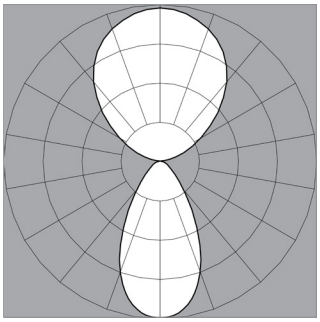
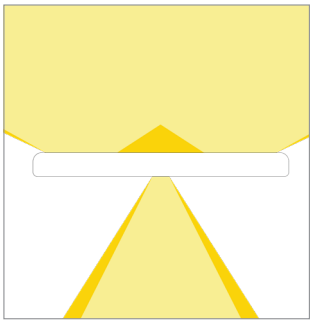
vode® Adaptive architectural lighting systems





IES Report

ZipThree® | Ceiling Cable | 707 | Symmetric, up | 60° Symmetric, down | 90 CRI | SO

707-Z3-XX-4-48-CC-XX-XX-XX-X-0-Z-SO-359-U1S2-0-BL-X

	2700K	3000K	3500K	4000K
Efficacy - Lumens per Watt	81	83	85	87
Total Lumens, 4’ rail length (1219mm)	4106	4236	4323	4409
Lumens per foot (305mm)	1027	1059	1081	1102
Lumens per foot UP (305mm)	701	723	737	752
Lumens per foot DOWN (305mm)	326	336	343	350
Input Power (W), 4’ rail length (1219mm)	51.2	51.2	51.2	51.2
Watts per foot (305mm)	12.9	12.9	12.9	12.9
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.

* R9: ~74 @ 3500K

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

NVLAP TESTING
NVLAP LAB CODE 200927-0

Report No: L031805809R01 **Issue Date: 4/13/2018**

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

Model Number: 707-Z3-CC-Z-SO-359-U1S2-BL

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: 3/29/18

Date of Tests: 4/5/18 - 4/10/18

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-S4	1/9/19
BK PRECISION	1747	PS-DC04	1/10/19
Fluke Digital Thermometer	52K/J	MT-TP05	1/10/19
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.

Test Summary	
Manufacturer:	Vode Lighting
Model Number:	707-Z3-CC-Z-SO-359-U1S2-BL
Driver Model Number:	MEAN WELL HLG-40H-36A(2 DRIVERS)
Total Lumens:	4322.63
Input Voltage (VAC/60Hz):	120.00
Input Current (Amp):	0.43
Input Power (W):	51.23
Input Power Factor:	0.99
Current ATHD @ 120V(%):	9%
Current ATHD @ 277V(%):	N/A
Efficacy:	84
Color Rendering Index (CRI):	96
Correlated Color Temperature (K):	3390
Chromaticity Coordinate x:	0.4112
Chromaticity Coordinate y:	0.3928
Ambient Temperature (°C):	25.0
Stabilization Time (Hours):	0:30
Total Operating Time (Hours):	1:30

