



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

Report No: L011705601



Report No: L011705601

Issue Date: 2/1/2017

Report Prepared For: Cerno LLC
1751 Mc Gaw Ave. Irvine, CA 92614

Model Number: 03-130-W

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. Catalog number is 03-130-W. Received in working and undamaged condition. No modifications were necessary.

Testing Condition: Fixture is tested with no special conditions.

Sample Arrival Date: 1/26/17

Date of Tests: 1/30/17 - 1/30/17

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.

Test Summary

Manufacturer:	Cerno LLC
Model Number:	03-130-W
Driver Model Number:	ROAL RLDD015L-700
Total Lumens:	588.70
Input Voltage (VAC/60Hz):	120.00
Input Current (Amp):	0.14
Input Power (W):	15.65
Input Power Factor:	0.99
Current ATHD @ 120V(%):	20%
Current ATHD @ 277V(%):	N/A
Efficacy:	38
Color Rendering Index (CRI):	94
Correlated Color Temperature (K):	2677
Chromaticity Coordinate x:	0.4621
Chromaticity Coordinate y:	0.4115
Ambient Temperature (°C):	25.0
Stabilization Time (Hours):	0:30
Total Operating Time (Hours):	2:55
Off State Power(W):	0.00

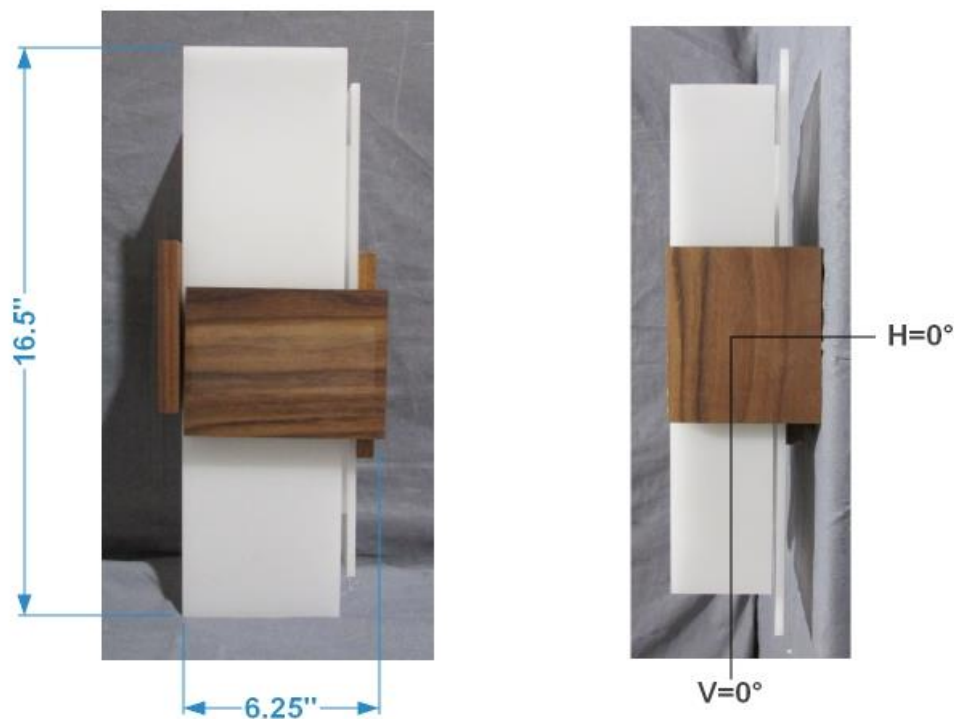
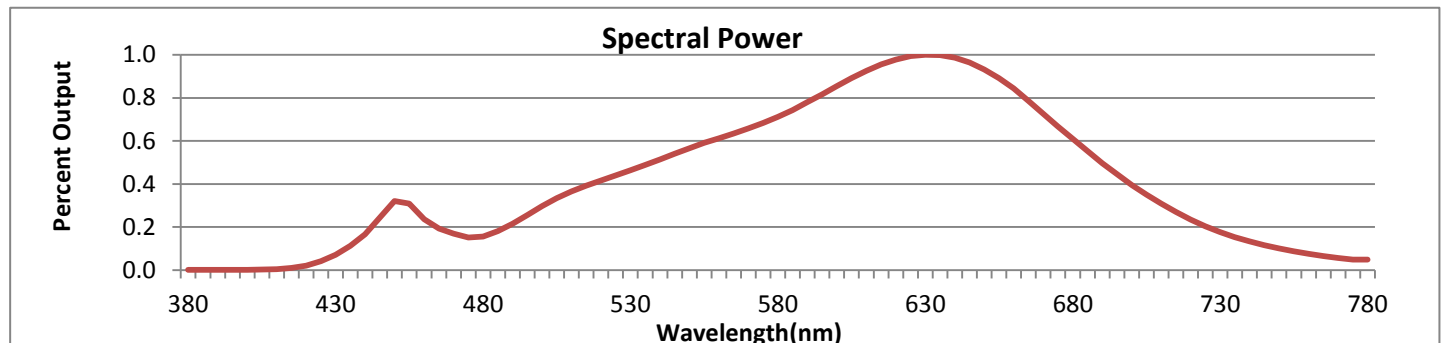


FIG. 1 LUMINAIRE



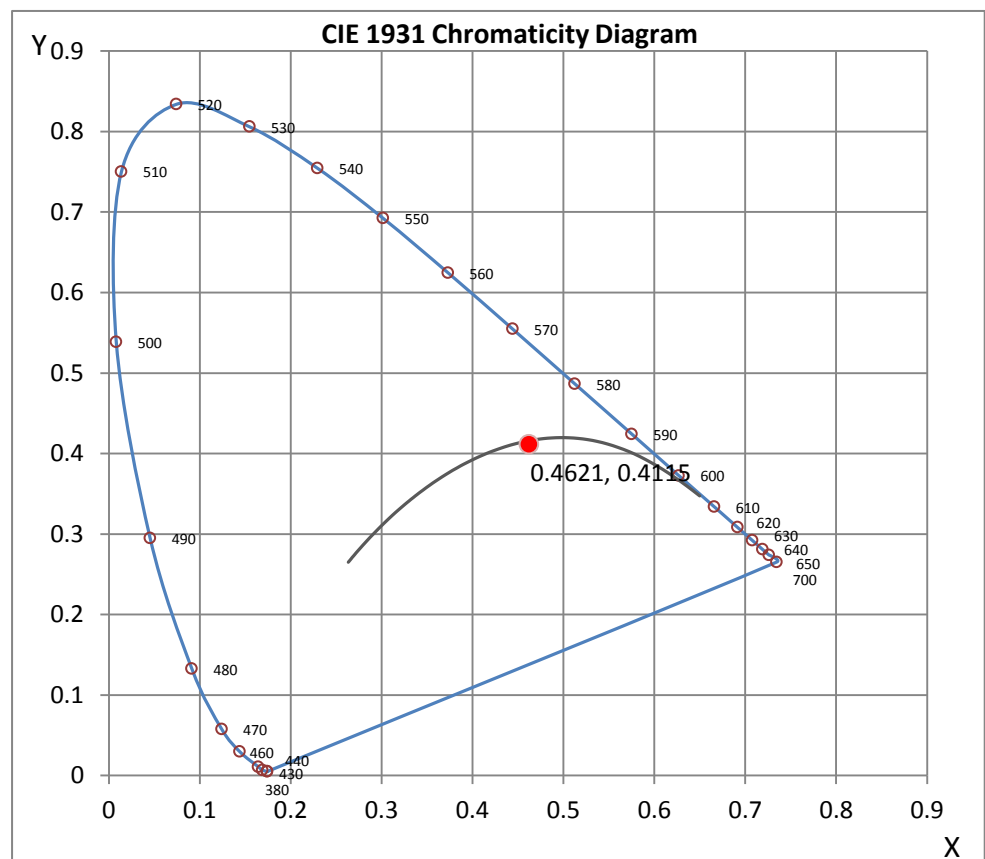
Wavelength	W/m ² nm	440	0.1663	510	0.3657	580	0.7121	650	0.9322	720	0.2352
380	0.0008	450	0.3203	520	0.4162	590	0.7795	660	0.8435	730	0.1761
390	0.0009	460	0.2356	530	0.4632	600	0.8551	670	0.7266	740	0.1328
400	0.0012	470	0.1694	540	0.5146	610	0.9265	680	0.6103	750	0.1006
410	0.0042	480	0.1562	550	0.5667	620	0.9783	690	0.4969	760	0.0754
420	0.0210	490	0.2158	560	0.6128	630	1.0000	700	0.3955	770	0.0562
430	0.0712	500	0.2973	570	0.6588	640	0.9873	710	0.3085	780	0.0483

CRI & CCT

x	0.4621
y	0.4115
u'	0.2635
v'	0.5280
CRI	94.10
CCT	2677
Duv	0.00016

R Values

R1	94.49
R2	96.30
R3	96.42
R4	94.90
R5	93.98
R6	95.57
R7	94.33
R8	86.61
R9	70.04
R10	90.31
R11	95.71
R12	85.61
R13	94.88
R14	97.05





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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 : JEFF AHN

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: 19*

**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 : L011705601.IES

DESCRIPTION INFORMATION (From Photometric File)

IESNA:LM-63-2002
[TEST] L011705601
[TESTLAB] LIGHT LABORATORY, INC.
[ISSUEDATE] 2/1/2017
[MANUFAC] Cerno LLC
[LUMCAT] 03-130-W
[LUMINAIRE] Acuo Sconce
[BALLASTCAT] ROAL RLDD015L-700
[OTHER] INDICATING THE CANDELA VALUES ARE ABSOLUTE AND
[MORE] SHOULD NOT BE FACTORED FOR DIFFERENT LAMP RATINGS.
[_INPUT] 120VAC, 15.65W
[_TEST PROCEDURE] IESNA:LM-79-08

