LightLab INTERNATIONAL ALLENTOWN LLC

NVLAP TESTING Lab Code: 201079-0

Report of Test

LLIA001599-003A

Indoor Distribution Photometry Test Report

Catalog Number: L1.2X-VW 5600K w/Int-2- no screen
Yoke mounted, formed aluminum housing, extruded aluminum heatsink, formed white enamel steel reflector, diffuse plastic enclosure above plastic baffle with specular aluminum interior, open bottom. 272 white LEDs - 136 WW, 136 CW. Controller set for 5600K, full output. One EldoLED POWERdrive 1061/S LED driver.

Prepared For:
Brightline L.P.
580 Mayer Street
Suite 7
Bridgeville, PA 15017, USA

Performance Summary					
Input Voltage	120.0	Vac	Luminous Flux	8504.7	Lumens
Input Current	0.8645	A	Total Efficacy	82.3	Lm/W
Input Power	103.3	W	Downward Flux	8496.7	Lumens
Frequency	60.00	Hz	Downward Flux	99.9	% of Total
Power Factor	0.995				
Current THD	5.0	%			

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

Test date: 12/09/2021
Report date: 12/10/2021

Signed: Michael L. Grather

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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

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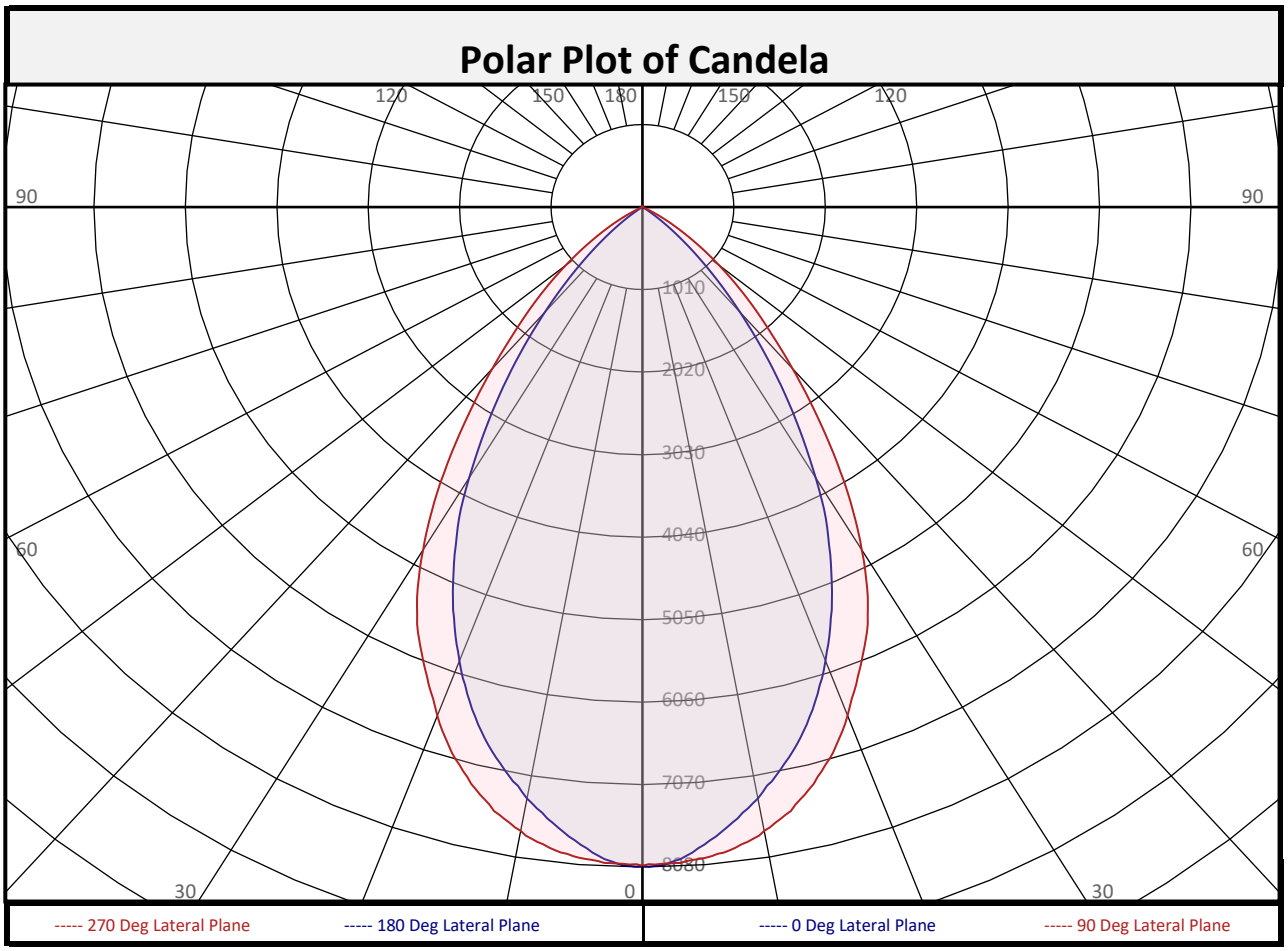

