LightLab INTERNATIONAL ALLENTOWN LLC

NVLAP TESTING Lab Code: 201079-0

Report of Test

LLIA001322-002

Indoor Distribution Photometry Test Report

Catalog Number: F-L24/30/40K/D/BL-87
Recessed ceiling, formed steel and extruded aluminum housing,
white reflector above LEDs, translucent white plastic enclosure.
84 white LEDs, 6 LED boards each with 14 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	3542.6	Lumens
Input Current	0.2332	A	Total Efficacy	127.9	Lm/W
Input Power	27.69	W	Downward Flux	3542.4	Lumens
Frequency	60.00	Hz	Downward Flux	100.0	% of Total
Power Factor	0.990				
Current THD	6.5	%			

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

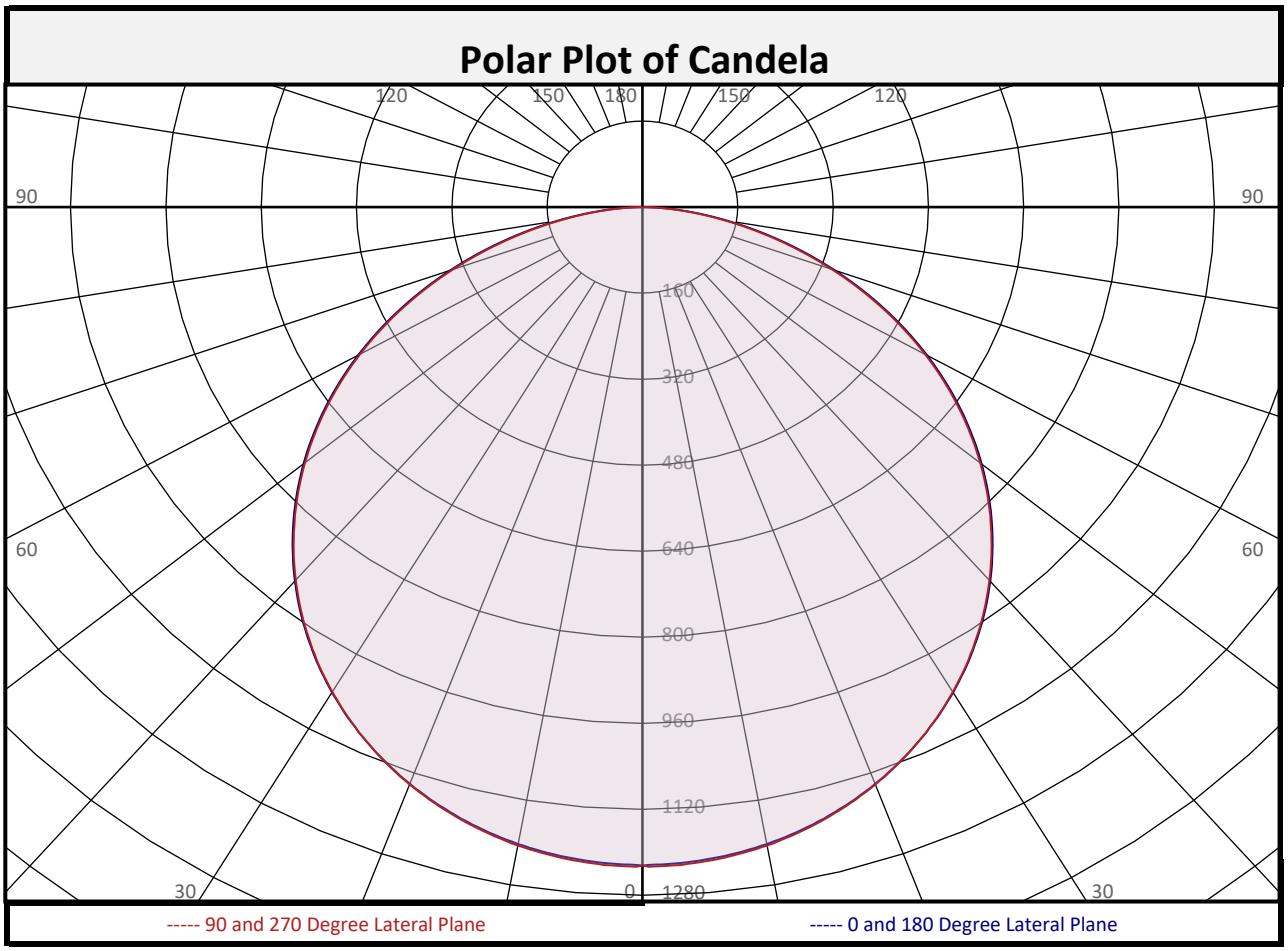
Test date: 09/25/2020
Report date: 09/28/2020

