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

Test #: L041412303R01
Date: 7/17/2014

NVLAP LAB CODE 200927-0

Test Report: **L041412303R01**

Model Number: **BIO-FLSH-LED4LO-04-ABW-TMW-D1X-SC-UNV-X1**

Report Prepared For: Prudential Lighting
1737 East 22nd Street

Test: Electrical and Photometric tests as required by the IESNA test standards.

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. Fixture catalog number is BIO-FLSH-LED4LO-04-ABW-TMW-D1X-SC-UNV-X1. Received in working and undamaged condition. No modifications were necessary.

Testing Condition: Fixture is tested with no special conditions.

Sample Arrival Date: 4/24/14

Date of Tests: 4/29/14 - 4/29/14

Seasoning of Sample SSL: 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	01/04/15
Xitron Power Analysis System	2503AH	MT-EL01	01/09/15
BK Precision DC Power Supply	1747	PSDC-04	01/08/15
Fluke Digital Thermometer	52k/J	MT-TP02-GC	01/04/15
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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LM-79 Test Summary	
Manufacturer:	Prudential Lighting
Model Number:	BIO-FLSH-LED4LO-04-ABW-TMW-D1X-SC-UNV-X1
LAMPCAT:	N/A
Driver Model Number:	OSRAM OPTOTRONIC OT30W/PRG1050C/UNV/DIM/L
Total Lumens:	1784.31
Input Voltage (VAC/60Hz):	120.00
Input Current (Amp):	0.16
Input Power (W):	19.04
Input Power Factor:	0.99
Total Harmonic Distortion @ 120V(%):	5%
Total Harmonic Distortion @ 277V(%):	16% (0.08A, 20.66W, 0.9PF)
Efficacy:	94
Color Rendering Index (CRI):	84
Correlated Color Temperature (K):	4043
Chromaticity Coordinate x:	0.3777
Chromaticity Coordinate y:	0.3725
Ambient Temperature (°F):	77.0
Stabilization Time (Hours):	0:55
Total Operating Time (Hours):	2:00
Off State Power(W):	0.00