Zonal Flux Summary

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	743.6	8.7%	90-100	0.1	0.0%	0-20	2697	31.7%
10-20	1953	23.0%	100-110	0.4	0.0%	0-30	5160	60.7%
20-30	2464	29.0%	110-120	0.6	0.0%	0-40	7135	83.9%
30-40	1975	23.2%	120-130	0.8	0.0%	0-60	8464	99.5%
40-50	1002	11.8%	130-140	1.1	0.0%	0-80	8496	99.9%
50-60	327.1	3.8%	140-150	1.3	0.0%	10-90	7753	91.2%
60-70	31.4	0.4%	150-160	1.6	0.0%	20-50	5440	64.0%
70-80	1.1	0.0%	160-170	1.4	0.0%	40-90	1362	16.0%
80-90	0.6	0.0%	170-180	0.6	0.0%	60-90	33.0	0.4%
0-90	8497	99.9%	90-180	8.0	0.1%	0-180	8505	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	8063	8063	8063	8063	8063	8063	8063	8063	8063
	2.5	8015	8020	8035	8038	8040	8038	8035	8020	8015
	5	7836	7858	7916	7976	7997	7976	7916	7858	7836
	7.5	7602	7640	7730	7853	7909	7853	7730	7640	7602
	10	7351	7395	7509	7672	7753	7672	7509	7395	7351
	12.5	7052	7112	7252	7440	7574	7440	7252	7112	7052
	15	6733	6805	6968	7167	7311	7167	6968	6805	6733
	17.5	6347	6439	6645	6844	7003	6844	6645	6439	6347
	20	5913	6050	6307	6462	6625	6462	6307	6050	5913
	22.5	5441	5636	5926	6027	6219	6027	5926	5636	5441
	25	4939	5158	5485	5624	5838	5624	5485	5158	4939
	27.5	4421	4619	4973	5184	5392	5184	4973	4619	4421
	30	3831	4076	4416	4643	4844	4643	4416	4076	3831
	32.5	3234	3428	3841	4059	4279	4059	3841	3428	3234
	35	2677	2829	3248	3453	3678	3453	3248	2829	2677
	37.5	2150	2273	2656	2859	3100	2859	2656	2273	2150
	40	1672	1773	2090	2322	2577	2322	2090	1773	1672
	42.5	1255	1354	1640	1863	2118	1863	1640	1354	1255
	45	898	1005	1266	1483	1747	1483	1266	1005	898
	47.5	600	721	972	1179	1407	1179	972	721	600
	50	358	489	736	922	1099	922	736	489	358
	52.5	172	297	544	709	820	709	544	297	172
	55	49	141	382	542	578	542	382	141	49
	57.5	4	33	244	397	379	397	244	33	4
	60	2	3	131	262	213	262	131	3	2
	62.5	2	2	47	139	81	139	47	2	2
	65	1	1	5	39	7	39	5	1	1
	67.5	1	1	2	3	3	3	2	1	1
	70	1	1	1	2	2	2	1	1	1
	72.5	1	1	1	1	1	1	1	1	1
	75	1	1	1	1	1	1	1	1	1
	77.5	1	1	1	1	1	1	1	1	1
	80	0	1	1	1	1	1	1	1	0
	82.5	0	0	1	1	1	1	1	0	0
	85	0	0	1	1	1	1	1	0	0
	87.5	0	0	0	0	0	0	0	0	0
	90	0	0	0	0	0	0	0	0	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
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	1	1	1	0	0	0	1	1	1
112.5	1	1	1	1	1	1	1	1	1
115	1	1	1	1	1	1	1	1	1
117.5	1	1	1	1	1	1	1	1	1
120	1	1	1	1	1	1	1	1	1
122.5	1	1	1	1	1	1	1	1	1
125	1	1	1	1	1	1	1	1	1
127.5	1	1	1	1	1	1	1	1	1
130	1	1	1	1	1	1	1	1	1
132.5	1	1	1	1	1	1	1	1	1
135	1	1	1	2	2	2	1	1	1
137.5	1	1	2	2	2	2	2	1	1
140	2	2	2	2	2	2	2	2	2
142.5	2	2	2	2	2	2	2	2	2
145	2	2	2	2	2	2	2	2	2
147.5	2	2	2	2	2	2	2	2	2
150	3	3	3	3	3	3	3	3	3
152.5	3	3	3	3	3	3	3	3	3
155	4	3	3	3	3	3	3	3	4
157.5	4	4	4	4	4	4	4	4	4
160	4	4	4	4	4	4	4	4	4
162.5	5	5	5	5	5	5	5	5	5
165	5	5	5	5	5	5	5	5	5
167.5	6	6	6	5	5	5	6	6	6
170	6	6	6	6	6	6	6	6	6
172.5	6	6	6	6	6	6	6	6	6
175	6	6	6	6	6	6	6	6	6
177.5	6	6	6	6	6	6	6	6	6
180	6	6	6	6	6	6	6	6	6

