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**IES INDOOR REPORT**  
**PHOTOMETRIC FILENAME : FSN-8601-OPAL.IES**

**DESCRIPTION INFORMATION (From Photometric File)**

IESNA:LM-63-2002  
[TEST] LM-79-08  
[TESTLAB] Orb Optronix, Inc.  
[ISSUE DATE] 07-18-2019  
[MANUFAC] Justice Design  
[LUMINAIRE] FSN-8601-OPAL-MBLK

**CHARACTERISTICS**

Lumens Per Lamp	N.A. (absolute)
Total Lamp Lumens	N.A. (absolute)
Luminaire Lumens	539
Total Luminaire Efficiency	N.A.
Luminaire Efficacy Rating (LER)	28
Total Luminaire Watts	19.3
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)	0.21 ft
Luminous Width (90-270)	1.45 ft
Luminous Height	0.38 ft

**LUMINANCE DATA (cd/sq.m)**

Angle In Degrees	Average 0-Deg	Average 45-Deg	Average 90-Deg
45	1516	1401	909
55	1755	1669	1227
65	1946	1912	1630
75	2137	2149	2308
85	2364	2434	3550

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**CANDELA TABULATION**

	<u>0.0</u>	<u>22.5</u>	<u>45.0</u>	<u>67.5</u>	<u>90.0</u>	<u>112.5</u>	<u>135.0</u>	<u>157.5</u>	<u>180.0</u>	<u>202.5</u>
<b>0.0</b>	0.850	0.850	0.850	0.850	0.850	0.850	0.850	0.850	0.850	0.850
<b>2.5</b>	4.870	4.370	1.750	2.570	1.600	0.960	0.880	0.520	0.510	0.620
<b>5.0</b>	9.210	8.740	5.280	4.470	2.850	1.990	1.680	0.790	0.450	0.710
<b>7.5</b>	13.660	13.360	9.200	6.800	4.150	3.030	2.350	1.060	0.480	0.870
<b>10.0</b>	18.470	18.200	13.210	9.700	5.450	4.170	3.200	1.390	0.440	1.060
<b>12.5</b>	23.180	22.970	17.280	12.610	6.720	5.220	3.960	1.690	0.530	1.240
<b>15.0</b>	27.900	27.790	21.210	15.460	8.030	6.310	4.720	2.050	0.410	1.320
<b>17.5</b>	32.740	32.700	25.220	18.280	9.400	7.450	5.430	2.320	0.390	1.610
<b>20.0</b>	37.710	37.740	29.380	21.280	10.730	8.540	6.230	2.670	0.500	1.780
<b>22.5</b>	42.650	42.730	33.480	24.170	12.110	9.690	6.950	2.980	0.490	1.910
<b>25.0</b>	47.580	47.720	37.680	26.980	13.370	10.940	7.750	3.340	0.480	2.120
<b>27.5</b>	52.440	52.530	41.740	29.770	14.630	12.010	8.420	3.610	0.450	2.290
<b>30.0</b>	57.070	57.110	45.720	32.310	15.830	13.100	9.130	3.870	0.440	2.470
<b>32.5</b>	61.690	61.660	49.560	34.840	17.020	14.080	9.760	4.230	0.450	2.620
<b>35.0</b>	66.280	66.150	53.350	37.200	18.080	15.070	10.430	4.460	0.490	2.810
<b>37.5</b>	71.070	70.680	57.190	39.660	19.260	16.180	11.100	4.720	0.530	2.910
<b>40.0</b>	75.850	75.350	61.120	42.160	20.540	17.280	11.770	5.090	0.490	3.150
<b>42.5</b>	80.670	80.050	65.230	44.620	21.800	18.400	12.480	5.340	0.490	3.240
<b>45.0</b>	85.300	84.550	69.160	47.190	22.980	19.400	13.200	5.650	0.450	3.430
<b>47.5</b>	89.850	88.760	73.000	49.470	24.090	20.420	13.910	5.980	0.530	3.630
<b>50.0</b>	94.150	92.770	76.660	51.770	25.180	21.510	14.530	6.230	0.450	3.750
<b>52.5</b>	98.260	96.720	80.360	53.890	26.270	22.390	15.210	6.530	0.620	3.920
<b>55.0</b>	102.180	100.480	83.800	56.100	27.380	23.420	15.830	6.780	0.620	4.130
<b>57.5</b>	105.730	103.910	87.140	58.080	28.270	24.280	16.410	7.080	0.580	4.250
<b>60.0</b>	108.870	106.720	90.080	59.810	29.110	24.830	16.980	7.280	0.670	4.410
<b>62.5</b>	111.400	109.140	92.610	61.330	29.750	25.550	17.430	7.510	0.670	4.540
<b>65.0</b>	113.640	111.270	94.750	62.650	30.470	26.080	17.870	7.620	0.710	4.660
<b>67.5</b>	115.640	113.350	96.610	63.890	31.060	26.580	18.270	7.880	0.750	4.730
<b>70.0</b>	117.570	115.210	98.400	65.100	31.720	27.110	18.730	8.000	0.750	4.750
<b>72.5</b>	119.610	117.100	100.180	66.300	32.800	27.470	19.170	8.270	0.840	4.870
<b>75.0</b>	121.410	118.950	101.840	67.590	33.460	27.920	19.670	8.370	0.850	4.980
<b>77.5</b>	123.150	120.790	103.250	68.770	33.920	28.410	20.050	8.580	0.840	5.080
<b>80.0</b>	124.590	122.500	104.630	69.880	34.400	28.820	20.360	8.720	1.070	5.190
<b>82.5</b>	125.840	123.680	105.730	70.990	34.830	29.180	20.720	8.800	0.980	5.310
<b>85.0</b>	126.520	124.500	106.590	71.840	35.000	29.400	20.920	8.980	1.160	5.380
<b>87.5</b>	126.770	124.890	107.060	72.380	35.130	29.450	21.010	8.970	1.160	5.430
<b>90.0</b>	126.510	124.890	106.910	72.610	35.040	29.500	21.030	9.000	1.200	5.470
<b>92.5</b>	125.740	124.330	106.350	72.630	34.830	29.280	20.990	8.900	1.200	5.550
<b>95.0</b>	124.630	123.450	105.520	72.310	34.510	29.190	20.840	8.880	1.160	5.520
<b>97.5</b>	123.460	122.400	104.490	72.000	34.190	28.880	20.710	8.740	1.070	5.450
<b>100.0</b>	122.150	121.250	103.530	71.590	33.800	28.700	20.380	8.600	1.020	5.340
<b>102.5</b>	120.820	120.190	102.280	70.990	33.320	28.300	19.940	8.290	0.890	5.320
<b>105.0</b>	119.230	118.850	100.970	70.280	32.810	27.900	19.790	8.090	0.750	5.030
<b>107.5</b>	117.410	117.350	99.450	69.380	32.300	27.500	19.400	7.960	0.710	4.910
<b>110.0</b>	115.260	115.370	97.770	68.360	31.740	27.100	19.020	7.830	0.760	4.870
<b>112.5</b>	112.810	113.070	95.820	67.130	31.080	26.560	18.520	7.580	0.660	4.730
<b>115.0</b>	110.290	110.620	93.690	65.600	30.300	26.030	17.980	7.420	0.580	4.600
<b>117.5</b>	107.530	108.050	91.360	64.070	29.520	25.400	17.470	7.270	0.580	4.480
<b>120.0</b>	104.680	105.370	88.930	62.350	28.730	24.730	17.000	7.030	0.620	4.420
<b>122.5</b>	101.780	102.260	86.360	60.490	27.830	24.060	16.390	6.750	0.530	4.320
<b>125.0</b>	98.570	99.010	83.660	58.560	26.950	23.300	15.770	6.580	0.490	4.150
<b>127.5</b>	94.870	95.240	80.860	56.320	26.020	22.500	15.190	6.300	0.540	4.030
<b>130.0</b>	90.820	91.140	77.670	53.960	24.920	21.560	14.470	6.020	0.480	3.900
<b>132.5</b>	86.630	86.990	74.260	51.310	23.800	20.660	13.800	5.770	0.490	3.760