CHARACTERISTICS

Lumens Per Lamp	N.A. (absolute)
Total Lamp Lumens	N.A. (absolute)
Luminaire Lumens	589
Total Luminaire Efficiency	N.A.
Luminaire Efficacy Rating (LER)	38
Total Luminaire Watts	15.65
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	Rectangular w/Sides
Luminous Length (0-180)	0.10 ft
Luminous Width (90-270)	0.10 ft
Luminous Height	0.35 ft

LUMINANCE DATA (cd/sq.m)

Angle In Degrees	Average 0-Deg	Average 45-Deg	Average 90-Deg
45	16562	12449	11568
55	18829	12790	9897
65	21183	13743	8853
75	23515	14858	8671
85	25732	15936	8768

IES INDOOR REPORT
PHOTOMETRIC FILENAME : L011705601.IES

CANDELA TABULATION

	0	5	10	15	20	25	30	35	40	45
0.0	118.376	118.376	118.376	118.376	118.376	118.376	118.376	118.376	118.376	118.376
2.5	122.001	121.983	121.930	121.843	121.722	121.580	121.433	121.257	121.207	120.921
5.0	127.135	127.082	126.940	126.745	126.474	126.138	125.777	125.335	124.937	124.548
7.5	134.402	134.285	134.036	133.669	133.185	132.558	131.809	130.862	129.965	129.103
10.0	143.161	143.130	142.660	142.219	141.555	140.638	139.486	138.114	136.555	134.828
12.5	135.061	135.537	137.593	141.129	142.511	143.043	143.766	144.713	143.706	141.340
15.0	95.944	96.643	99.651	104.704	111.710	119.081	128.055	138.663	143.201	144.901
17.5	63.489	63.964	65.840	69.026	73.159	79.679	91.960	105.878	120.481	136.896
20.0	56.801	56.670	57.185	57.868	58.508	59.066	65.376	72.333	87.465	106.616
22.5	52.579	52.811	53.843	55.011	56.088	57.674	58.783	59.458	65.913	77.745
25.0	45.304	45.539	46.363	47.471	49.621	52.711	55.772	58.687	60.091	67.091
27.5	42.162	42.365	42.984	43.923	45.075	46.507	48.888	54.360	58.773	65.387
30.0	39.178	39.634	40.585	41.708	42.574	44.348	46.829	49.934	56.653	62.043
32.5	40.179	40.556	41.042	41.329	41.332	42.456	44.786	50.123	54.718	55.703
35.0	41.179	41.707	42.363	42.777	42.921	43.263	44.717	48.991	51.536	50.235
37.5	43.057	43.641	44.249	44.522	44.611	45.153	46.764	48.422	48.302	46.640
40.0	44.935	45.634	46.301	46.623	46.747	47.076	48.219	49.097	47.515	46.142
42.5	46.971	47.748	48.457	48.779	48.834	49.280	49.916	50.227	48.576	47.272
45.0	49.007	49.881	50.755	51.138	51.276	51.479	52.023	52.157	50.530	48.703
47.5	51.904	52.837	53.480	53.645	53.835	54.023	54.146	54.069	52.203	50.080
50.0	54.800	55.869	56.452	56.617	56.626	56.657	56.825	56.259	53.924	51.477
52.5	57.521	58.658	59.365	59.534	59.460	59.480	59.408	58.674	56.141	53.257
55.0	60.241	61.469	62.243	62.358	62.323	62.297	62.042	60.988	58.193	55.046
57.5	63.015	64.275	65.057	65.157	65.136	65.042	64.797	63.406	60.240	56.927
60.0	65.788	67.090	67.868	67.989	67.834	67.678	67.211	65.849	62.430	58.956
62.5	68.298	69.694	70.559	70.760	70.663	70.417	69.758	67.965	64.639	60.901
65.0	70.808	72.307	73.174	73.479	73.278	72.993	72.326	70.183	66.593	62.731
67.5	73.213	74.730	75.720	76.092	76.013	75.534	74.509	72.409	68.556	64.537
70.0	75.618	77.153	78.178	78.666	78.529	77.964	76.654	74.533	70.461	66.332
72.5	77.601	79.332	80.745	81.040	80.767	80.231	78.910	76.295	72.304	68.076
75.0	79.584	81.423	82.835	83.352	83.058	82.194	80.775	77.983	73.986	69.634
77.5	81.305	83.297	84.996	85.434	84.997	83.983	82.277	79.442	75.447	71.059
80.0	83.025	85.155	86.934	87.175	86.586	85.468	83.613	80.828	76.737	72.335
82.5	84.271	86.945	88.680	88.729	87.895	86.756	84.760	81.877	77.889	73.463
85.0	85.517	88.735	90.162	89.991	89.042	87.789	85.715	82.722	78.770	74.364
87.5	86.742	90.410	91.105	90.898	89.879	88.568	86.396	83.339	79.491	75.173
90.0	87.967	90.853	91.520	91.275	90.292	88.923	86.641	83.411	79.760	75.477
92.5	86.778	90.470	91.279	91.100	90.017	88.564	86.395	83.103	79.491	75.262
95.0	85.588	89.099	90.395	90.377	89.333	87.935	85.678	82.441	78.826	74.639
97.5	84.500	87.584	89.114	89.286	88.429	87.055	84.813	81.551	78.044	73.875
100.0	83.411	85.964	87.667	87.923	87.181	85.868	83.640	80.536	77.009	72.944
102.5	81.919	84.360	85.923	86.402	85.697	84.449	82.261	79.285	75.808	71.846
105.0	80.427	82.723	84.009	84.527	83.858	82.816	80.718	77.812	74.370	70.531
107.5	78.619	80.767	82.144	82.441	81.968	81.024	78.953	76.116	72.800	68.972
110.0	76.811	78.745	79.737	80.316	79.844	78.845	76.984	74.262	70.999	67.384
112.5	74.600	76.457	77.472	77.840	77.524	76.500	74.722	72.204	69.123	65.633
115.0	72.388	74.129	75.007	75.386	75.024	74.111	72.426	70.009	67.070	63.789
117.5	70.001	71.632	72.549	72.767	72.334	71.493	70.025	67.675	64.951	61.750
120.0	67.613	69.085	69.842	69.948	69.567	68.924	67.469	65.273	62.638	59.669
122.5	64.858	66.229	66.988	67.173	66.793	66.161	64.728	62.689	60.331	57.496
125.0	62.102	63.338	64.054	64.266	63.883	63.229	61.907	60.097	57.877	55.259
127.5	59.294	60.480	61.175	61.360	60.986	60.316	59.106	57.447	55.448	53.096
130.0	56.485	57.526	58.127	58.266	57.891	57.367	56.284	54.819	53.104	51.006
132.5	53.501	54.440	54.969	55.138	55.037	54.578	53.606	52.327	50.761	48.915

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CANDELA TABULATION - (Cont.)

135.0	50.517	51.434	52.061	52.408	52.414	51.864	51.113	49.934	48.544	46.810
137.5	48.218	49.032	49.571	49.816	49.859	49.368	48.688	47.621	46.298	44.791
140.0	45.918	46.633	47.137	47.286	47.302	46.952	46.253	45.358	44.144	42.814
142.5	43.566	44.215	44.664	44.824	44.781	44.503	43.919	43.146	42.074	40.978
145.0	41.214	41.812	42.213	42.407	42.341	42.125	41.647	41.025	40.197	39.332
147.5	39.003	39.481	39.903	40.026	39.905	39.813	39.906	39.983	38.735	38.013
150.0	36.791	37.164	37.627	37.799	37.794	37.804	38.871	41.443	40.324	38.048
152.5	34.895	35.282	35.730	35.927	36.354	37.505	40.325	46.403	48.112	43.321
155.0	35.246	35.749	36.645	37.491	40.109	43.597	46.681	50.750	57.230	56.139
157.5	42.653	43.358	44.936	46.113	46.846	48.170	52.549	58.595	62.983	68.127
160.0	47.006	47.306	49.474	51.969	55.184	59.255	61.383	63.919	68.559	75.041
162.5	58.898	59.342	60.099	61.034	62.200	64.367	68.734	73.083	89.710	112.659
165.0	67.947	68.545	70.058	72.213	74.828	85.659	99.973	116.283	132.370	149.633
167.5	111.303	112.536	116.178	122.032	128.427	136.145	145.602	156.665	159.639	158.012
170.0	159.064	159.095	158.810	158.522	158.093	157.479	156.653	155.742	152.937	148.826
172.5	149.497	149.357	148.844	147.981	146.817	145.257	143.350	141.026	138.993	137.172
175.0	133.735	133.666	133.414	133.075	132.593	131.943	131.152	130.207	129.586	129.144
177.5	125.424	125.419	125.370	125.278	125.142	124.959	124.830	124.637	124.600	124.401
180.0	121.000	121.000	121.000	121.000	121.000	121.000	121.000	121.000	121.000	121.000

