



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

Test #: L10138201

Date: 10/28/2013



NVLAP LAB CODE 200927-0

Test Report: L10138201

Model Number: LUX-LED-360°-4R-UNV-URDL

Report Prepared For: LUX DYNAMICS - Phase III
 1350 Capitol Blvd. Reno, NV. 89502

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 LUX-LED-360°-4R-UNV-URDL. Received in working and undamaged condition. No modifications were necessary.

Testing Condition: Fixture is tested with no special conditions.

Sample Arrival Date: 10/17/13

Date of Tests: 10/28/13 - 10/28/13

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	01/04/14
Xitron Power Analysis System	2503AH	MT-EL01	01/09/14
Fluke Digital Thermometer	52k/J	MT-TP02-GC	01/04/14
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.

LM-79 Test Summary

Manufacturer:	LUX DYNAMICS - Phase III
Model Number:	LUX-LED-360°-4R-UNV-URDL
LAMPCAT:	N/A
Driver Model Number:	OSRAM OPTOTRONIC OT100W/4X600C/UNV/DIM
Total Lumens:	6975.98
Input Voltage (VAC/60Hz):	120.00
Input Current (Amp):	0.74
Input Power (W):	88.41
Input Power Factor:	1.00
Total Harmonic Distortion @ 120V(%):	8%
Total Harmonic Distortion @ 277V(%):	N/A
Efficacy:	79
Color Rendering Index (CRI):	85
Correlated Color Temperature (K):	4861
Chromaticity Coordinate x:	0.3497
Chromaticity Coordinate y:	0.3596
Ambient Temperature (°F):	77.0
Stabilization Time (Hours):	1:10
Total Operating Time (Hours):	2:00
Off State Power(W):	0.00

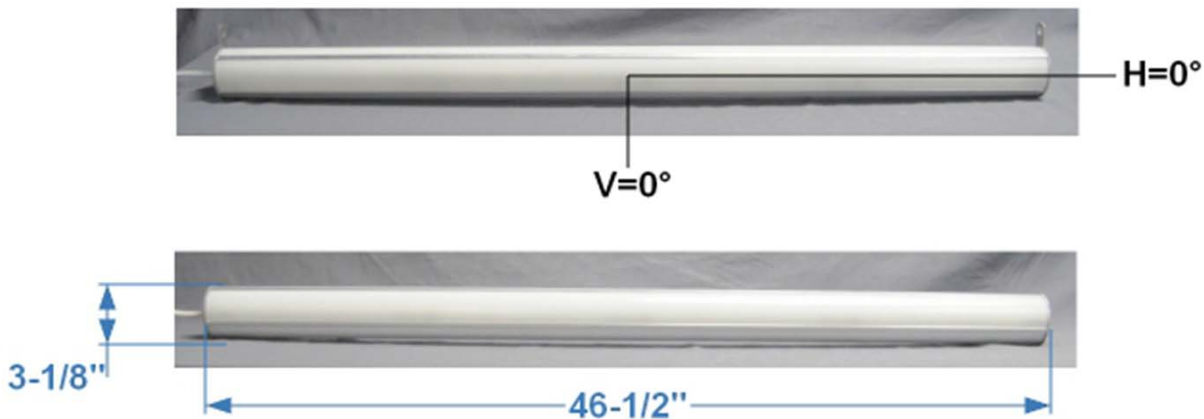
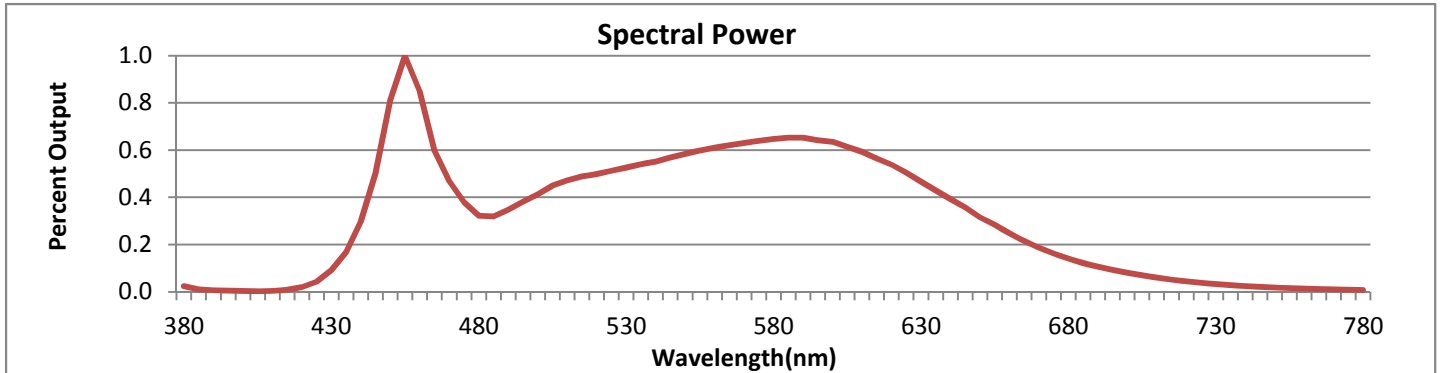


