LightLab INTERNATIONAL ALLENTOWN LLC

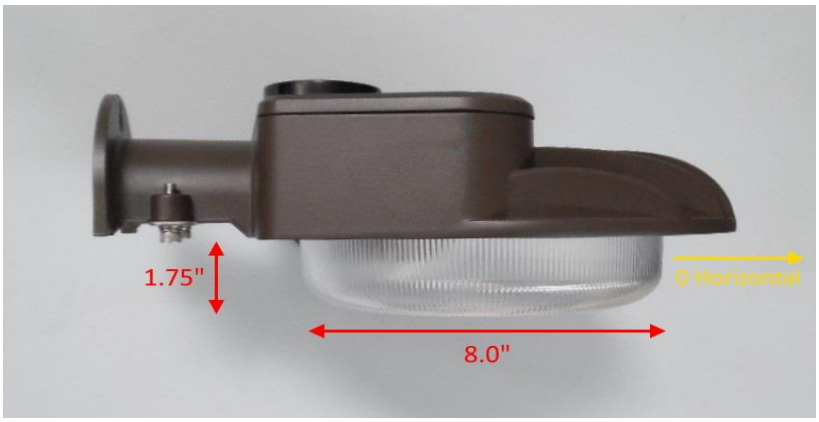
NVLAP TESTING Lab Code: 201079-0

Report of Test

LLIA001561-002

Indoor Distribution Photometry Test Report

Catalog Number: ARL-BL-60W-PCTS-BZ - 30W and 4000K Setting
Pole/arm mount, brown painted cast aluminum luminaire and driver housings,
white plastic reflector, clear plastic drop enclosure with concentric lenses.
256 LEDs, 128 cool white and 128 warm white LEDs on white circuit board
One LED Power HB-HLA60-46 LED driver with one Linoya LYSPD10A surge suppressor



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

Performance Summary					
Input Voltage	120.0	V	Luminous Flux	5354.9	Lumens
Input Current	0.2706	A	Total Efficacy	167.8	Lm/W
Input Power	31.92	W	Downward Flux	5290.6	Lumens
Frequency	60.00	Hz	Downward Flux	98.8	% of Total
Power Factor	0.983				
Current THD	7.5	%			

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

Test date: 10/13/2021
Report date: 10/14/2021

Signed: Michael L. Grather

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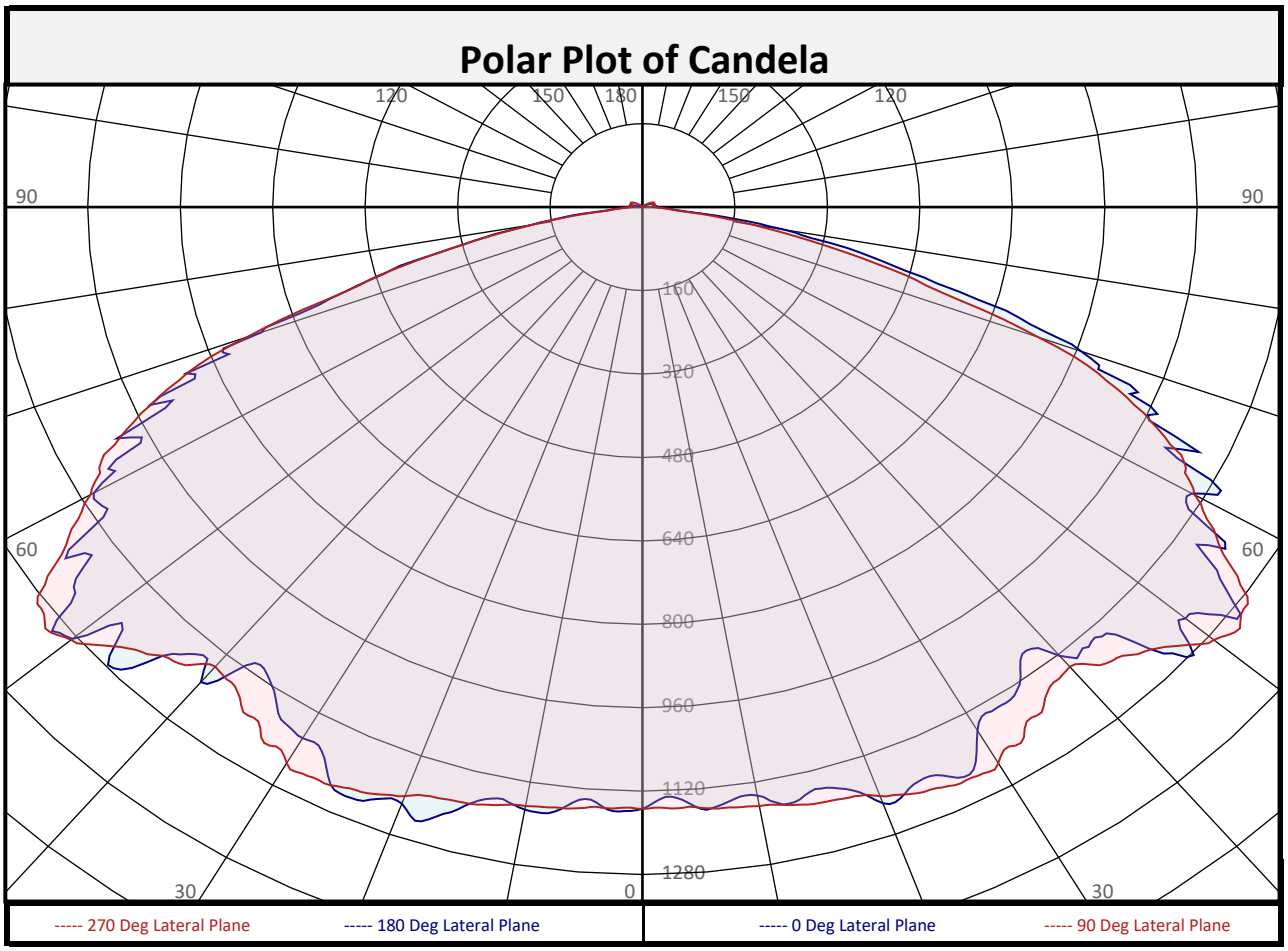

