LightLab INTERNATIONAL ALLENTOWN LLC

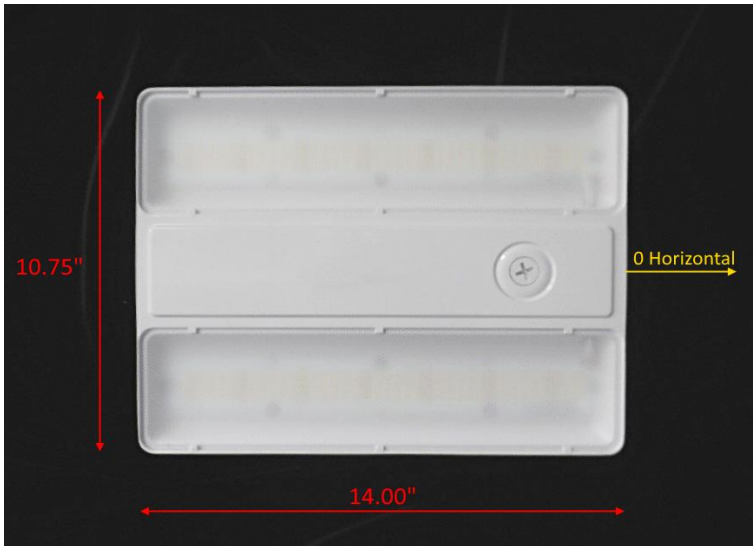
NVLAP TESTING Lab Code: 201079-0

Report of Test

LLIA002241-007

Indoor Distribution Photometry Test Report

Catalog Number: LHB-18L-W-40K-U
Highbay/Pendant mounted, cast white painted aluminum housing,
clear prismatic plastic enclosures below LEDs
312 white LEDs on two LED boards with 160 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	17840.2	Lumens
Input Current	1.017	A	Total Efficacy	146.8	Lm/W
Input Power	121.5	W	Downward Flux	17840.1	Lumens
Frequency	60.00	Hz	Downward Flux	100.0	% of Total
Power Factor	0.995				
Current THD	4.0	%			

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

Test date: 10/19/2023
Report date: 10/26/2023

Signed: Michael L. Grather Digitally signed by Michael L. Grather Date: 2023.10.26 15:04:29 -04'00'

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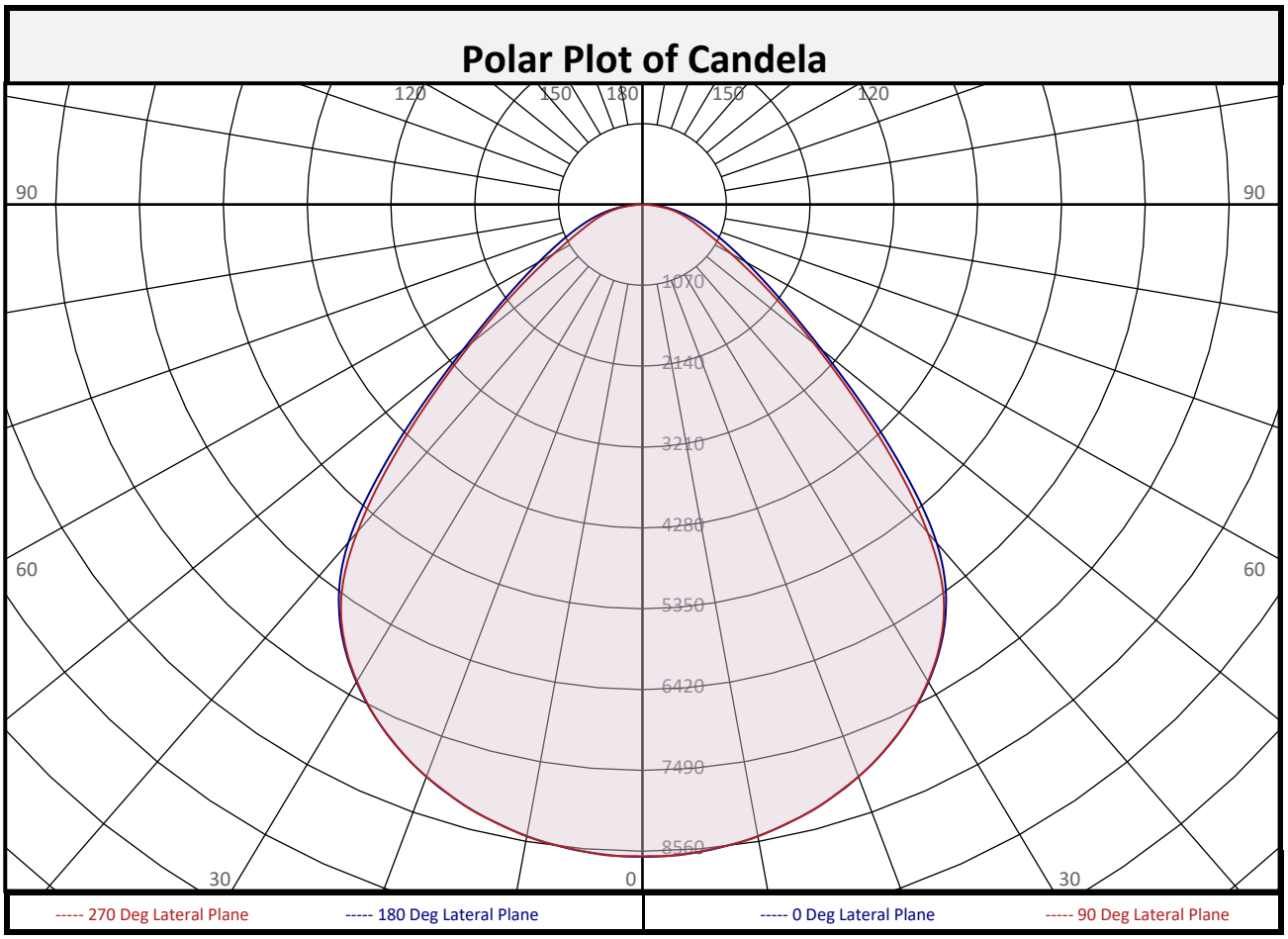

