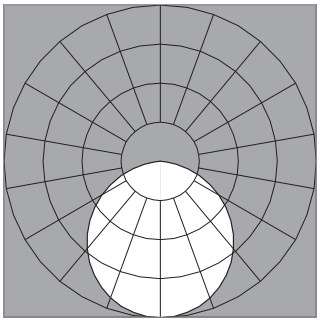

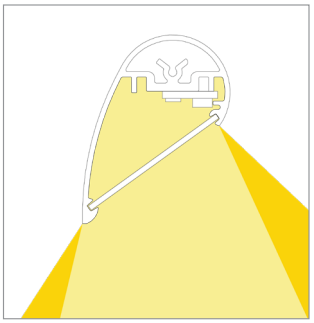

IES Report

WingRail® | 107 | Diffuse | 90 CRI | SO

107-WG-XX-4-48-XX-XX-XX-XX-X-X-Z-SO-359-D1-X-XX-X

	2700K	3000K	3500K	4000K
Efficacy - Lumens per Watt	71	73	74	76
Total Lumens, 4’ rail length (1219mm)	1687	1741	1776	1812
Lumens per foot (305mm)	422	435	444	453
Input Power (W), 4’ rail length (1219mm)	24.1	24.1	24.1	24.1
Watts per foot (305mm)	6.1	6.1	6.1	6.1
CRI	96	96	96	96

Due to the large number of options in Vode’s product offering, most Vode IES reports are factored reports prepared from source reports. Source reports are the IES test reports prepared for Vode by an NVLAP accredited photometric test laboratory. Factored reports are based on data from the Vode source reports.

If the data above is in black, it is directly from a Vode source report. If it is in grey, it is factored from Vode source reports. Reference details on Vode source reports can be found on the IES File Finder page on vode.com.

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

NVLAP TESTING
NVLAP LAB CODE 200927-0

Report No: **L091700111** **Issue Date: 9/21/2017**

Report Prepared For: Vode Lighting
21684 8th Street East, Suite 700, Sonoma, CA 95476

Model Number: **107-WG-48-Z-SO-359-D1**

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

Testing Condition: Fixture is tested with no special conditions.

Sample Arrival Date: 9/15/17

Date of Tests: 9/18/17 - 9/21/17

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.

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

NVLAP TESTING
NVLAP LAB CODE 200927-0

Test Summary	
Manufacturer:	Vode Lighting
Model Number:	107-WG-48-Z-SO-359-D1
Driver Model Number:	MEAN WELL HLG-40H-36A
Total Lumens:	1776.07
Input Voltage (VAC/60Hz):	120.00
Input Current (Amp):	0.2
Input Power (W):	24.06
Input Power Factor:	0.99
Current ATHD @ 120V(%):	10%
Current ATHD @ 277V(%):	N/A
Efficacy:	74
Color Rendering Index (CRI):	96
Correlated Color Temperature (K):	3347
Chromaticity Coordinate x:	0.4131
Chromaticity Coordinate y:	0.3924
Ambient Temperature (°C):	25.0
Stabilization Time (Hours):	0:50
Total Operating Time (Hours):	1:40

