LightLab INTERNATIONAL ALLENTOWN LLC

NVLAP TESTING Lab Code: 201079-0

Report of Test

LLIA002241-008

Indoor Distribution Photometry Test Report

Catalog Number: LHB-24L-W-40K-U
Highbay/Pendant mounted, cast white painted aluminum housing,
clear prismatic plastic enclosures below LEDs
468 white LEDs on two LED boards with 234 LEDs each
One Lifud LF-FAA150 LED driver

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

Performance Summary					
Input Voltage	120.0	Vac	Luminous Flux	23899.1	Lumens
Input Current	1.347	A	Total Efficacy	148.2	Lm/W
Input Power	161.3	W	Downward Flux	23899.0	Lumens
Frequency	60.00	Hz	Downward Flux	100.0	% of Total
Power Factor	0.997				
Current THD	3.3	%			

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

Test date: 10/23/2023
Report date: 10/26/2023

Signed: Michael L. Grather Digitally signed by Michael L. Grather Date: 2023.10.26 14:36:35 -04'00'

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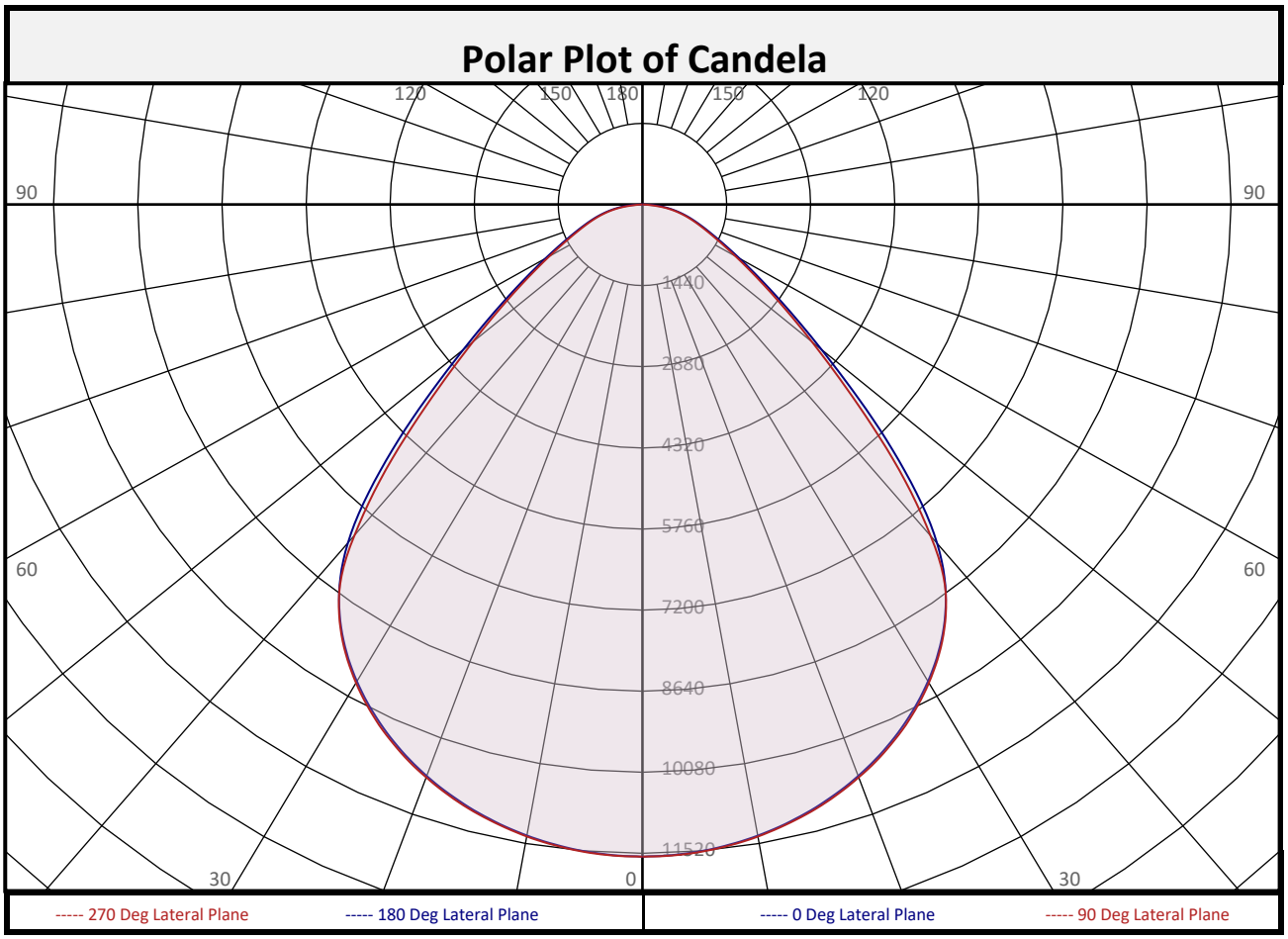

