LightLab INTERNATIONAL ALLENTOWN LLC

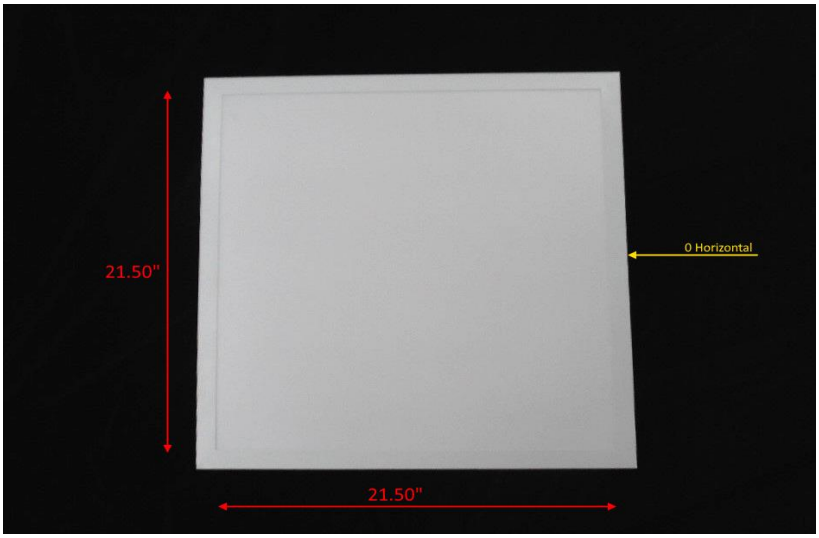
NVLAP TESTING Lab Code: 201079-0

Report of Test

LLIA001322-001

Indoor Distribution Photometry Test Report

Catalog Number: F-L22/20/40K/D/BL-87
Recessed ceiling, formed steel and extruded aluminum housing,
white reflector above LEDs, translucent white plastic enclosure.
42 white LEDs, 6 LED boards each with 7 LEDs with plastic optics below.
One LED driver



Prepared For:
Topaz Lighting Corp
925 Waverly Avenue
Holtsville, NY 11742, USA

Performance Summary					
Input Voltage	120.0	V	Luminous Flux	2462.6	Lumens
Input Current	0.1723	A	Total Efficacy	119.8	Lm/W
Input Power	20.55	W	Downward Flux	2462.5	Lumens
Frequency	60.00	Hz	Downward Flux	100.0	% of Total
Power Factor	0.994				
Current THD	4.7	%			

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

Test date: 09/25/2020
Report date: 09/28/2020

Signed: Michael L. Grather

USA west coast LightLab International, LLC, 24825 N. 16th Avenue, Suite 125, Phoenix, AZ, 85085 | Ph : +1 623-434-1499 | Fx : +1 623-434-1492 | www.lightlabint.com

USA east coast LightLab Int'l Allentown LLC, 905 Harrison Street, Suite 135, Allentown, PA 18103 | Ph: +1 484-273-0705 | www.lightlaballentown.com | (issuing laboratory)

Australasia & S.E. Asia LightLab International, 50 Redcliffe Gardens Drive, Clontarf, Queensland, 4019, Australia | Ph : +61 7 3283 7862 | Fx : +61 7 3283 8751 | www.lightlabint.com

