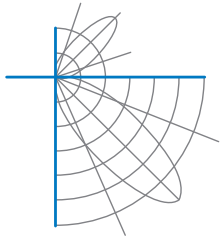
Voltage	120.0 Vac
Current	0.1620 A
Power	19.04 W
Frequency	59.99 Hz
Power Factor	0.979
Current THD	11.9 %
Total Luminous Flux	1679.4 lm
Efficacy	88.2 lm/W
Chromaticity (x,y)	(0.3802, 0.3816)
(u',v')	(0.2230, 0.5037)
Duv	0.0023
CCT	4042 K
CRI (Ra)	83
R9	5
TM-30: Rf	81
TM-30: Rg	93
TM-30: Rcs,h1	-12

Prepared For:

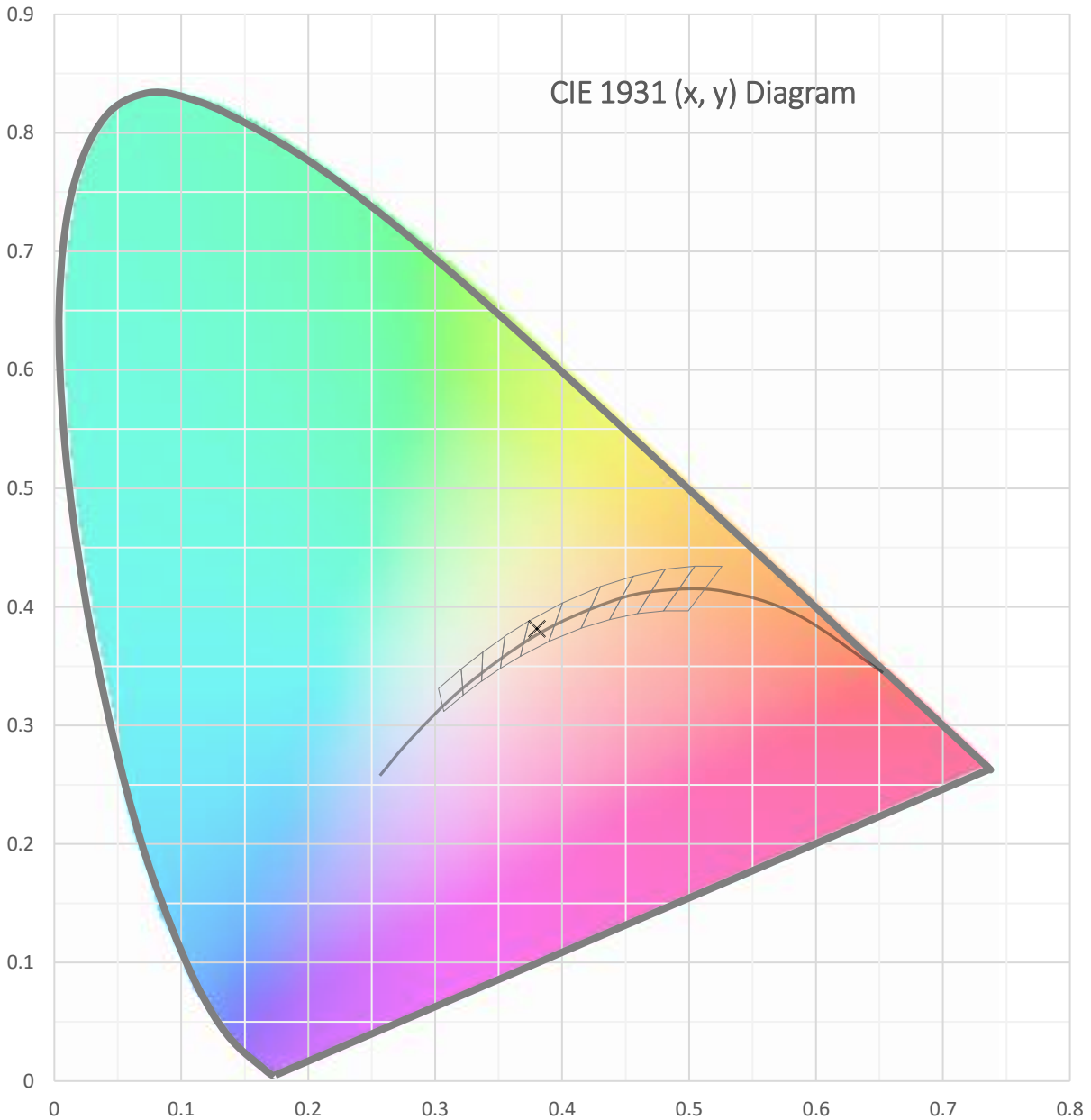
Precision Architectural Lighting
4830 Timber Creek Drive
Houston, TX 77017, USA

