IES File

Performance Summary

The performance data in black text is confirmed through third party testing (see the following Light Laboratory report for details). The performance data in grey text is calculated by Vode. For reference only.

ZipTwo LED - Zipper board™ with 120° Symmetric Lens, Standard Output

ZipTwo LED, 48", 3500K, Zipper board with 120° symmetric lens, standard output
707-Z2-4-48-X-X-X-X-Z-SO-35-S3-X-X

	2700K	3000K	3500K	4000K
Efficacy - Lumens per Watt	103	108	112	117
Total Lumens, 4' rail length (1219mm)	2804	2926	3048	3170
Lumens per foot (305mm)	701	731	762	792
Input Power (W), 4' rail length (1219mm)	27.3	27.3	27.3	27.3
Watts per foot (305mm)	6.9	6.9	6.9	6.9
CRI (>80min., 85 avg.)	-	-	84	-

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

NVLAP TESTING
NVLAP LAB CODE 200927-0

Report No: **L031700424** **Issue Date: 3/21/2017**

Report Prepared For: Vode Lighting
1206 E MacArthur Suite 3 Sonoma, CA 95476

Model Number: **707-Z2-48-Z-SO-35-S3-AL**

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: 3/15/17

Date of Tests: 3/20/17 - 3/21/17

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.

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NVLAP TESTING
NVLAP LAB CODE 200927-0

Test Summary	
Manufacturer:	Vode Lighting
Model Number:	707-Z2-48-Z-SO-35-S3-AL
Driver Model Number:	MEAN WELL HLG-40H-36A(700MA)
Total Lumens:	3047.61
Input Voltage (VAC/60Hz):	120.00
Input Current (Amp):	0.23
Input Power (W):	27.32
Input Power Factor:	0.99
Current ATHD @ 120V(%):	9%
Current ATHD @ 277V(%):	N/A
Efficacy:	112
Color Rendering Index (CRI):	84
Correlated Color Temperature (K):	3441
Chromaticity Coordinate x:	0.4099
Chromaticity Coordinate y:	0.3955
Ambient Temperature (°C):	25.0
Stabilization Time (Hours):	0:35
Total Operating Time (Hours):	1:25