Zonal Flux Summary

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	818.2	4.6%	90-100	0.1	0.0%	0-20	3165	17.7%
10-20	2347	13.2%	100-110	0.0	0.0%	0-30	6727	37.7%
20-30	3561	20.0%	110-120	0.0	0.0%	0-40	10895	61.1%
30-40	4168	23.4%	120-130	0.0	0.0%	0-60	16016	89.8%
40-50	3295	18.5%	130-140	0.0	0.0%	0-80	17668	99.0%
50-60	1827	10.2%	140-150	0.0	0.0%	10-90	17022	95.4%
60-70	1040	5.8%	150-160	0.0	0.0%	20-50	11024	61.8%
70-80	611.8	3.4%	160-170	0.0	0.0%	40-90	6945	38.9%
80-90	171.9	1.0%	170-180	0.0	0.0%	60-90	1824	10.2%
0-90	17840	100.0%	90-180	0.1	0.0%	0-180	17840	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	8632	8632	8632	8632	8632	8632	8632	8632	8632
2.5	8625	8623	8636	8639	8629	8639	8636	8623	8625
5	8597	8600	8612	8606	8596	8606	8612	8600	8597
7.5	8551	8558	8557	8556	8551	8556	8557	8558	8551
10	8489	8495	8494	8503	8494	8503	8494	8495	8489
12.5	8408	8409	8422	8417	8405	8417	8422	8409	8408
15	8312	8307	8322	8322	8316	8322	8322	8307	8312
17.5	8194	8190	8198	8210	8192	8210	8198	8190	8194
20	8060	8061	8071	8069	8060	8069	8071	8061	8060
22.5	7906	7910	7916	7922	7903	7922	7916	7910	7906
25	7729	7732	7733	7742	7724	7742	7733	7732	7729
27.5	7529	7528	7537	7544	7523	7544	7537	7528	7529
30	7300	7297	7311	7313	7287	7313	7311	7297	7300
32.5	7040	7039	7046	7045	7022	7045	7046	7039	7040
35	6734	6734	6738	6727	6700	6727	6738	6734	6734
37.5	6353	6352	6338	6305	6268	6305	6338	6352	6353
40	5840	5822	5777	5708	5658	5708	5777	5822	5840
42.5	5137	5107	5056	4983	4928	4983	5056	5107	5137
45	4364	4333	4281	4214	4164	4214	4281	4333	4364
47.5	3618	3588	3542	3491	3452	3491	3542	3588	3618
50	2986	2942	2913	2883	2848	2883	2913	2942	2986
52.5	2488	2410	2400	2397	2342	2397	2400	2410	2488
55	2096	1980	1990	2011	1927	2011	1990	1980	2096
57.5	1783	1632	1661	1701	1585	1701	1661	1632	1783
60	1529	1356	1400	1453	1311	1453	1400	1356	1529
62.5	1317	1139	1192	1252	1096	1252	1192	1139	1317
65	1140	972	1030	1088	930	1088	1030	972	1140
67.5	987	843	898	948	800	948	898	843	987
70	853	740	788	824	697	824	788	740	853
72.5	734	651	688	710	606	710	688	651	734
75	621	566	590	597	517	597	590	566	621
77.5	512	478	490	484	428	484	490	478	512
80	404	384	385	368	333	368	385	384	404
82.5	296	285	275	242	216	242	275	285	296
85	188	178	148	111	98	111	148	178	188
87.5	76	59	36	24	20	24	36	59	76
90	0	1	1	2	2	2	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	2	2	2	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	63		74	68	63		71	66	62		69	65	61	59
5	81	70	62	56		80	69	62	56		67	61	56		65	59	55		63	58	54	52
6	76	64	56	50		74	63	55	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	36	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	239.8	7.52	7.50
8.0	134.9	10.02	10.00
10.0	86.3	12.53	12.50
12.0	59.9	15.03	15.00
14.0	44.0	17.54	17.50
16.0	33.7	20.04	20.00