Zonal Flux Summary									
Zone (Deg Vert)	Flux (Lumens)	Percent of Total	Zone (Deg Vert)	Flux (Lumens)	Percent of Total	Zone (Deg Vert)	Flux (Lumens)	Percent of Total
0-10	110.7	2.1%	90-100	21.6	0.4%	0-20	447.4	8.4%
10-20	336.7	6.3%	100-110	21.0	0.4%	0-30	1012	18.9%
20-30	564.6	10.5%	110-120	15.0	0.3%	0-40	1751	32.7%
30-40	738.9	13.8%	120-130	5.7	0.1%	0-60	3769	70.4%
40-50	938.3	17.5%	130-140	1.0	0.0%	0-80	5208	97.3%
50-60	1080	20.2%	140-150	0.0	0.0%	10-90	5180	96.7%
60-70	955.0	17.8%	150-160	0.0	0.0%	20-50	2242	41.9%
70-80	483.2	9.0%	160-170	0.0	0.0%	40-90	3540	66.1%
80-90	82.9	1.5%	170-180	0.0	0.0%	60-90	1521	28.4%
0-90	5291	98.8%	90-180	64.3	1.2%	0-180	5355	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	1154	1154	1154	1154	1154	1154	1154	1154	1154
2.5	1131	1136	1138	1143	1154	1162	1172	1171	1159
5	1158	1163	1144	1142	1156	1172	1157	1147	1139
7.5	1149	1155	1174	1147	1161	1173	1151	1163	1169
10	1146	1149	1161	1160	1166	1171	1173	1182	1173
12.5	1172	1179	1158	1188	1174	1170	1192	1180	1161
15	1155	1179	1177	1196	1183	1177	1206	1181	1189
17.5	1170	1168	1213	1195	1187	1193	1195	1225	1231
20	1216	1194	1204	1191	1202	1202	1206	1241	1217
22.5	1206	1233	1197	1204	1218	1226	1232	1219	1230
25	1202	1204	1197	1213	1228	1237	1240	1239	1240
27.5	1226	1204	1219	1218	1233	1246	1237	1236	1192
30	1160	1225	1233	1226	1231	1236	1212	1177	1176
32.5	1140	1156	1212	1210	1218	1214	1217	1169	1165
35	1131	1136	1196	1189	1190	1196	1206	1165	1119
37.5	1080	1145	1184	1178	1158	1185	1188	1130	1102
40	1123	1120	1180	1171	1150	1176	1189	1144	1189
42.5	1144	1158	1181	1185	1187	1191	1199	1216	1162
45	1159	1203	1211	1210	1212	1216	1223	1200	1250
47.5	1277	1218	1236	1236	1246	1244	1233	1256	1235
50	1227	1272	1240	1254	1291	1247	1236	1280	1288
52.5	1297	1251	1229	1267	1304	1256	1224	1232	1247
55	1214	1229	1201	1239	1263	1224	1187	1222	1164
57.5	1196	1147	1169	1178	1178	1163	1150	1124	1106
60	1098	1125	1129	1120	1103	1102	1099	1064	1097
62.5	1045	1077	1087	1076	1056	1053	1044	1027	979
65	967	1000	1027	1002	970	980	977	941	911
67.5	928	918	915	893	868	866	865	850	838
70	807	793	770	753	728	719	725	729	701
72.5	659	638	621	582	540	566	582	553	540
75	471	494	494	450	419	430	444	433	434
77.5	364	365	363	322	297	308	314	302	298
80	249	249	235	211	191	197	200	202	193
82.5	136	132	121	109	107	103	109	115	122
85	52	54	53	48	48	49	52	53	52
87.5	33	32	32	30	30	31	34	33	33
90	21	21	20	19	19	19	20	20	20