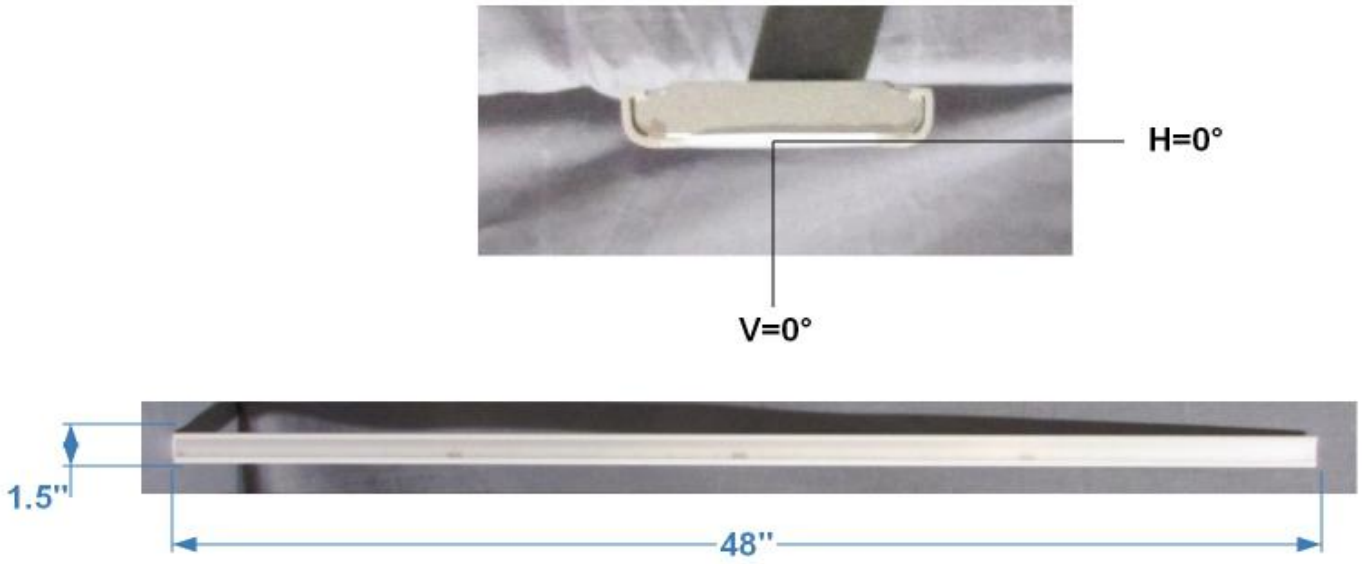

FIG. 1 LUMINAIRE

*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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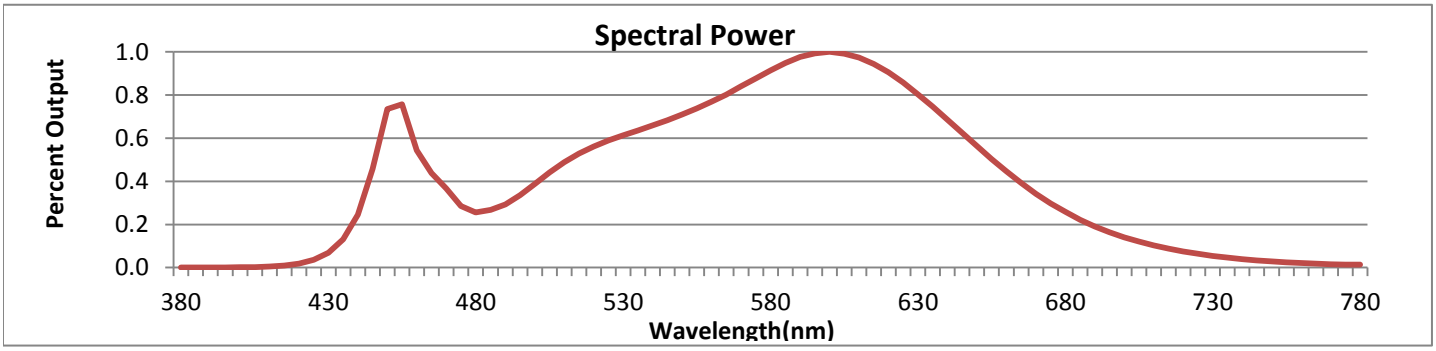
Report No: L031700424

NVLAP TESTING
NVLAP LAB CODE 200927-0



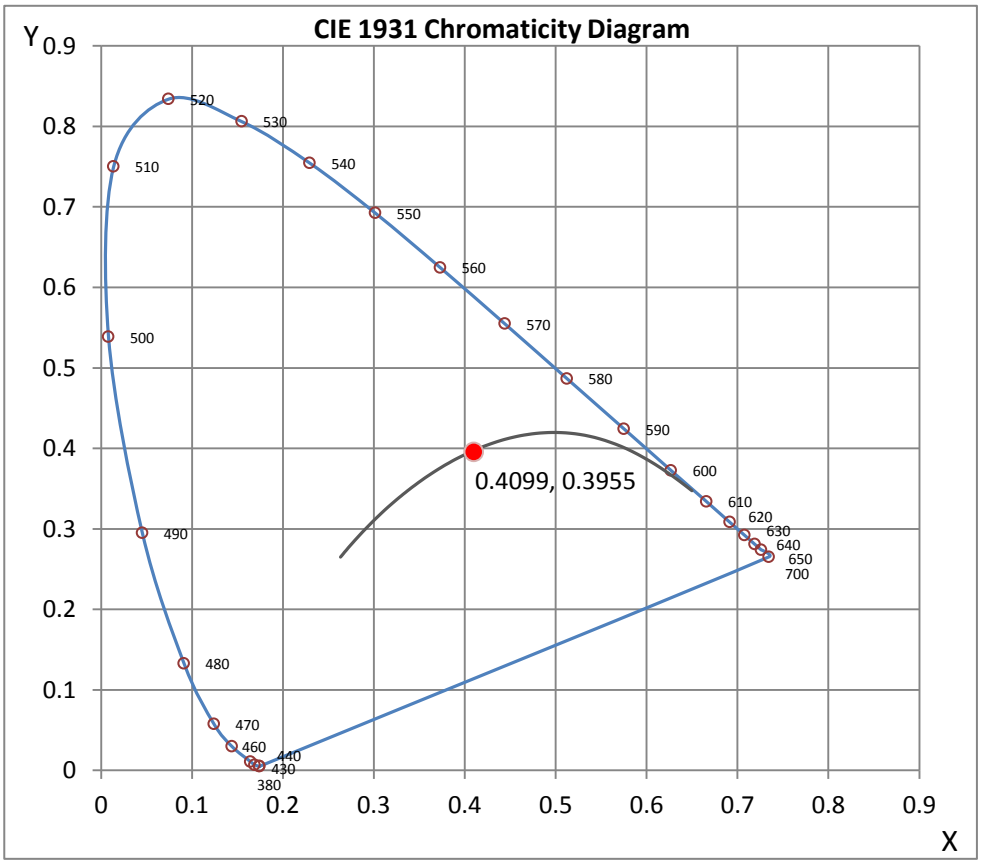
Wavelength	W/m²nm	440	0.2452	510	0.4893	580	0.9152	650	0.5637	720	0.0747
380	0.0009	450	0.7357	520	0.5617	590	0.9772	660	0.4467	730	0.0542
390	0.0009	460	0.5439	530	0.6138	600	1.0000	670	0.3421	740	0.0394
400	0.0015	470	0.3665	540	0.6594	610	0.9744	680	0.2580	750	0.0290
410	0.0044	480	0.2562	550	0.7093	620	0.9059	690	0.1912	760	0.0215
420	0.0187	490	0.2935	560	0.7687	630	0.8038	700	0.1404	770	0.0158
430	0.0688	500	0.3885	570	0.8403	640	0.6860	710	0.1027	780	0.0137