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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	113	110	107	105		111	108	106	103		104	102	100		100	99	97		97	95	94	93
2	107	102	97	94		105	100	96	93		97	93	91		94	91	89		91	89	87	85
3	101	94	89	84		99	92	88	84		90	86	82		87	84	81		85	82	80	78
4	95	87	81	76		93	86	80	76		84	79	75		82	77	74		80	76	73	72
5	90	81	74	70		88	80	74	69		78	73	69		76	72	68		75	71	67	66
6	85	75	69	64		83	74	68	64		73	67	63		71	66	63		70	66	62	61
7	80	70	64	59		79	69	63	59		68	62	58		67	62	58		66	61	58	56
8	76	66	59	55		74	65	59	54		64	58	54		63	58	54		62	57	54	52
9	72	61	55	51		71	61	55	51		60	54	50		59	54	50		58	53	50	49
10	68	58	52	47		67	57	51	47		56	51	47		56	51	47		55	50	47	45

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	224.0	5.24	5.95
8.0	126.0	6.98	7.93
10.0	80.6	8.73	9.91
12.0	56.0	10.47	11.90
14.0	41.1	12.22	13.88
16.0	31.5	13.96	15.86

Spacing Criterion

0 deg:	0.9
90 deg:	1.0
180 deg:	0.9
270 deg:	1.0

Average Luminance (cd/m^2)

	0 deg Plane	45 deg Plane	90 deg Plane
0	68859	68859	68859
45	10846	15295	21094
55	730	5685	8609
65	26	101	143
75	27	34	38
85	33	56	107

Beam and Field Angle

0-180 Degree Plane

Beam Angle: 58.3°

Field Angle: 91.4°

90-270 Degree Plane

Beam Angle: 67.0°

Field Angle: 105.2°

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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	7.5	7.5	7.5	7.5	7.5	14.7	15.8	15.1	16.1	16.4
	3H	7.5	7.5	7.5	7.5	7.5	14.5	15.5	14.9	15.8	16.2
	4H	7.5	7.5	7.5	7.5	7.5	14.5	15.3	14.9	15.7	16.1
	6H	7.5	7.5	7.5	7.5	7.5	14.3	15.1	14.8	15.5	15.9
	8H	7.5	7.5	7.5	7.5	7.5	14.3	15.0	14.7	15.4	15.8
	12H	7.5	7.5	7.5	7.5	7.5	14.2	15.0	14.7	15.3	15.8
4H	2H	7.5	7.5	7.5	7.5	7.5	14.5	15.3	14.9	15.7	16.1
	3H	7.5	7.5	7.5	7.5	7.5	14.3	15.0	14.7	15.4	15.8
	4H	7.5	7.5	7.5	7.5	7.5	14.1	14.8	14.6	15.2	15.6
	6H	7.5	7.5	7.5	7.5	7.5	14.0	14.6	14.5	15.0	15.5
	8H	7.5	7.5	7.5	7.5	7.5	14.0	14.5	14.4	14.9	15.4
	12H	7.5	7.5	7.5	7.5	7.5	13.9	14.3	14.4	14.8	15.3
8H	4H	7.5	7.5	7.5	7.5	7.5	14.0	14.5	14.4	14.9	15.4
	6H	7.5	7.5	7.5	7.5	7.5	13.8	14.3	14.4	14.8	15.2
	8H	7.5	7.5	7.5	7.5	7.5	13.8	14.1	14.3	14.7	15.2
	12H	7.5	7.5	7.5	7.5	7.5	13.7	14.0	14.3	14.5	15.1
12H	4H	7.5	7.5	7.5	7.5	7.5	13.9	14.3	14.4	14.8	15.3
	6H	7.5	7.5	7.5	7.5	7.5	13.8	14.1	14.3	14.6	15.2
	8H	7.5	7.5	7.5	7.5	7.5	13.7	14.0	14.3	14.5	15.1