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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	21	21	20	19	19	19	20	20	20
92.5	20	20	20	19	19	19	19	19	19
95	21	22	22	20	20	20	20	19	19
97.5	20	20	20	19	19	19	19	18	18
100	22	22	23	21	21	21	21	19	17
102.5	22	23	23	22	21	21	21	19	16
105	20	21	23	21	21	21	21	18	12
107.5	19	19	20	20	20	20	19	16	8
110	18	18	19	20	20	19	17	14	4
112.5	17	18	19	20	21	20	17	13	2
115	13	15	18	20	20	19	15	11	2
117.5	9	11	15	18	19	18	12	8	0
120	6	7	12	15	17	15	9	6	0
122.5	3	5	8	12	14	13	6	4	0
125	2	3	6	10	11	10	5	3	0
127.5	0	2	4	7	9	7	4	2	0
130	0	0	3	5	6	5	3	0	0
132.5	0	0	2	3	4	3	2	0	0
135	0	0	1	2	3	2	1	0	0
137.5	0	0	0	2	2	2	0	0	0
140	0	0	0	0	2	1	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		110	110	110		105	105	105		101	101	101	99
1	107	102	97	93		104	100	95	91		95	92	88		91	88	85		87	85	83	80
2	96	87	79	73		93	85	78	72		81	75	70		78	73	68		74	70	67	64
3	87	75	66	59		84	73	65	58		70	63	57		67	61	56		64	59	54	52
4	78	65	56	48		76	64	55	48		61	53	47		58	52	46		56	50	45	43
5	71	57	48	40		69	56	47	40		54	46	39		52	44	39		50	43	38	36
6	65	51	41	34		63	50	41	34		48	40	34		46	39	33		44	38	33	30
7	60	46	36	30		58	45	36	29		43	35	29		41	34	29		40	33	28	26
8	56	41	32	26		54	41	32	26		39	31	26		38	30	25		36	30	25	23
9	52	38	29	23		50	37	29	23		36	28	23		34	27	22		33	27	22	20
10	48	34	26	20		47	34	26	20		33	25	20		32	25	20		31	24	20	18

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	32.1	8.82	9.23
8.0	18.0	11.77	12.30
10.0	11.5	14.71	15.38
12.0	8.0	17.65	18.45
14.0	5.9	20.59	21.53
16.0	4.5	23.53	24.61

Spacing Criterion

0 deg:	1.5
90 deg:	1.5
180 deg:	1.5
270 deg:	1.5

Average Luminance (cd/m^2)

	0 deg Plane	45 deg Plane	90 deg Plane
0	35585	35585	35585
45	39546	41298	41346
55	46691	46188	48567
65	44189	46896	44293
75	27495	28878	24467
85	4430	4481	4082