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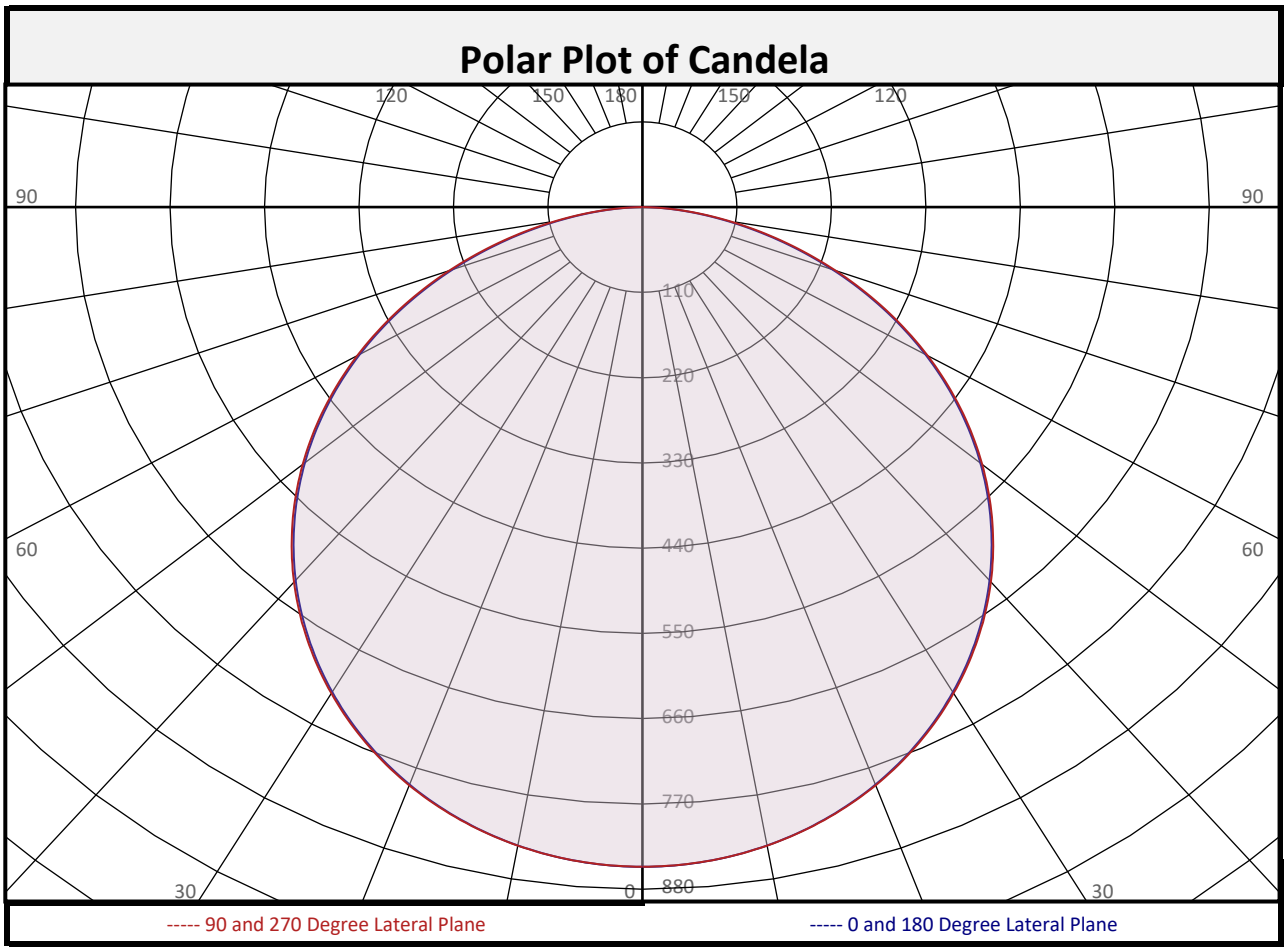

Zonal Flux Summary									
Zone (Deg Vert)	Flux (Lumens)	Percent of Total	Zone (Deg Vert)	Flux (Lumens)	Percent of Total	Zone (Deg Vert)	Flux (Lumens)	Percent of Total
0-10	80.6	3.3%	90-100	0.0	0.0%	0-20	311.6	12.7%
10-20	231.0	9.4%	100-110	0.0	0.0%	0-30	662.6	26.9%
20-30	351.0	14.3%	110-120	0.0	0.0%	0-40	1088	44.2%
30-40	425.1	17.3%	120-130	0.0	0.0%	0-60	1933	78.5%
40-50	443.2	18.0%	130-140	0.0	0.0%	0-80	2415	98.1%
50-60	402.2	16.3%	140-150	0.0	0.0%	10-90	2382	96.7%
60-70	306.6	12.5%	150-160	0.0	0.0%	20-50	1219	49.5%
70-80	175.3	7.1%	160-170	0.0	0.0%	40-90	1375	55.8%
80-90	47.6	1.9%	170-180	0.0	0.0%	60-90	529.4	21.5%
0-90	2463	100.0%	90-180	0.0	0.0%	0-180	2463	100.0%

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Luminous Intensity (Candela) Table