Vert. Angles **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>	<u>95</u>
0.0	118.376	118.376	118.376	118.376	118.376	118.376	118.376	118.376	118.376	118.376
2.5	120.745	120.520	120.303	120.069	119.821	119.560	119.287	119.003	118.710	118.674
5.0	124.103	123.600	123.038	122.430	121.908	121.410	120.922	120.353	119.780	119.688
7.5	128.154	127.114	126.129	125.247	124.309	123.430	122.576	121.772	120.939	120.783
10.0	132.924	131.100	129.565	127.925	126.564	125.298	124.087	123.053	121.957	121.713
12.5	138.719	135.998	133.091	130.854	128.774	127.106	125.556	124.274	122.993	122.642
15.0	144.744	141.323	137.714	133.986	131.173	128.696	126.929	125.375	123.923	123.447
17.5	143.503	146.896	142.379	137.927	133.595	130.384	128.109	126.309	124.713	124.144
20.0	128.170	142.630	146.861	141.613	136.123	131.594	128.498	126.474	124.765	124.165
22.5	104.258	132.471	145.907	144.448	136.853	129.493	124.071	121.367	119.184	119.488
25.0	90.221	126.783	143.730	136.305	121.670	108.142	97.812	92.408	90.994	92.258
27.5	85.109	109.166	114.647	100.619	81.632	69.347	60.149	55.932	54.326	55.716
30.0	70.919	76.153	71.817	60.186	50.441	42.177	38.314	35.148	34.298	33.991
32.5	53.866	50.132	43.643	38.518	38.155	37.035	35.253	33.873	32.578	32.238
35.0	45.520	40.642	38.091	36.621	37.314	37.003	35.433	34.078	32.789	32.419
37.5	43.393	40.634	38.911	37.015	36.685	37.091	35.724	34.388	33.052	32.689
40.0	43.755	41.590	39.817	37.855	36.773	37.464	36.494	35.053	33.666	33.266
42.5	44.762	42.794	40.895	38.913	37.279	37.700	37.163	35.609	34.106	33.687
45.0	46.150	44.103	42.042	39.863	37.953	37.649	37.582	35.872	34.228	33.798
47.5	47.589	45.439	43.186	40.743	38.753	37.589	37.709	35.821	34.088	33.660
50.0	48.986	46.783	44.242	41.605	39.367	37.745	37.766	35.663	33.737	33.368
52.5	50.593	48.120	45.314	42.430	39.975	37.970	37.684	35.325	33.210	32.902
55.0	52.191	49.443	46.465	43.327	40.575	37.998	36.327	33.821	31.665	31.534
57.5	53.814	50.735	47.566	44.158	41.029	37.817	34.812	32.307	30.156	29.936
60.0	55.504	52.139	48.795	45.088	41.654	38.166	34.895	32.207	29.875	29.559
62.5	57.243	53.648	49.973	46.055	42.329	38.673	35.144	32.238	29.717	29.417
65.0	58.937	55.051	51.086	47.009	43.057	39.206	35.435	32.300	29.594	29.294
67.5	60.543	56.410	52.290	47.979	43.869	39.743	35.726	32.350	29.472	29.196
70.0	62.149	57.827	53.443	48.951	44.617	40.350	36.093	32.483	29.419	29.101
72.5	63.740	59.255	54.604	49.963	45.418	40.938	36.504	32.649	29.383	29.076
75.0	65.263	60.624	55.828	51.012	46.270	41.564	36.901	32.806	29.348	29.023
77.5	66.629	61.931	57.023	52.048	47.040	42.132	37.277	33.003	29.296	28.963
80.0	67.897	63.106	58.106	52.975	47.829	42.733	37.641	33.157	29.278	28.914

IES INDOOR REPORT
PHOTOMETRIC FILENAME : L011705601.IES

CANDELA TABULATION - (Cont.)

82.5	68.972	64.103	59.060	53.807	48.533	43.230	38.038	33.230	29.226	28.860
85.0	69.883	64.961	59.805	54.515	49.140	43.660	38.300	33.331	29.138	28.770
87.5	70.605	65.718	60.468	55.055	49.570	44.042	38.527	33.380	29.085	28.682
90.0	70.913	65.963	60.733	55.362	49.780	44.304	38.686	33.474	29.103	28.717
92.5	70.736	65.751	60.534	55.148	49.605	44.105	38.543	33.389	29.103	28.708
95.0	70.151	65.291	60.096	54.754	49.338	43.838	38.395	33.296	29.103	28.735
97.5	69.423	64.593	59.476	54.200	48.810	43.450	38.096	33.140	29.103	28.685
100.0	68.534	63.722	58.676	53.490	48.196	42.968	37.692	32.944	29.032	28.648
102.5	67.481	62.748	57.785	52.675	47.536	42.398	37.189	32.670	28.962	28.593
105.0	66.268	61.608	56.738	51.766	46.706	41.738	36.722	32.359	28.857	28.440
107.5	64.844	60.323	55.585	50.708	45.867	41.013	36.207	32.026	28.716	28.348
110.0	63.325	58.891	54.383	49.623	44.900	40.233	35.651	31.647	28.506	28.183
112.5	61.682	57.448	53.059	48.512	43.950	39.424	35.041	31.254	28.330	28.025
115.0	59.974	55.930	51.692	47.318	42.988	38.629	34.451	30.920	28.155	27.867
117.5	58.165	54.310	50.357	46.142	42.038	37.843	33.886	30.566	27.962	27.716
120.0	56.281	52.611	48.932	44.900	41.019	37.069	33.341	30.289	27.874	27.578
122.5	54.361	50.980	47.435	43.650	40.019	36.282	32.848	30.076	27.769	27.548
125.0	52.450	49.359	45.956	42.406	38.974	35.531	32.357	29.885	27.733	27.523
127.5	50.543	47.681	44.486	41.187	38.038	34.828	31.946	29.699	27.698	27.544
130.0	48.634	45.962	43.007	40.034	37.157	34.203	31.616	29.539	27.698	27.555
132.5	46.777	44.339	41.671	39.052	36.528	33.875	31.537	29.591	27.857	27.697
135.0	44.950	42.814	40.389	38.240	36.389	35.192	34.175	31.405	29.594	29.351
137.5	43.074	41.251	39.272	37.463	36.069	36.032	36.859	34.459	32.736	32.447
140.0	41.373	39.871	38.373	36.886	35.885	36.851	37.709	35.663	34.017	33.764
142.5	39.802	38.640	37.553	36.387	35.644	38.309	38.640	36.745	35.299	34.987
145.0	38.467	37.578	36.720	35.699	36.211	39.330	38.905	37.408	36.053	35.812
147.5	37.596	36.639	36.031	35.397	37.505	40.209	38.718	37.313	36.071	35.892
150.0	36.949	36.323	35.273	35.520	39.217	40.200	38.601	37.268	36.159	36.040
152.5	38.474	36.289	35.738	38.194	41.057	40.480	38.594	37.177	36.089	36.026
155.0	50.333	45.127	41.476	42.739	43.201	41.357	39.303	37.837	36.720	36.653
157.5	79.252	90.490	82.138	67.725	55.176	46.481	41.844	40.053	38.493	38.622
160.0	109.811	139.126	147.836	125.415	101.230	83.906	72.439	66.088	62.102	63.778
162.5	136.689	161.561	160.345	154.032	140.800	131.756	123.372	117.685	115.725	115.180
165.0	159.724	158.050	153.242	145.027	139.359	134.891	133.186	131.772	130.488	130.183
167.5	156.422	150.220	143.605	138.890	134.667	132.215	130.411	129.215	128.083	127.809
170.0	144.296	140.180	136.988	133.601	131.620	130.047	128.666	127.803	126.907	126.690
172.5	135.192	132.985	131.194	130.086	128.906	127.853	127.090	126.372	125.626	125.497
175.0	128.622	127.958	127.288	126.519	126.016	125.607	125.174	124.718	124.239	124.175
177.5	124.280	124.119	124.005	123.839	123.652	123.444	123.220	122.981	122.730	122.700
180.0	121.000	121.000	121.000	121.000	121.000	121.000	121.000	121.000	121.000	121.000

**Vert.
Angles**

Horizontal Angles

	<u>100</u>	<u>105</u>	<u>110</u>	<u>115</u>	<u>120</u>	<u>125</u>	<u>130</u>	<u>135</u>	<u>140</u>	<u>145</u>
0.0	118.376	118.376	118.376	118.376	118.376	118.376	118.376	118.376	118.376	118.376
2.5	118.631	118.584	118.531	118.475	118.416	118.356	118.319	118.253	118.200	118.152
5.0	119.597	119.432	119.291	119.178	119.145	119.089	119.027	118.961	118.886	118.784
7.5	120.606	120.416	120.395	120.359	120.282	120.155	120.018	119.858	119.666	119.337
10.0	121.422	121.333	121.302	121.215	121.096	120.966	120.416	119.611	118.866	117.513
12.5	122.307	122.263	122.179	121.976	121.561	120.475	119.436	115.559	111.967	107.811
15.0	123.106	123.030	122.833	122.277	120.839	117.514	112.402	105.425	97.392	90.067
17.5	123.884	123.720	123.293	121.506	117.281	110.834	100.186	89.986	80.458	72.192
20.0	124.036	123.756	122.555	119.100	111.057	98.280	85.960	74.485	65.875	58.227
22.5	120.346	121.649	120.082	112.748	99.268	84.415	71.625	62.076	53.869	46.948
25.0	96.483	103.538	106.254	99.957	84.010	67.508	57.600	50.818	44.786	40.073
27.5	59.547	67.098	71.328	70.715	61.855	51.940	45.922	42.938	40.195	38.749

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CANDELA TABULATION - (Cont.)

