LightLab INTERNATIONAL ALLENTOWN LLC

NVLAP TESTING Lab Code: 201079-0

Report of Test

LLIA001928-006

Indoor Distribution Photometry Test Report

Catalog Number: PL24-40WPCTS-D - 40W/4000K setting
Recessed mounted, formed white painted steel housing/reflector,
white painted aluminum frame, diffuse white plastic enclosure.
180 white LEDs on six white circuit boards with optic below each LED
One Fosen FS-TMG017-V01 LED driver, set for 40W and 4000K

Prepared For:
Topaz Lighting, A Southwire Company
925 Waverly Avenue
Holtsville, NY 11742, USA

Performance Summary					
Input Voltage	120.0	Vac	Luminous Flux	5489.7	Lumens
Input Current	0.3098	A	Total Efficacy	148.5	Lm/W
Input Power	36.97	W	Downward Flux	5489.7	Lumens
Frequency	60.00	Hz	Downward Flux	100.0	% of Total
Power Factor	0.995				
Current THD	5.3	%			

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

Test date: 11/23/2022
Report date: 11/28/2022

Signed: Michael L. Grather

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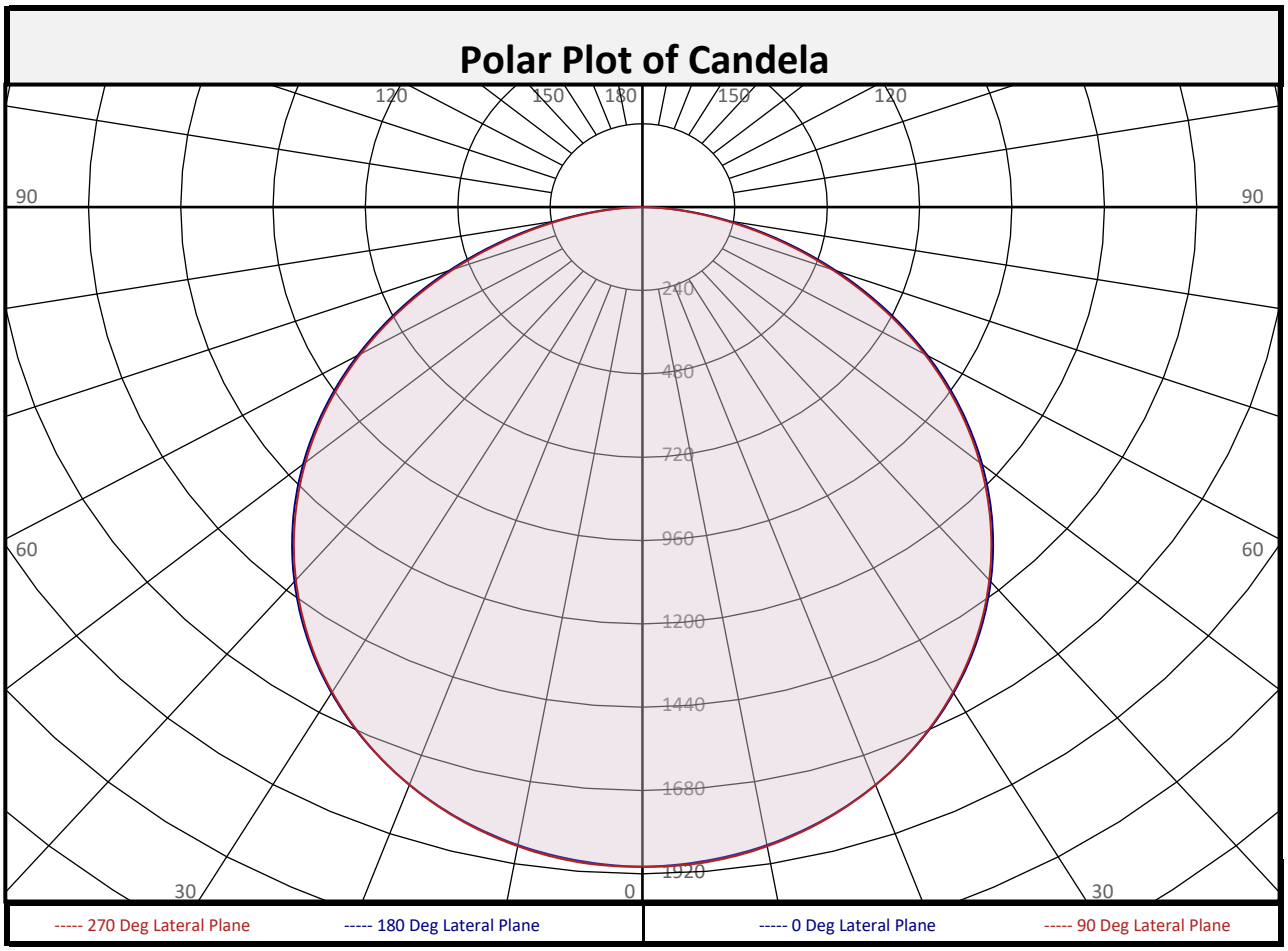