Maximum UGR = 16.4

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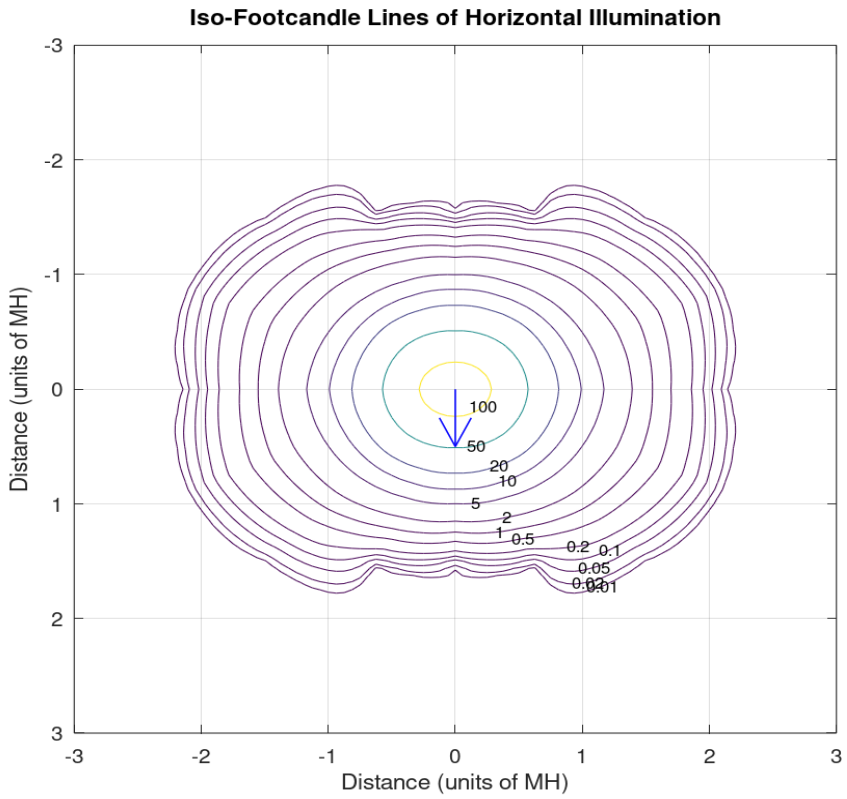
Iso-Illuminance Plot



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

Report of Test

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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.

Report of Test

LLIA001599-003B

Integrating Sphere Report

Catalog Number: L1.2X-VW 5600K w/Int-2- no screen

Yoke mounted, formed aluminum housing, extruded aluminum heatsink, formed white enamel steel reflector, diffuse plastic enclosure above plastic baffle with specular aluminum interior, open bottom. 272 white LEDs - 136 WW, 136 CW. Controller set for 5600K, full output. One EldoLED POWERdrive 1061/S LED driver.