30.0	36.572	39.675	43.142	44.235	41.213	38.338	37.931	39.263	39.022	38.556
32.5	32.538	32.606	31.730	31.658	30.547	30.230	33.042	36.770	38.098	38.099
35.0	32.642	32.458	31.270	29.938	28.773	28.433	30.085	33.011	36.068	37.545
37.5	32.835	32.247	30.928	29.773	28.809	28.310	28.579	30.253	33.283	36.185
40.0	33.224	32.296	30.814	29.661	29.051	28.635	28.597	28.978	30.710	33.599
42.5	33.542	32.403	30.939	30.004	29.354	28.920	28.778	28.822	29.120	30.973
45.0	33.541	32.262	30.972	30.233	29.540	29.059	28.758	28.688	28.478	29.010
47.5	33.289	31.954	30.882	30.328	29.618	29.027	28.654	28.307	28.096	27.805
50.0	32.804	31.479	30.696	30.213	29.538	28.927	28.451	28.015	27.614	27.169
52.5	32.234	30.927	30.426	30.048	29.370	28.693	28.179	27.692	27.101	26.583
55.0	31.131	30.363	30.124	29.756	29.142	28.454	27.894	27.318	26.673	25.899
57.5	29.889	29.722	29.574	29.432	28.892	28.247	27.591	26.950	26.213	25.370
60.0	29.506	29.370	29.168	28.965	28.547	27.928	27.262	26.579	25.805	24.909
62.5	29.310	29.128	28.943	28.743	28.243	27.647	26.956	26.278	25.453	24.353
65.0	29.160	28.970	28.758	28.531	28.114	27.434	26.750	26.072	25.151	23.884
67.5	29.035	28.806	28.624	28.437	27.957	27.292	26.580	25.835	24.988	23.487
70.0	28.941	28.752	28.514	28.333	27.874	27.153	26.420	25.658	24.672	23.180
72.5	28.858	28.671	28.454	28.277	27.815	27.082	26.312	25.539	24.368	22.987
75.0	28.778	28.612	28.426	28.225	27.735	27.027	26.223	25.410	24.155	22.831
77.5	28.733	28.541	28.398	28.221	27.703	26.962	26.211	25.356	23.977	22.674
80.0	28.684	28.526	28.389	28.197	27.690	26.923	26.132	25.229	23.820	22.584
82.5	28.582	28.498	28.368	28.197	27.696	26.939	26.180	25.245	23.713	22.463
85.0	28.508	28.461	28.319	28.180	27.684	26.948	26.166	25.214	23.640	22.391
87.5	28.453	28.404	28.295	28.187	27.671	26.966	26.178	25.235	23.578	22.346
90.0	28.471	28.418	28.330	28.208	27.769	26.996	26.189	24.644	23.591	22.327
92.5	28.452	28.433	28.330	28.192	27.736	27.000	26.187	24.677	23.605	22.381
95.0	28.470	28.417	28.239	28.128	27.648	26.910	26.111	24.636	23.549	22.343
97.5	28.487	28.405	28.228	28.039	27.562	26.794	26.013	24.544	23.443	22.242
100.0	28.468	28.338	28.170	27.892	27.404	26.623	25.839	24.455	23.297	22.113
102.5	28.368	28.249	28.069	27.788	27.256	26.465	25.683	24.360	23.165	21.971
105.0	28.274	28.121	27.921	27.665	27.078	26.321	25.547	24.290	23.017	21.823
107.5	28.135	27.992	27.781	27.495	26.972	26.201	25.378	24.213	22.867	21.696
110.0	27.990	27.851	27.636	27.329	26.842	26.066	25.230	24.167	22.745	21.583
112.5	27.844	27.657	27.465	27.214	26.692	25.921	25.142	24.179	22.664	21.498
115.0	27.691	27.519	27.285	27.047	26.572	25.817	25.047	24.204	22.688	21.429
117.5	27.548	27.392	27.207	26.900	26.406	25.751	24.988	24.114	22.775	21.360
120.0	27.428	27.253	27.044	26.815	26.352	25.689	24.930	24.061	22.865	21.346
122.5	27.394	27.210	27.001	26.775	26.314	25.627	24.908	24.046	23.077	21.529
125.0	27.378	27.164	26.987	26.738	26.272	25.645	24.947	24.125	23.162	21.837
127.5	27.419	27.231	26.998	26.770	26.317	25.704	25.010	24.261	23.326	22.181
130.0	27.449	27.247	27.062	26.891	26.463	25.886	25.221	24.486	23.565	22.551
132.5	27.616	27.469	27.297	27.195	26.856	26.238	25.567	24.822	23.925	22.906
135.0	28.816	28.152	28.017	27.771	27.308	26.594	25.964	25.283	24.358	23.320
137.5	31.002	29.133	28.672	28.257	27.748	27.051	26.433	25.775	24.908	23.933
140.0	32.482	30.268	29.375	28.825	28.182	27.426	26.899	26.307	25.572	24.706
142.5	34.123	31.469	30.002	29.233	28.427	27.726	27.301	26.880	26.312	25.690
145.0	35.059	32.292	30.288	29.229	28.458	27.887	27.547	27.422	27.174	26.844
147.5	35.438	32.915	30.467	29.118	28.323	27.782	27.656	27.751	27.957	29.258
150.0	35.716	33.593	30.670	28.946	28.023	27.594	27.629	28.007	29.764	34.174
152.5	35.952	34.475	31.598	29.334	28.052	27.415	27.776	30.019	34.892	40.234
155.0	36.809	36.050	33.405	30.539	28.638	28.650	31.674	36.682	41.440	43.570
157.5	39.245	40.177	40.117	37.561	34.685	35.333	40.248	44.343	45.158	44.534
160.0	66.337	70.960	72.499	67.015	53.711	48.482	47.609	48.277	46.772	45.153
162.5	117.378	119.611	116.558	100.587	80.918	61.744	55.594	51.325	49.555	47.546
165.0	129.589	128.674	123.522	115.432	99.158	83.719	68.896	60.068	55.282	51.392
167.5	127.462	126.903	125.597	121.671	115.937	103.743	92.476	80.892	70.185	62.317

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CANDELA TABULATION - (Cont.)

170.0	126.435	126.110	125.749	124.669	121.892	119.270	112.985	104.729	97.256	90.200
172.5	125.343	125.170	124.909	124.666	124.387	123.227	121.385	119.676	118.111	115.374
175.0	124.089	123.981	123.851	123.689	123.484	123.214	123.029	122.758	122.467	122.219
177.5	122.661	122.613	122.556	122.490	122.415	122.308	122.253	122.175	122.096	122.020
180.0	121.000	121.000	121.000	121.000	121.000	121.000	121.000	121.000	121.000	121.000

Vert. Angles **Horizontal Angles**

	150	155	160	165	170	175	180	185	190	195
0.0	118.376	118.376	118.376	118.376	118.376	118.376	118.376	118.376	118.376	118.376
2.5	118.132	118.104	118.105	118.116	118.123	118.128	118.130	118.158	118.185	118.211
5.0	118.653	118.517	118.443	118.391	118.343	118.308	118.271	118.331	118.388	118.522
7.5	118.787	118.255	117.817	117.461	117.205	117.032	116.937	117.028	117.261	117.637
10.0	115.088	112.953	111.105	109.596	108.456	107.678	107.318	107.495	108.244	109.392
12.5	102.351	97.538	93.488	90.712	87.492	85.812	85.087	85.488	86.920	89.930
15.0	83.297	77.352	72.989	69.135	66.580	64.818	64.085	64.552	66.005	68.319
17.5	65.941	60.413	56.294	53.100	50.590	48.811	48.060	48.639	50.189	52.543
20.0	52.172	47.277	43.906	41.349	39.260	37.714	37.177	37.839	39.400	41.550
22.5	42.266	38.989	37.833	36.936	36.185	35.566	35.377	35.927	36.733	37.885
25.0	38.552	37.560	37.054	36.638	36.330	35.688	35.457	36.171	37.018	37.930
27.5	38.184	37.656	37.255	36.889	36.445	35.682	35.404	36.150	37.147	38.250
30.0	38.147	37.632	37.131	36.821	36.473	35.770	35.457	36.287	37.273	38.271
32.5	37.900	37.559	37.162	36.580	36.051	35.204	34.825	35.733	36.862	38.025
35.0	37.615	37.057	36.469	35.939	35.452	34.602	34.193	35.146	36.175	37.361
37.5	36.674	36.179	35.671	35.077	34.364	33.507	33.000	34.063	35.167	36.480
40.0	35.512	35.188	34.490	33.825	33.101	32.363	31.806	32.919	33.995	35.327
42.5	33.687	33.937	33.261	32.556	31.724	30.910	30.332	31.496	32.574	34.121
45.0	31.154	32.615	31.819	31.031	30.170	29.417	28.857	30.073	31.039	32.531
47.5	28.785	30.669	30.250	29.343	27.885	26.779	26.084	27.423	28.759	30.794
50.0	27.045	28.469	28.177	26.590	25.045	24.065	23.310	24.681	26.020	28.114
52.5	25.960	26.247	25.644	24.057	23.016	22.342	21.713	23.065	24.084	25.682
55.0	25.088	24.298	23.396	22.522	21.380	20.770	20.116	21.575	22.725	24.382
57.5	24.254	23.066	22.279	21.302	20.010	19.430	18.800	20.354	21.528	23.237
60.0	23.534	22.337	21.293	20.088	18.654	18.140	17.483	19.156	20.490	22.297
62.5	22.939	21.804	20.543	19.114	17.507	17.078	16.535	18.257	19.588	21.460
65.0	22.596	21.356	19.958	18.407	16.545	16.118	15.587	17.403	18.818	20.931
67.5	22.297	21.030	19.545	17.530	15.568	14.675	14.025	16.009	18.018	20.307
70.0	22.075	20.774	19.207	17.445	14.389	13.135	12.463	14.508	17.001	19.916
72.5	21.860	20.541	18.959	16.550	13.259	11.966	11.392	13.656	16.367	19.540
75.0	21.679	20.357	18.709	16.205	12.711	10.713	10.321	13.088	16.105	19.241
77.5	21.517	20.146	18.439	16.120	11.824	9.989	9.584	12.594	15.910	19.018
80.0	21.380	20.006	18.320	15.503	11.449	9.184	8.847	12.152	15.710	18.477
82.5	21.269	19.850	18.213	15.218	11.411	9.099	9.233	11.985	15.250	18.056
85.0	21.158	19.789	18.189	15.684	10.991	9.382	9.619	11.488	14.747	17.773
87.5	21.053	19.687	18.058	15.935	11.585	8.868	8.915	10.657	14.216	17.388
90.0	21.028	19.659	18.009	16.113	12.182	9.724	8.210	10.286	13.551	16.991
92.5	21.088	19.692	18.161	16.295	12.616	10.375	7.984	7.406	12.735	16.516
95.0	21.053	19.654	18.136	16.156	12.923	10.005	7.758	7.206	11.871	15.956
97.5	20.962	19.570	18.004	15.837	13.125	11.004	7.618	7.314	11.525	15.544
100.0	20.824	19.451	17.875	15.756	13.211	11.269	7.477	7.768	11.437	15.210
102.5	20.678	19.326	17.786	15.808	12.950	11.253	8.039	8.466	11.522	15.021
105.0	20.546	19.204	17.700	15.687	12.825	11.314	8.601	9.127	11.566	14.643
107.5	20.460	19.089	17.469	15.329	12.712	11.552	9.128	9.707	11.734	14.605
110.0	20.362	18.981	17.375	15.537	12.770	11.836	9.654	10.327	12.140	14.422
112.5	20.265	18.879	17.356	15.454	12.917	12.306	10.286	10.896	12.425	14.552
115.0	20.199	18.794	17.307	15.558	13.235	12.752	10.918	11.462	12.970	14.827

