LIGHT LABORATORY INC.
8165 E Kaiser Blvd. Anaheim, CA 92808
p. 714.282.2270
f. 714.676.5558

Report No: L021507504R02
Date: 6/18/2015

NVLAP LAB CODE 200927-0

Report No: **L021507504R02**

Report Prepared For: Prudential Ltg.
1774 E. 21st Street, Los Angeles, CA 90058

Model Number: **BIO-LIN-LED4-LO-CW**

Test: Electrical and Photometric tests

Standards Used: Appropriate part or all test guidelines were used for test performed:
IESNA LM79: 2008 Approved Methods for Electrical and Photometric Measurements of Solid-State Lighting Products
ANSI NEMA ANSLG C78.377: 2008 Specification of the Chromaticity of Solid State Lighting Products
ANSI C82.77:2002: Harmonic Emission Limits-Related Quality Requirements for Lighting Equipment

Description of Sample: Client submitted the sample. Catalog number is BIO-LIN-LED4-LO-CW. Received in working and undamaged condition. No modifications were necessary.

Testing Condition: Fixture is tested with no special conditions.

Sample Arrival Date: 2/20/15

Date of Tests: 2/24/15 - 2/24/15

Seasoning of Sample: No seasoning was performed in accordance with IESNA LM-79.

Equipment List

Equipment Used	Model No	Stock No	Calibration Due Date
Chroma Programmable AC Source	61604	PS-AC02	--
Yokogawa Digital Power Meter	WT210	MT-EL06-S1	11/10/15
Xitron Power Analysis System	2503AH	MT-EL01	10/20/15
BK Precision DC Power Supply	1747	PSDC-04	01/08/16
Fluke Digital Thermometer	52k/J	MT-TP02-GC	01/05/16
LLI Type C Goniophotometer System	RMG-C-MKII	CD-LL04-GC	--
LLI 2M Sphere	2MR97	CD-SN03-S2	--
LLI Spectroradiometer	SPR-3000	MT-SC01-S2	Before Use

*All Results in accordance to IESNA LM-79-2008: Approved Method for the Electrical and Photometric Testing of Solid-State Lighting.

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Test Summary	
Manufacturer:	Prudential Ltg.
Model Number:	BIO-LIN-LED4-LO-CW
Driver Model Number:	OSRAM OPTOTRONIC OT30W/PRG1050C/UNV/DIM/L
Total Lumens:	1691.07
Input Voltage (VAC/60Hz):	120.00
Input Current (Amp):	0.15
Input Power (W):	17.38
Input Power Factor:	0.98
Current ATHD @ 120V(%):	5%
Current ATHD @ 277V(%):	N/A
Efficacy:	97
Ambient Temperature (°C):	25.0
Stabilization Time (Hours):	0:30
Total Operating Time (Hours):	1:45
Off State Power(W):	0.00