Zonal Flux Summary												
Zone (Deg Vert)	Flux (Lumens)	Percent of Total		Zone (Deg Vert)	Flux (Lumens)	Percent of Total		Zone (Deg Vert)	Flux (Lumens)	Percent of Total
0-10	179.8	3.3%		90-100	0.0	0.0%		0-20	695.1	12.7%
10-20	515.3	9.4%		100-110	0.0	0.0%		0-30	1478	26.9%
20-30	783.1	14.3%		110-120	0.0	0.0%		0-40	2426	44.2%
30-40	948.0	17.3%		120-130	0.0	0.0%		0-60	4310	78.5%
40-50	988.1	18.0%		130-140	0.0	0.0%		0-80	5384	98.1%
50-60	896.3	16.3%		140-150	0.0	0.0%		10-90	5310	96.7%
60-70	683.2	12.4%		150-160	0.0	0.0%		20-50	2719	49.5%
70-80	390.0	7.1%		160-170	0.0	0.0%		40-90	3064	55.8%
80-90	106.1	1.9%		170-180	0.0	0.0%		60-90	1179	21.5%
0-90	5490	100.0%		90-180	0.0	0.0%		0-180	5490	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	1899	1899	1899	1899	1899	1899	1899	1899	1899
2.5	1896	1896	1897	1898	1899	1898	1897	1896	1896
5	1889	1889	1890	1892	1894	1892	1890	1889	1889
7.5	1879	1879	1880	1882	1883	1882	1880	1879	1879
10	1865	1865	1866	1868	1868	1868	1866	1865	1865
12.5	1847	1847	1847	1849	1850	1849	1847	1847	1847
15	1825	1825	1825	1826	1827	1826	1825	1825	1825
17.5	1800	1799	1799	1800	1801	1800	1799	1799	1800
20	1770	1770	1769	1770	1771	1770	1769	1770	1770
22.5	1737	1736	1736	1736	1737	1736	1736	1736	1737
25	1700	1699	1699	1699	1699	1699	1699	1699	1700
27.5	1660	1659	1658	1657	1658	1657	1658	1659	1660
30	1616	1615	1614	1613	1613	1613	1614	1615	1616
32.5	1569	1568	1566	1565	1565	1565	1566	1568	1569
35	1518	1517	1515	1514	1513	1514	1515	1517	1518
37.5	1465	1464	1461	1460	1459	1460	1461	1464	1465
40	1408	1406	1404	1402	1401	1402	1404	1406	1408
42.5	1348	1347	1344	1342	1341	1342	1344	1347	1348
45	1285	1284	1281	1279	1278	1279	1281	1284	1285
47.5	1220	1219	1216	1213	1212	1213	1216	1219	1220
50	1152	1150	1147	1145	1144	1145	1147	1150	1152
52.5	1081	1080	1076	1074	1072	1074	1076	1080	1081
55	1008	1007	1003	1000	999	1000	1003	1007	1008
57.5	933	931	928	925	924	925	928	931	933
60	856	854	851	847	846	847	851	854	856
62.5	776	775	771	768	767	768	771	775	776
65	696	695	691	687	686	687	691	695	696
67.5	615	614	610	606	604	606	610	614	615
70	534	532	528	524	522	524	528	532	534
72.5	454	452	447	443	441	443	447	452	454
75	374	372	368	363	361	363	368	372	374
77.5	298	296	292	287	285	287	292	296	298
80	226	224	219	215	213	215	219	224	226
82.5	158	157	153	149	147	149	153	157	158
85	95	94	92	89	88	89	92	94	95
87.5	40	39	39	38	37	38	39	39	40
90	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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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	0	0	0	0	0	0	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

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	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	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	52.8	7.59	7.57
8.0	29.7	10.12	10.09
10.0	19.0	12.65	12.62
12.0	13.2	15.18	15.14
14.0	9.7	17.71	17.67
16.0	7.4	20.23	20.19

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	2958	2958	2958
45	2832	2822	2815
55	2737	2725	2714
65	2567	2546	2527
75	2253	2214	2174
85	1698	1647	1572