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CANDELA TABULATION - (Cont.)

117.5	20.128	18.777	17.310	15.828	13.630	13.253	11.515	11.956	13.387	14.989
120.0	20.138	18.823	17.317	15.934	14.034	13.754	12.111	12.467	13.782	15.146
122.5	20.211	18.896	17.525	16.397	14.501	14.255	12.726	12.938	14.102	15.383
125.0	20.268	19.018	17.724	16.661	14.967	14.757	13.340	13.503	14.554	15.759
127.5	20.696	19.267	18.093	17.141	15.518	15.352	13.955	14.082	15.027	16.133
130.0	21.263	19.765	18.559	17.794	16.245	15.980	14.569	14.765	15.747	17.223
132.5	21.878	20.528	19.425	18.592	17.313	17.076	15.780	15.898	16.754	17.728
135.0	22.382	21.405	20.758	20.148	18.696	18.237	16.991	17.153	18.036	19.187
137.5	23.008	22.533	22.719	21.855	20.597	20.025	18.834	18.932	19.739	20.822
140.0	23.954	24.559	25.869	24.587	23.040	21.984	20.677	20.874	22.016	23.610
142.5	25.380	27.956	29.129	27.907	26.662	25.694	24.504	24.605	25.610	26.975
145.0	28.299	32.241	32.309	31.080	30.109	29.350	28.330	28.296	29.007	30.019
147.5	33.533	36.452	35.287	33.975	33.010	32.207	31.262	31.154	31.821	32.822
150.0	39.056	39.291	38.067	36.812	35.874	35.061	34.193	34.029	34.661	35.591
152.5	42.253	41.650	40.561	39.499	38.618	37.882	37.072	36.900	37.397	38.238
155.0	43.494	43.017	42.194	41.610	40.732	40.074	39.354	39.169	39.573	40.324
157.5	43.927	43.390	42.743	42.118	41.556	40.988	40.398	40.242	40.523	40.989
160.0	44.347	43.555	42.864	42.342	41.848	41.412	40.933	40.803	41.024	41.391
162.5	45.806	44.144	43.254	42.622	42.109	41.713	41.319	41.363	41.669	42.195
165.0	49.406	47.516	46.009	44.934	44.307	43.877	43.601	43.741	44.153	44.962
167.5	58.678	55.329	52.366	50.361	49.369	48.857	48.753	49.022	49.669	50.848
170.0	83.234	77.152	71.996	67.893	64.962	63.238	62.769	63.513	65.464	68.552
172.5	110.847	106.959	103.703	101.104	99.284	98.183	97.795	98.204	99.316	101.137
175.0	121.112	120.365	119.721	119.185	118.783	118.552	118.429	118.484	118.647	118.962
177.5	121.915	121.796	121.758	121.715	121.675	121.638	121.606	121.602	121.602	121.606
180.0	121.000	121.000	121.000	121.000	121.000	121.000	121.000	121.000	121.000	121.000

**Vert.
Angles**

Horizontal Angles

	<u>200</u>	<u>205</u>	<u>210</u>	<u>215</u>	<u>220</u>	<u>225</u>	<u>230</u>	<u>235</u>	<u>240</u>	<u>245</u>
0.0	118.376	118.376	118.376	118.376	118.376	118.376	118.376	118.376	118.376	118.376
2.5	118.235	118.250	118.335	118.389	118.460	118.536	118.611	118.667	118.779	118.856
5.0	118.690	118.862	119.039	119.196	119.389	119.576	119.734	119.801	119.952	120.023
7.5	118.114	118.676	119.339	120.024	120.456	120.738	120.996	121.204	121.353	121.459
10.0	110.952	112.901	115.151	117.827	119.421	120.389	121.524	122.330	122.544	122.718
12.5	92.528	96.514	101.314	106.950	111.473	115.591	120.162	121.620	123.247	123.869
15.0	71.903	75.997	81.617	88.081	95.504	103.988	111.649	117.780	122.040	124.254
17.5	55.604	59.477	64.588	70.332	78.066	87.137	97.735	109.273	117.291	122.950
20.0	44.116	47.181	51.663	57.017	63.892	71.604	82.519	95.016	109.069	119.600
22.5	39.176	40.444	43.329	47.035	52.923	60.217	69.274	81.501	96.932	112.712
25.0	38.862	39.807	40.969	42.451	45.919	51.136	59.292	69.833	83.640	100.025
27.5	39.188	40.192	41.131	42.045	43.477	46.189	51.219	58.919	65.444	71.770
30.0	39.261	40.308	41.321	42.465	43.412	44.217	44.891	46.208	46.943	47.226
32.5	39.298	40.297	41.302	42.346	42.976	41.554	39.236	38.138	37.393	36.798
35.0	38.612	39.868	41.200	41.959	40.688	37.589	35.257	34.963	35.750	35.955
37.5	37.841	39.047	40.285	40.055	37.340	34.871	33.885	34.853	35.797	35.945
40.0	36.746	38.028	38.730	36.846	34.752	33.951	34.145	35.268	36.124	36.040
42.5	35.540	36.808	36.248	34.139	33.506	33.922	34.349	35.554	36.591	36.410
45.0	34.008	35.242	33.524	32.554	33.090	33.737	34.364	35.690	36.733	36.703
47.5	32.203	32.576	31.481	31.818	32.751	33.429	34.225	35.565	36.667	36.610
50.0	29.964	30.235	30.233	31.273	32.251	33.118	34.025	35.351	36.411	36.403
52.5	27.576	28.467	29.413	30.679	31.759	32.787	33.663	34.957	36.012	36.085
55.0	25.703	27.090	28.691	30.079	31.310	32.339	33.277	34.546	35.594	35.618
57.5	24.707	26.146	27.960	29.587	30.808	31.858	32.862	34.101	35.023	35.007
60.0	23.911	25.567	27.286	29.085	30.354	31.390	32.396	33.582	34.547	34.628
62.5	23.322	25.067	26.704	28.493	29.906	30.990	31.960	33.219	34.230	34.324

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CANDELA TABULATION - (Cont.)