Zonal Flux Summary

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	1097	4.6%	90-100	0.1	0.0%	0-20	4244	17.8%
10-20	3147	13.2%	100-110	0.0	0.0%	0-30	9021	37.7%
20-30	4776	20.0%	110-120	0.0	0.0%	0-40	14627	61.2%
30-40	5606	23.5%	120-130	0.0	0.0%	0-60	21474	89.9%
40-50	4425	18.5%	130-140	0.0	0.0%	0-80	23659	99.0%
50-60	2422	10.1%	140-150	0.0	0.0%	10-90	22802	95.4%
60-70	1372	5.7%	150-160	0.0	0.0%	20-50	14808	62.0%
70-80	813.5	3.4%	160-170	0.0	0.0%	40-90	9272	38.8%
80-90	240.2	1.0%	170-180	0.0	0.0%	60-90	2425	10.1%
0-90	23899	100.0%	90-180	0.1	0.0%	0-180	23899	100.0%

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Luminous Intensity (Candela) Table

Vertical (Gamma) Angles - Data was acquired in 0.5° increments, 2.5° increments shown.	Lateral (C-Plane) Angles									
	0	22.5	45	67.5	90	112.5	135	157.5	180
0	11581	11581	11581	11581	11581	11581	11581	11581	11581
2.5	11564	11560	11578	11582	11571	11582	11578	11560	11564
5	11525	11525	11544	11547	11537	11547	11544	11525	11525
7.5	11462	11463	11481	11483	11476	11483	11481	11463	11462
10	11378	11382	11396	11399	11395	11399	11396	11382	11378
12.5	11270	11274	11286	11288	11286	11288	11286	11274	11270
15	11137	11142	11153	11159	11160	11159	11153	11142	11137
17.5	10979	10983	10995	11006	11005	11006	10995	10983	10979
20	10798	10801	10817	10825	10825	10825	10817	10801	10798
22.5	10590	10589	10609	10625	10623	10625	10609	10589	10590
25	10351	10351	10375	10391	10386	10391	10375	10351	10351
27.5	10082	10085	10109	10131	10117	10131	10109	10085	10082
30	9777	9779	9805	9825	9808	9825	9805	9779	9777
32.5	9428	9431	9462	9473	9457	9473	9462	9431	9428
35	9021	9033	9053	9058	9040	9058	9053	9033	9021
37.5	8519	8532	8535	8528	8505	8528	8535	8532	8519
40	7845	7847	7800	7726	7671	7726	7800	7847	7845
42.5	6940	6905	6814	6711	6658	6711	6814	6905	6940
45	5902	5860	5742	5628	5570	5628	5742	5860	5902
47.5	4872	4827	4717	4625	4584	4625	4717	4827	4872
50	3995	3951	3867	3800	3782	3800	3867	3951	3995
52.5	3294	3248	3181	3132	3134	3132	3181	3248	3294
55	2734	2687	2632	2597	2610	2597	2632	2687	2734
57.5	2283	2237	2192	2166	2185	2166	2192	2237	2283
60	1921	1880	1843	1823	1840	1823	1843	1880	1921
62.5	1629	1597	1568	1552	1561	1552	1568	1597	1629
65	1393	1375	1354	1339	1337	1339	1354	1375	1393
67.5	1202	1196	1184	1167	1154	1167	1184	1196	1202
70	1043	1047	1043	1023	1003	1023	1043	1047	1043
72.5	904	913	912	890	867	890	912	913	904
75	774	784	783	762	737	762	783	784	774
77.5	647	656	652	631	607	631	652	656	647
80	520	526	518	494	476	494	518	526	520
82.5	390	392	378	346	325	346	378	392	390
85	263	262	227	162	141	162	227	262	263
87.5	107	94	45	23	19	23	45	94	107
90	0	1	1	1	1	1	1	1	0