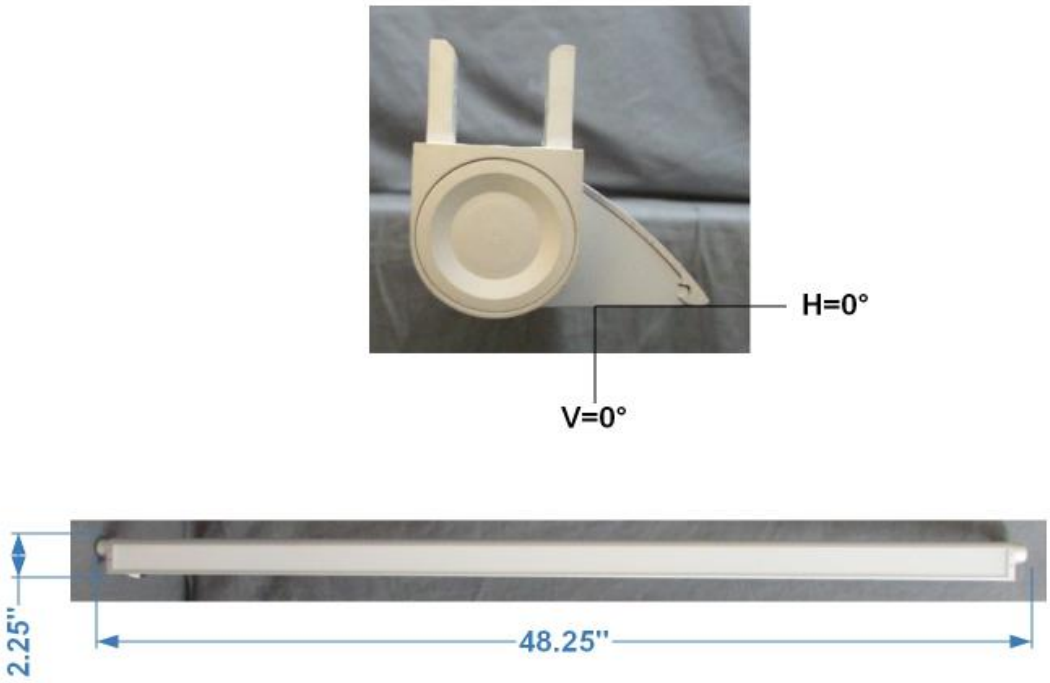

FIG. 1 LUMINAIRE

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

LIGHT LABORATORY INC.
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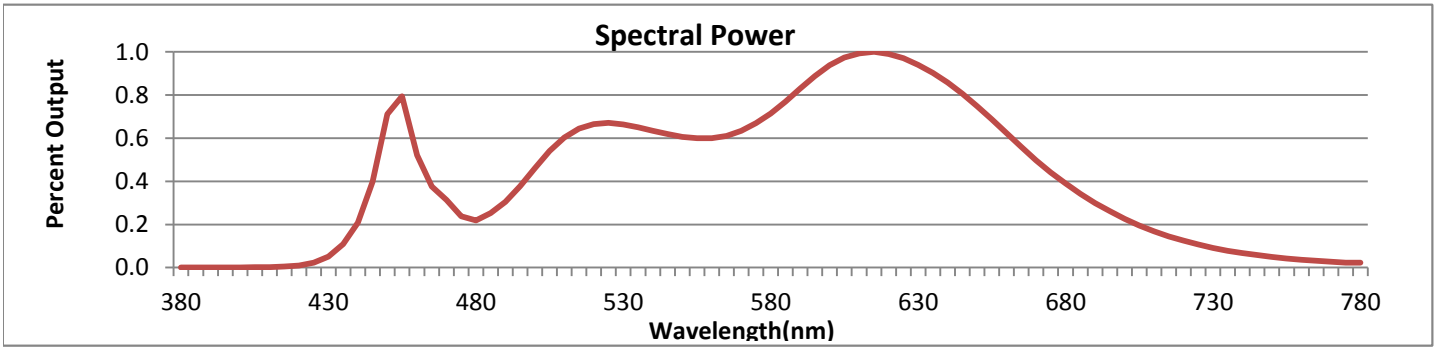
www.lightlaboratory.com