65.0	22.834	24.679	26.279	27.922	29.512	30.641	31.632	32.913	33.900	34.068
67.5	22.396	24.331	25.902	27.415	29.173	30.296	31.392	32.618	33.672	33.892
70.0	22.077	23.953	25.529	26.971	28.728	30.043	31.143	32.369	33.477	33.713
72.5	21.768	23.600	25.203	26.650	28.352	29.812	30.939	32.134	33.231	33.575
75.0	21.378	23.237	24.870	26.359	28.038	29.596	30.771	31.935	33.062	33.437
77.5	21.026	22.911	24.585	26.121	27.715	29.410	30.610	31.776	32.907	33.308
80.0	20.730	22.613	24.309	25.876	27.477	29.244	30.440	31.606	32.723	33.144
82.5	20.410	22.320	24.020	25.635	27.177	29.003	30.248	31.437	32.591	33.054
85.0	20.057	21.963	23.685	25.330	26.915	28.844	30.112	31.284	32.445	32.944
87.5	19.658	21.591	23.378	25.080	26.667	28.679	29.940	31.185	32.332	32.844
90.0	19.308	21.239	23.100	24.820	26.435	28.436	29.805	30.998	32.227	32.806
92.5	18.890	20.902	22.781	24.539	26.154	28.220	29.543	30.798	32.063	32.695
95.0	18.590	20.593	22.494	24.250	25.901	27.932	29.304	30.580	31.808	32.555
97.5	18.327	20.349	22.231	23.987	25.684	27.700	29.040	30.266	31.573	32.364
100.0	17.978	20.074	21.976	23.723	25.478	27.431	28.785	30.004	31.230	32.137
102.5	17.673	19.780	21.673	23.447	25.292	27.223	28.558	29.741	30.985	31.965
105.0	17.420	19.538	21.396	23.212	25.105	26.913	28.292	29.579	30.770	31.790
107.5	17.153	19.307	21.178	22.931	24.938	26.687	28.063	29.343	30.546	31.582
110.0	17.055	19.112	20.975	22.722	24.807	26.467	27.815	29.150	30.388	31.341
112.5	16.925	18.985	20.771	22.638	24.750	26.259	27.631	28.967	30.178	31.188
115.0	16.892	18.882	20.607	22.586	24.555	26.071	27.432	28.776	30.002	31.007
117.5	16.906	18.718	20.460	22.546	24.403	25.895	27.317	28.697	29.865	30.832
120.0	16.926	18.619	20.539	22.639	24.256	25.743	27.219	28.656	29.941	30.701
122.5	17.038	18.626	20.712	22.650	24.195	25.690	27.200	28.752	30.046	30.609
125.0	17.227	19.006	20.922	22.612	24.194	25.677	27.200	28.907	30.284	30.616
127.5	17.777	19.421	21.081	22.647	24.193	25.689	27.169	29.004	30.392	30.590
130.0	18.536	19.845	21.351	22.778	24.219	25.735	27.208	29.217	30.556	30.660
132.5	19.513	20.368	21.661	23.007	24.357	25.864	27.357	29.355	30.941	30.917
135.0	20.783	21.213	22.098	23.297	24.726	26.050	27.519	29.615	31.209	31.248
137.5	22.485	23.257	22.852	23.790	25.113	26.422	27.750	29.926	31.601	31.467
140.0	25.515	26.471	24.485	24.541	25.584	26.758	28.004	30.169	31.880	31.780
142.5	28.625	29.779	27.364	25.439	26.264	27.140	28.232	30.402	32.019	31.734
145.0	31.361	32.850	31.841	27.818	27.015	27.570	28.297	30.370	31.927	31.469
147.5	34.050	35.572	36.313	33.023	28.719	27.882	28.349	30.255	31.777	31.159
150.0	36.738	38.083	39.478	38.652	33.328	29.208	28.386	30.094	31.539	30.729
152.5	39.219	40.313	41.463	42.010	39.593	34.461	30.301	30.121	31.611	31.042
155.0	40.843	41.530	42.292	42.867	43.632	41.855	37.601	35.141	33.945	31.796
157.5	41.471	42.020	42.709	43.777	44.996	46.040	46.764	46.782	45.612	44.910
160.0	41.883	42.546	43.374	44.307	46.284	48.706	52.735	58.461	65.405	76.857
162.5	42.881	43.723	45.164	46.847	49.687	53.270	59.855	68.103	85.904	103.853
165.0	46.071	47.675	49.752	52.105	56.830	62.979	72.717	87.425	102.117	116.817
167.5	53.016	56.260	60.012	64.206	72.396	83.228	94.897	105.600	117.042	122.225
170.0	72.711	77.963	84.220	91.371	98.430	105.717	113.645	119.584	121.987	124.521
172.5	103.689	106.930	110.855	115.331	117.980	119.509	121.141	122.837	123.903	124.209
175.0	119.395	119.958	120.700	121.794	122.019	122.277	122.527	122.767	122.996	123.215
177.5	121.613	121.638	121.703	121.783	121.835	121.890	121.964	121.999	122.061	122.119
180.0	121.000	121.000	121.000	121.000	121.000	121.000	121.000	121.000	121.000	121.000

Vert. Angles	Horizontal Angles									
	<u>250</u>	<u>255</u>	<u>260</u>	<u>265</u>	<u>270</u>	<u>275</u>	<u>280</u>	<u>285</u>	<u>290</u>	<u>295</u>
0.0	118.376	118.376	118.376	118.376	118.376	118.376	118.376	118.376	118.376	118.376
2.5	118.923	118.981	119.028	119.067	119.096	119.382	119.658	119.920	120.168	120.398
5.0	120.136	120.253	120.351	120.427	120.483	121.038	121.566	122.061	122.516	122.981
7.5	121.515	121.629	121.784	121.906	121.992	122.741	123.453	124.202	125.034	125.983
10.0	122.888	122.975	123.073	123.234	123.361	124.300	125.201	126.350	127.590	128.852

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CANDELA TABULATION - (Cont.)

12.5	124.163	124.309	124.474	124.611	124.713	125.817	126.946	128.427	130.011	131.825
15.0	125.125	125.513	125.691	125.841	125.959	127.203	128.629	130.286	132.414	134.904
17.5	125.865	126.479	126.815	126.987	127.118	128.376	130.022	132.064	134.684	138.455
20.0	125.007	127.406	128.101	128.458	128.662	129.874	131.573	133.887	137.368	142.086
22.5	123.695	127.685	127.874	127.162	126.837	128.837	131.501	135.319	140.618	146.466
25.0	109.776	109.262	106.265	102.904	102.824	104.773	110.735	119.996	132.245	144.605
27.5	75.323	72.550	67.443	64.266	63.173	65.485	72.489	81.555	98.374	112.359
30.0	47.212	44.554	41.946	40.333	39.108	41.285	44.591	49.825	59.303	70.104
32.5	37.702	38.686	38.686	38.290	37.756	38.798	40.148	41.816	42.673	43.319
35.0	37.342	38.760	39.068	38.684	38.055	39.093	40.331	41.653	41.302	39.660
37.5	37.253	38.879	39.564	39.261	38.582	39.528	40.579	41.635	40.491	39.878
40.0	37.323	39.223	40.247	40.076	39.353	40.289	41.402	41.881	40.255	40.549
42.5	37.384	39.301	40.545	40.492	39.775	40.782	41.929	42.010	40.474	41.503
45.0	37.144	38.942	40.315	40.403	39.740	40.860	42.101	41.626	40.866	42.203
47.5	36.968	38.325	39.816	40.040	39.371	40.609	41.935	41.151	41.386	42.941
50.0	36.650	37.555	39.000	39.432	38.757	40.149	41.663	40.840	41.753	43.576
52.5	36.278	36.791	38.010	38.443	37.774	39.308	41.354	40.732	42.131	44.215
55.0	35.746	36.055	36.383	36.190	35.492	37.044	39.072	40.328	42.427	44.880
57.5	35.094	35.404	35.523	35.276	34.632	36.137	37.876	40.037	42.613	45.448
60.0	34.774	35.110	35.241	35.064	34.368	36.022	37.874	40.282	43.110	46.269
62.5	34.527	34.791	34.948	34.832	34.211	35.924	37.998	40.661	43.667	47.112
65.0	34.312	34.564	34.738	34.581	34.052	35.899	38.154	41.051	44.272	47.955
67.5	34.107	34.363	34.511	34.375	33.825	35.824	38.256	41.494	44.943	48.804
70.0	33.924	34.179	34.310	34.279	33.772	35.872	38.517	41.917	45.595	49.718
72.5	33.771	34.070	34.182	34.124	33.684	35.944	38.772	42.450	46.311	50.657
75.0	33.691	33.949	34.088	34.053	33.631	36.070	39.103	42.950	47.049	51.633
77.5	33.597	33.867	33.992	33.948	33.579	36.166	39.376	43.434	47.775	52.544
80.0	33.471	33.739	33.882	33.862	33.526	36.230	39.649	43.879	48.399	53.423
82.5	33.363	33.663	33.806	33.781	33.509	36.329	39.977	44.334	48.979	54.197
85.0	33.272	33.571	33.742	33.737	33.456	36.442	40.188	44.719	49.689	54.944
87.5	33.211	33.513	33.666	33.693	33.421	36.515	40.350	45.052	50.155	55.598
90.0	33.210	33.579	33.807	33.842	33.561	36.738	40.652	45.462	50.552	56.081
92.5	33.176	33.579	33.842	33.921	33.702	36.787	40.758	45.608	50.716	56.223
95.0	33.102	33.530	33.878	34.000	33.772	36.862	40.793	45.488	50.682	56.033
97.5	33.016	33.498	33.880	34.027	33.790	36.861	40.793	45.345	50.368	55.637
100.0	32.870	33.414	33.815	34.036	33.807	36.783	40.623	45.126	50.010	55.075
102.5	32.751	33.289	33.729	33.928	33.737	36.634	40.415	44.818	49.589	54.480
105.0	32.566	33.155	33.618	33.833	33.631	36.434	40.219	44.525	49.057	53.777
107.5	32.349	32.968	33.477	33.693	33.456	36.176	39.880	44.132	48.387	52.941
110.0	32.123	32.755	33.256	33.444	33.245	35.878	39.513	43.596	47.689	52.044
112.5	31.974	32.572	33.077	33.250	33.000	35.536	39.090	43.017	46.920	51.086
115.0	31.778	32.355	32.869	33.060	32.789	35.216	38.597	42.414	46.093	50.064
117.5	31.597	32.213	32.705	32.846	32.596	34.854	38.069	41.672	45.214	48.984
120.0	31.426	32.069	32.551	32.677	32.403	34.552	37.568	40.908	44.372	47.895
122.5	31.284	31.961	32.402	32.553	32.332	34.207	37.048	40.141	43.358	46.935
125.0	31.164	31.809	32.295	32.403	32.157	33.892	36.514	39.351	42.306	45.903
127.5	31.083	31.696	32.165	32.255	31.999	33.637	36.031	38.565	41.295	44.851
130.0	31.009	31.625	32.107	32.156	31.911	33.311	35.566	37.842	40.248	43.577
132.5	31.213	31.743	32.149	32.218	31.911	33.215	35.381	37.334	39.332	42.320
135.0	31.643	32.302	33.299	33.989	33.526	34.983	37.427	37.838	38.745	41.290
137.5	31.918	32.752	34.423	35.689	35.492	36.688	38.829	37.802	38.150	40.162
140.0	32.186	33.318	35.305	36.358	36.159	37.204	39.169	38.454	37.559	39.281
142.5	32.261	33.851	36.210	36.987	36.738	37.660	39.439	39.146	36.986	38.543
145.0	32.043	33.879	36.251	36.985	36.720	37.461	39.039	39.431	37.060	37.381
147.5	31.673	33.695	36.075	36.590	36.282	37.008	38.444	39.655	37.765	36.933
150.0	31.284	33.595	35.628	36.098	35.773	36.526	37.844	39.120	38.552	36.311

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CANDELA TABULATION - (Cont.)