16 lateral half-planes of data were acquired, 22.5 degree increments shown.

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Luminous Intensity (Candela) Table

Vertical (Gamma) Angles - Data was acquired in 0.5° increments, 2.5° increments shown.	Lateral (C-Plane) Angles									
		0	22.5	45	67.5	90	112.5	135	157.5	180
	90	0	1	1	1	1	1	1	1	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

16 lateral half-planes of data were acquired, 22.5 degree increments shown.

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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	111	107	103	100		108	105	101	98		100	98	95		97	94	92		93	91	90	88
2	102	95	90	85		100	94	88	84		90	86	82		87	83	80		84	81	78	76
3	95	86	79	73		92	84	78	73		81	76	71		79	74	70		76	72	69	67
4	88	77	70	64		86	76	69	64		74	68	63		72	66	62		69	65	61	59
5	82	70	62	56		80	69	62	56		67	61	56		65	60	55		63	58	54	53
6	76	64	56	50		74	63	56	50		61	55	50		60	54	49		58	53	49	47
7	71	59	51	45		69	58	50	45		56	50	45		55	49	44		54	48	44	42
8	66	54	46	41		65	53	46	41		52	45	40		51	45	40		50	44	40	38
9	62	50	42	37		61	49	42	37		48	41	37		47	41	37		46	41	37	35
10	58	46	39	34		57	46	39	34		45	38	34		44	38	34		43	37	33	32

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	321.7	7.51	7.52
8.0	180.9	10.01	10.03
10.0	115.8	12.51	12.54
12.0	80.4	15.01	15.04
14.0	59.1	17.51	17.55
16.0	45.2	20.01	20.06

Spacing Criterion

0 deg:	1.3
90 deg:	1.3
180 deg:	1.3
270 deg:	1.3

Average Luminance (cd/m^2)

	0 deg Plane	45 deg Plane	90 deg Plane
0	120875	120875	120875
45	87120	84762	82215
55	49757	47888	47505
65	34405	33445	33024
75	31199	31596	29728
85	31476	27188	16850