	Lateral (C-Plane) Angles									
Vertical (Gamma) Angles		0	22.5	45	67.5	90	112.5	135	157.5	180
	0	851	851	851	851	851	851	851	851	851
	2.5	850	850	850	850	850	850	850	850	850
	5	847	847	848	847	847	847	848	847	847
	7.5	843	843	843	843	843	843	843	843	843
	10	836	836	837	836	837	836	837	836	836
	12.5	828	828	828	828	828	828	828	828	828
	15	818	818	819	819	819	819	819	818	818
	17.5	806	806	807	807	807	807	807	806	806
	20	793	793	793	794	794	794	793	793	793
	22.5	778	778	778	779	779	779	778	778	778
	25	761	761	762	762	763	762	762	761	761
	27.5	743	743	743	744	744	744	743	743	743
	30	723	723	724	724	724	724	724	723	723
	32.5	701	701	702	703	703	703	702	701	701
	35	678	679	680	680	681	680	680	679	678
	37.5	654	654	656	656	657	656	656	654	654
	40	628	629	630	631	631	631	630	629	628
	42.5	601	602	603	604	604	604	603	602	601
	45	573	574	575	576	576	576	575	574	573
	47.5	544	544	546	546	547	546	546	544	544
	50	513	514	515	516	517	516	515	514	513
	52.5	482	482	483	484	485	484	483	482	482
	55	449	449	450	452	452	452	450	449	449
	57.5	415	415	416	418	418	418	416	415	415
	60	380	381	382	383	384	383	382	381	380
	62.5	344	345	346	347	348	347	346	345	344
	65	308	309	310	311	312	311	310	309	308
	67.5	272	272	273	275	276	275	273	272	272
	70	235	236	237	239	239	239	237	236	235
	72.5	199	199	201	202	203	202	201	199	199
	75	163	164	165	167	168	167	165	164	163
	77.5	129	130	131	133	134	133	131	130	129
	80	97	97	99	100	101	100	99	97	97
	82.5	67	67	69	70	71	70	69	67	67
	85	39	40	41	43	43	43	41	40	39
	87.5	16	16	17	18	18	18	17	16	16
	90	0	0	1	1	1	1	1	0	0

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Luminous Intensity (Candela) Table

Vertical (Gamma) Angles	Lateral (C-Plane) Angles									
	0	22.5	45	67.5	90	112.5	135	157.5	180
90	0	0	1	1	1	1	1	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	109	104	99	96		106	102	98	94		97	94	91		93	91	88		90	88	86	83
2	99	90	83	78		96	88	82	77		85	79	75		82	77	73		79	75	71	69
3	90	79	71	64		87	78	70	64		75	68	63		72	66	61		69	64	60	58
4	82	70	61	54		80	69	60	54		66	59	53		64	58	52		62	56	52	50
5	76	63	53	47		73	61	53	46		59	52	46		57	51	45		55	50	45	43
6	70	56	47	41		68	55	47	41		53	46	40		52	45	40		50	44	39	37
7	65	51	42	36		63	50	42	36		49	41	36		47	40	35		46	40	35	33
8	60	46	38	32		59	46	38	32		44	37	32		43	36	31		42	36	31	29
9	56	43	34	29		55	42	34	29		41	34	29		40	33	28		39	33	28	26
10	53	39	31	26		51	39	31	26		38	31	26		37	30	26		36	30	26	24

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	23.6	7.57	7.59
8.0	13.3	10.09	10.12
10.0	8.5	12.62	12.65
12.0	5.9	15.14	15.18
14.0	4.3	17.66	17.71
16.0	3.3	20.19	20.24

Average Luminance (cd/m^2)

	0 deg Plane	45 deg Plane	90 deg Plane
0	2854	2854	2854
45	2718	2726	2733
55	2623	2632	2642
65	2447	2459	2475
75	2113	2141	2172
85	1518	1595	1648

Spacing Criterion

0 degree plane:	1.3
90 degree plane:	1.3
180 degree plane:	1.3
270 degree plane:	1.3