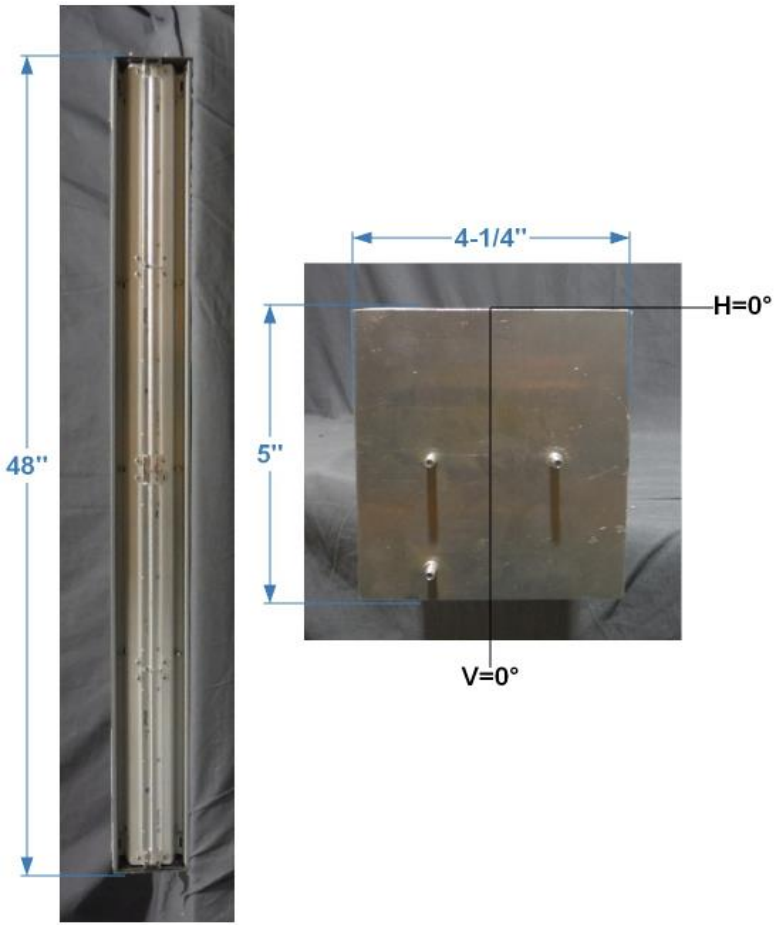

FIG.1 LUMINAIRE

*All Results in accordance to IESNA LM-79-2008: Approved Method for the Electrical and Photometric Testing of Solid-State Lighting.

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Test Methods

Photometric Measurements - Goniophotometer

A Custom Light Laboratory Type C Rotating Mirror Goniophotometer was used to measure candelas(intensity) at each angle of distribution as defined by IESNA for the appropriate fixture type.

Ambient temperature is set to 25°C and is measured from the center of the fixture, within 1ft from the outside of the fixture. Temperature is maintained at 25°C throughout the testing process and the sample is stabilized for at least 30mins and longer as necessary for the sample to achieve stabilization.

Electrical measurements are measured using the listed equipment.

Spectral Measurements - Integrating Sphere

A Sensing Spectroradiometer SPR-3000, in conjunction with Light Laboratory 2 meter integrating sphere was used to measure chromaticity coordinates, correlated color temperature(CCT) and the color rendering index(CRI) for each sample.

Ambient temperature is set to 25°C and is measured from the center of the fixture, within 1ft from the outside of the fixture. Temperature is maintained at 25°C throughout the testing process and the sample is stabilized for at least 30mins and longer as necessary for the sample to achieve stabilization.

Electrical measurements are measured using the listed equipment.

Disclaimers:

This report must not be used by the customer to claim product certification, approval or endorsement by NVLAP, NIST or any agency of Federal Government.

Report Prepared by : Randy Chau

Test Report Released by:

Jeff Ahn
Engineering Manager

Test Report Reviewed by:

Steve Kang
Quality Assurance

**Attached are photometric data reports. Total number of pages: 10*

*All Results in accordance to IESNA LM-79-2008: Approved Method for the Electrical and Photometric Testing of Solid-State Lighting.

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Photometric Test Report

IES INDOOR REPORT
PHOTOMETRIC FILENAME : L021507504R02.IES

DESCRIPTION INFORMATION (From Photometric File)

IESNA:LM-63-2002
[TEST] L021507504R02
[TESTLAB] LIGHT LABORATORY, INC.
[ISSUEDATE] 6/18/2015
[MANUFAC] PRUDENTIAL LTG.
[LUMCAT] BIO-LIN-LED4-LO-CW
[LUMINAIRE] 4-1/2"L. X 48"W. X 5"H. LED LUMINAIRE
[MORE] LEDS WITH OPTICS
[BALLASTCAT] OSRAM OPTOTRONIC OT30W/PRG1050C/UNV/DIM/L
[BALLAST] INPUT: 120-277VAC, 0.31-0.15A, 50/60Hz. OUTPUT: 30W, 10-55VDC, 350-1050mA
[LAMPPOSITION] 0,0
[LAMPCAT] N/A
[OTHER] INDICATING THE CANDELA VALUES ARE ABSOLUTE AND
[MORE] SHOULD NOT BE FACTORED FOR DIFFERENT LAMP RATINGS.
[_INPUT] 120VAC, 17.38W
[_TEST PROCEDURE] IESNA:LM-79-08