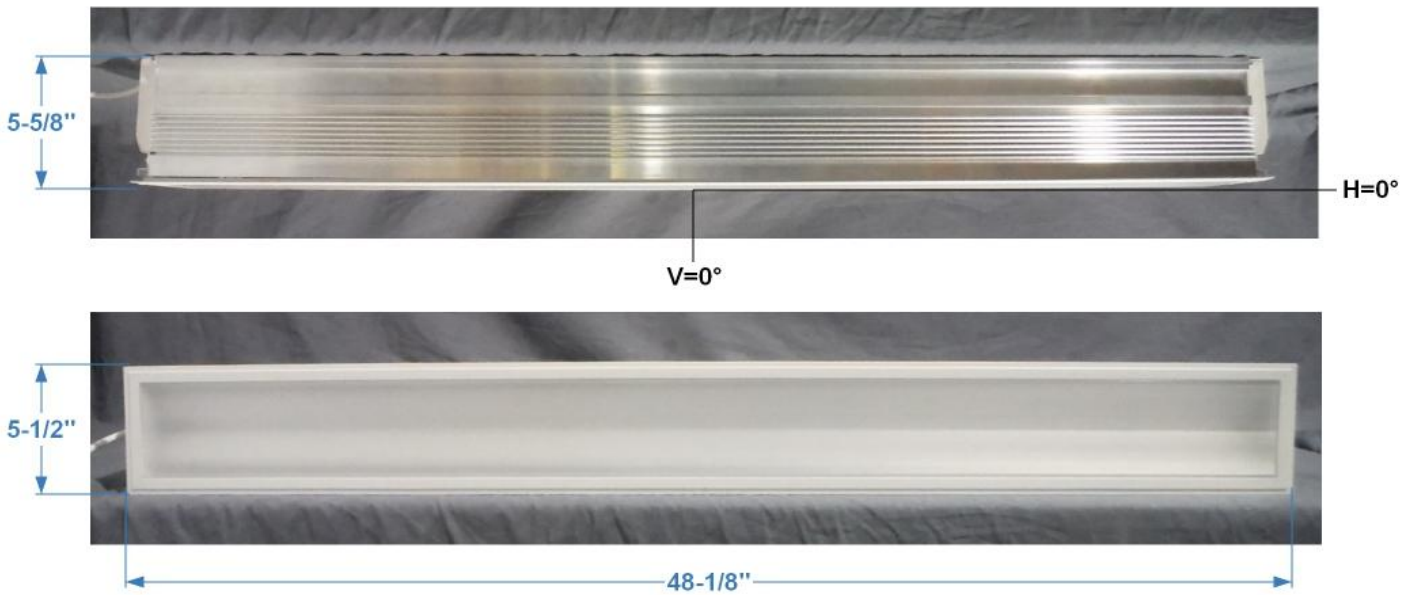

FIG.1 LUMINAIRE

*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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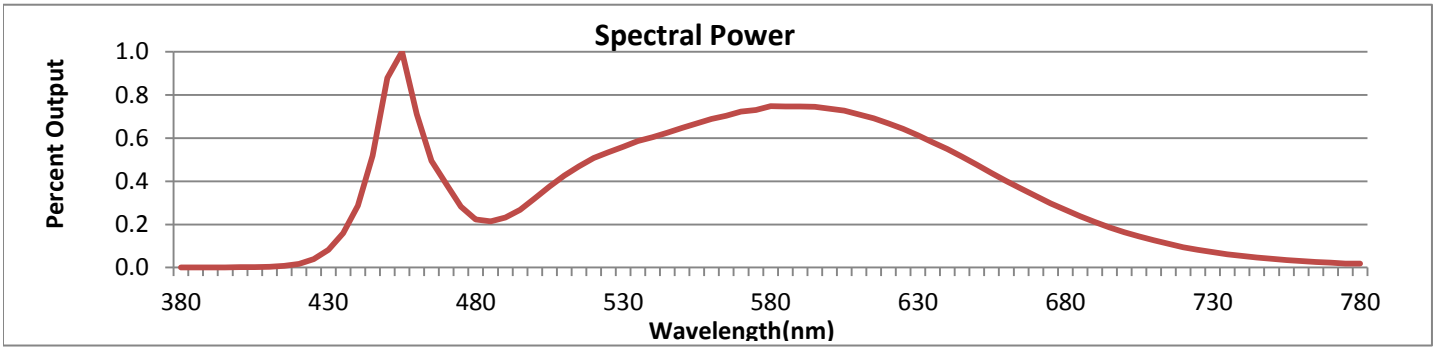