CRI & CCT

x	0.4099
y	0.3955
u'	0.2367
v'	0.5139
CRI	83.70
CCT	3441
Duv	0.00109

R Values

R1	82.17
R2	91.00
R3	96.72
R4	81.67
R5	81.79
R6	87.82
R7	85.06
R8	63.03
R9	11.50
R10	78.47
R11	80.69
R12	64.75
R13	84.43
R14	98.42



*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 : 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.

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Photometric Test Report

IES INDOOR REPORT
PHOTOMETRIC FILENAME : L031700424.IES

DESCRIPTION INFORMATION (From Photometric File)

IESNA:LM-63-2002
[TEST] L031700424
[TESTLAB] LIGHT LABORATORY, INC.
[ISSUEDATE] 3/21/2017
[MANUFAC] VODE LIGHTING
[LUMCAT] 707-Z2-48-Z-SO-35-S3-AL
[LUMINAIRE] ZIPTWO LED, 48", 3500K, ZIPPER BOARD,
[MORE] 120 DEG SYMMETRIC LENS,STANDARD OUTPUT (700MA)
[BALLASTCAT] MEAN WELL HLG-40H-36A(700MA)
[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, 27.32W
[TEST PROCEDURE] IESNA:LM-79-08

CHARACTERISTICS

Lumens Per Lamp	N.A. (absolute)
Total Lamp Lumens	N.A. (absolute)
Luminaire Lumens	3048
Total Luminaire Efficiency	N.A.
Luminaire Efficacy Rating (LER)	112
Total Luminaire Watts	27.32
Ballast Factor	1.00
CIE Type	Direct
Spacing Criterion (0-180)	1.60
Spacing Criterion (90-270)	1.16
Spacing Criterion (Diagonal)	1.54
Basic Luminous Shape	Rectangular
Luminous Length (0-180)	0.06 ft
Luminous Width (90-270)	4.00 ft
Luminous Height	0.00 ft

LUMINANCE DATA (cd/sq.m)

Angle In Degrees	Average 0-Deg	Average 45-Deg	Average 90-Deg
45	58425	51328	34028
55	54137	48825	32420
65	42410	39759	31383
75	29604	27873	26488
85	20564	17994	15937