FIG1. LUMINAIRE

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



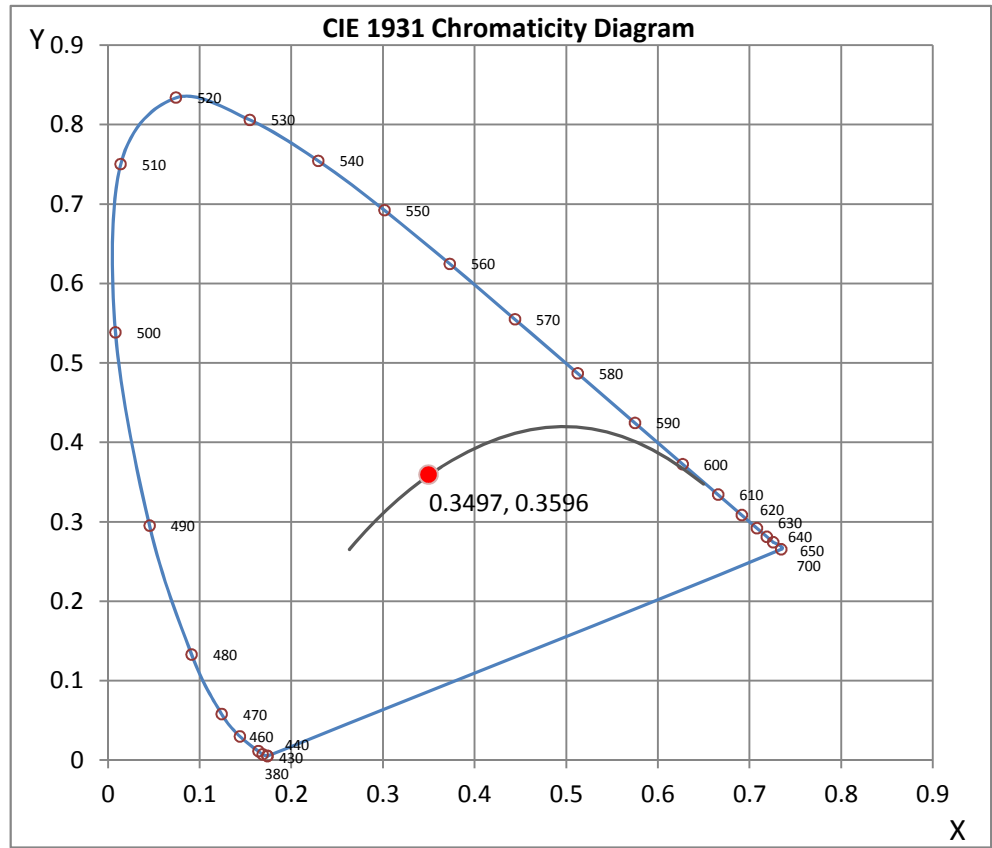
Wavelength	W/m ² nm	440	0.1341	510	0.2125	580	0.2924	650	0.1425	720	0.0199
380	0.0107	450	0.3661	520	0.2248	590	0.2945	660	0.1119	730	0.0146
390	0.0029	460	0.3832	530	0.2370	600	0.2866	670	0.0843	740	0.0109
400	0.0013	470	0.2122	540	0.2490	610	0.2679	680	0.0634	750	0.0080
410	0.0018	480	0.1451	550	0.2632	620	0.2430	690	0.0480	760	0.0061
420	0.0089	490	0.1567	560	0.2755	630	0.2111	700	0.0366	770	0.0044
430	0.0412	500	0.1864	570	0.2847	640	0.1771	710	0.0272	780	0.0033

CRI & CCT

x	0.3497
y	0.3596
u'	0.2114
v'	0.4892
CRI	84.70
CCT	4861
Duv	0.00217

R Values

R1	83.41
R2	92.69
R3	95.65
R4	80.77
R5	82.66
R6	87.88
R7	86.46
R8	67.92
R9	15.89
R10	81.60
R11	80.13
R12	59.10
R13	87.05
R14	97.86