152.5	31.625	33.914	35.446	35.637	35.351	36.083	37.440	38.984	39.498	38.278
155.0	32.823	34.862	35.711	35.669	35.422	36.157	37.538	39.126	40.773	41.051
157.5	44.374	42.842	39.710	38.785	37.897	38.835	40.795	44.776	53.578	67.335
160.0	83.756	82.561	76.242	70.085	68.316	69.185	75.292	86.794	104.157	123.909
162.5	119.294	122.721	121.184	118.849	117.534	119.506	123.525	130.791	141.174	153.149
165.0	123.707	127.694	128.319	128.761	128.943	130.055	131.718	134.141	139.839	146.365
167.5	125.627	126.813	127.288	127.554	127.732	128.741	129.859	131.918	134.664	139.565
170.0	125.484	125.844	126.138	126.349	126.486	127.338	128.110	129.538	131.204	133.373
172.5	124.516	124.771	124.909	125.033	125.134	125.788	126.413	127.081	128.254	129.504
175.0	123.372	123.486	123.616	123.647	123.677	124.166	124.651	125.028	125.411	125.888
177.5	122.172	122.220	122.262	122.297	122.326	122.573	122.811	123.040	123.257	123.463
180.0	121.000	121.000	121.000	121.000	121.000	121.000	121.000	121.000	121.000	121.000

Vert. Angles	Horizontal Angles									
	<u>300</u>	<u>305</u>	<u>310</u>	<u>315</u>	<u>320</u>	<u>325</u>	<u>330</u>	<u>335</u>	<u>340</u>	<u>345</u>
0.0	118.376	118.376	118.376	118.376	118.376	118.376	118.376	118.376	118.376	118.376
2.5	120.611	120.780	120.981	121.143	121.398	121.424	121.573	121.670	121.808	121.907
5.0	123.544	124.013	124.559	124.998	125.372	125.735	126.123	126.434	126.702	126.899
7.5	126.832	127.736	128.691	129.582	130.393	131.224	132.132	132.856	133.449	133.893
10.0	130.348	131.723	133.394	135.170	136.783	138.289	139.646	140.884	141.819	142.499
12.5	133.833	136.444	138.881	141.474	143.874	145.047	144.373	143.791	143.329	141.980
15.0	138.186	141.539	144.884	145.446	144.416	140.312	130.026	121.278	113.748	106.419
17.5	142.659	147.104	144.945	139.377	123.815	109.439	95.013	82.340	75.217	70.630
20.0	147.181	144.353	131.725	111.688	91.749	75.828	67.743	60.753	59.827	58.973
22.5	144.925	130.326	104.858	81.331	69.030	61.406	60.299	58.867	57.315	56.095
25.0	137.726	105.964	78.371	66.639	61.837	60.121	57.266	54.210	51.068	48.568
27.5	107.413	84.659	67.796	62.727	59.678	55.362	50.369	47.865	45.981	44.528
30.0	71.206	64.124	61.235	59.915	54.307	48.427	47.313	45.171	43.550	42.250
32.5	46.079	48.939	53.276	54.190	49.448	47.921	44.557	42.901	41.698	41.559
35.0	40.513	43.148	46.860	48.310	47.607	44.921	43.389	43.155	43.017	42.801
37.5	41.116	42.552	44.466	45.683	45.944	45.034	44.823	44.749	44.463	44.380
40.0	41.753	43.248	44.961	45.473	46.000	46.561	46.546	46.455	46.396	46.384
42.5	42.593	44.229	45.780	46.565	47.199	48.032	48.314	48.476	48.418	48.451
45.0	43.614	45.261	46.902	47.793	48.816	49.726	50.291	50.464	50.711	50.714
47.5	44.556	46.304	48.072	49.371	50.420	51.532	52.259	52.935	53.164	53.168
50.0	45.431	47.419	49.313	50.852	52.198	53.610	54.672	55.493	55.910	56.202
52.5	46.262	48.455	50.617	52.369	54.262	55.890	57.226	58.207	58.818	59.174
55.0	47.167	49.618	52.065	54.099	56.353	58.313	59.885	60.987	61.663	62.031
57.5	48.143	50.778	53.604	56.126	58.496	60.770	62.456	63.693	64.446	64.882
60.0	49.176	52.044	55.244	58.070	60.643	63.093	65.006	66.288	67.135	67.661
62.5	50.218	53.447	56.869	59.939	62.773	65.368	67.411	68.836	69.803	70.403
65.0	51.345	54.879	58.450	61.806	64.818	67.572	69.792	71.343	72.411	73.014
67.5	52.459	56.230	60.070	63.616	66.784	69.745	72.032	73.760	74.970	75.539
70.0	53.539	57.614	61.621	65.344	68.713	71.805	74.206	76.091	77.327	77.986
72.5	54.666	58.947	63.189	67.044	70.573	73.729	76.303	78.281	79.501	80.263
75.0	55.825	60.264	64.703	68.715	72.348	75.570	78.197	80.197	81.606	82.395
77.5	56.983	61.559	66.068	70.206	73.953	77.236	79.918	82.012	83.429	84.297
80.0	58.013	62.741	67.316	71.564	75.418	78.731	81.540	83.621	85.104	85.976
82.5	59.002	63.767	68.368	72.642	76.548	80.006	82.878	85.059	86.574	87.448
85.0	59.823	64.638	69.365	73.625	77.555	80.985	83.878	86.160	87.828	88.786
87.5	60.577	65.461	70.156	74.471	78.411	81.898	84.885	87.052	88.689	89.725
90.0	61.119	66.104	70.668	75.056	79.023	82.498	85.447	87.729	89.309	90.257
92.5	61.298	66.279	70.904	75.194	79.140	82.604	85.553	87.645	89.241	90.126
95.0	61.054	65.885	70.498	74.797	78.668	82.127	84.955	87.109	88.657	89.513
97.5	60.648	65.437	69.979	74.203	78.072	81.511	84.285	86.350	87.787	88.567

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CANDELA TABULATION - (Cont.)

100.0	60.085	64.840	69.288	73.461	77.283	80.647	83.358	85.324	86.671	87.311
102.5	59.389	64.025	68.460	72.527	76.286	79.605	82.191	84.102	85.286	85.865
105.0	58.544	63.088	67.420	71.413	75.063	78.329	80.817	82.607	83.610	84.134
107.5	57.571	62.030	66.232	70.145	73.692	76.792	79.190	80.915	81.815	82.135
110.0	56.552	60.821	64.894	68.703	72.090	75.181	77.360	78.869	79.750	80.048
112.5	55.426	59.477	63.391	67.067	70.321	73.286	75.318	76.697	77.588	77.707
115.0	54.205	58.044	61.775	65.323	68.397	71.178	73.136	74.413	75.165	75.289
117.5	52.999	56.542	60.122	63.485	66.363	68.921	70.901	71.942	72.500	72.719
120.0	51.988	54.969	58.350	61.376	64.129	66.680	68.336	69.392	69.800	69.911
122.5	51.083	53.433	56.438	59.226	61.836	64.182	65.723	66.646	66.992	67.069
125.0	50.217	51.777	54.499	57.054	59.484	61.561	62.979	63.732	64.129	64.164
127.5	48.967	50.242	52.594	54.882	57.097	58.927	60.122	60.785	61.058	61.220
130.0	47.625	48.339	50.617	52.760	54.634	56.261	57.304	57.798	57.935	58.078
132.5	46.202	46.863	48.605	50.583	52.229	53.698	54.490	54.866	54.955	54.878
135.0	44.724	44.918	46.700	48.365	49.921	51.166	51.849	52.036	52.152	52.092
137.5	43.504	43.473	44.737	46.265	47.468	48.620	49.134	49.408	49.424	49.478
140.0	42.271	41.682	42.679	44.010	45.034	46.052	46.556	46.829	46.875	46.910
142.5	41.162	40.261	40.796	41.876	42.761	43.779	44.149	44.347	44.372	44.388
145.0	39.996	39.031	39.117	39.919	40.525	41.325	41.606	41.741	41.853	41.933
147.5	39.040	37.401	37.885	38.207	38.528	39.110	39.246	39.282	39.337	39.528
150.0	37.966	37.144	36.821	37.362	38.722	38.132	37.301	37.103	37.127	37.215
152.5	37.870	36.622	37.372	40.820	43.197	42.981	38.775	36.644	35.562	35.274
155.0	41.645	39.872	45.887	51.481	51.925	47.560	45.162	42.488	39.225	36.746
157.5	77.059	75.492	62.902	62.211	59.598	56.191	50.624	46.616	45.730	45.201
160.0	140.513	125.280	99.282	71.191	66.068	61.270	59.252	57.546	53.842	50.990
162.5	158.900	159.824	135.972	112.553	88.902	71.736	67.002	62.530	60.647	59.956
165.0	154.396	158.716	159.856	149.581	132.369	116.124	99.472	84.965	74.180	71.601
167.5	144.662	150.982	156.910	158.150	159.352	156.251	145.268	135.938	128.344	121.988
170.0	137.081	140.531	144.623	148.996	153.041	155.782	156.568	157.321	157.927	158.424
172.5	130.693	132.593	134.961	137.108	139.054	141.113	143.399	145.276	146.818	148.028
175.0	126.670	127.399	128.072	128.671	129.188	129.887	130.897	131.723	132.434	132.996
177.5	123.656	123.834	124.022	124.148	124.375	124.437	124.660	124.844	125.033	125.197
180.0	121.000	121.000	121.000	121.000	121.000	121.000	121.000	121.000	121.000	121.000

Vert. Angles	Horizontal Angles		
	<u>350</u>	<u>355</u>	<u>360</u>
0.0	118.376	118.376	118.376
2.5	121.973	122.004	122.001
5.0	127.030	127.128	127.135
7.5	134.188	134.361	134.402
10.0	142.934	143.284	143.161
12.5	138.326	135.963	135.061
15.0	100.916	97.336	95.944
17.5	67.041	64.600	63.489
20.0	58.090	57.241	56.801
22.5	54.833	53.433	52.579
25.0	47.244	46.098	45.304
27.5	43.599	42.886	42.162
30.0	41.059	39.990	39.178
32.5	41.327	40.817	40.179
35.0	42.427	41.872	41.179
37.5	44.199	43.748	43.057
40.0	46.149	45.680	44.935
42.5	48.257	47.764	46.971
45.0	50.446	49.879	49.007

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CANDELA TABULATION - (Cont.)