Beam and Field Angle

0-180 Degree Plane

Beam Angle: 90.5°

Field Angle: 136.3°

90-270 Degree Plane

Beam Angle: 89.0°

Field Angle: 134.9°

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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	22.3	23.7	22.6	24.0	24.3	22.0	23.5	22.4	23.8	24.1
	3H	23.6	24.8	23.9	25.2	25.5	23.3	24.6	23.7	24.9	25.3
	4H	24.1	25.3	24.5	25.7	26.0	23.9	25.1	24.3	25.4	25.8
	6H	24.6	25.7	25.0	26.1	26.5	24.4	25.5	24.8	25.8	26.2
	8H	24.8	25.9	25.3	26.3	26.7	24.5	25.6	25.0	25.9	26.3
	12H	25.0	26.0	25.4	26.4	26.8	24.6	25.6	25.0	26.0	26.4
4H	2H	22.6	23.8	23.0	24.2	24.6	22.4	23.6	22.8	24.0	24.4
	3H	24.2	25.2	24.6	25.6	26.0	24.0	25.0	24.4	25.4	25.8
	4H	24.9	25.8	25.4	26.2	26.7	24.7	25.6	25.2	26.0	26.5
	6H	25.6	26.4	26.1	26.8	27.3	25.4	26.1	25.8	26.6	27.0
	8H	25.9	26.6	26.3	27.0	27.5	25.6	26.3	26.0	26.7	27.2
	12H	26.1	26.7	26.5	27.2	27.7	25.6	26.3	26.1	26.8	27.2
8H	4H	25.2	25.9	25.7	26.4	26.8	25.0	25.7	25.5	26.2	26.6
	6H	26.0	26.6	26.5	27.1	27.6	25.8	26.4	26.3	26.9	27.3
	8H	26.4	26.9	26.9	27.4	27.9	26.1	26.6	26.6	27.1	27.6
	12H	26.7	27.2	27.2	27.6	28.2	26.2	26.7	26.7	27.2	27.8
12H	4H	25.2	25.9	25.7	26.3	26.8	25.0	25.7	25.5	26.2	26.6
	6H	26.1	26.6	26.6	27.1	27.6	25.9	26.4	26.4	26.9	27.4
	8H	26.5	27.0	27.0	27.5	28.0	26.2	26.7	26.7	27.2	27.7

Maximum UGR = 28.2

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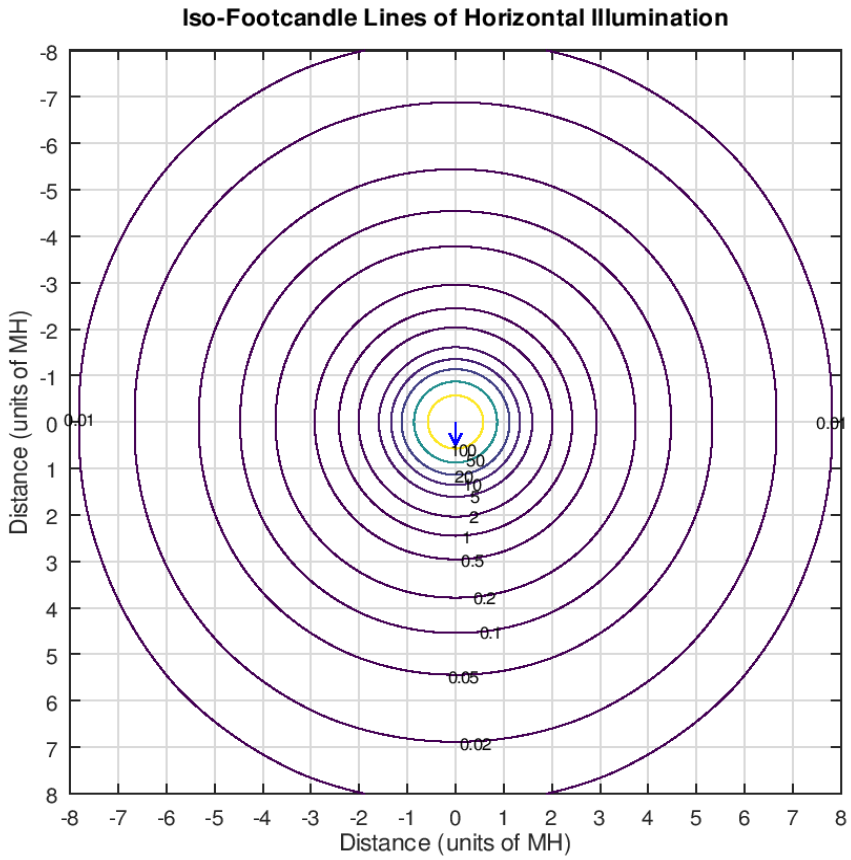
Iso-Illuminance Plot



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	24.6 °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-41-20 and LM-46-20.

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.