Report No: L091700111

NVLAP TESTING
NVLAP LAB CODE 200927-0



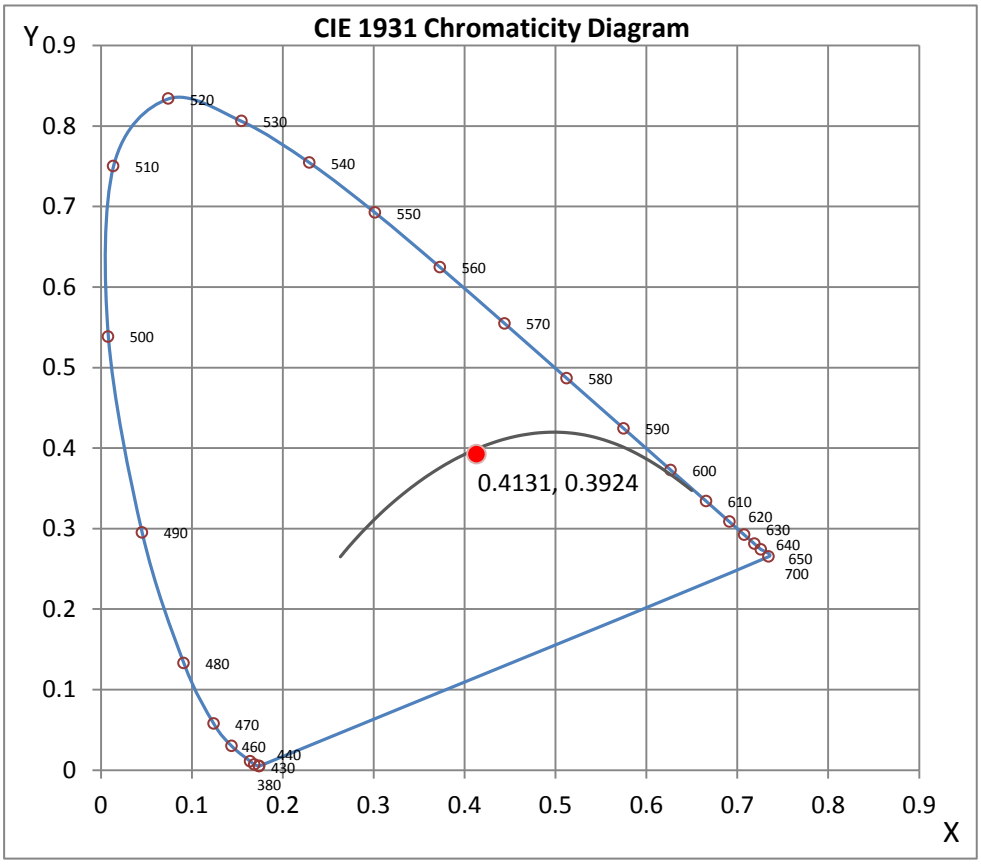
Wavelength	W/m²nm	440	0.2086	510	0.6023	580	0.7149	650	0.7485	720	0.1245
380	0.0009	450	0.7108	520	0.6655	590	0.8304	660	0.6239	730	0.0916
390	0.0009	460	0.5207	530	0.6642	600	0.9378	670	0.4978	740	0.0673
400	0.0012	470	0.3138	540	0.6336	610	0.9939	680	0.3904	750	0.0496
410	0.0023	480	0.2183	550	0.6066	620	0.9907	690	0.2989	760	0.0366
420	0.0099	490	0.3051	560	0.5998	630	0.9404	700	0.2257	770	0.0270
430	0.0512	500	0.4609	570	0.6336	640	0.8583	710	0.1684	780	0.0232

CRI & CCT

x	0.4131
y	0.3924
u'	0.2401
v'	0.5131
CRI	95.70
CCT	3347
Duv	-0.00090

R Values

R1	97.27
R2	98.76
R3	98.91
R4	95.21
R5	97.37
R6	94.28
R7	94.63
R8	89.37
R9	74.58
R10	98.02
R11	88.13
R12	82.94
R13	96.90
R14	98.39



*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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NVLAP TESTING
NVLAP LAB CODE 200927-0

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 : Keyur Patel

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: 9*

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

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

Photometric Test Report

IES INDOOR REPORT
PHOTOMETRIC FILENAME : L091700111.IES

DESCRIPTION INFORMATION (From Photometric File)