CHARACTERISTICS

Lumens Per Lamp	N.A. (absolute)
Total Lamp Lumens	N.A. (absolute)
Luminaire Lumens	1691
Total Luminaire Efficiency	N.A.
Luminaire Efficacy Rating (LER)	97
Total Luminaire Watts	17.38
Ballast Factor	1.00
CIE Type	Indirect
Spacing Criterion (0-180)	N.A.
Spacing Criterion (90-270)	N.A.
Spacing Criterion (Diagonal)	N.A.
Basic Luminous Shape	Rectangular
Luminous Length (0-180)	0.33 ft
Luminous Width (90-270)	3.94 ft
Luminous Height	0.00 ft

IES INDOOR REPORT
PHOTOMETRIC FILENAME : L021507504R02.IES

LUMINANCE DATA (cd/sq.m)

Angle In Degrees	Average 0-Deg	Average 45-Deg	Average 90-Deg
45	0	0	0
55	0	0	0
65	0	0	0
75	0	0	0
85	0	0	0

IES INDOOR REPORT
PHOTOMETRIC FILENAME : L021507504R02.IES

CANDELA TABULATION

	0	5	10	15	20	25	30	35	40	45
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
45	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
60	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
65	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
70	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
75	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
85	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
90	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
95	81.43	84.49	91.92	107.31	130.31	163.02	196.34	205.70	175.84	120.08
100	481.69	492.08	505.42	523.39	529.85	502.12	424.69	318.65	212.98	123.01
105	583.63	580.94	565.27	539.39	494.02	430.64	357.10	284.39	214.42	147.01
110	575.78	570.95	554.85	525.54	480.53	423.90	359.72	294.65	235.10	181.53
115	549.68	544.18	530.64	502.00	464.44	418.57	365.20	311.14	260.32	217.59
120	533.38	529.16	515.56	492.84	460.46	421.01	376.80	330.87	286.87	249.41
125	524.31	520.80	507.65	488.05	461.42	428.00	390.13	349.73	312.04	277.99
130	513.43	510.30	499.59	480.72	457.61	430.06	396.67	362.84	330.29	301.58
135	494.62	491.25	482.19	465.99	446.55	422.65	394.93	366.86	340.39	317.56
140	465.77	461.81	453.01	440.89	425.98	407.09	385.45	365.04	344.93	327.45
145	431.11	428.43	421.87	413.04	402.22	388.75	374.49	360.00	345.49	331.93
150	400.93	398.84	394.77	389.48	383.10	374.40	364.90	354.59	344.30	333.07
155	379.97	379.27	376.49	372.67	368.52	363.12	356.50	348.91	341.22	332.55
160	363.28	364.03	361.57	359.36	356.61	352.90	348.09	342.94	337.50	331.48
165	349.60	349.52	348.14	346.71	344.82	342.66	339.77	336.67	333.49	330.21
170	338.81	338.40	336.92	336.75	335.92	335.14	334.07	332.59	331.42	330.07
175	332.73	331.63	332.02	331.42	331.21	331.26	331.53	331.22	331.02	330.67
180	330.00	330.00	330.00	330.00	330.00	330.00	330.00	330.00	330.00	330.00

Vert. Angles **Horizontal Angles**

	50	55	60	65	70	75	80	85	90
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
45	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
60	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

IES INDOOR REPORT
PHOTOMETRIC FILENAME : L021507504R02.IES

CANDELA TABULATION - (Cont.)