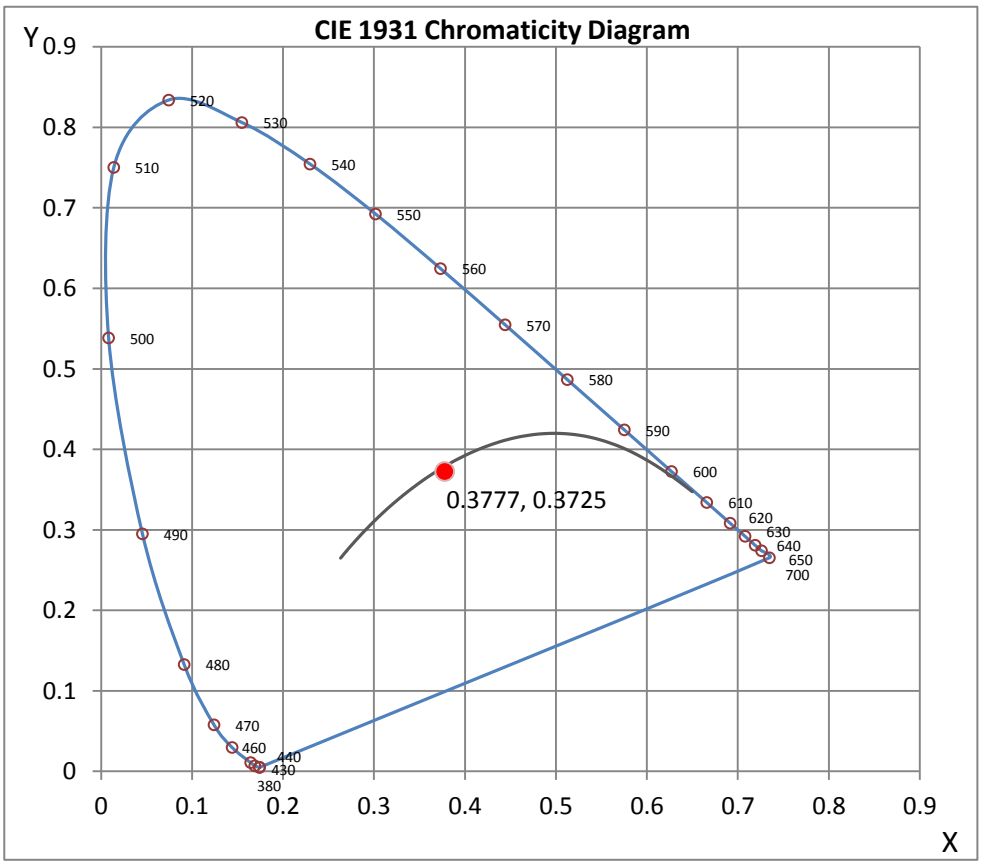
Wavelength	W/m²nm	440	0.0089	510	0.0133	580	0.0234	650	0.0149	720	0.0030
380	0.0000	450	0.0274	520	0.0159	590	0.0233	660	0.0125	730	0.0022
390	0.0000	460	0.0222	530	0.0175	600	0.0230	670	0.0103	740	0.0017
400	0.0000	470	0.0121	540	0.0189	610	0.0222	680	0.0083	750	0.0012
410	0.0001	480	0.0069	550	0.0202	620	0.0209	690	0.0066	760	0.0009
420	0.0005	490	0.0073	560	0.0215	630	0.0192	700	0.0051	770	0.0007
430	0.0025	500	0.0100	570	0.0226	640	0.0171	710	0.0040	780	0.0006

CRI & CCT

x	0.3777
y	0.3725
u'	0.2250
v'	0.4993
CRI	84.10
CCT	4043
Duv	-0.00119

R Values

R1	83.03
R2	89.75
R3	92.99
R4	81.89
R5	81.67
R6	83.59
R7	88.51
R8	71.43
R9	26.99
R10	73.91
R11	79.21
R12	56.11
R13	84.72
R14	95.77



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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 : Wilson Khounlavong

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 : L041412303R01.IES

DESCRIPTION INFORMATION (From Photometric File)

IESNA:LM-63-2002
[TEST] L041412303R01
[TESTLAB] LIGHT LABORATORY, INC.
[ISSUEDATE] 5/5/2014
[MANUFAC] PRUDENTIAL LIGHTING
[LUMCAT] BIO-FLSH-LED4LO-04-ABW-TMW-D1X-SC-UNV-X1
[LUMINAIRE] 48-1/8"L X 5-1/2"W X 5-5/8"H. LED LUMINAIRE.
[MORE] DIFFUSED LENS.
[BALLASTCAT] OSRAM OPTOTRONIC OT30W/PRG1050C/UNV/DIM/L
[BALLAST] INPUT: 120-277VAC, 0.31-0.15A, 50/60HZ. OUTPUT: 10-55VDC, 0.35-1.05A.
[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, 19.04W
[_TEST PROCEDURE] IESNA:LM-79-08