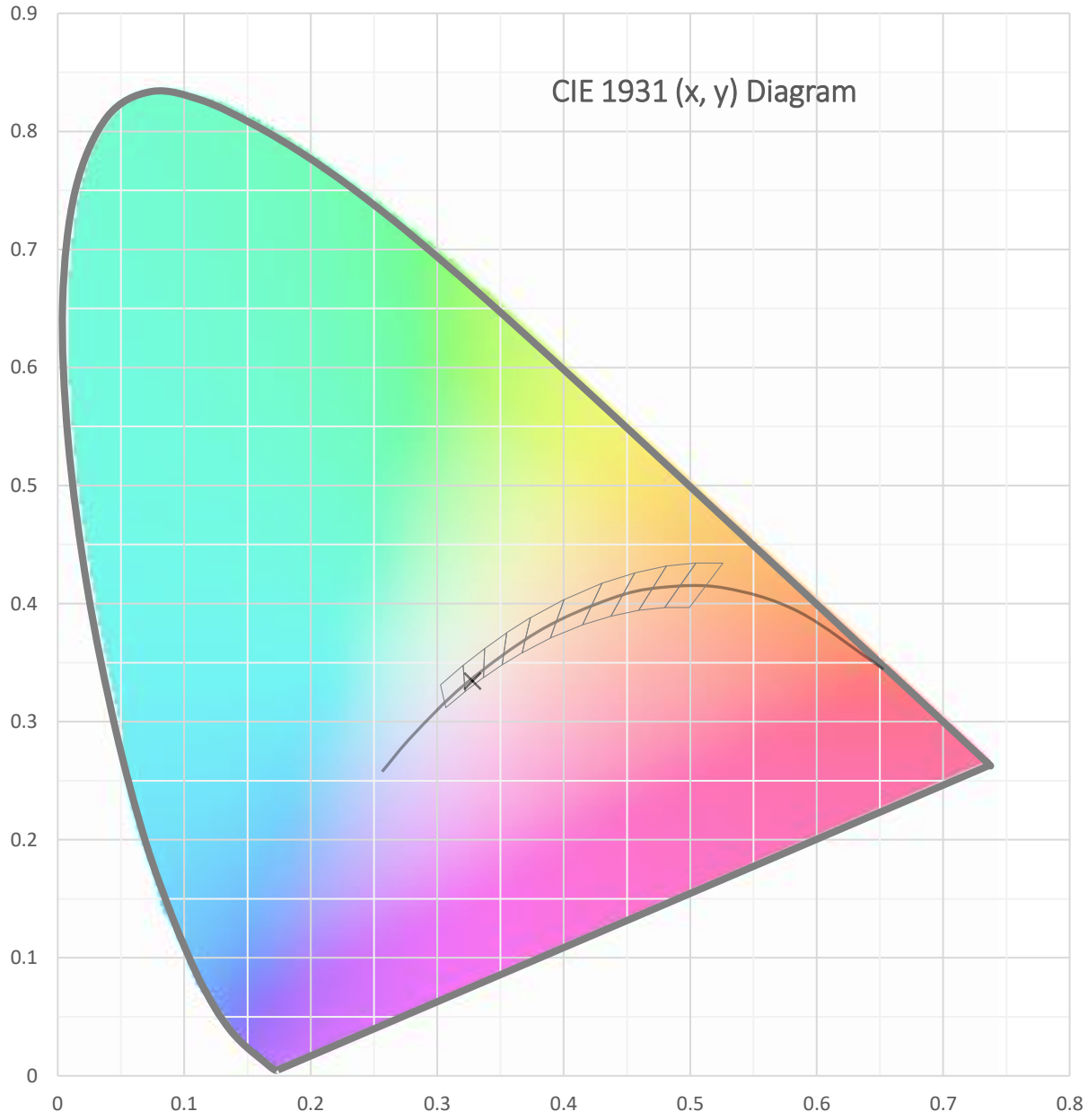
Performance Summary

Voltage	120.0	Vac
Current	0.8605	A
Power	102.8	W
Frequency	59.99	Hz
Power Factor	0.995	
Current THD	5.1	%
Total Luminous Flux	8690.5	lm
Efficacy	84.5	lm/W
Chromaticity (x,y)	(0.3280, 0.3343)	
(u',v')	(0.2064, 0.4734)	
Duv	-0.0015	
CCT	5707	K
CRI (Ra)	95	
R9	91	
TM-30: Rf	89	
TM-30: Rg	98	
TM-30: Rcs,h1	0	

Prepared For:
Brightline L.P.
580 Mayer Street
Suite 7
Bridgeville, PA 15017, USA