IES INDOOR REPORT
PHOTOMETRIC FILENAME : L031700424.IES

CANDELA TABULATION

	0	5	10	15	20	25	30	35	40	45
0	972	972	972	972	972	972	972	972	972	972
5	976	976	976	975	975	975	974	973	973	972
10	997	996	995	993	991	988	985	981	977	973
15	1024	1023	1021	1017	1012	1007	1000	992	983	974
20	1046	1045	1042	1037	1030	1022	1011	1000	986	971
25	1057	1057	1053	1047	1039	1028	1015	999	981	961
30	1056	1055	1051	1045	1034	1022	1008	989	967	943
35	1036	1035	1031	1025	1015	1002	986	966	942	914
40	994	993	989	983	974	962	946	926	900	871
45	922	921	918	914	908	897	883	864	840	810
50	822	821	820	817	812	805	794	778	757	729
55	693	693	693	692	689	685	678	666	648	625
60	547	547	547	547	547	545	541	533	521	503
65	400	401	401	402	402	402	400	395	386	375
70	273	273	274	274	275	274	273	270	265	258
75	171	172	172	172	172	172	171	168	165	161
80	96	96	96	96	96	95	94	93	91	88
85	40	40	40	40	40	39	39	38	37	35
90	6	6	6	6	6	6	6	5	5	5

Vert. Angles	**Horizontal Angles**								
	50	**55**	**60**	**65**	**70**	**75**	**80**	**85**	**90**
0	972	972	972	972	972	972	972	972	972
5	971	971	970	969	969	968	968	968	968
10	969	965	961	957	954	951	949	948	948
15	964	954	945	935	928	921	916	913	912
20	955	938	922	906	892	880	871	865	863
25	939	916	892	868	848	830	816	808	805
30	915	885	855	824	797	773	755	744	740
35	881	847	810	773	740	712	689	676	671
40	836	797	756	715	678	647	623	608	603
45	774	734	692	650	612	580	556	542	537
50	694	656	616	576	542	513	492	479	474
55	595	562	528	497	469	446	429	418	415
60	481	456	432	411	392	377	366	359	357
65	360	346	333	322	313	305	300	297	296
70	250	243	237	233	231	229	229	228	228
75	157	154	152	151	151	152	152	153	153
80	86	84	83	83	83	82	82	83	83
85	34	34	33	32	32	31	31	31	31
90	4	4	4	4	4	4	3	3	3

IES INDOOR REPORT
PHOTOMETRIC FILENAME : L031700424.IES

ZONAL LUMEN SUMMARY

Zone	Lumens	%Lamp	%Fixt
0-20	367.41	N.A.	12.10
0-30	803.73	N.A.	26.40
0-40	1355.68	N.A.	44.50
0-60	2468.43	N.A.	81.00
0-80	3002.71	N.A.	98.50
0-90	3047.61	N.A.	100.00
10-90	2954.82	N.A.	97.00
20-40	988.27	N.A.	32.40
20-50	1578.62	N.A.	51.80
40-70	1471.44	N.A.	48.30
60-80	534.29	N.A.	17.50
70-80	175.59	N.A.	5.80
80-90	44.90	N.A.	1.50
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	3047.61	N.A.	100.00

Total Luminaire Efficiency = N.A.%

ZONAL LUMEN SUMMARY

Zone	Lumens
0-10	92.80
10-20	274.61
20-30	436.32
30-40	551.95
40-50	590.35
50-60	522.40
60-70	358.70
70-80	175.59
80-90	44.90
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 : L031700424.IES

