LIGHT LABORATORY INC.
8165 E Kaiser Blvd. Anaheim, CA 92808
www.lightlaboratory.com

NVLAP TESTING
NVLAP LAB CODE 200927-0

Report No: L111700902R01 **Issue Date: 11/17/2017**

Report Prepared For: Number Eight Lighting Company
526 Portal Street, Cotati, CA 94931

Model Number: 400-HI-R-40/EL1-4-1000/FLR-4-WH/WW4

Test: Photometric/Colorimetric/Electrical Test

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. Received in working and undamaged condition. No modifications were necessary.

Testing Condition: Fixture is tested with no special conditions.

Sample Arrival Date: 11/8/17

Date of Tests: 11/16/17 - 11/17/17

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	11/28/17
ITECH	IT6122	PS-DC03-S1	11/28/17
Fluke Digital Thermometer	52k/J	MT-TP02-GC	11/28/17
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:	Number Eight Lighting Company
Model Number:	400-HI-R-40/EL1-4-1000/FLR-4-WH/WW4
Driver Model Number:	eldoLED ECOdrive 261/S
Total Lumens:	578.34
Input Voltage (VAC/60Hz):	120.00
Input Current (Amp):	0.12
Input Power (W):	14.36
Input Power Factor:	0.99
Current ATHD @ 120V(%):	11%
Current ATHD @ 277V(%):	N/A
Efficacy:	40
Color Rendering Index (CRI):	93
Correlated Color Temperature (K):	2854
Chromaticity Coordinate x:	0.4505
Chromaticity Coordinate y:	0.4129
Ambient Temperature (°C):	25.0
Stabilization Time (Hours):	0:30
Total Operating Time (Hours):	1:00

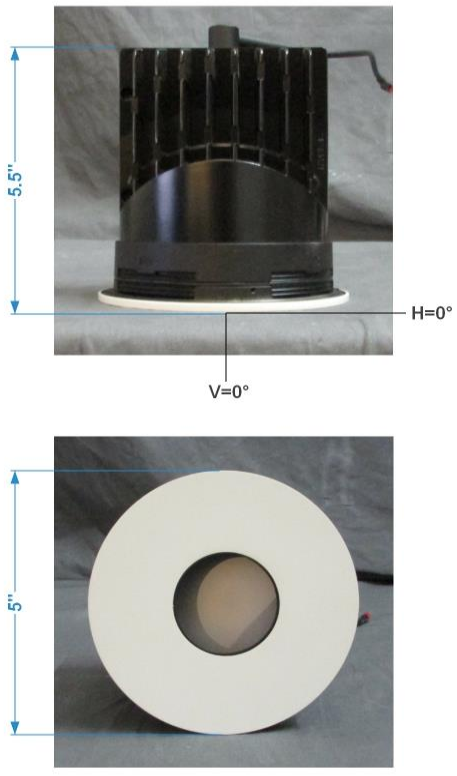

FIG. 1 LUMINAIRE

*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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Report No: L111700902R01

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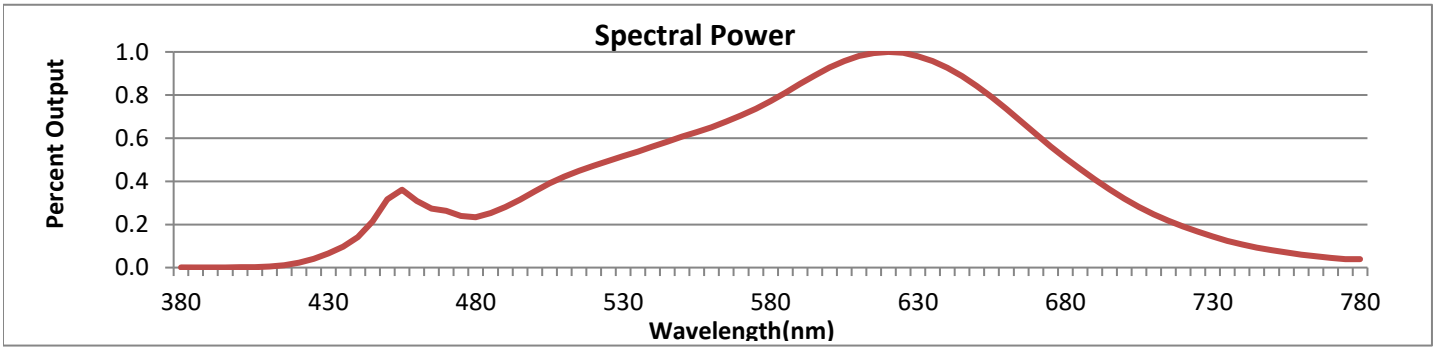