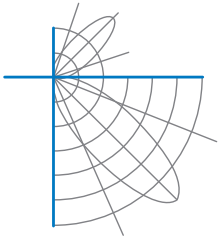
Test date: 12/10/2020

Report date: 12/14/2020

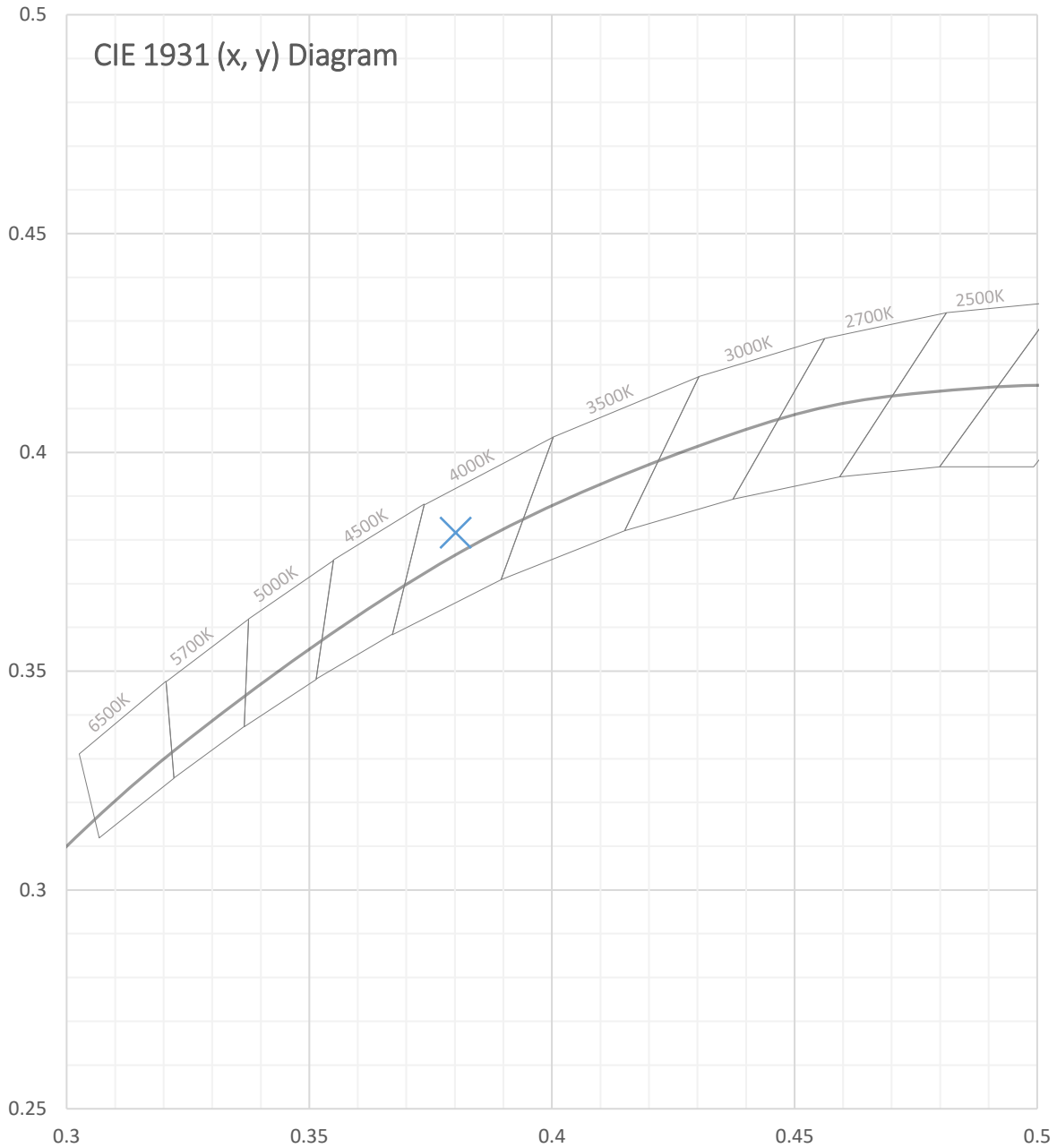


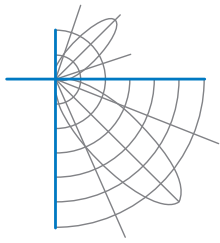
Test Report Number: LLIA001357-002B





Test Report Number: LLIA001357-002B



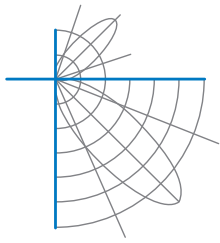


Test Report Number: LLIA001357-002B

Total Radiant Flux	5.065 W
Total Luminous Flux	1679.4 Lm
Chromaticity CIE 1931 (x, y)	(0.3802, 0.3816)
Chromaticity CIE 1976 (u', v')	(0.2230, 0.5037)
Correlated Color Temperature (CCT)	4042 K
Color Rendering Index (Ra)	83
R1	81
R2	90
R3	96
R4	80
R5	81
R6	86
R7	85
R8	63
R9	5
R10	77
R11	79
R12	59
R13	83
R14	98
TM-30: Rf	81
TM-30: Rg	93
TM-30: Rcs,h1	-12
Distance from Planckian Locus (Duv)	0.0023
Scotopic/Photopic Ratio ‡	1.718