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



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

Test #: L10138201

Date: 10/28/2013



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:

Test Report Reviewed by:

Jeff Ahn
 Engineering Manager

Steve Kang
 Quality Assurance

**Attached are photometric data reports. Total number of pages: 11*

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



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

Photometric Test Report

IES INDOOR REPORT
PHOTOMETRIC FILENAME : L10138201N.IES

DESCRIPTION INFORMATION (From Photometric File)

IESNA:LM-63-2002
[TEST] L010138201
[TESTLAB] LIGHT LABORATORY, INC.
[ISSUE DATE] 10/28/2013
[MANUFAC] LUX DYNAMICS
[LUMCAT] LUX-LED-360°-4R-UNV-URDL
[LUMINAIRE] 46-1/2"L. X 3-1/8"DIA. LED LUMINAIRE
[MORE] ACRYLIC LENS
[BALLASTCAT] OSRAM OPTOTRONIC OT100W/4X600C/UNV/DIM
[BALLAST] INPUT: 120-277VAC, 1.0-0.5A, 50/60Hz. OUTPUT: 100W, 10-40VDC, 4X600mA
[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, 88.41W
[_TEST PROCEDURE] IESNA:LM-79-08

CHARACTERISTICS

Lumens Per Lamp	N.A. (absolute)
Total Lamp Lumens	N.A. (absolute)
Luminaire Lumens	6976
Total Luminaire Efficiency	N.A.
Luminaire Efficacy Rating (LER)	79
Total Luminaire Watts	88.41
Ballast Factor	1.00
CIE Type	General Diffuse
Spacing Criterion (0-180)	N.A.
Spacing Criterion (90-270)	N.A.
Spacing Criterion (Diagonal)	N.A.
Basic Luminous Shape	Hor. Cylinder Along Length
Luminous Length (0-180)	3.88 ft
Luminous Width (90-270)	0.26 ft (Diameter)
Luminous Height	0.26 ft (Diameter)

IES INDOOR REPORT
PHOTOMETRIC FILENAME : L10138201N.IES

LUMINANCE DATA (cd/sq.m)

Angle In Degrees	Average 0-Deg	Average 45-Deg	Average 90-Deg
45	139212	9113	7888
55	91241	8440	7888
65	56542	7842	7803
75	26841	7288	7803
85	5490	7019	7782

**IES INDOOR REPORT
PHOTOMETRIC FILENAME : L10138201N.IES**

CANDELA TABULATION

	<u>0</u>	<u>5</u>	<u>10</u>	<u>15</u>	<u>20</u>	<u>25</u>	<u>30</u>	<u>35</u>	<u>40</u>	<u>45</u>
0	716	716	716	716	716	716	716	716	716	716
5	717	717	717	717	717	717	718	718	718	718
10	708	708	708	709	709	710	711	712	713	714
15	693	693	693	694	696	698	700	702	705	707
20	670	671	672	674	676	680	683	687	691	695
25	643	643	645	648	652	657	663	669	676	682
30	609	610	612	617	623	630	638	647	656	666
35	579	580	584	590	598	608	619	632	645	659
40	535	536	541	549	561	574	588	605	624	643
45	486	488	495	505	519	536	556	579	603	627
50	426	428	437	451	469	491	517	546	574	601
55	369	373	384	402	427	456	488	521	553	584
60	311	315	330	351	382	417	453	490	526	561
65	253	259	279	307	344	384	425	467	507	545
70	190	198	223	258	301	346	392	438	482	524
75	128	139	171	212	260	311	362	412	461	508
80	73	88	126	173	227	284	337	394	448	498
85	27	47	91	144	204	266	325	383	439	490
90	8	29	77	132	194	257	320	378	434	487
95	27	47	91	144	204	266	325	383	439	490
100	73	88	126	173	227	284	337	394	448	498
105	128	139	171	212	260	311	362	412	461	508
110	190	198	223	258	301	346	392	438	482	524
115	253	259	279	307	344	384	425	467	507	545
120	311	315	330	351	382	417	453	490	526	561
125	369	373	384	402	427	456	488	521	553	584
130	426	428	437	451	469	491	517	546	574	601
135	486	488	495	505	519	536	556	579	603	627
140	535	536	541	549	561	574	588	605	624	643
145	579	580	584	590	598	608	619	632	645	659
150	609	610	612	617	623	630	638	647	656	666
155	643	643	645	648	652	657	663	669	676	682
160	670	671	672	674	676	680	683	687	691	695
165	693	693	693	694	696	698	700	702	705	707
170	708	708	708	709	709	710	711	712	713	714
175	717	717	717	717	717	718	718	718	718	718
180	716	716	716	716	716	716	716	716	716	716