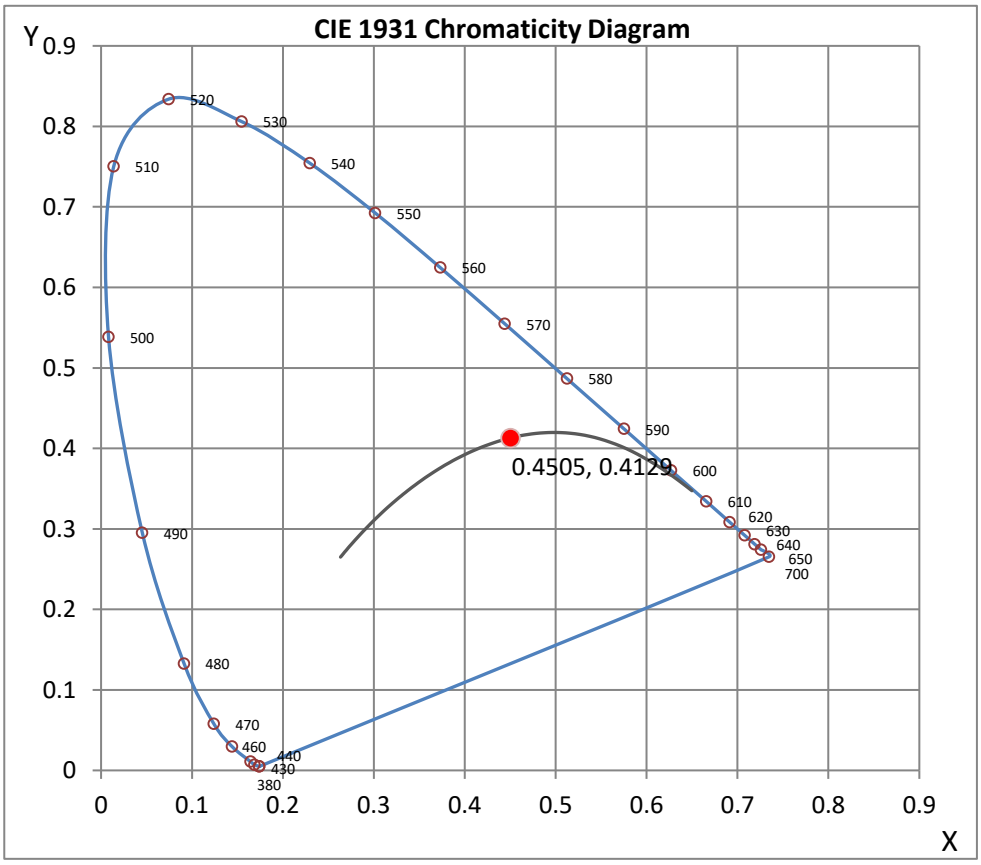
Wavelength	W/m²nm	440	0.1421	510	0.4216	580	0.7726	650	0.8425	720	0.1907
380	0.0008	450	0.3161	520	0.4717	590	0.8530	660	0.7361	730	0.1441
390	0.0008	460	0.3093	530	0.5166	600	0.9283	670	0.6193	740	0.1073
400	0.0013	470	0.2637	540	0.5608	610	0.9808	680	0.5087	750	0.0810
410	0.0045	480	0.2339	550	0.6069	620	1.0000	690	0.4082	760	0.0606
420	0.0221	490	0.2812	560	0.6510	630	0.9798	700	0.3201	770	0.0454
430	0.0652	500	0.3544	570	0.7048	640	0.9268	710	0.2469	780	0.0392