Electrical Data

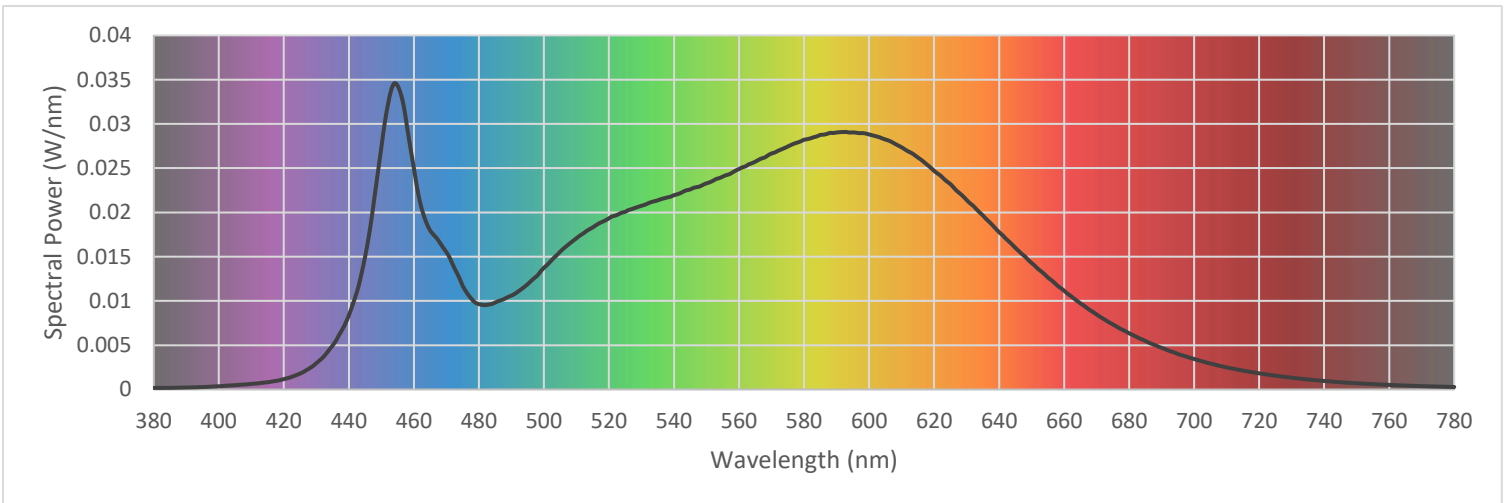
Voltage	120.0 Vac
Current	0.1620 A
Power	19.04 W
Frequency	59.99 Hz
Power Factor	0.979
Current THD	11.9 %

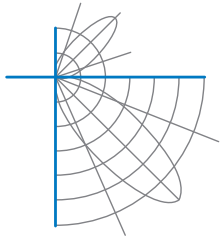


Test Report Number: LLIA001357-002B

Summary Spectral Power Distribution (wavelength - nm, spectral power - W/nm)