CHARACTERISTICS

Lumens Per Lamp	N.A. (absolute)
Total Lamp Lumens	N.A. (absolute)
Luminaire Lumens	1784
Total Luminaire Efficiency	N.A.
Luminaire Efficacy Rating (LER)	94
Total Luminaire Watts	19.04
Ballast Factor	1.00
CIE Type	Direct
Spacing Criterion (0-180)	1.18
Spacing Criterion (90-270)	1.44
Spacing Criterion (Diagonal)	1.48
Basic Luminous Shape	Rectangular
Luminous Length (0-180)	3.83 ft
Luminous Width (90-270)	0.33 ft
Luminous Height	0.00 ft

IES INDOOR REPORT
PHOTOMETRIC FILENAME : L041412303R01.IES

LUMINANCE DATA (cd/sq.m)

Angle In Degrees	Average 0-Deg	Average 45-Deg	Average 90-Deg
45	4262	5726	5293
55	3832	5107	3941
65	3395	4295	3005
75	2839	3140	2189
85	2213	1902	1540

IES INDOOR REPORT
PHOTOMETRIC FILENAME : L041412303R01.IES

CANDELA TABULATION

	0	5	10	15	20	25	30	35	40	45
0	621.49	621.49	621.49	621.49	621.49	621.49	621.49	621.49	621.49	621.49
5	615.56	615.84	616.44	617.46	618.86	621.27	623.79	626.21	628.29	630.45
10	603.67	604.35	606.42	609.90	614.20	620.07	626.54	633.03	639.20	645.36
15	584.66	585.98	590.33	596.70	605.09	615.39	626.26	637.02	647.25	656.78
20	558.67	560.94	567.50	577.62	590.36	604.69	619.64	633.45	646.07	657.17
25	526.66	529.78	538.69	552.31	568.70	586.40	603.89	619.48	632.51	643.10
30	489.09	493.04	504.19	520.70	539.93	559.79	578.56	594.15	606.35	615.54
35	447.13	451.72	464.33	482.97	503.93	524.92	543.45	558.32	569.19	577.15
40	401.49	406.40	419.96	439.34	460.86	481.79	499.85	513.60	523.55	530.81
45	354.18	359.44	373.24	391.25	412.12	431.90	448.82	461.52	470.55	475.88
50	305.78	311.22	325.75	344.03	358.85	377.06	392.52	403.63	410.17	412.44
55	258.33	262.92	273.54	288.99	304.77	318.93	332.64	344.84	345.59	344.26
60	216.64	219.11	227.98	240.69	255.70	267.73	279.62	288.06	286.72	282.27
65	168.62	173.02	177.57	187.57	199.58	210.06	217.82	221.02	219.92	213.34
70	127.19	128.67	131.90	138.11	146.50	152.22	156.89	159.29	157.01	150.42
75	86.37	87.00	88.73	93.01	94.31	99.12	102.47	103.03	100.52	95.53
80	51.41	50.57	51.63	50.27	52.57	54.58	55.60	55.23	53.40	50.61
85	22.67	21.71	20.62	20.68	20.95	21.13	21.08	20.77	20.20	19.48
90	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Vert. Angles	**Horizontal Angles**								
	50	**55**	**60**	**65**	**70**	**75**	**80**	**85**	**90**
0	621.49	621.49	621.49	621.49	621.49	621.49	621.49	621.49	621.49
5	632.48	634.38	636.28	637.56	638.57	639.50	640.29	641.03	642.00
10	651.01	656.13	660.83	664.62	667.89	670.15	671.84	673.82	675.06
15	665.10	672.24	678.58	683.48	687.82	690.61	692.42	694.50	694.81
20	666.24	673.40	679.24	683.85	687.24	689.14	690.45	691.94	691.75
25	651.07	656.79	661.44	664.65	666.73	667.81	668.35	669.10	669.68
30	621.91	626.59	630.34	632.84	634.38	635.13	635.31	636.30	636.69
35	582.89	586.99	590.25	591.68	591.90	591.47	591.03	591.23	591.36
40	535.42	537.90	538.45	536.41	533.43	529.89	527.32	525.83	525.23
45	477.65	476.01	471.50	464.30	456.53	449.49	444.28	441.19	439.85
50	409.62	402.89	392.59	381.22	370.28	360.65	353.26	349.16	348.19
55	336.78	325.40	312.19	298.86	287.11	277.93	270.38	266.13	265.66
60	272.05	260.12	245.51	233.24	222.75	213.55	208.08	205.11	204.79
65	202.81	191.07	179.68	169.63	162.21	155.94	152.20	149.53	149.27
70	141.67	132.63	124.26	117.59	112.19	108.49	105.90	104.24	103.86
75	89.48	83.79	78.69	74.60	71.57	69.43	67.82	66.93	66.59
80	47.52	44.85	42.51	40.66	39.26	38.18	37.43	37.01	36.84
85	18.72	18.03	17.43	16.91	16.49	16.13	15.91	15.78	15.77
90	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