Vert. Horizontal Angles

	<u>50</u>	<u>55</u>	<u>60</u>	<u>65</u>	<u>70</u>	<u>75</u>	<u>80</u>	<u>85</u>	<u>90</u>
0	716	716	716	716	716	716	716	716	716
5	719	719	719	719	719	720	720	719	720
10	716	717	718	719	719	720	720	721	721
15	709	712	714	716	717	719	719	720	720
20	700	704	707	711	714	716	717	718	719
25	689	695	700	706	710	714	716	718	718
30	675	685	694	702	709	715	719	722	723
35	673	687	700	712	722	730	735	739	740
40	662	680	696	711	722	732	739	743	744
45	650	671	690	707	721	732	740	745	740
50	627	652	673	692	708	721	730	735	743
55	614	642	666	687	705	719	729	735	740
60	594	627	654	677	697	713	724	731	736

**IES INDOOR REPORT
PHOTOMETRIC FILENAME : L10138201N.IES**

CANDELA TABULATION - (Cont.)

65	582	615	644	671	692	709	722	729	732
70	564	601	633	663	687	707	720	728	731
75	552	592	628	660	685	706	720	729	732
80	545	587	624	657	683	704	720	729	731
85	538	581	620	653	680	702	718	727	730
90	536	579	618	653	681	703	719	728	731
95	538	581	620	653	680	702	718	727	730
100	545	587	624	657	683	704	720	729	731
105	552	592	628	660	685	706	720	729	732
110	564	601	633	663	687	707	720	728	731
115	582	615	644	671	692	709	722	729	732
120	594	627	654	677	697	713	724	731	736
125	614	642	666	687	705	719	729	735	740
130	627	652	673	692	708	721	730	735	743
135	650	671	690	707	721	732	740	745	740
140	662	680	696	711	722	732	739	743	744
145	673	687	700	712	722	730	735	739	740
150	675	685	694	702	709	715	719	722	723
155	689	695	700	706	710	714	716	718	718
160	700	704	707	711	714	716	717	718	719
165	709	712	714	716	717	719	719	720	720
170	716	717	718	719	719	720	720	721	721
175	719	719	719	719	719	720	720	719	720
180	716	716	716	716	716	716	716	716	716

IES INDOOR REPORT
PHOTOMETRIC FILENAME : L10138201N.IES

ZONAL LUMEN SUMMARY

Zone	Lumens	%Lamp	%Fixt
0-20	268.22	N.A.	3.80
0-30	583.06	N.A.	8.40
0-40	995.31	N.A.	14.30
0-60	1982.99	N.A.	28.40
0-80	3001.67	N.A.	43.00
0-90	3487.99	N.A.	50.00
10-90	3419.59	N.A.	49.00
20-40	727.09	N.A.	10.40
20-50	1205.7	N.A.	17.30
40-70	1503.58	N.A.	21.60
60-80	1018.69	N.A.	14.60
70-80	502.79	N.A.	7.20
80-90	486.31	N.A.	7.00
90-110	989.11	N.A.	14.20
90-120	1505.00	N.A.	21.60
90-130	2014.07	N.A.	28.90
90-150	2904.93	N.A.	41.60
90-180	3487.99	N.A.	50.00
110-180	2498.88	N.A.	35.80
0-180	6975.98	N.A.	100.00

Total Luminaire Efficiency = N.A.%

ZONAL LUMEN SUMMARY

Zone	Lumens
0-10	68.40
10-20	199.82
20-30	314.84
30-40	412.25
40-50	478.61
50-60	509.07
60-70	515.90
70-80	502.79
80-90	486.31
90-100	486.31
100-110	502.79
110-120	515.90
120-130	509.07
130-140	478.61
140-150	412.25
150-160	314.84
160-170	199.82
170-180	68.40