65	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
70	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
75	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
85	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
90	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
95	71.20	44.79	32.53	27.15	25.07	24.82	22.91	17.18	14.26
100	91.30	68.18	59.48	56.15	53.43	48.64	42.38	35.39	31.87
105	119.68	97.92	87.54	82.22	77.95	72.09	63.80	56.11	52.84
110	148.09	130.58	119.33	112.96	106.60	97.44	87.16	79.30	76.18
115	184.28	165.64	155.64	146.45	135.80	123.31	112.06	104.31	101.49
120	220.89	201.91	187.02	174.17	162.03	148.39	136.85	129.41	126.78
125	251.96	232.99	217.57	202.83	185.74	171.92	162.11	155.08	152.81
130	278.68	260.21	244.10	228.06	212.17	196.78	186.36	180.88	178.89
135	298.22	281.25	265.33	248.91	233.33	220.17	210.10	204.26	202.58
140	311.11	295.56	280.48	264.80	250.73	238.82	230.24	225.23	223.81
145	317.92	304.53	290.73	277.31	265.43	255.84	248.90	245.11	244.05
150	321.72	310.32	298.93	288.13	279.12	271.81	267.04	264.27	263.49
155	323.53	315.20	306.42	298.98	292.72	287.26	283.98	282.50	281.98
160	325.31	319.83	314.17	309.18	305.00	301.09	299.54	298.52	298.48
165	327.01	323.51	320.80	317.97	315.35	313.28	312.46	311.68	311.32
170	328.14	327.21	326.02	324.49	323.21	321.69	321.79	321.48	321.62
175	330.01	329.80	329.05	328.54	328.14	326.93	327.15	327.32	327.08
180	330.00	330.00	330.00	330.00	330.00	330.00	330.00	330.00	330.00

IES INDOOR REPORT
PHOTOMETRIC FILENAME : L021507504R02.IES

ZONAL LUMEN SUMMARY

Zone	Lumens	%Lamp	%Fixt
0-20	0.00	N.A.	0.00
0-30	0.00	N.A.	0.00
0-40	0.00	N.A.	0.00
0-60	0.00	N.A.	0.00
0-80	0.00	N.A.	0.00
0-90	0.00	N.A.	0.00
10-90	0.00	N.A.	0.00
20-40	0.00	N.A.	0.00
20-50	0.00	N.A.	0.00
40-70	0.00	N.A.	0.00
60-80	0.00	N.A.	0.00
70-80	0.00	N.A.	0.00
80-90	0.00	N.A.	0.00
90-110	383.34	N.A.	22.70
90-120	663.36	N.A.	39.20
90-130	944.34	N.A.	55.80
90-150	1412.6	N.A.	83.50
90-180	1691.07	N.A.	100.00
110-180	1307.73	N.A.	77.30
0-180	1691.07	N.A.	100.00

Total Luminaire Efficiency = N.A.%

ZONAL LUMEN SUMMARY

Zone	Lumens
0-10	0.00
10-20	0.00
20-30	0.00
30-40	0.00
40-50	0.00
50-60	0.00
60-70	0.00
70-80	0.00
80-90	0.00
90-100	113.72
100-110	269.62
110-120	280.02
120-130	280.98
130-140	258.44
140-150	209.82
150-160	153.34
160-170	93.65
170-180	31.49