Beam and Field Angle

0-180 Degree Plane

Beam Angle: 113.9°

Field Angle: 162.6°

90-270 Degree Plane

Beam Angle: 113.3°

Field Angle: 161.7°

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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	15.7	17.3	16.0	17.6	18.0	15.6	17.3	16.0	17.6	17.9
	3H	17.5	19.0	17.9	19.3	19.7	17.4	18.9	17.8	19.3	19.6
	4H	18.2	19.6	18.6	19.9	20.3	18.1	19.5	18.5	19.8	20.2
	6H	18.7	20.0	19.1	20.4	20.7	18.5	19.9	19.0	20.2	20.6
	8H	18.9	20.1	19.3	20.5	20.9	18.7	19.9	19.1	20.3	20.7
	12H	19.0	20.1	19.4	20.5	21.0	18.8	20.0	19.2	20.4	20.8
4H	2H	16.3	17.7	16.7	18.1	18.4	16.3	17.7	16.7	18.0	18.4
	3H	18.4	19.5	18.8	19.9	20.3	18.3	19.5	18.7	19.9	20.3
	4H	19.2	20.2	19.6	20.6	21.1	19.1	20.1	19.5	20.6	21.0
	6H	19.8	20.7	20.3	21.2	21.6	19.7	20.6	20.1	21.0	21.5
	8H	20.0	20.9	20.5	21.3	21.8	19.9	20.7	20.3	21.2	21.6
	12H	20.2	20.9	20.6	21.4	21.9	20.0	20.8	20.5	21.3	21.7
8H	4H	19.5	20.4	19.9	20.8	21.3	19.4	20.3	19.9	20.7	21.2
	6H	20.2	21.0	20.7	21.4	21.9	20.1	20.8	20.6	21.3	21.8
	8H	20.5	21.2	21.0	21.7	22.1	20.3	21.0	20.9	21.5	22.0
	12H	20.7	21.3	21.2	21.8	22.4	20.6	21.1	21.1	21.6	22.2
12H	4H	19.5	20.3	20.0	20.8	21.2	19.4	20.2	19.9	20.7	21.2
	6H	20.3	20.9	20.8	21.4	21.9	20.2	20.8	20.7	21.3	21.8
	8H	20.6	21.2	21.1	21.7	22.2	20.5	21.1	21.0	21.5	22.1

Maximum UGR = 22.4

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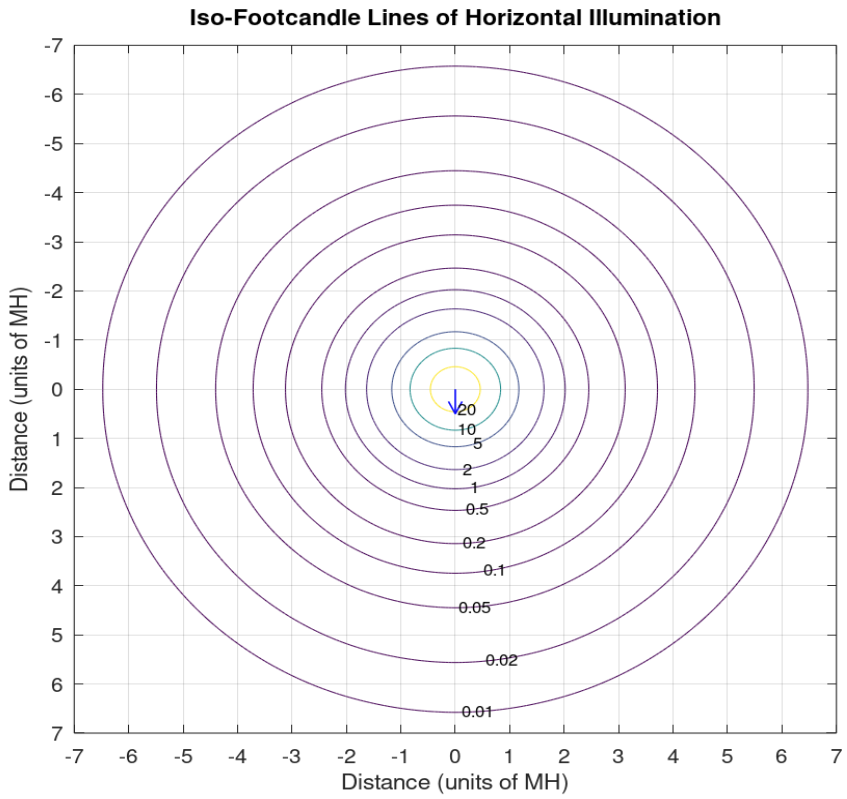
Iso-Illuminance Plot



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	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-41-20 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.