CRI & CCT

x	0.4505
y	0.4129
u'	0.2555
v'	0.5268
CRI	92.90
CCT	2854
Duv	0.11620

R Values

R1	92.76
R2	96.72
R3	99.52
R4	92.72
R5	92.55
R6	96.82
R7	91.61
R8	80.43
R9	56.72
R10	91.67
R11	94.03
R12	84.00
R13	93.88
R14	99.20



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

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 : Joseph Shin

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 : L111700902R01.IES

DESCRIPTION INFORMATION (From Photometric File)

IESNA:LM-63-2002
[TEST] L111700902R01
[TESTLAB] LIGHT LABORATORY, INC. (www.lightlaboratory.com)
[ISSUEDATE] 11/17/2017
[MANUFAC] Number Eight Lighting Company
[LUMCAT] 400-HI-R-40/EL1-4-1000/FLR-4-WH/WW4
[LUMINAIRE] LED Recessed Downlight, 90+ CRI, 40° Beam Spread, 20° Aiming Angle,
[MORE] 2" Dia. Aperture Trim, Wall Wash Lens Accessory
[BALLASTCAT] eldoLED ECOdrive 261/S
[OTHER] INDICATING THE CANDELA VALUES ARE ABSOLUTE AND
[MORE] SHOULD NOT BE FACTORED FOR DIFFERENT LAMP RATINGS.
[INPUT] 120VAC, 14.36W
[TEST PROCEDURE] IESNA:LM-79-08

CHARACTERISTICS

Lumens Per Lamp	N.A. (absolute)
Total Lamp Lumens	N.A. (absolute)
Luminaire Lumens	578
Total Luminaire Efficiency	N.A.
Luminaire Efficacy Rating (LER)	40
Total Luminaire Watts	14.36
Ballast Factor	1.00
CIE Type	Direct
Spacing Criterion (0-180)	0.66
Spacing Criterion (90-270)	1.30
Spacing Criterion (Diagonal)	1.26
Basic Luminous Shape	Circular
Luminous Length (0-180)	0.17 ft (Diameter)
Luminous Width (90-270)	0.17 ft (Diameter)
Luminous Height	0.00 ft

LUMINANCE DATA (cd/sq.m)

Angle In Degrees	Average 0-Deg	Average 45-Deg	Average 90-Deg
45	21441	38459	117321
55	8425	18090	73184
65	1906	2466	22645
75	2746	2746	2746
85	6523	5980	5980