Test date: 12/03/2021
Report date: 12/10/2021

Test Report Number: LLIA001599-003B



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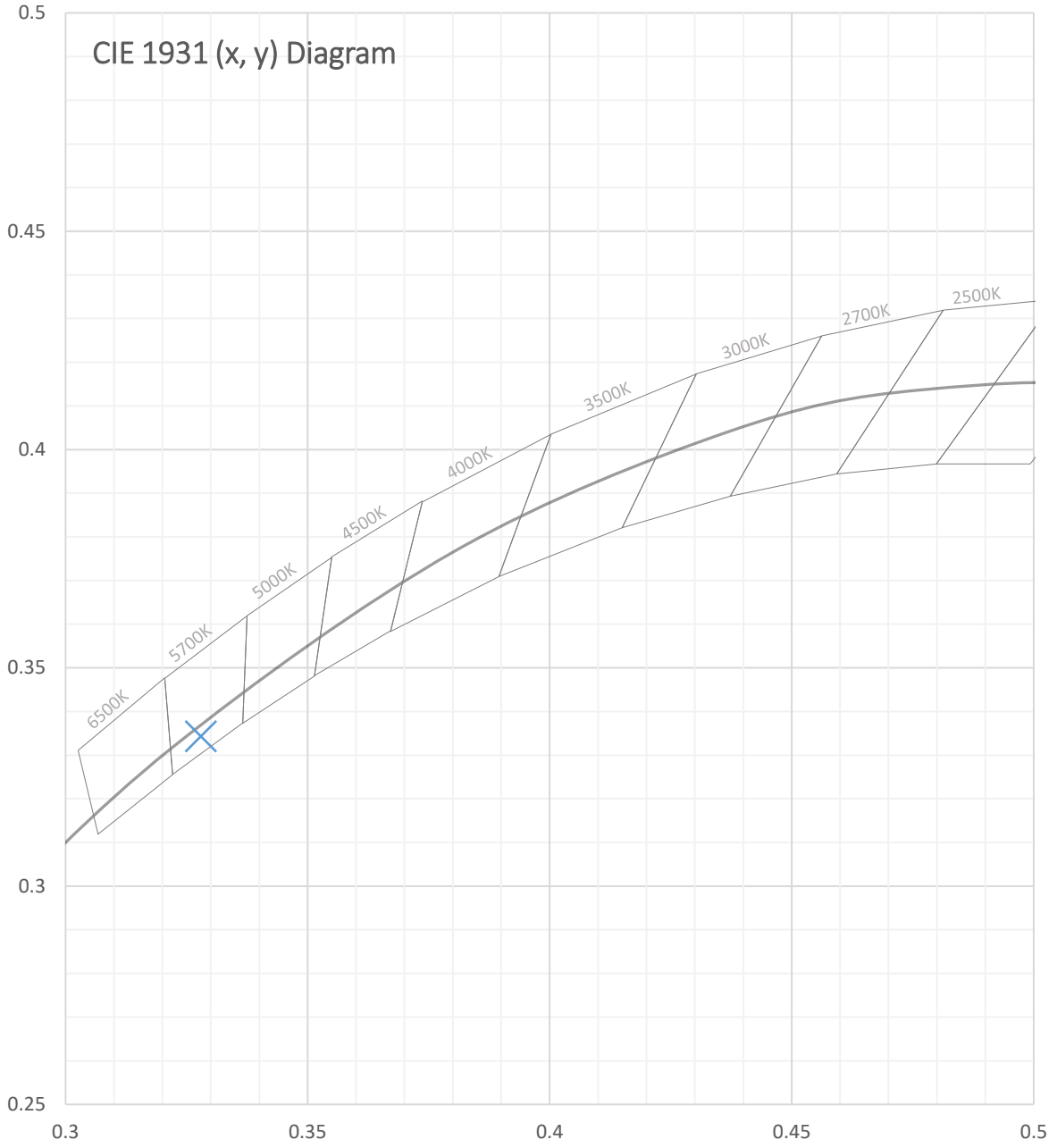

Test Report Number: LLIA001599-003B

Total Radiant Flux	32.85	W
Total Luminous Flux	8690.5	Lm
Chromaticity CIE 1931 (x, y)	(0.3280, 0.3343)	
Chromaticity CIE 1976 (u', v')	(0.2064, 0.4734)	
Correlated Color Temperature (CCT)	5707	K
Color Rendering Index (Ra)	95	
R1	96	
R2	96	
R3	98	
R4	94	
R5	94	
R6	94	
R7	94	
R8	95	
R9	91	
R10	95	
R11	97	
R12	73	
R13	96	
R14	99	
TM-30: Rf	89	
TM-30: Rg	98	
TM-30: Rcs,h1	0	
Distance from Planckian Locus (Duv)	-0.0015	
Scotopic/Photopic Ratio ǂ	2.322	

Electrical Data

Voltage	120.0	Vac
Current	0.8605	A
Power	102.8	W
Frequency	59.99	Hz
Power Factor	0.995	
Current THD	5.1	%