IES INDOOR REPORT
PHOTOMETRIC FILENAME : L041412303R01.IES

ZONAL LUMEN SUMMARY

Zone	Lumens	%Lamp	%Fixt
0-20	243.22	N.A.	13.60
0-30	528.93	N.A.	29.60
0-40	872.32	N.A.	48.90
0-60	1483.33	N.A.	83.10
0-80	1761.2	N.A.	98.70
0-90	1784.31	N.A.	100.00
10-90	1723.88	N.A.	96.60
20-40	629.10	N.A.	35.30
20-50	966.74	N.A.	54.20
40-70	796.37	N.A.	44.60
60-80	277.87	N.A.	15.60
70-80	92.52	N.A.	5.20
80-90	23.11	N.A.	1.30
90-110	0.00	N.A.	0.00
90-120	0.00	N.A.	0.00
90-130	0.00	N.A.	0.00
90-150	0.00	N.A.	0.00
90-180	0.00	N.A.	0.00
110-180	0.00	N.A.	0.00
0-180	1784.31	N.A.	100.00

Total Luminaire Efficiency = N.A.%

ZONAL LUMEN SUMMARY

Zone	Lumens
0-10	60.43
10-20	182.79
20-30	285.72
30-40	343.38
40-50	337.64
50-60	273.37
60-70	185.36
70-80	92.52
80-90	23.11
90-100	0.00
100-110	0.00
110-120	0.00
120-130	0.00
130-140	0.00
140-150	0.00
150-160	0.00
160-170	0.00
170-180	0.00