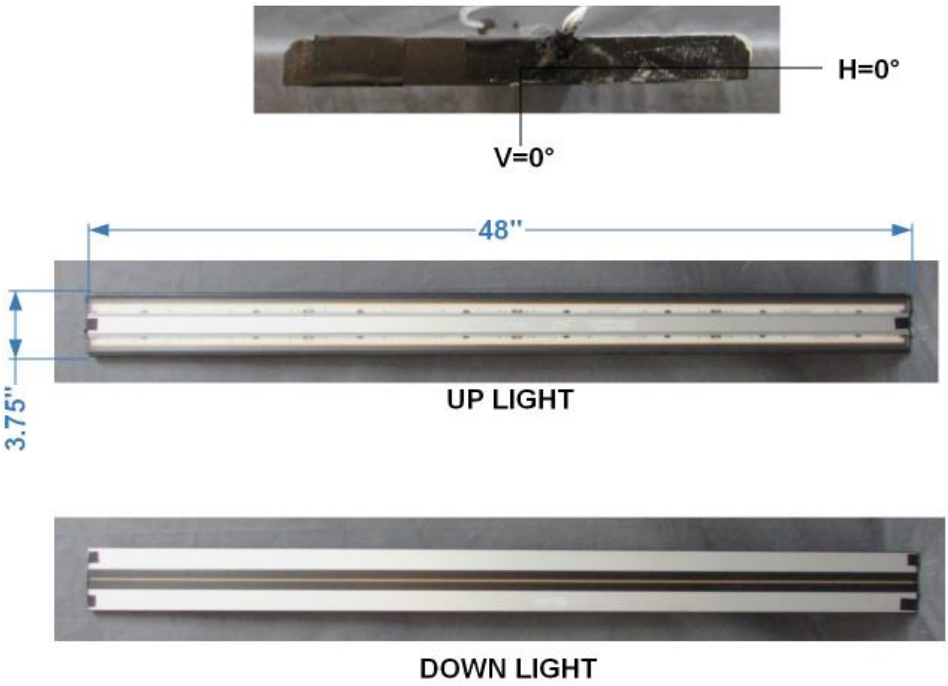


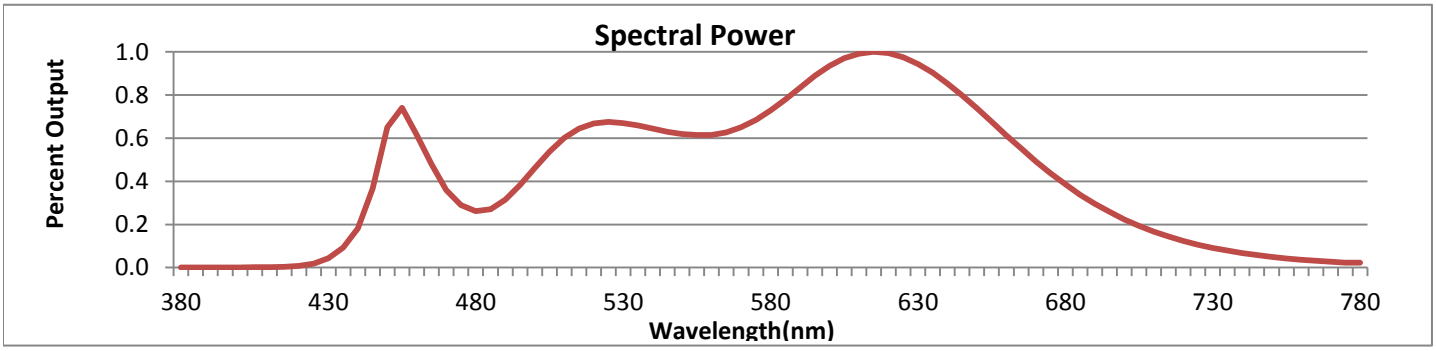
FIG. 1 LUMINAIRE

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

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

Report No: L031805809R01

NVLAP TESTING
NVLAP LAB CODE 200927-0



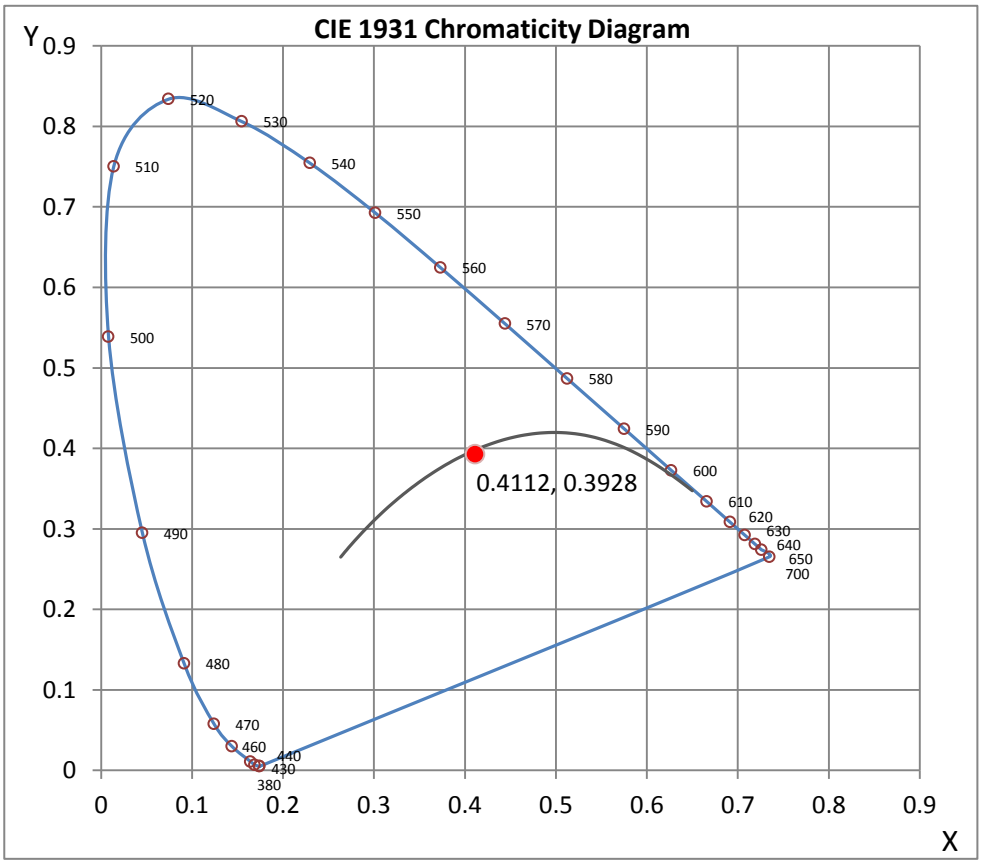
Wavelength	W/m²nm	440	0.1818	510	0.6009	580	0.7293	650	0.7394	720	0.1240
380	0.0008	450	0.6506	520	0.6684	590	0.8349	660	0.6140	730	0.0915
390	0.0010	460	0.6156	530	0.6701	600	0.9348	670	0.4918	740	0.0673
400	0.0011	470	0.3596	540	0.6451	610	0.9925	680	0.3859	750	0.0494
410	0.0020	480	0.2616	550	0.6198	620	0.9950	690	0.2957	760	0.0364
420	0.0083	490	0.3147	560	0.6155	630	0.9437	700	0.2236	770	0.0269
430	0.0428	500	0.4616	570	0.6499	640	0.8545	710	0.1673	780	0.0232

CRI & CCT

x	0.4112
y	0.3928
u'	0.2387
v'	0.5130
CRI	95.90
CCT	3390
Duv	-0.00034

R Values

R1	97.66
R2	98.69
R3	99.17
R4	97.16
R5	97.74
R6	94.34
R7	93.96
R8	88.68
R9	73.82
R10	98.01
R11	90.77
R12	80.80
R13	97.28
R14	98.73



*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: 10*

*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 : L031805809R01.IES

DESCRIPTION INFORMATION (From Photometric File)