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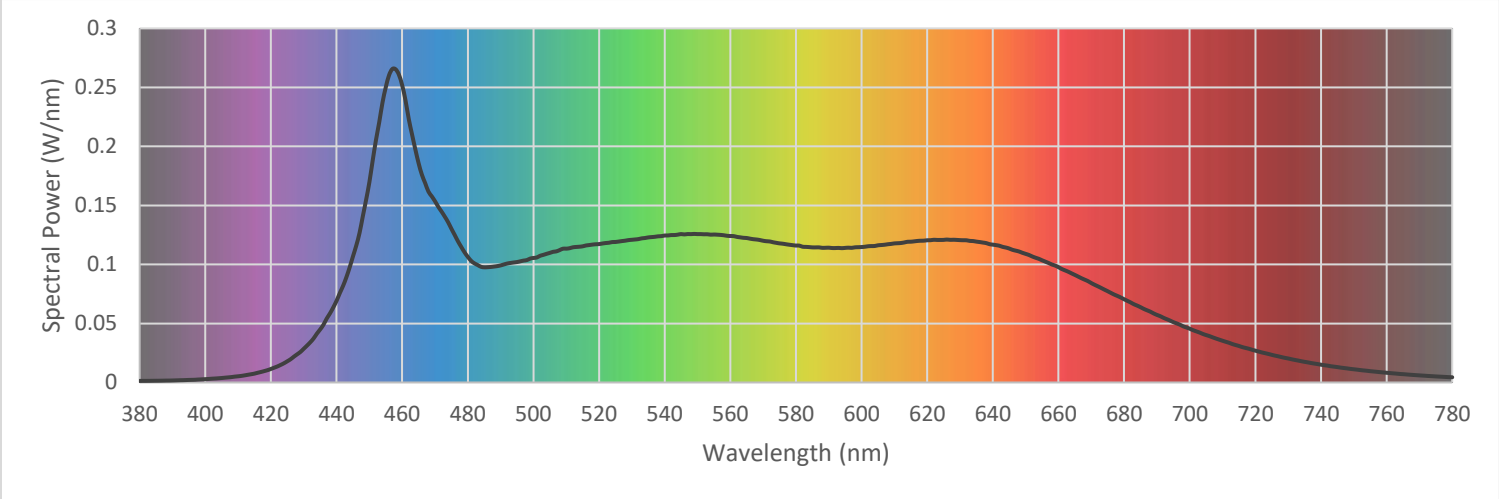
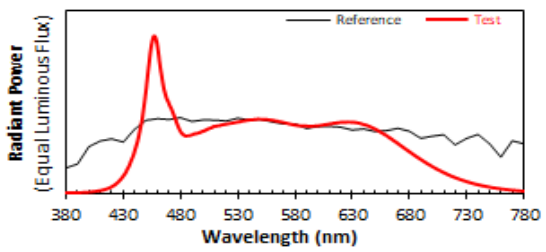
Summary Spectral Power Distribution (wavelength - nm, spectral power - W/nm)

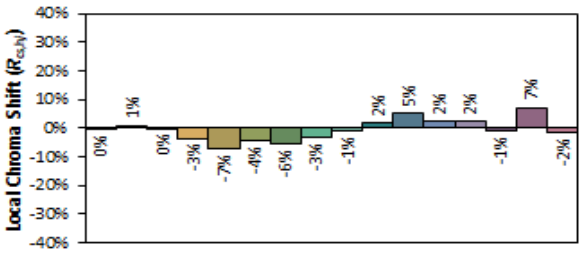
380	0.001318	480	0.106423	580	0.115994	680	0.070514
385	0.001454	485	0.097568	585	0.114447	685	0.063792
390	0.001678	490	0.099184	590	0.114195	690	0.057258
395	0.002154	495	0.102021	595	0.114009	695	0.051117
400	0.002804	500	0.105487	600	0.114730	700	0.045542
405	0.003773	505	0.109783	605	0.116220	705	0.040168
410	0.005242	510	0.113370	610	0.117803	710	0.035344
415	0.007524	515	0.115339	615	0.119252	715	0.030922
420	0.011454	520	0.117251	620	0.120477	720	0.026937
425	0.017979	525	0.119037	625	0.120803	725	0.023405
430	0.028567	530	0.120893	630	0.120585	730	0.020334
435	0.044905	535	0.122904	635	0.119316	735	0.017480
440	0.069213	540	0.124507	640	0.116764	740	0.015072
445	0.106839	545	0.125716	645	0.113478	745	0.013036
450	0.169624	550	0.125696	650	0.108965	750	0.011166
455	0.250055	555	0.125329	655	0.103519	755	0.009579
460	0.251750	560	0.124071	660	0.097681	760	0.008224
465	0.185770	565	0.122383	665	0.091103	765	0.007030
470	0.153556	570	0.120068	670	0.084238	770	0.005999
475	0.130231	575	0.117842	675	0.077302	775	0.005125
						780	0.004391