IES INDOOR REPORT
PHOTOMETRIC FILENAME : L111700902R01.IES

CANDELA TABULATION

	0	5	10	15	20	25	30	35	40	45
0	299.1	299.1	299.1	299.1	299.1	299.1	299.1	299.1	299.1	299.1
5	267.9	268.1	268.5	269.2	270.0	271.0	272.4	274.0	275.6	277.5
10	233.7	234.0	234.8	236.0	237.7	240.0	242.8	245.8	249.4	253.3
15	197.8	198.1	199.3	201.1	203.5	206.9	211.2	216.0	221.0	226.9
20	160.4	160.8	162.1	164.6	167.7	171.7	176.9	183.1	190.0	197.5
25	124.7	125.1	126.6	129.0	132.7	137.3	142.9	149.7	157.9	166.5
30	94.0	94.5	95.8	98.3	101.8	105.9	111.6	119.0	127.1	136.9
35	67.6	68.0	69.3	71.3	74.3	78.3	83.6	89.7	97.5	106.8
40	47.6	48.0	49.0	50.6	53.0	56.4	61.0	66.5	72.5	80.6
45	32.0	32.2	32.9	34.2	36.1	38.4	41.7	46.2	51.3	57.4
50	20.5	20.6	21.1	21.9	23.2	25.0	27.4	30.3	34.0	38.4
55	10.2	10.3	10.6	11.1	11.8	12.9	14.4	16.9	19.5	21.9
60	3.3	3.4	3.6	3.8	4.2	4.7	5.5	6.5	7.7	9.3
65	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.8	1.9	2.2
70	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6
75	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
80	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.3
85	1.2	1.2	1.2	1.2	1.2	1.1	1.1	1.1	1.1	1.1
90	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Vert. Angles	**Horizontal Angles**									
	50	**55**	**60**	**65**	**70**	**75**	**80**	**85**	**90**	**95**
0	299.1	299.1	299.1	299.1	299.1	299.1	299.1	299.1	299.1	299.1
5	279.6	281.6	283.9	286.3	288.7	291.2	293.7	296.0	298.4	300.8
10	257.6	262.4	267.0	271.8	276.9	281.9	286.9	291.9	296.8	301.4
15	233.7	240.5	247.6	255.2	263.3	270.8	278.5	286.5	293.7	300.6
20	206.2	215.5	225.0	235.6	245.8	256.2	267.5	278.2	288.3	297.8
25	176.1	187.9	199.9	211.6	225.1	238.9	252.3	266.5	279.0	290.9
30	147.6	159.3	172.8	187.3	201.4	217.5	234.2	249.2	265.0	280.0
35	117.7	129.6	142.8	157.5	173.6	190.3	208.2	226.3	243.4	259.7
40	90.3	101.7	113.8	127.4	143.6	159.9	177.4	196.6	214.0	230.7
45	65.1	74.2	85.1	97.4	110.0	125.4	142.1	157.9	175.1	191.9
50	43.7	50.9	59.0	68.3	79.1	90.8	104.2	118.3	132.2	145.9
55	25.6	29.9	35.3	41.7	49.0	57.4	67.3	78.2	88.6	99.1
60	11.4	14.2	17.9	21.8	25.9	31.1	37.8	44.9	52.1	59.8
65	2.6	3.4	4.4	5.8	7.8	10.1	12.9	16.5	20.2	24.1
70	1.6	1.6	1.6	1.6	1.7	1.9	2.2	2.7	3.3	4.1
75	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
80	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3
85	1.0	1.0	1.0	1.1	1.1	1.1	1.1	1.1	1.1	1.2
90	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Vert. Angles	**Horizontal Angles**									
	100	**105**	**110**	**115**	**120**	**125**	**130**	**135**	**140**	**145**
0	299.1	299.1	299.1	299.1	299.1	299.1	299.1	299.1	299.1	299.1
5	302.9	305.3	307.5	309.4	311.3	313.1	314.8	316.3	317.7	319.0
10	306.0	310.3	314.3	318.2	321.6	324.8	327.8	330.2	332.4	334.3
15	307.7	314.0	319.7	324.8	329.5	333.5	337.1	340.1	342.6	344.7
20	306.9	315.5	322.7	329.1	334.9	339.4	343.0	346.2	348.5	350.0
25	302.8	312.7	321.8	329.7	335.5	340.5	344.5	347.0	348.5	349.3
30	292.6	304.9	315.5	323.4	330.2	335.3	338.5	340.3	341.0	340.8
35	275.0	288.3	299.4	308.6	315.4	320.1	323.0	323.9	323.5	322.2

CANDELA TABULATION - (Cont.)