IESNA:LM-63-2002
[TEST] L031805809R01
[TESTLAB] LIGHT LABORATORY, INC. (www.lightlaboratory.com)
[ISSUEDATE] 4/13/2018
[MANUFAC] Vode Lighting
[LUMCAT] 707-Z3-CC-Z-SO-359-U1S2-BL
[LUMINAIRE] ZipThree Suspended, 48", 3500K, 90 CRI, zipper board,
[MORE] symmetric lens up/60° symmetric lens down, standard output, black anodized finish
[BALLASTCAT] MEAN WELL HLG-40H-36A(2 DRIVERS)
[OTHER] INDICATING THE CANDELA VALUES ARE ABSOLUTE AND
[MORE] SHOULD NOT BE FACTORED FOR DIFFERENT LAMP RATINGS.
[INPUT] 120VAC, 51.23W
[TEST PROCEDURE] IESNA:LM-79-08

CHARACTERISTICS

Lumens Per Lamp	N.A. (absolute)
Total Lamp Lumens	N.A. (absolute)
Luminaire Lumens	4323
Total Luminaire Efficiency	N.A.
Luminaire Efficacy Rating (LER)	84
Total Luminaire Watts	51.23
Ballast Factor	1.00
CIE Type	Semi-Indirect
Spacing Criterion (0-180)	N.A.
Spacing Criterion (90-270)	N.A.
Spacing Criterion (Diagonal)	N.A.
Basic Luminous Shape	Rectangular w/Sides
Luminous Length (0-180)	0.25 ft
Luminous Width (90-270)	3.98 ft
Luminous Height	0.02 ft

LUMINANCE DATA (cd/sq.m)

Angle In Degrees	Average 0-Deg	Average 45-Deg	Average 90-Deg
45	1748	3309	5848
55	795	1631	3180
65	415	838	1695
75	225	477	984
85	130	220	469