Beam and Field Angle

0-180 Degree Plane

Beam Angle: 143.3°

Field Angle: 164.7°

90-270 Degree Plane

Beam Angle: 142.1°

Field Angle: 163.5°

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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	25.3	27.1	25.7	27.4	27.8	25.4	27.2	25.8	27.5	27.9
	3H	27.5	29.1	27.9	29.4	29.8	27.4	29	27.8	29.4	29.8
	4H	28	29.5	28.4	29.9	30.3	27.9	29.4	28.3	29.7	30.1
	6H	28.3	29.7	28.7	30.1	30.5	28.1	29.5	28.5	29.8	30.2
	8H	28.3	29.7	28.8	30.1	30.5	28	29.4	28.5	29.8	30.2
	12H	28.3	29.6	28.8	30	30.5	28	29.3	28.5	29.7	30.2
4H	2H	26.1	27.7	26.6	28	28.4	26.2	27.7	26.6	28.1	28.5
	3H	28.4	29.7	28.8	30.1	30.5	28.3	29.5	28.7	30	30.4
	4H	29	30.2	29.4	30.6	31.1	28.8	29.9	29.2	30.4	30.8
	6H	29.4	30.4	29.8	30.8	31.3	29	30	29.5	30.5	31
	8H	29.4	30.4	29.9	30.8	31.3	29	30	29.5	30.5	30.9
	12H	29.4	30.3	29.9	30.8	31.3	29	29.9	29.5	30.4	30.9
8H	4H	29.2	30.2	29.7	30.6	31.1	29	29.9	29.4	30.4	30.9
	6H	29.6	30.4	30.1	30.9	31.4	29.3	30.1	29.8	30.6	31.1
	8H	29.7	30.4	30.2	30.9	31.4	29.3	30	29.8	30.5	31
	12H	29.7	30.3	30.2	30.8	31.4	29.3	29.9	29.8	30.5	31
12H	4H	29.2	30.1	29.7	30.6	31.1	29	29.8	29.5	30.3	30.8
	6H	29.6	30.3	30.2	30.8	31.4	29.3	30	29.8	30.5	31
	8H	29.7	30.3	30.2	30.9	31.4	29.3	30	29.9	30.5	31

Maximum UGR = 31.4

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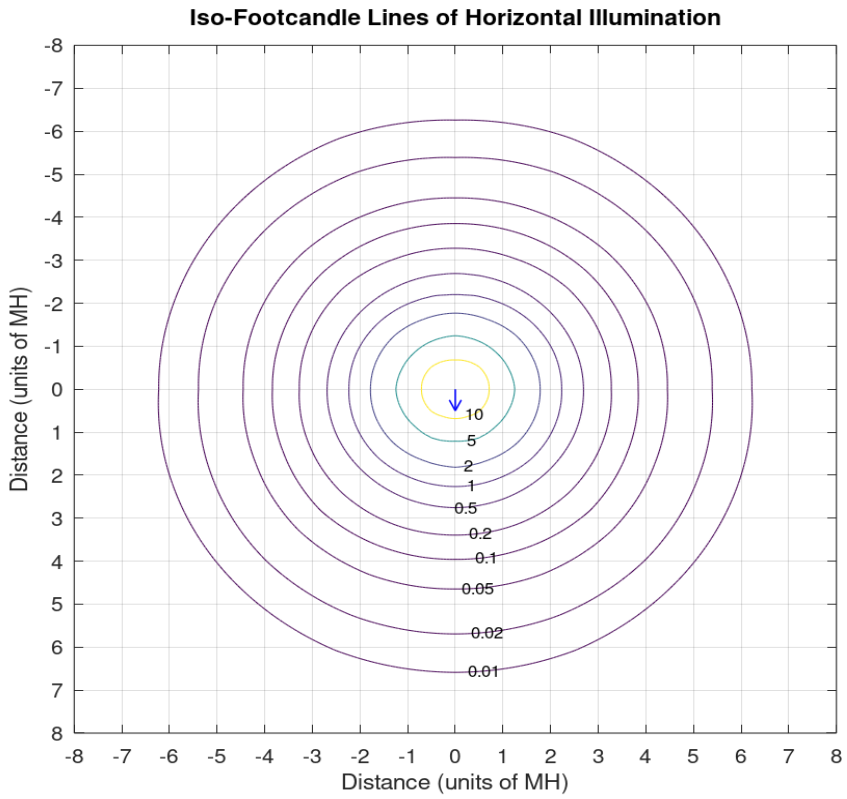
Iso-Illuminance Plot



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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Additional Pictures of Test Subject

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Test Distance	9.5 m
Ambient Temperature	24.5 °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.