IESNA:LM-63-2002
[TEST] L091700111
[TESTLAB] LIGHT LABORATORY, INC. (www.lightlaboratory.com)
[ISSUEDATE] 9/21/2017
[MANUFAC] Vode Lighting
[LUMCAT] 107-WG-48-Z-SO-359-D1
[LUMINAIRE] WingRail LED, 48", 3500K, 90 CRI, zipper board,
[MORE] diffuse lens, standard output
[BALLASTCAT] MEAN WELL HLG-40H-36A
[OTHER] INDICATING THE CANDELA VALUES ARE ABSOLUTE AND
[MORE] SHOULD NOT BE FACTORED FOR DIFFERENT LAMP RATINGS.
[INPUT] 120VAC, 24.06W
[TEST PROCEDURE] IESNA:LM-79-08

CHARACTERISTICS

Lumens Per Lamp	N.A. (absolute)
Total Lamp Lumens	N.A. (absolute)
Luminaire Lumens	1776
Total Luminaire Efficiency	N.A.
Luminaire Efficacy Rating (LER)	74
Total Luminaire Watts	24.06
Ballast Factor	1.00
CIE Type	Direct
Spacing Criterion (0-180)	1.26
Spacing Criterion (90-270)	1.26
Spacing Criterion (Diagonal)	1.38
Basic Luminous Shape	Rectangular
Luminous Length (0-180)	0.13 ft
Luminous Width (90-270)	3.83 ft
Luminous Height	0.00 ft

LUMINANCE DATA (cd/sq.m)

Angle In Degrees	Average 0-Deg	Average 45-Deg	Average 90-Deg
45	12641	12631	12636
55	12101	12126	12170
65	11203	11294	11390
75	9569	9767	9971
85	7325	6750	7038

IES INDOOR REPORT
PHOTOMETRIC FILENAME : L091700111.IES

CANDELA TABULATION

	0	5	10	15	20	25	30	35	40	45
0	625.26	625.26	625.26	625.26	625.26	625.26	625.26	625.26	625.26	625.26
5	622.44	622.19	622.11	622.15	622.40	622.44	622.48	622.48	622.53	622.65
10	614.22	613.93	613.72	613.97	614.06	614.06	613.97	614.14	614.06	614.10
15	600.19	599.94	599.57	599.69	599.86	599.86	599.86	599.86	599.94	599.90
20	580.68	580.51	580.22	580.30	580.43	580.47	580.47	580.43	580.47	580.39
25	556.18	555.89	555.64	555.72	555.81	555.76	555.72	555.68	555.60	555.56
30	526.87	526.70	526.37	526.45	526.49	526.58	526.37	526.37	526.29	526.20
35	493.07	492.91	492.70	492.70	492.78	492.82	492.66	492.62	492.53	492.49
40	455.29	455.17	454.96	454.96	455.12	455.04	455.00	454.92	454.83	454.79
45	413.86	413.69	413.44	413.52	413.56	413.69	413.56	413.56	413.56	413.52
50	369.18	368.93	368.89	368.93	369.06	369.06	369.10	369.14	369.06	369.14
55	321.35	321.27	321.19	321.35	321.48	321.52	321.52	321.64	321.81	322.02
60	271.53	271.53	271.36	271.41	271.61	271.78	271.90	272.15	272.32	272.57
65	219.22	219.42	219.42	219.51	219.76	219.88	220.21	220.42	220.71	221.00
70	166.57	166.61	166.82	166.95	167.11	167.44	167.69	167.98	168.36	168.77
75	114.67	114.92	114.80	115.01	115.17	115.46	115.80	116.21	116.58	117.04
80	66.35	66.43	66.39	66.43	66.51	66.68	66.89	67.05	67.38	67.80
85	29.56	29.40	29.23	29.06	28.81	28.48	28.19	27.90	27.53	27.24
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	625.26	625.26	625.26	625.26	625.26	625.26	625.26	625.26	625.26
5	622.57	622.57	622.61	622.57	622.48	622.61	622.61	622.61	622.69
10	614.10	614.18	614.10	614.06	614.06	614.02	614.02	614.02	613.97
15	599.86	599.90	599.82	599.82	599.73	599.77	599.82	599.73	599.77
20	580.43	580.30	580.30	580.22	580.18	580.14	580.18	580.14	580.09
25	555.47	555.47	555.39	555.31	555.31	555.27	555.27	555.27	555.18
30	526.08	526.08	525.91	525.83	525.87	525.62	525.75	525.66	525.62
35	492.45	492.37	492.32	492.28	492.20	492.16	492.24	492.32	492.24
40	454.75	454.71	454.67	454.63	454.58	454.54	454.58	454.58	454.63
45	413.44	413.48	413.56	413.56	413.48	413.44	413.56	413.69	413.69
50	369.22	369.26	369.22	369.39	369.39	369.43	369.51	369.64	369.51
55	322.10	322.14	322.47	322.56	322.76	322.72	322.93	323.14	323.18
60	272.73	272.98	273.15	273.44	273.56	273.77	273.94	273.98	273.94
65	221.33	221.63	222.00	222.17	222.41	222.62	222.75	222.95	222.87
70	169.15	169.52	169.98	170.23	170.47	170.77	170.85	171.01	170.89
75	117.33	117.87	118.29	118.66	118.91	119.20	119.32	119.37	119.49
80	68.22	68.75	69.29	69.79	70.04	70.42	70.54	70.50	70.50
85	26.95	26.86	26.95	27.15	27.57	28.03	28.32	28.36	28.40
90	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