IES INDOOR REPORT
PHOTOMETRIC FILENAME : L041412303R01.IES

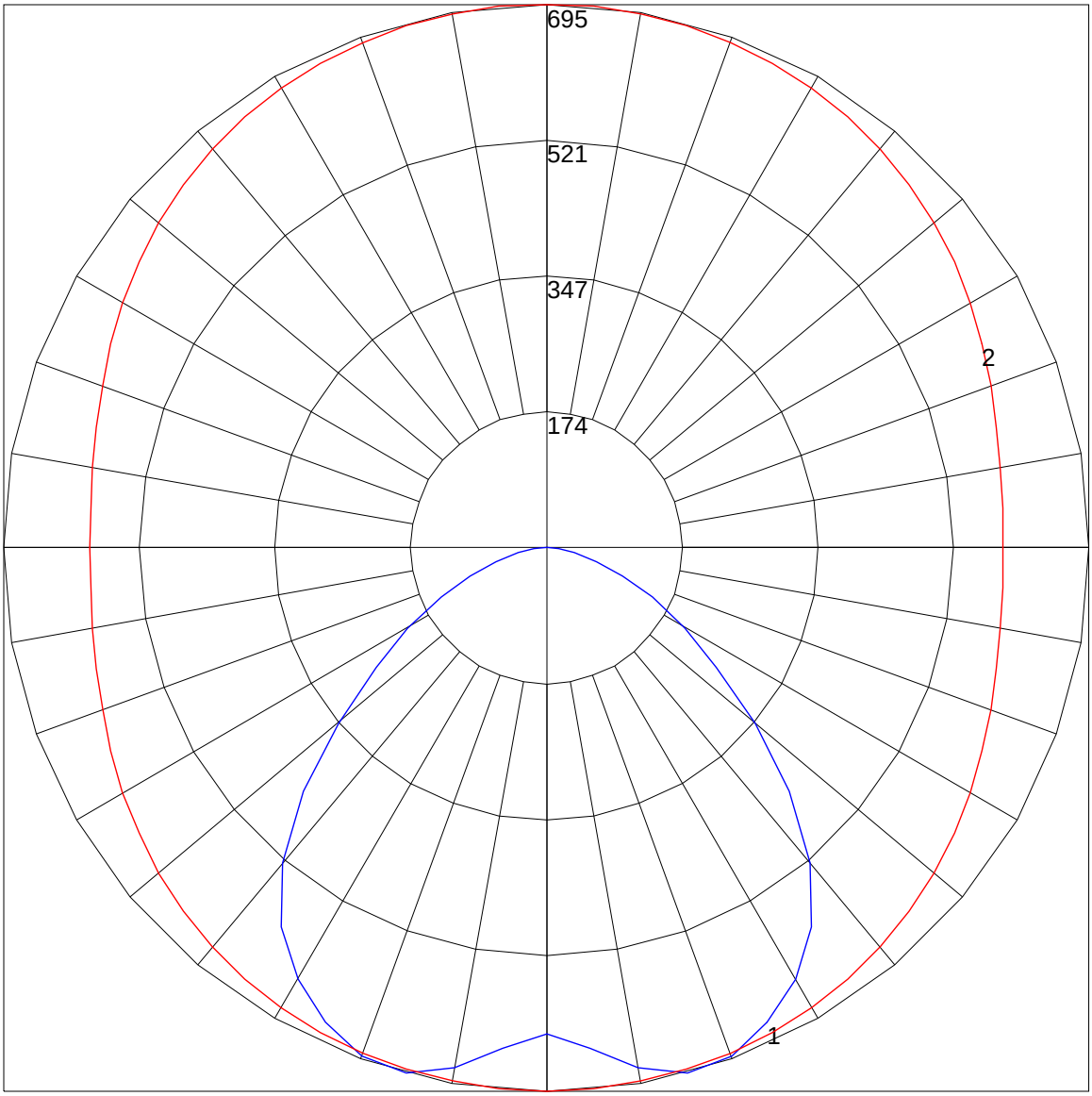
COEFFICIENTS OF UTILIZATION - ZONAL CAVITY METHOD

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	119	119	119	119	116	116	116	116	111	111	111	106	106	106	102	102	102	100
1	109	105	101	97	107	103	99	96	99	96	93	95	92	90	91	89	87	85
2	100	92	86	80	97	90	84	79	87	82	78	84	79	76	81	77	74	72
3	92	81	74	67	89	80	73	67	77	71	66	74	69	64	72	67	63	61
4	84	72	64	57	82	71	63	57	69	62	56	66	60	56	64	59	55	53
5	77	65	56	50	75	64	56	49	62	54	49	60	53	48	58	52	48	46
6	72	59	50	44	70	58	49	43	56	48	43	54	48	43	53	47	42	40
7	66	53	45	39	65	52	44	38	51	43	38	49	43	38	48	42	38	36
8	62	49	40	34	60	48	40	34	47	39	34	45	39	34	44	38	34	32
9	58	45	36	31	56	44	36	31	43	36	31	42	35	31	41	35	30	29
10	54	41	33	28	53	41	33	28	40	33	28	39	32	28	38	32	28	26

IES INDOOR REPORT
PHOTOMETRIC FILENAME : L041412303R01.IES

POLAR GRAPH



Maximum Candela = 694.81 Located At Horizontal Angle = 90, Vertical Angle = 15
1 - Vertical Plane Through Horizontal Angles (90 - 270) (Through Max. Cd.)
2 - Horizontal Cone Through Vertical Angle (15) (Through Max. Cd.)