IES INDOOR REPORT
PHOTOMETRIC FILENAME : L031805809R01.IES

CANDELA TABULATION

	0	5	10	15	20	25	30	35	40	45
0.0	1104	1104	1104	1104	1104	1104	1104	1104	1104	1104
1.0	1103	1103	1103	1103	1103	1103	1103	1103	1103	1103
3.0	1097	1097	1097	1097	1097	1098	1098	1098	1099	1099
5.0	1085	1085	1085	1085	1086	1087	1088	1089	1090	1091
7.0	1066	1066	1066	1067	1069	1070	1072	1074	1076	1078
9.0	1040	1040	1041	1043	1045	1048	1051	1054	1057	1061
11.0	1008	1008	1010	1012	1015	1019	1024	1029	1034	1039
13.0	968	969	971	974	979	985	991	998	1005	1013
15.0	922	923	926	930	937	944	953	962	972	982
17.0	869	870	874	880	887	897	908	920	933	946
19.5	795	797	801	809	819	831	845	861	878	895
22.5	697	699	705	714	727	742	760	780	802	824
25.5	594	596	603	614	629	647	668	692	718	744
29.0	476	478	485	497	513	533	557	584	613	643
33.0	353	356	362	373	389	409	433	461	492	525
37.5	242	243	249	259	273	290	311	337	366	397
42.5	152	154	158	165	175	189	205	226	250	276
47.5	95	96	99	104	111	120	132	147	164	183
55.0	47	48	49	52	55	60	66	74	83	94
65.0	19	19	20	21	22	24	27	30	33	37
75.0	7	8	8	8	9	9	10	11	12	14
85.0	2	2	2	2	2	2	2	2	3	3
90.0	0	0	0	0	0	0	0	0	0	0
95.0	23	23	23	24	24	24	24	25	25	26
100.0	63	63	63	64	65	65	67	68	69	71
105.0	114	114	114	115	117	119	121	123	126	128
110.0	178	178	179	181	183	186	189	193	196	200
115.0	257	257	259	261	264	267	271	276	281	286
120.0	350	350	352	354	358	362	366	372	378	384
125.0	455	456	457	460	464	468	473	479	486	493
130.0	569	570	571	574	578	582	588	594	600	607
135.0	686	687	688	691	694	698	703	708	714	719
140.0	798	799	800	802	805	808	812	816	820	824
145.0	899	899	900	901	903	905	908	911	913	916
150.0	984	984	984	985	986	988	989	991	992	994
155.0	1051	1051	1052	1052	1053	1054	1055	1056	1057	1058
160.0	1105	1105	1105	1105	1106	1106	1107	1107	1108	1109
165.0	1146	1146	1146	1146	1146	1147	1147	1148	1148	1149
170.0	1175	1175	1176	1176	1176	1176	1177	1177	1177	1178
175.0	1194	1194	1194	1195	1195	1195	1195	1195	1195	1195
180.0	1201	1201	1201	1201	1201	1201	1201	1201	1201	1201

Vert. Angles	**Horizontal Angles**								
	50	**55**	**60**	**65**	**70**	**75**	**80**	**85**	**90**
0.0	1104	1104	1104	1104	1104	1104	1104	1104	1104
1.0	1103	1103	1103	1103	1103	1104	1104	1104	1104
3.0	1100	1100	1100	1101	1101	1101	1101	1101	1101
5.0	1092	1093	1094	1095	1096	1096	1097	1097	1097
7.0	1080	1082	1084	1086	1087	1088	1089	1090	1090
9.0	1064	1068	1071	1074	1076	1078	1080	1081	1081
11.0	1045	1050	1054	1059	1062	1065	1067	1068	1069
13.0	1020	1028	1034	1040	1045	1049	1052	1054	1054
15.0	992	1001	1010	1018	1024	1030	1033	1036	1036

CANDELA TABULATION - (Cont.)