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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	15.5	17.1	15.9	17.5	17.8	15.5	17.2	15.9	17.5	17.8
	3H	17.3	18.8	17.7	19.1	19.5	17.4	18.9	17.7	19.2	19.5
	4H	18.0	19.4	18.4	19.7	20.1	18.0	19.4	18.4	19.8	20.2
	6H	18.4	19.7	18.8	20.1	20.5	18.5	19.8	18.9	20.2	20.6
	8H	18.6	19.8	19.0	20.2	20.6	18.7	20.0	19.1	20.3	20.7
	12H	18.7	19.9	19.1	20.3	20.7	18.8	20.0	19.2	20.4	20.8
4H	2H	16.1	17.5	16.5	17.9	18.3	16.2	17.6	16.6	17.9	18.3
	3H	18.2	19.3	18.6	19.7	20.1	18.2	19.4	18.6	19.8	20.2
	4H	18.9	20.0	19.4	20.4	20.9	19.0	20.1	19.4	20.5	20.9
	6H	19.6	20.5	20.0	20.9	21.4	19.7	20.6	20.1	21.0	21.5
	8H	19.7	20.6	20.2	21.1	21.5	19.9	20.7	20.3	21.2	21.6
	12H	19.9	20.7	20.4	21.1	21.6	20.0	20.8	20.5	21.3	21.7
8H	4H	19.3	20.1	19.7	20.6	21.0	19.3	20.2	19.8	20.7	21.1
	6H	20.0	20.7	20.5	21.2	21.7	20.1	20.8	20.6	21.3	21.8
	8H	20.2	20.9	20.7	21.4	21.9	20.4	21.0	20.9	21.5	22.0
	12H	20.4	21.0	21.0	21.5	22.1	20.6	21.2	21.1	21.7	22.2
12H	4H	19.3	20.1	19.8	20.6	21.0	19.4	20.2	19.8	20.6	21.1
	6H	20.1	20.7	20.6	21.2	21.7	20.1	20.8	20.7	21.3	21.8
	8H	20.4	20.9	20.9	21.4	22.0	20.5	21.1	21.0	21.5	22.1

Maximum UGR = 22.2

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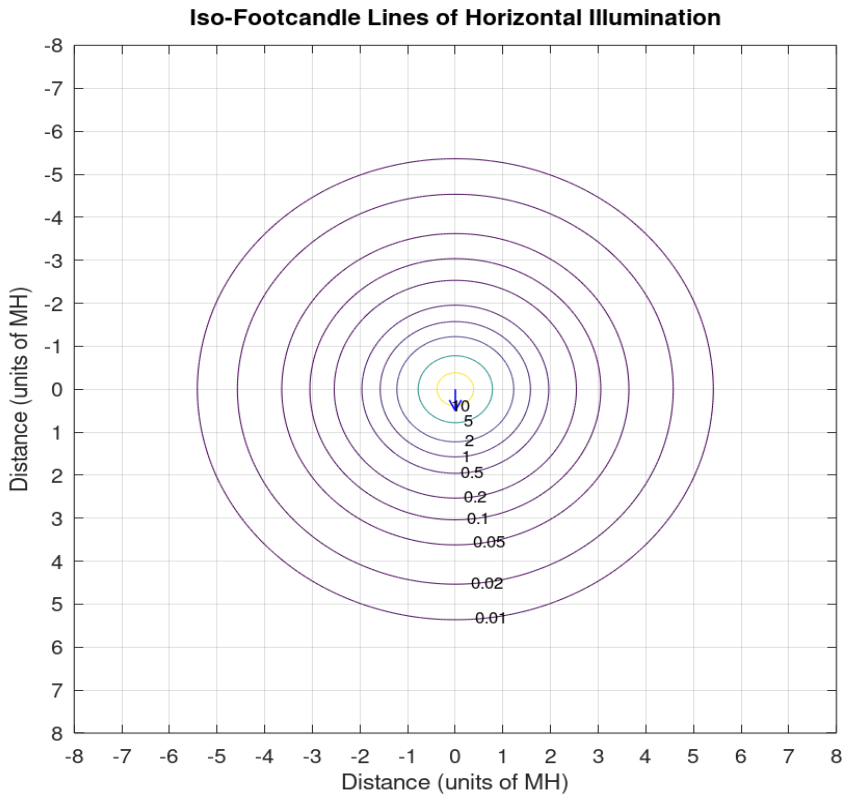
Iso-Illuminance Plot



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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Test Distance	9.5 m
Ambient Temperature	24.9 °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.