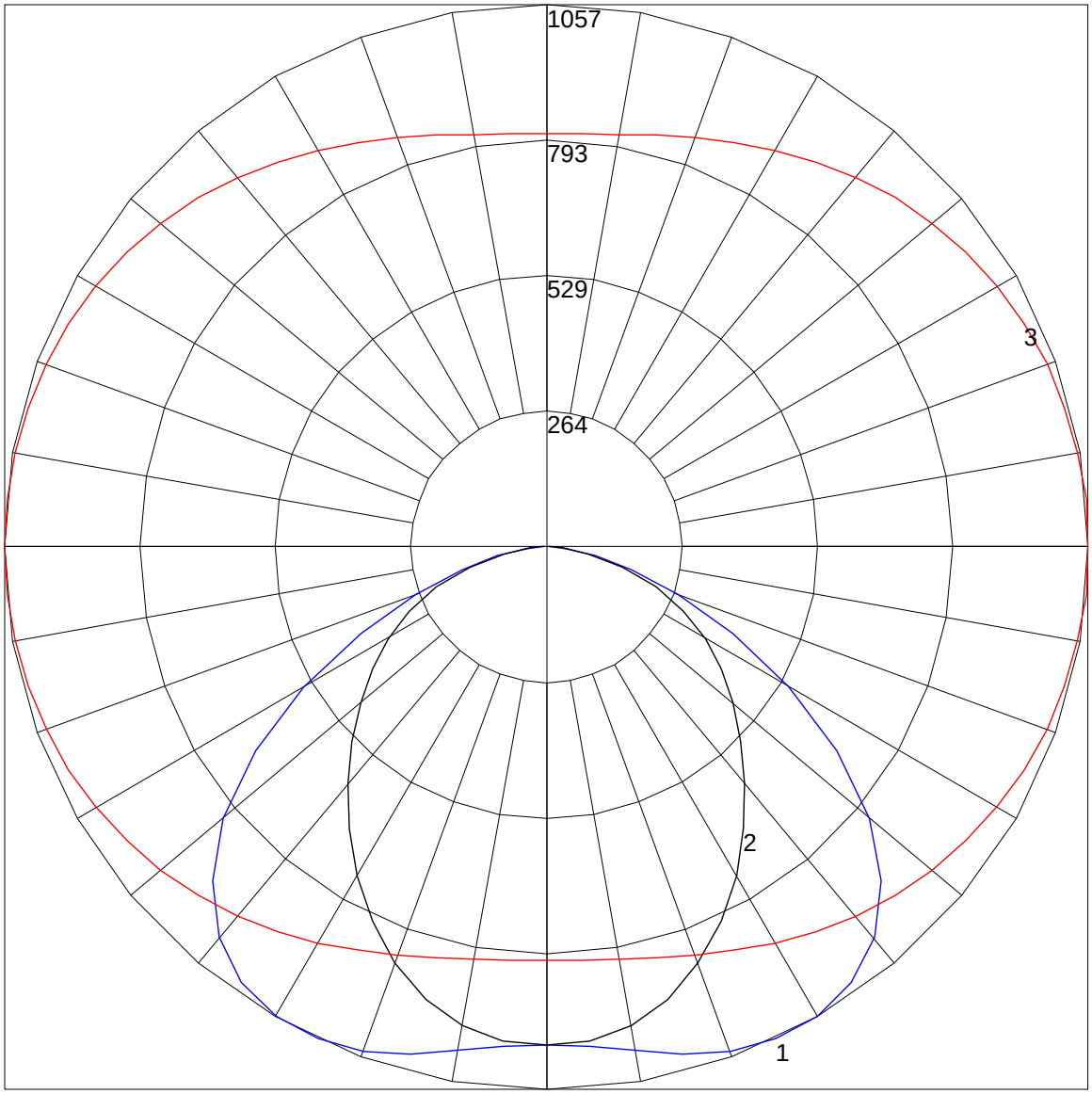
COEFFICIENTS OF UTILIZATION - ZONAL CAVITY METHOD

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	95	98	95	92	94	91	89	90	88	86	84
2	99	91	84	79	97	89	83	78	86	80	76	82	78	74	79	76	73	70
3	90	80	72	65	88	78	71	65	75	69	64	73	67	62	70	65	61	59
4	83	71	62	55	80	69	61	55	67	60	54	65	58	53	62	57	53	50
5	76	63	54	47	74	62	53	47	60	52	47	58	51	46	56	50	46	43
6	70	57	48	41	68	56	47	41	54	46	41	52	45	40	51	45	40	38
7	65	51	42	36	63	50	42	36	49	41	36	47	41	36	46	40	35	33
8	60	47	38	32	59	46	38	32	45	37	32	43	37	32	42	36	31	30
9	56	43	34	29	55	42	34	29	41	34	29	40	33	28	39	33	28	26
10	53	39	31	26	51	39	31	26	38	31	26	37	30	26	36	30	26	24

IES INDOOR REPORT
PHOTOMETRIC FILENAME : L031700424.IES

POLAR GRAPH



Maximum Candela = 1057 Located At Horizontal Angle = 0, Vertical Angle = 25
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 (25) (Through Max. Cd.)