17.0	959	971	982	992	1000	1007	1012	1015	1016
19.5	911	927	942	954	965	974	980	984	985
22.5	845	866	884	901	915	926	934	939	940
25.5	770	796	819	840	857	870	880	885	887
29.0	675	705	733	758	778	794	805	812	814
33.0	560	593	624	652	675	693	706	713	716
37.5	432	465	497	526	550	569	582	590	592
42.5	305	334	363	388	410	428	440	447	450
47.5	205	228	249	269	288	301	311	317	319
55.0	105	118	130	141	151	159	165	169	170
65.0	42	47	51	56	59	63	65	67	67
75.0	15	17	18	20	21	22	23	24	24
85.0	3	3	3	4	4	4	4	4	4
90.0	0	0	0	0	0	0	0	0	0
95.0	26	27	27	27	27	28	27	27	27
100.0	72	73	75	76	77	78	78	78	78
105.0	131	134	137	139	141	142	143	144	144
110.0	205	209	212	216	219	221	222	223	223
115.0	291	297	301	306	309	312	314	315	315
120.0	390	396	402	407	411	414	416	417	418
125.0	499	506	512	517	520	524	526	528	529
130.0	613	619	624	629	633	636	639	641	641
135.0	725	730	734	738	741	744	747	749	749
140.0	828	832	835	838	841	843	846	847	848
145.0	919	921	924	926	928	931	933	934	935
150.0	996	997	999	1001	1003	1005	1007	1008	1008
155.0	1059	1060	1062	1063	1065	1066	1068	1069	1069
160.0	1110	1111	1112	1114	1115	1116	1117	1118	1118
165.0	1150	1151	1151	1152	1153	1154	1155	1155	1155
170.0	1178	1179	1179	1180	1180	1180	1181	1181	1181
175.0	1195	1196	1196	1196	1196	1196	1196	1196	1196
180.0	1201	1201	1201	1201	1201	1201	1201	1201	1201

IES INDOOR REPORT
PHOTOMETRIC FILENAME : L031805809R01.IES

ZONAL LUMEN SUMMARY

Zone	Lumens	%Lamp	%Fixt
0-20	360.35	N.A.	8.30
0-30	687.88	N.A.	15.90
0-40	954.33	N.A.	22.10
0-60	1266.89	N.A.	29.30
0-80	1362.48	N.A.	31.50
0-90	1372.75	N.A.	31.80
10-90	1289.02	N.A.	29.80
20-40	593.98	N.A.	13.70
20-50	811.13	N.A.	18.80
40-70	379.83	N.A.	8.80
60-80	95.59	N.A.	2.20
70-80	28.32	N.A.	0.70
80-90	10.27	N.A.	0.20
90-110	172.58	N.A.	4.00
90-120	458.85	N.A.	10.60
90-130	900.13	N.A.	20.80
90-150	2024.63	N.A.	46.80
90-180	2949.87	N.A.	68.20
110-180	2777.29	N.A.	64.30
0-180	4322.63	N.A.	100.00

Total Luminaire Efficiency = N.A.%

ZONAL LUMEN SUMMARY

Zone	Lumens
0-10	83.73
10-20	276.62
20-30	327.53
30-40	266.45
40-50	217.15
50-60	95.41
60-70	67.28
70-80	28.32
80-90	10.27
90-100	33.12
100-110	139.46
110-120	286.26
120-130	441.28
130-140	552.93
140-150	571.57
150-160	487.38
160-170	324.32
170-180	113.55