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

Report of Test

LLIA001322-002



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	116.0	3.3%	90-100	0.2	0.0%	0-20	448.4	12.7%
10-20	332.4	9.4%	100-110	0.0	0.0%	0-30	953.7	26.9%
20-30	505.3	14.3%	110-120	0.0	0.0%	0-40	1566	44.2%
30-40	611.9	17.3%	120-130	0.0	0.0%	0-60	2783	78.6%
40-50	638.1	18.0%	130-140	0.0	0.0%	0-80	3475	98.1%
50-60	579.0	16.3%	140-150	0.0	0.0%	10-90	3426	96.7%
60-70	441.1	12.5%	150-160	0.0	0.0%	20-50	1755	49.5%
70-80	250.7	7.1%	160-170	0.0	0.0%	40-90	1977	55.8%
80-90	67.9	1.9%	170-180	0.0	0.0%	60-90	759.7	21.4%
0-90	3542	100.0%	90-180	0.2	0.0%	0-180	3543	100.0%

Report of Test

LLIA001322-002

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	1225	1225	1225	1225	1225	1225	1225	1225	1225
	2.5	1222	1222	1223	1225	1226	1225	1223	1222	1222
	5	1218	1219	1219	1221	1221	1221	1219	1219	1218
	7.5	1212	1211	1212	1214	1215	1214	1212	1211	1212
	10	1203	1202	1203	1205	1206	1205	1203	1202	1203
	12.5	1191	1191	1192	1193	1194	1193	1192	1191	1191
	15	1178	1177	1177	1179	1179	1179	1177	1177	1178
	17.5	1161	1160	1161	1162	1162	1162	1161	1160	1161
	20	1142	1141	1142	1142	1143	1142	1142	1141	1142
	22.5	1121	1120	1120	1120	1121	1120	1120	1120	1121
	25	1097	1096	1096	1096	1097	1096	1096	1096	1097
	27.5	1071	1070	1070	1070	1070	1070	1070	1070	1071
	30	1043	1042	1041	1041	1042	1041	1041	1042	1043
	32.5	1012	1011	1011	1011	1011	1011	1011	1011	1012
	35	980	978	978	978	977	978	978	978	980
	37.5	945	944	943	943	943	943	943	944	945
	40	908	907	907	906	906	906	907	907	908
	42.5	870	869	868	867	867	867	868	869	870
	45	829	829	827	826	826	826	827	829	829
	47.5	787	786	785	784	784	784	785	786	787
	50	743	742	741	740	740	740	741	742	743
	52.5	697	697	696	694	694	694	696	697	697
	55	650	650	648	647	646	647	648	650	650
	57.5	602	601	600	598	598	598	600	601	602
	60	552	551	550	548	548	548	550	551	552
	62.5	501	500	498	497	496	497	498	500	501
	65	448	448	446	445	444	445	446	448	448
	67.5	396	395	393	392	391	392	393	395	396
	70	343	342	340	339	338	339	340	342	343
	72.5	291	290	288	286	285	286	288	290	291
	75	239	238	236	235	234	235	236	238	239
	77.5	190	189	187	185	184	185	187	189	190
	80	143	142	140	138	137	138	140	142	143
	82.5	99	99	97	96	95	96	97	99	99
	85	59	59	59	57	57	57	59	59	59
	87.5	24	25	25	26	25	26	25	25	24
	90	1	2	4	5	5	5	4	2	1

Report of Test

LLIA001322-002

Luminous Intensity (Candela) Table

	Lateral (C-Plane) Angles									
Vertical (Gamma) Angles		0	22.5	45	67.5	90	112.5	135	157.5	180
	90	1	2	4	5	5	5	4	2	1
	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

LLIA001322-002

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	80	75		82	77	73		79	75	72	69
3	90	79	71	64		87	78	70	64		75	68	63		72	66	62		69	65	60	58
4	82	70	61	54		80	69	60	54		66	59	53		64	58	53		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	34.0	7.59	7.58
8.0	19.1	10.12	10.11
10.0	12.2	12.65	12.64
12.0	8.5	15.18	15.16
14.0	6.2	17.71	17.69
16.0	4.8	20.24	20.22

Average Luminance (cd/m^2)

	0 deg Plane	45 deg Plane	90 deg Plane
0	1941	1941	1941
45	1858	1854	1851
55	1796	1791	1786
65	1680	1672	1665
75	1464	1447	1430
85	1077	1064	1034