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	131825	131825	131825
45	94243	92448	89935
55	55807	52991	51294
65	41177	37201	33591
75	36657	34798	30521
85	32973	25910	17181

Beam and Field Angle

0-180 Degree Plane

Beam Angle: 90.3°

Field Angle: 139.6°

90-270 Degree Plane

Beam Angle: 89.0°

Field Angle: 132.4°

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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	22.4	23.8	22.7	24.1	24.4	22.5	23.9	22.8	24.2	24.5
	3H	23.7	25.0	24.1	25.3	25.7	23.7	25.0	24.1	25.3	25.7
	4H	24.4	25.5	24.8	25.9	26.3	24.2	25.4	24.6	25.7	26.1
	6H	24.9	26.0	25.3	26.4	26.7	24.6	25.7	25.0	26.1	26.5
	8H	25.1	26.1	25.5	26.5	26.9	24.8	25.8	25.2	26.2	26.6
	12H	25.2	26.2	25.7	26.6	27.0	24.8	25.8	25.2	26.2	26.6
4H	2H	22.8	24.0	23.2	24.3	24.7	22.9	24.0	23.3	24.4	24.8
	3H	24.4	25.3	24.8	25.7	26.1	24.4	25.4	24.8	25.8	26.2
	4H	25.1	26.0	25.6	26.4	26.9	25.1	26.0	25.5	26.4	26.8
	6H	25.8	26.6	26.3	27.0	27.5	25.6	26.4	26.1	26.9	27.3
	8H	26.1	26.8	26.5	27.2	27.7	25.8	26.5	26.3	27.0	27.4
	12H	26.3	26.9	26.7	27.4	27.8	25.9	26.5	26.4	27.0	27.5
8H	4H	25.4	26.1	25.9	26.6	27.0	25.4	26.1	25.8	26.5	27.0
	6H	26.2	26.8	26.7	27.3	27.8	26.1	26.7	26.6	27.1	27.6
	8H	26.6	27.1	27.1	27.6	28.1	26.3	26.8	26.8	27.3	27.8
	12H	26.9	27.3	27.4	27.8	28.4	26.4	26.9	26.9	27.4	27.9
12H	4H	25.4	26.1	25.9	26.5	27.0	25.4	26.0	25.9	26.5	27.0
	6H	26.3	26.8	26.8	27.3	27.8	26.1	26.7	26.7	27.1	27.7
	8H	26.7	27.1	27.2	27.6	28.2	26.4	26.9	26.9	27.4	27.9

Maximum UGR = 28.4

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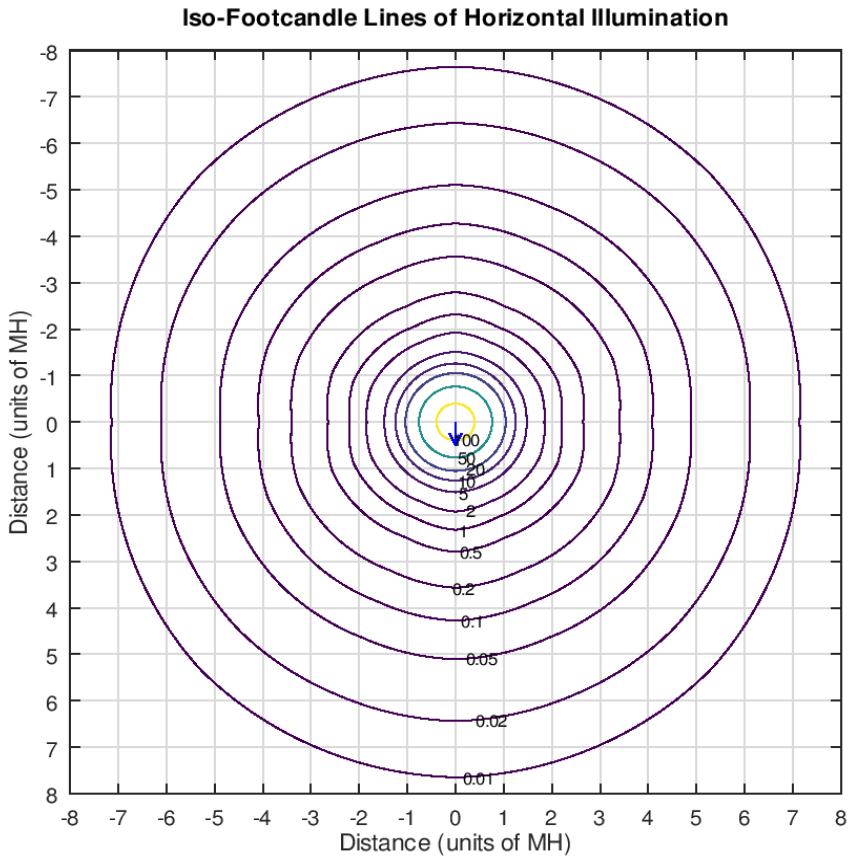
Iso-Illuminance Plot



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-41-20 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.