IES INDOOR REPORT
PHOTOMETRIC FILENAME : L031805809R01.IES

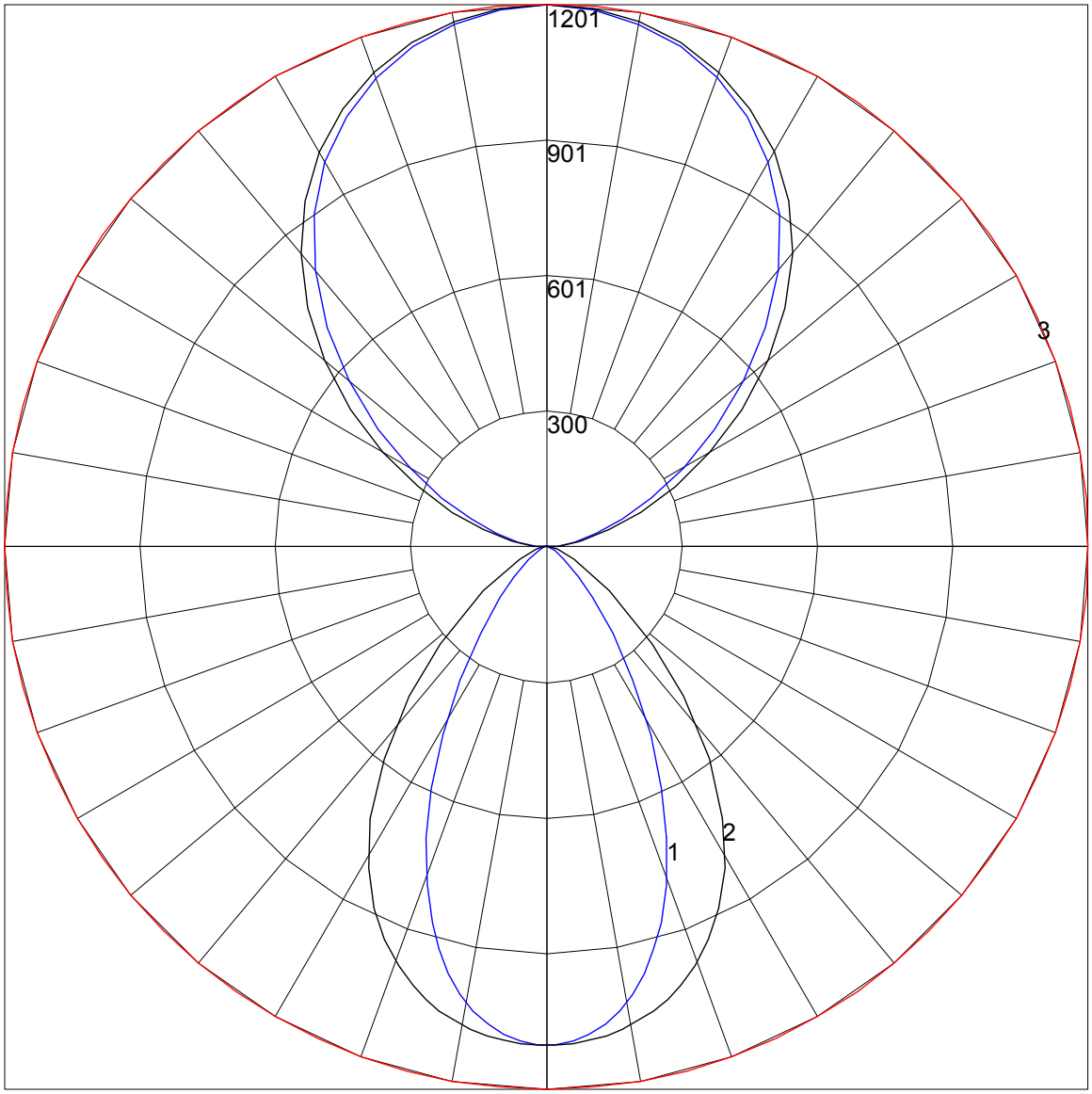
COEFFICIENTS OF UTILIZATION - ZONAL CAVITY METHOD

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	103	103	103	103	92	92	92	92	73	73	73	56	56	56	39	39	39	32
1	95	91	87	84	85	82	79	76	65	63	62	50	49	48	36	35	35	28
2	87	80	75	70	78	73	68	64	58	55	53	45	43	41	33	32	31	25
3	80	71	65	60	72	65	59	55	52	48	45	41	38	36	30	29	27	23
4	73	64	57	51	66	58	52	47	47	43	39	37	34	32	28	26	24	20
5	68	57	50	45	61	52	46	41	43	38	35	34	31	28	25	24	22	18
6	63	52	44	39	57	47	41	36	39	34	31	31	28	25	23	21	20	17
7	58	47	40	35	53	43	37	32	35	31	27	28	25	23	22	20	18	15
8	54	43	36	31	49	39	33	29	33	28	25	26	23	21	20	18	17	14
9	51	39	32	28	46	36	30	26	30	26	22	24	21	19	19	17	15	13
10	47	36	30	25	43	33	27	23	28	23	20	23	19	17	18	16	14	12

IES INDOOR REPORT
PHOTOMETRIC FILENAME : L031805809R01.IES

POLAR GRAPH



Maximum Candela = 1201 Located At Horizontal Angle = 0, Vertical Angle = 180
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 (180) (Through Max. Cd.)