IES INDOOR REPORT
PHOTOMETRIC FILENAME : L091700111.IES

ZONAL LUMEN SUMMARY

Zone	Lumens	%Lamp	%Fixt
0-20	228.42	N.A.	12.90
0-30	484.44	N.A.	27.30
0-40	792.50	N.A.	44.60
0-60	1399.22	N.A.	78.80
0-80	1742.23	N.A.	98.10
0-90	1776.07	N.A.	100.00
10-90	1716.92	N.A.	96.70
20-40	564.08	N.A.	31.80
20-50	883.04	N.A.	49.70
40-70	825.44	N.A.	46.50
60-80	343.02	N.A.	19.30
70-80	124.29	N.A.	7.00
80-90	33.84	N.A.	1.90
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	1776.07	N.A.	100.00

Total Luminaire Efficiency = N.A.%

ZONAL LUMEN SUMMARY

Zone	Lumens
0-10	59.15
10-20	169.27
20-30	256.02
30-40	308.06
40-50	318.96
50-60	287.75
60-70	218.73
70-80	124.29
80-90	33.84
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 : L091700111.IES

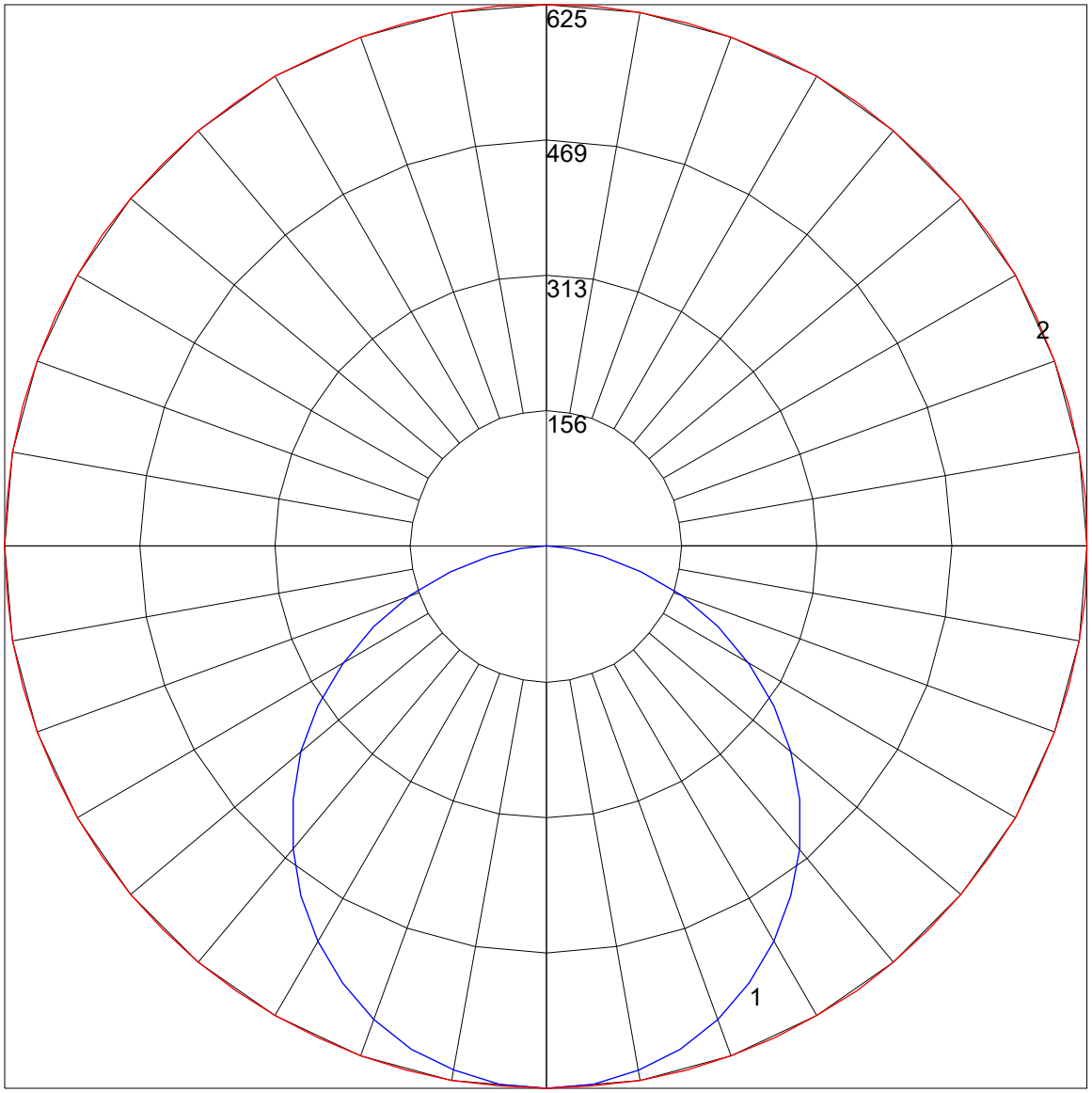
COEFFICIENTS OF UTILIZATION - ZONAL CAVITY METHOD