Spacing Criterion

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

Report of Test

LLIA001322-002

UGR TABLE - CORRECTED

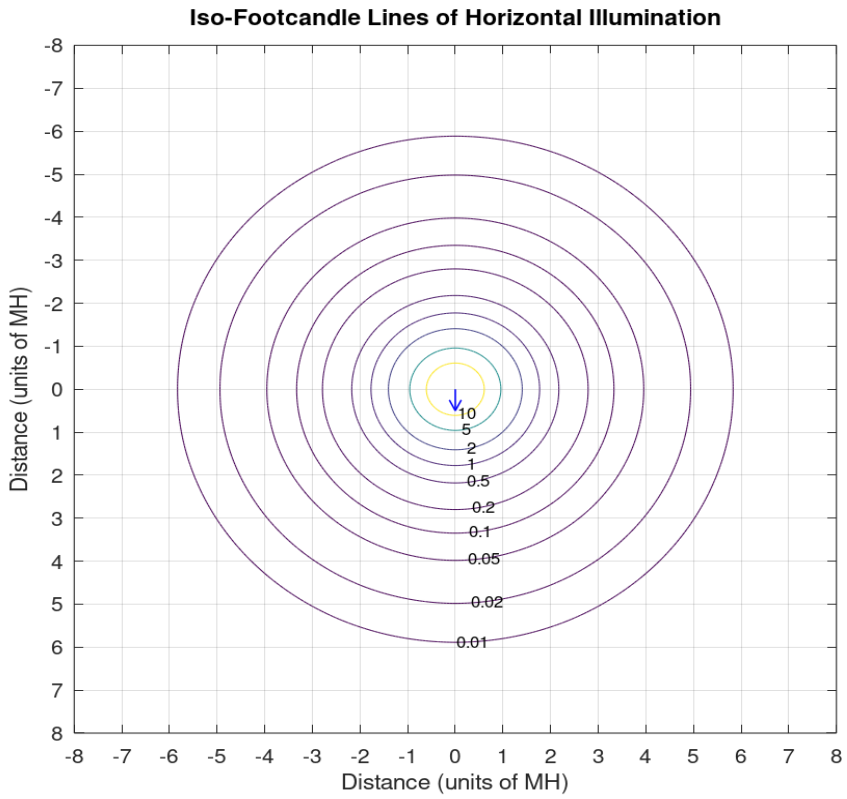
Reflectances											
Ceiling Cavity		70	70	50	50	30	70	70	50	50	30
Walls		50	30	50	30	30	50	30	50	30	30
Floor Cavity		20	20	20	20	20	20	20	20	20	20
Room Size		UGR Viewed Crosswise					UGR Viewed Endwise				
X=2H	Y=2H	14.2	15.9	14.6	16.2	16.5	14.2	15.8	14.6	16.2	16.5
	3H	16.1	17.6	16.4	17.9	18.2	16.0	17.5	16.4	17.8	18.2
	4H	16.7	18.1	17.1	18.5	18.9	16.7	18.1	17.1	18.4	18.8
	6H	17.2	18.5	17.6	18.9	19.3	17.1	18.4	17.5	18.8	19.2
	8H	17.4	18.6	17.8	19.0	19.4	17.3	18.5	17.7	18.9	19.3
	12H	17.5	18.7	17.9	19.0	19.5	17.4	18.6	17.8	18.9	19.4
4H	2H	14.9	16.3	15.3	16.6	17.0	14.8	16.2	15.2	16.6	17.0
	3H	16.9	18.1	17.3	18.5	18.9	16.9	18.0	17.3	18.4	18.8
	4H	17.7	18.8	18.1	19.2	19.6	17.6	18.7	18.1	19.1	19.6
	6H	18.3	19.3	18.8	19.7	20.2	18.2	19.2	18.7	19.6	20.1
	8H	18.5	19.4	19.0	19.8	20.3	18.4	19.3	18.9	19.7	20.2
	12H	18.7	19.5	19.1	19.9	20.4	18.6	19.3	19.0	19.8	20.3
8H	4H	18.0	18.9	18.5	19.3	19.8	18.0	18.8	18.4	19.3	19.7
	6H	18.8	19.5	19.2	20.0	20.4	18.7	19.4	19.2	19.9	20.4
	8H	19.0	19.7	19.5	20.2	20.7	18.9	19.6	19.4	20.1	20.6
	12H	19.2	19.8	19.7	20.3	20.9	19.1	19.7	19.6	20.2	20.7
12H	4H	18.0	18.8	18.5	19.3	19.8	18.0	18.8	18.5	19.3	19.7
	6H	18.8	19.5	19.3	19.9	20.5	18.7	19.4	19.2	19.8	20.4
	8H	19.1	19.7	19.6	20.2	20.8	19.0	19.6	19.5	20.1	20.7

Maximum UGR = 20.9

Report of Test

LLIA001322-002

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

LLIA001322-002

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.