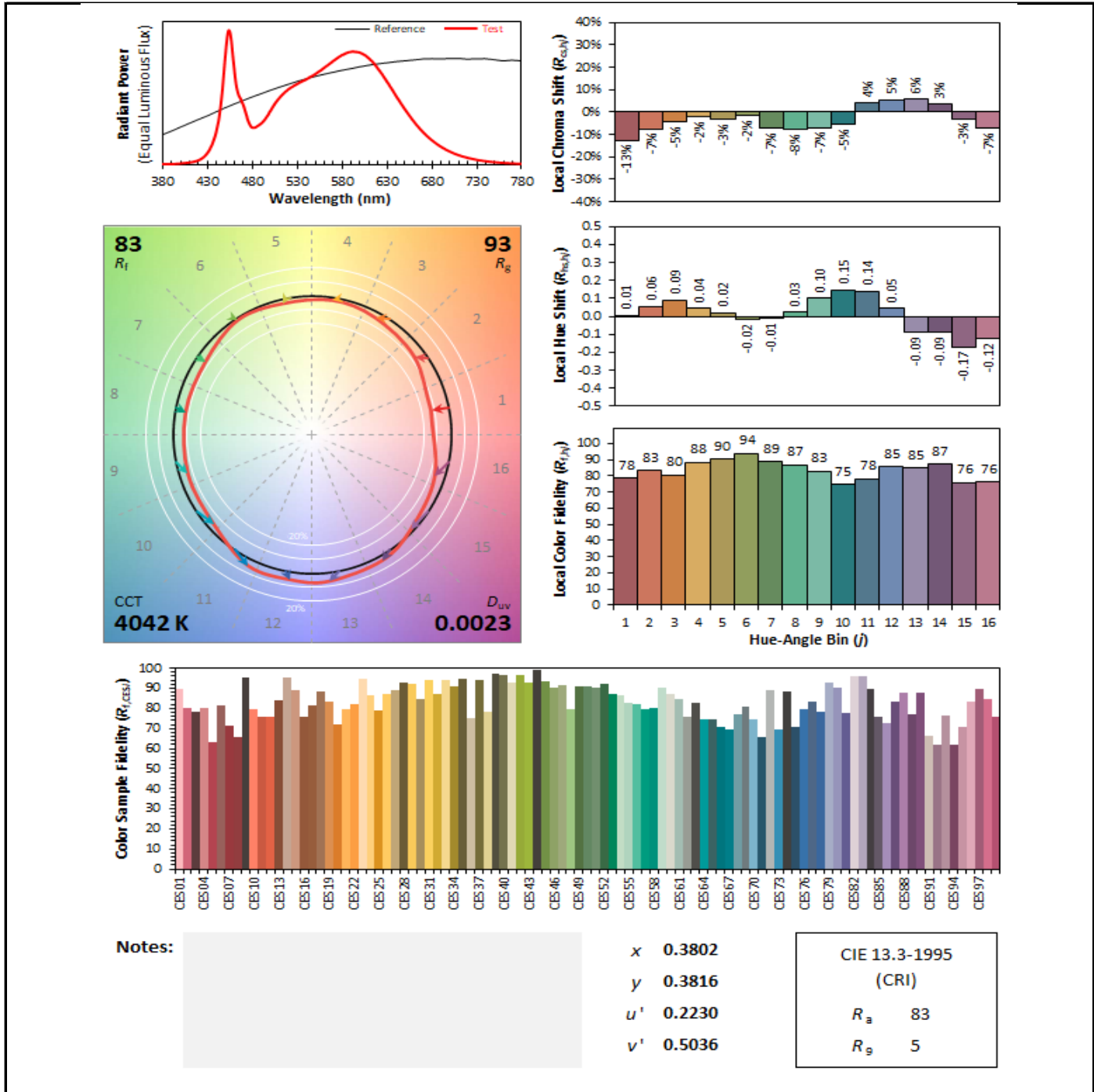
380	0.000176	480	0.009639	580	0.028210	680	0.006347
385	0.000182	485	0.009819	585	0.028751	685	0.005480
390	0.000219	490	0.010607	590	0.029026	690	0.004703
395	0.000273	495	0.011900	595	0.029038	695	0.004008
400	0.000364	500	0.013744	600	0.028808	700	0.003444
405	0.000484	505	0.015573	605	0.028239	705	0.002929
410	0.000626	510	0.017081	610	0.027359	710	0.002488
415	0.000815	515	0.018309	615	0.026209	715	0.002137
420	0.001170	520	0.019337	620	0.024700	720	0.001823
425	0.001797	525	0.020071	625	0.023210	725	0.001554
430	0.002975	530	0.020754	630	0.021413	730	0.001329
435	0.004974	535	0.021364	635	0.019664	735	0.001129
440	0.008381	540	0.021944	640	0.017766	740	0.000958
445	0.015025	545	0.022594	645	0.016000	745	0.000817
450	0.027384	550	0.023285	650	0.014289	750	0.000700
455	0.034297	555	0.024047	655	0.012658	755	0.000597
460	0.024965	560	0.024901	660	0.011159	760	0.000515
465	0.017957	565	0.025731	665	0.009733	765	0.000441
470	0.015502	570	0.026659	670	0.008468	770	0.000376
475	0.011702	575	0.027445	675	0.007353	775	0.000325
						780	0.000280

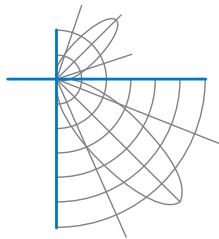




Test Report Number: LLIA001357-002B

IES TM-30 Details





Test Report Number: LLIA001357-002B

Test Equipment Configuration: LightLab International Allentown 2m Integrating Sphere
Measurements acquired using a Labsphere CDS 2600 spectroradiometer
Testing was performed using 4π geometry

Test Temperature: 24.6 °C

Test Procedure: Tested in accordance with the applicable sections of:
LM-79-19, LM-78-07, LM-58-13, ANSI_ANSLG C78.377-2017, TM-30-18

Significance: 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.

Notes: The measurements 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

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.