40	247.3	261.0	272.3	282.0	288.7	292.9	294.8	295.1	293.6	291.3
45	206.0	219.8	231.5	239.7	245.9	249.6	250.9	250.4	248.4	245.4
50	159.1	170.6	180.2	187.8	193.0	196.0	197.0	196.3	194.2	191.4
55	109.9	119.0	126.7	133.0	137.3	139.7	140.4	139.7	138.1	135.7
60	67.4	74.3	80.3	85.3	88.8	90.7	91.4	91.1	90.0	88.5
65	28.6	32.6	36.3	39.7	42.2	43.9	44.7	45.0	44.7	44.1
70	5.0	6.1	7.2	8.2	9.2	10.0	10.6	11.1	11.4	11.5
75	1.5	1.5	1.6	1.6	1.7	1.7	1.8	1.9	1.9	2.0
80	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.4	1.4	1.4
85	1.2	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.2
90	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Vert. Angles	**Horizontal Angles**						
	150	**155**	**160**	**165**	**170**	**175**	**180**
0	299.1	299.1	299.1	299.1	299.1	299.1	299.1
5	320.1	321.1	321.8	322.3	322.7	322.9	323.0
10	336.0	337.2	338.3	339.1	339.7	340.0	340.1
15	346.3	347.5	348.5	349.1	349.7	350.0	350.0
20	351.1	351.9	352.3	352.6	352.7	352.7	352.7
25	349.4	349.3	348.9	348.4	348.0	347.6	347.5
30	339.7	338.5	337.2	335.9	334.9	334.3	334.1
35	320.2	317.7	315.4	313.4	311.8	310.8	310.5
40	288.3	285.2	282.1	279.6	277.8	276.6	276.1
45	242.0	238.5	235.3	232.5	230.4	229.1	228.7
50	188.0	184.5	181.4	179.0	177.2	176.0	175.6
55	132.9	130.2	127.6	125.6	124.1	123.1	122.8
60	86.6	84.6	82.9	81.6	80.5	79.8	79.5
65	43.4	42.6	41.8	41.1	40.7	40.4	40.2
70	11.6	11.6	11.6	11.6	11.6	11.5	11.5
75	2.1	2.1	2.2	2.2	2.3	2.3	2.3
80	1.4	1.4	1.4	1.4	1.4	1.5	1.5
85	1.2	1.2	1.2	1.2	1.2	1.2	1.2
90	0.0	0.0	0.0	0.0	0.0	0.0	0.0

IES INDOOR REPORT
PHOTOMETRIC FILENAME : L111700902R01.IES

ZONAL LUMEN SUMMARY

Zone	Lumens	%Lamp	%Fixt
0-20	108.13	N.A.	18.70
0-30	226.42	N.A.	39.10
0-40	360.71	N.A.	62.40
0-60	550.39	N.A.	95.20
0-80	577.36	N.A.	99.80
0-90	578.34	N.A.	100.00
10-90	550.15	N.A.	95.10
20-40	252.57	N.A.	43.70
20-50	370.22	N.A.	64.00
40-70	213.92	N.A.	37.00
60-80	26.96	N.A.	4.70
70-80	2.73	N.A.	0.50
80-90	0.98	N.A.	0.20
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	578.34	N.A.	100.00

Total Luminaire Efficiency = N.A.%

ZONAL LUMEN SUMMARY

Zone	Lumens
0-10	28.19
10-20	79.95
20-30	118.28
30-40	134.29
40-50	117.65
50-60	72.04
60-70	24.23
70-80	2.73
80-90	0.98
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 : L111700902R01.IES