47.5	53.219	52.820	51.904
50.0	56.236	55.848	54.800
52.5	59.219	58.722	57.521
55.0	62.115	61.584	60.241
57.5	64.933	64.455	63.015
60.0	67.769	67.314	65.788
62.5	70.491	69.947	68.298
65.0	73.048	72.545	70.808
67.5	75.627	75.054	73.213
70.0	78.049	77.504	75.618
72.5	80.499	79.670	77.601
75.0	82.448	81.720	79.584
77.5	84.347	83.541	81.305
80.0	86.138	85.245	83.025
82.5	87.607	86.746	84.271
85.0	88.948	88.007	85.517
87.5	90.032	89.280	86.742
90.0	90.502	89.800	87.967
92.5	90.239	89.374	86.778
95.0	89.510	88.196	85.588
97.5	88.380	86.960	84.500
100.0	87.105	85.624	83.411
102.5	85.484	84.099	81.919
105.0	83.710	82.509	80.427
107.5	81.874	80.652	78.619
110.0	79.614	78.754	76.811
112.5	77.375	76.527	74.600
115.0	74.961	74.246	72.388
117.5	72.484	71.771	70.001
120.0	69.820	69.248	67.613
122.5	66.963	66.406	64.858
125.0	64.079	63.567	62.102
127.5	61.116	60.648	59.294
130.0	58.080	57.748	56.485
132.5	54.907	54.603	53.501
135.0	51.896	51.573	50.517
137.5	49.394	49.113	48.218
140.0	46.900	46.688	45.918
142.5	44.425	44.254	43.566
145.0	41.981	41.827	41.214
147.5	39.601	39.485	39.003
150.0	37.277	37.164	36.791
152.5	35.326	35.242	34.895
155.0	36.227	35.697	35.246
157.5	44.411	43.270	42.653
160.0	48.973	47.198	47.006
162.5	59.457	59.159	58.898
165.0	69.718	68.437	67.947
167.5	116.171	112.608	111.303
170.0	158.802	159.126	159.064
172.5	148.868	149.363	149.497
175.0	133.395	133.658	133.735
177.5	125.316	125.392	125.424
180.0	121.000	121.000	121.000

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ZONAL LUMEN SUMMARY

Zone	Lumens	%Lamp	%Fixt
0-20	42.70	N.A.	7.30
0-30	74.83	N.A.	12.70
0-40	99.89	N.A.	17.00
0-60	166.73	N.A.	28.30
0-80	256.18	N.A.	43.50
0-90	306.95	N.A.	52.10
10-90	295.19	N.A.	50.10
20-40	57.19	N.A.	9.70
20-50	87.72	N.A.	14.90
40-70	108.95	N.A.	18.50
60-80	89.45	N.A.	15.20
70-80	47.33	N.A.	8.00
80-90	50.77	N.A.	8.60
90-110	97.90	N.A.	16.60
90-120	139.11	N.A.	23.60
90-130	173.22	N.A.	29.40
90-150	222.80	N.A.	37.80
90-180	281.75	N.A.	47.90
110-180	183.84	N.A.	31.20
0-180	588.70	N.A.	100.00

Total Luminaire Efficiency = N.A.%

ZONAL LUMEN SUMMARY

Zone	Lumens
0-10	11.76
10-20	30.94
20-30	32.13
30-40	25.07
40-50	30.53
50-60	36.31
60-70	42.11
70-80	47.33
80-90	50.77
90-100	50.78
100-110	47.12
110-120	41.20
120-130	34.12
130-140	27.43
140-150	22.15
150-160	20.03
160-170	27.00
170-180	11.91

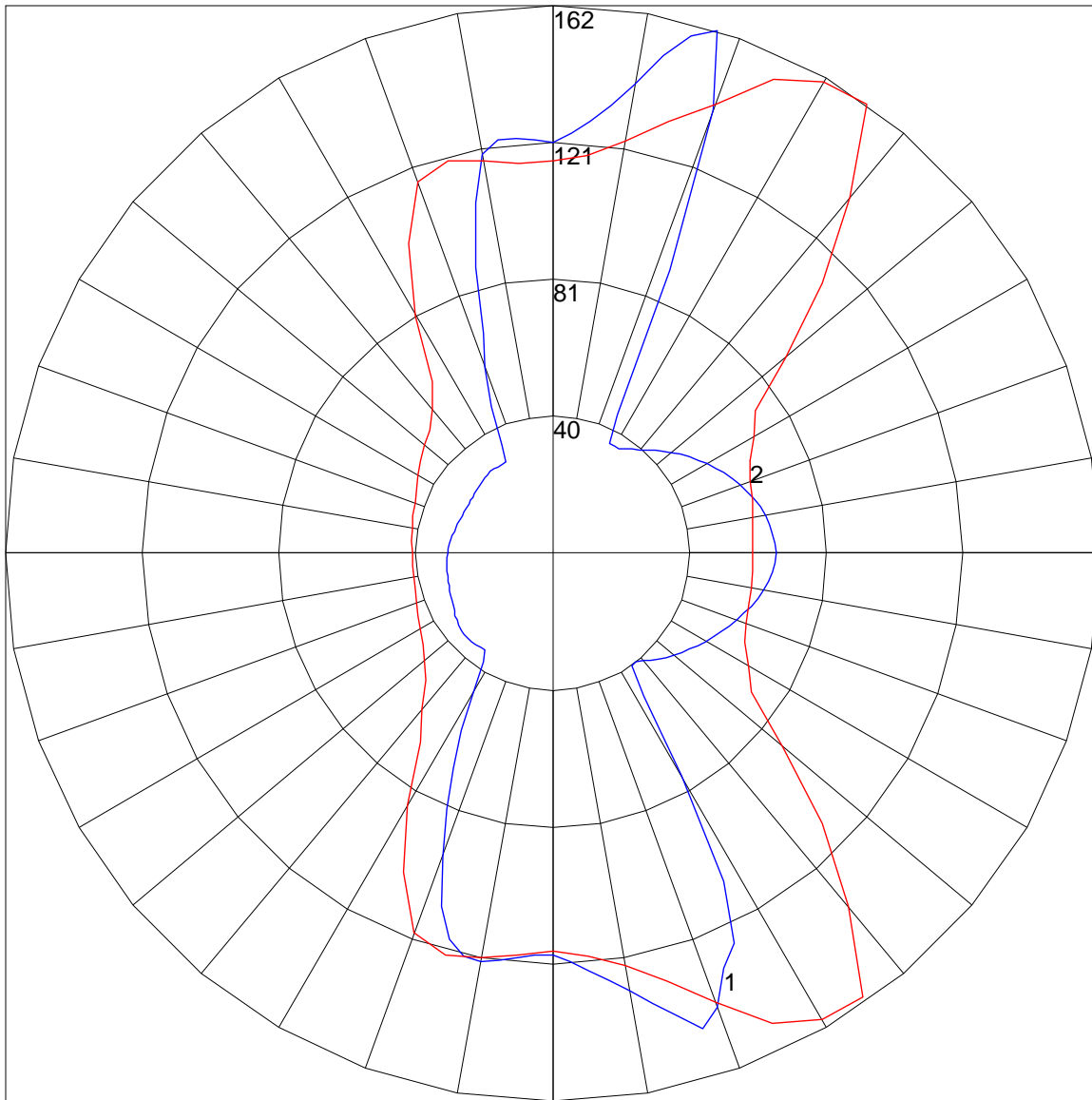
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COEFFICIENTS OF UTILIZATION - ZONAL CAVITY METHOD

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	108	108	108	108	100	100	100	100	84	84	84	71	71	71	58	58	58	52
1	94	88	83	78	87	81	77	73	68	65	62	56	54	51	45	43	42	36
2	85	76	68	62	78	70	63	57	58	53	49	48	44	41	38	35	33	28
3	77	66	57	51	70	61	53	47	51	45	40	42	37	34	33	30	27	23
4	70	58	49	42	64	54	46	40	45	39	34	37	32	28	30	26	23	19
5	65	52	43	36	59	48	40	34	40	34	29	33	28	25	27	23	20	17
6	60	47	38	31	55	43	35	29	36	30	26	30	25	22	25	21	18	15
7	55	42	34	28	51	39	31	26	33	27	23	28	23	19	23	19	16	13
8	51	38	30	25	47	36	28	23	30	24	20	26	21	17	21	17	14	12
9	48	35	27	22	44	33	26	21	28	22	18	24	19	16	20	16	13	11
10	45	32	25	20	41	30	23	19	26	20	17	22	18	14	18	15	12	10

POLAR GRAPH



Maximum Candela = 161.561 Located At Horizontal Angle = 55, Vertical Angle = 162.5
1 - Vertical Plane Through Horizontal Angles (55 - 235) (Through Max. Cd.)
2 - Horizontal Cone Through Vertical Angle (162.5) (Through Max. Cd.)