IES INDOOR REPORT
PHOTOMETRIC FILENAME : L021507504R02.IES

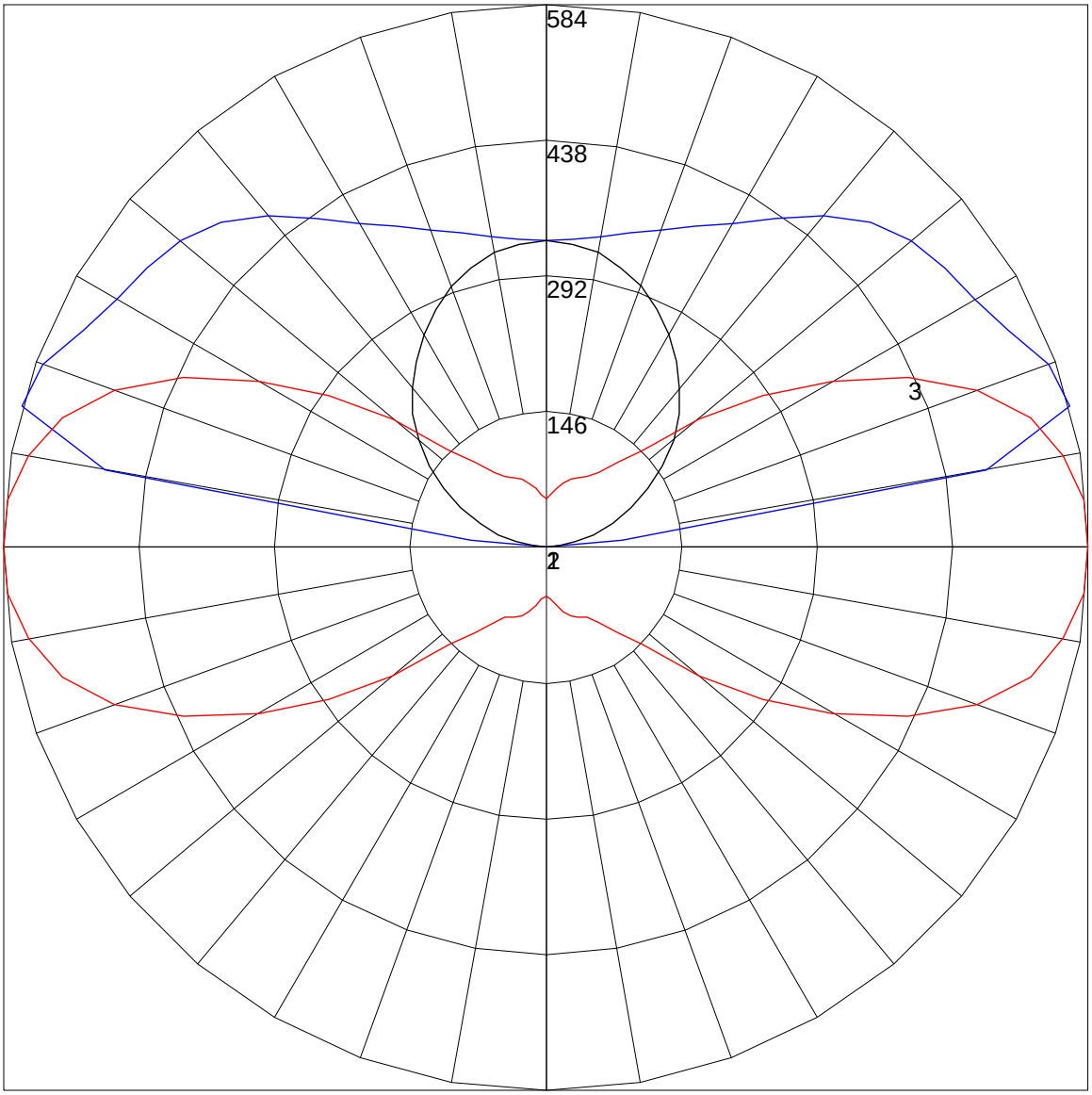
COEFFICIENTS OF UTILIZATION - ZONAL CAVITY METHOD

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
0	95	95	95	95	81	81	81	81	56	56	56	32	32	32	10	10	10	0
1	87	83	79	76	74	71	68	65	48	47	45	28	27	26	9	9	8	0
2	79	72	66	62	67	62	57	53	42	40	37	24	23	22	8	7	7	0
3	72	63	56	51	61	54	49	44	37	34	31	21	20	18	7	6	6	0
4	65	56	48	43	56	48	42	37	33	29	26	19	17	16	6	6	5	0
5	60	49	42	36	51	42	36	32	29	25	22	17	15	13	5	5	4	0
6	55	44	36	31	47	38	32	27	26	22	19	15	13	11	5	4	4	0
7	50	39	32	27	43	34	28	23	23	19	17	14	11	10	4	4	3	0
8	47	35	28	23	40	30	24	20	21	17	14	12	10	9	4	3	3	0
9	43	32	25	20	37	28	22	18	19	15	13	11	9	8	4	3	3	0
10	40	29	22	18	34	25	19	16	17	14	11	10	8	7	3	3	2	0

IES INDOOR REPORT
PHOTOMETRIC FILENAME : L021507504R02.IES

POLAR GRAPH



Maximum Candela = 583.63 Located At Horizontal Angle = 0, Vertical Angle = 105
1 - Vertical Plane Through Horizontal Angles (0 - 180) (Through Max. Cd.)
2 - Vertical Plane Through Horizontal Angles (90 - 270)
3 - Horizontal Cone Through Vertical Angle (105) (Through Max. Cd.)