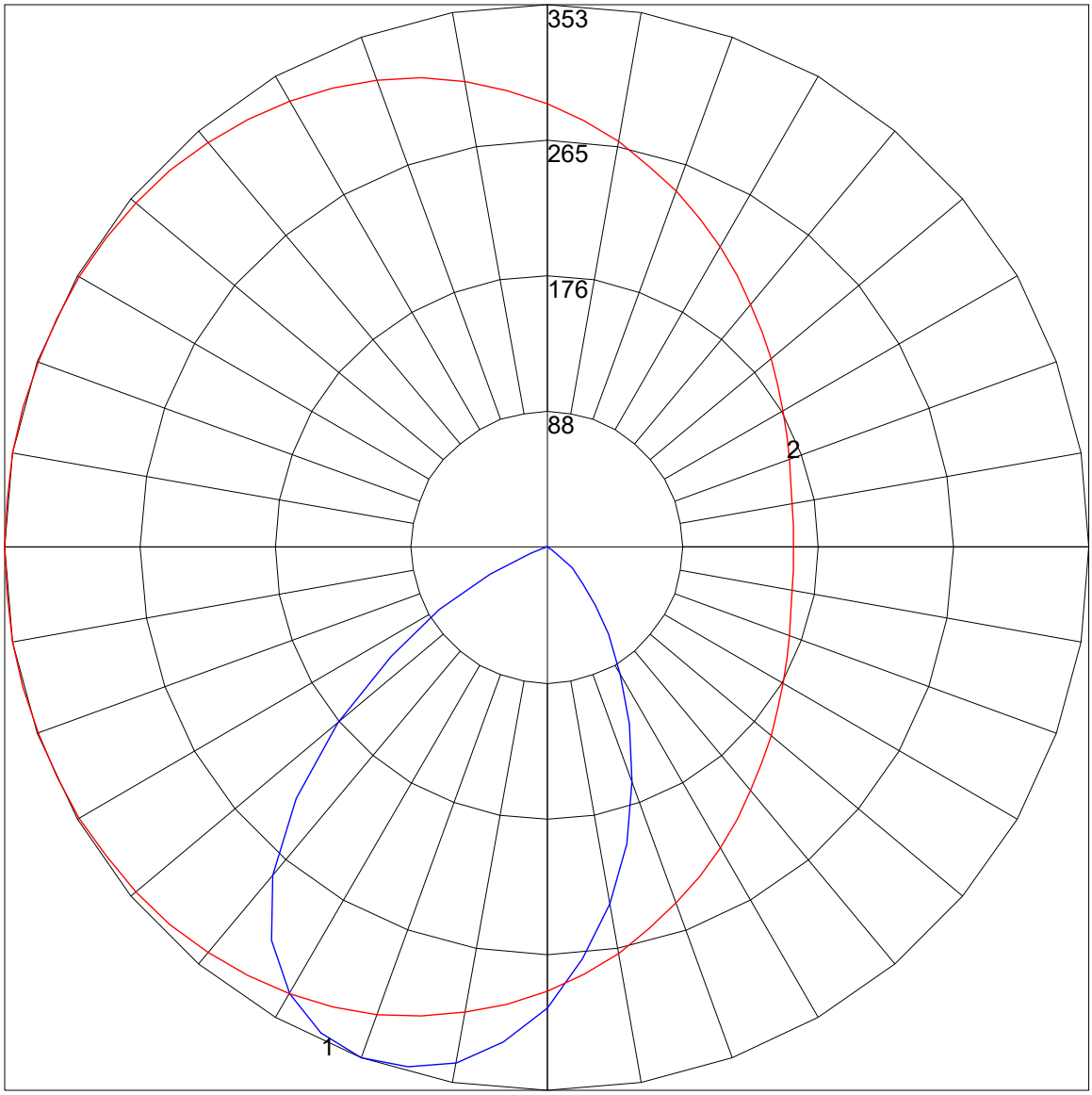
COEFFICIENTS OF UTILIZATION - ZONAL CAVITY METHOD

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	112	108	105	102	109	106	103	100	102	99	97	98	96	94	94	93	92	90
2	104	97	92	88	101	96	91	87	92	88	85	89	86	83	86	83	81	79
3	96	88	81	76	94	86	80	75	83	78	74	81	76	73	78	75	72	70
4	89	79	72	66	87	78	71	66	76	70	65	74	68	64	71	67	63	62
5	83	72	64	59	81	71	64	58	69	63	58	67	62	57	65	60	57	55
6	77	66	58	52	75	65	57	52	63	56	52	61	56	51	60	55	51	49
7	72	60	52	47	70	59	52	47	58	51	46	56	50	46	55	50	46	44
8	67	55	48	42	66	54	47	42	53	47	42	52	46	42	51	46	41	40
9	63	51	43	38	62	50	43	38	49	43	38	48	42	38	47	42	38	36
10	59	47	40	35	58	47	40	35	46	39	35	45	39	35	44	39	35	33

IES INDOOR REPORT
PHOTOMETRIC FILENAME : L111700902R01.IES

POLAR GRAPH



Maximum Candela = 352.7 Located At Horizontal Angle = 170, Vertical Angle = 20
1 - Vertical Plane Through Horizontal Angles (170 - 350) (Through Max. Cd.)
2 - Horizontal Cone Through Vertical Angle (20) (Through Max. Cd.)