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	104	100	96	106	102	98	94	97	94	91	93	91	88	90	88	86	84
2	99	90	84	78	96	89	82	77	85	80	75	82	77	73	79	75	72	70
3	90	79	71	65	87	78	70	64	75	68	63	72	66	62	69	65	61	58
4	82	70	61	55	80	69	61	54	66	59	53	64	58	53	62	56	52	50
5	76	63	54	47	74	62	53	47	59	52	46	57	51	46	56	50	45	43
6	70	56	47	41	68	56	47	41	54	46	40	52	45	40	50	44	40	38
7	65	51	42	36	63	50	42	36	49	41	36	47	41	35	46	40	35	33
8	60	47	38	32	59	46	38	32	45	37	32	43	37	32	42	36	32	30
9	56	43	35	29	55	42	34	29	41	34	29	40	33	29	39	33	28	27
10	53	40	32	26	52	39	31	26	38	31	26	37	31	26	36	30	26	24

IES INDOOR REPORT
PHOTOMETRIC FILENAME : L091700111.IES

POLAR GRAPH



Maximum Candela = 625.26 Located At Horizontal Angle = 0, Vertical Angle = 0
1 - Vertical Plane Through Horizontal Angles (0 - 180) (Through Max. Cd.)
2 - Horizontal Cone Through Vertical Angle (0) (Through Max. Cd.)