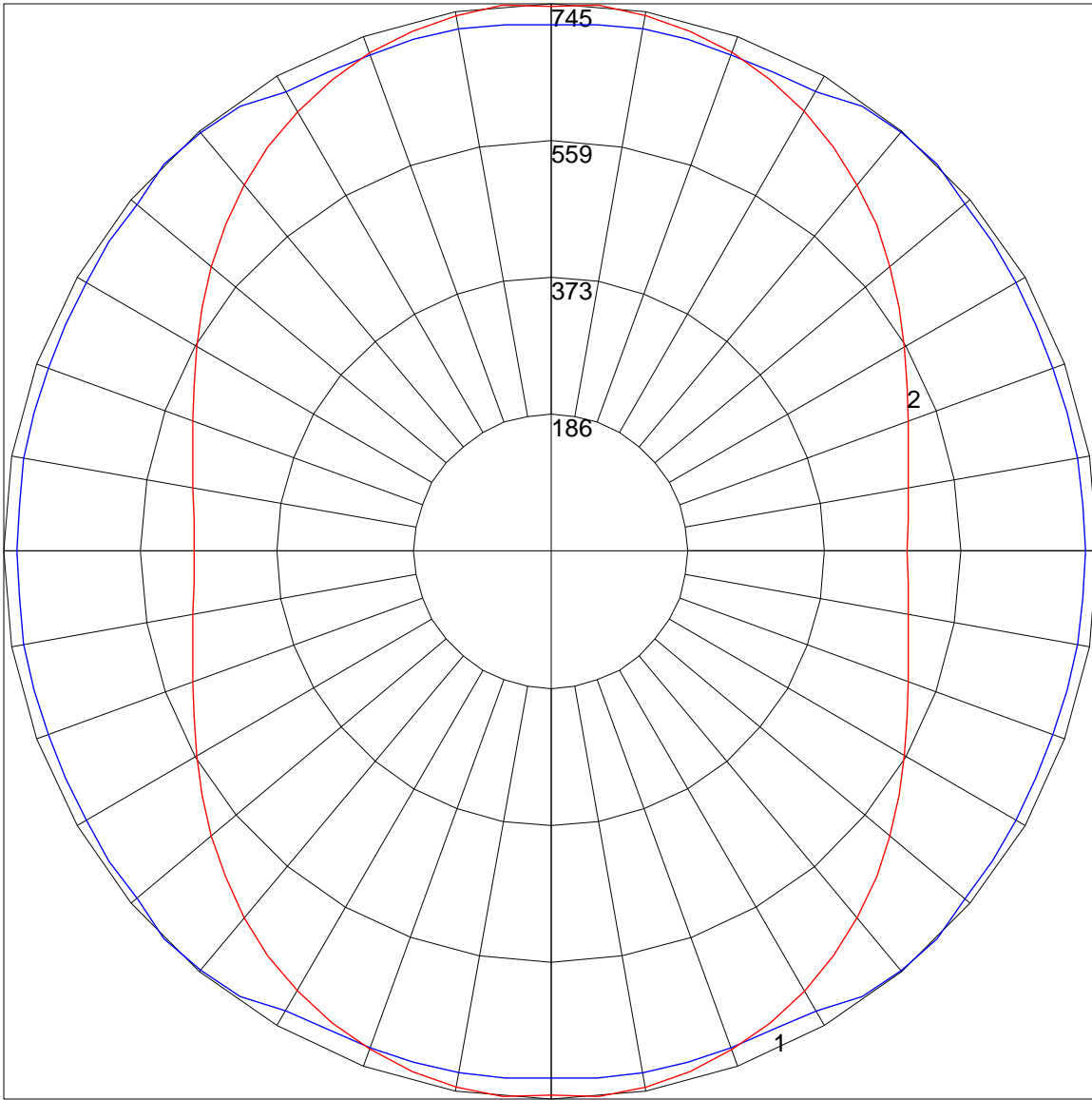
IES INDOOR REPORT
PHOTOMETRIC FILENAME : L10138201N.IES

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	
0	107	107	107	107	99	99	99	99	83	83	83	69	69	69	56	56	56	50
1	95	89	84	79	87	82	77	73	68	65	62	56	53	51	44	43	41	35
2	85	76	68	62	77	70	63	58	58	53	49	47	43	40	37	35	32	27
3	77	66	57	50	70	60	53	47	50	44	40	41	36	33	32	29	26	22
4	70	58	49	42	64	53	45	39	44	38	33	36	31	27	28	25	22	18
5	64	51	42	35	58	47	39	33	39	33	28	32	27	23	25	21	18	15
6	59	45	37	30	53	42	34	28	35	29	24	29	24	20	23	19	16	13
7	54	41	32	26	49	38	30	24	32	25	21	26	21	17	21	17	14	11
8	50	37	29	23	46	34	27	21	29	23	18	24	19	15	19	15	12	10
9	46	33	26	20	42	31	24	19	26	20	16	22	17	14	17	14	11	9
10	43	31	23	18	40	28	21	17	24	18	14	20	15	12	16	12	10	8

POLAR GRAPH



Maximum Candela = 745 Located At Horizontal Angle = 85, Vertical Angle = 45
1 - Vertical Plane Through Horizontal Angles (85 - 265) (Through Max. Cd.)
2 - Horizontal Cone Through Vertical Angle (45) (Through Max. Cd.)