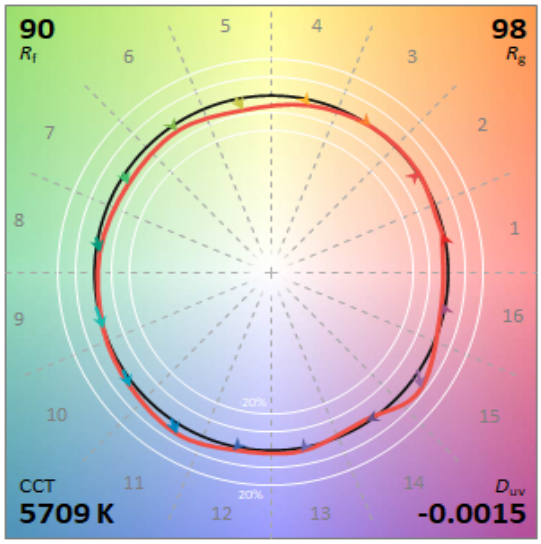


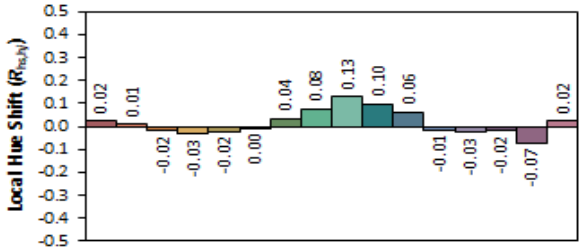
Test Report Number: LLIA001599-003B

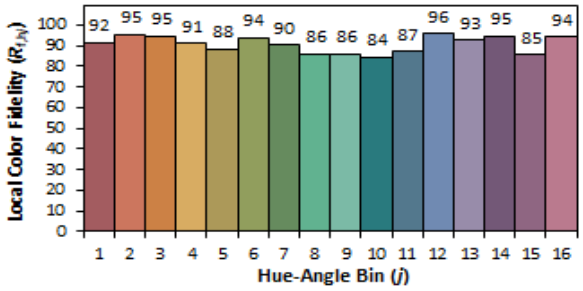
IES TM-30 Details

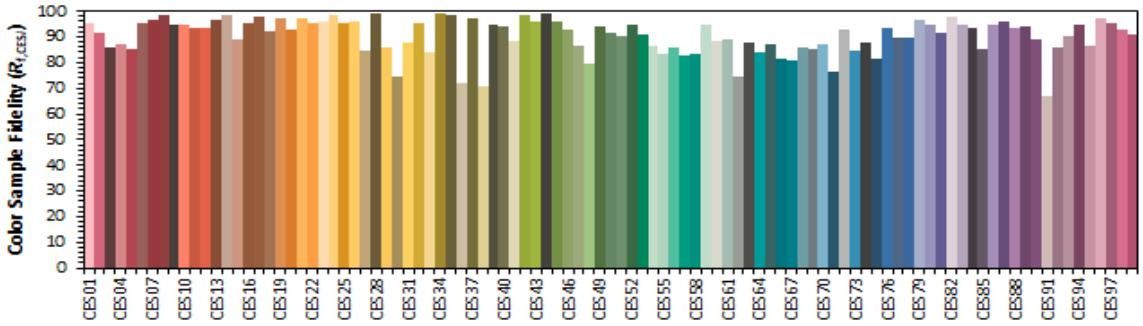












Notes:

x	0.3279
y	0.3342
u'	0.2064
v'	0.4733

CIE 13.3-1995 (CRI)

R_a	95
R_9	91

Test Report Number: LLIA001599-003B

Test Equipment Configuration:	LightLab International Allentown 2m Integrating Sphere Measurements acquired using a Labsphere CDS 2600 spectroradiometer Testing was performed using 4π geometry
Test Temperature:	25.3 °C
Test Procedure:	Tested in accordance with the applicable sections of: LM-79-19, LM-78-20, LM-58-20, ANSI_ANSLG C78.377-2017, TM-30-20
Significance:	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.
Notes:	The measurements 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 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.

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