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**CANDELA TABULATION - (Cont.)**

135.0	82.420	82.700	70.750	48.700	22.650	19.690	13.100	5.550	0.450	3.570
137.5	78.030	78.290	67.320	46.060	21.440	18.940	12.530	5.290	0.520	3.440
140.0	73.550	73.740	63.690	43.410	20.340	17.580	11.730	4.950	0.450	3.260
142.5	68.730	68.920	60.130	40.570	19.120	16.640	10.920	4.620	0.440	3.040
145.0	63.360	63.400	56.080	37.650	17.830	15.520	10.120	4.280	0.450	2.900
147.5	58.040	58.080	51.600	34.440	16.380	14.260	9.290	3.960	0.480	2.650
150.0	52.970	52.990	47.300	31.330	14.980	13.060	8.560	3.700	0.450	2.550
152.5	47.840	47.900	43.210	28.470	13.560	11.900	7.790	3.360	0.390	2.250
155.0	42.840	42.720	38.920	25.470	12.260	10.830	7.010	2.980	0.500	2.180
157.5	37.580	37.540	34.710	22.530	10.880	9.630	6.240	2.690	0.440	1.970
160.0	32.460	32.320	30.330	19.490	9.490	8.510	5.390	2.170	0.480	1.660
162.5	27.280	27.320	25.970	16.440	8.160	7.300	4.570	1.730	0.410	1.400
165.0	23.210	23.080	21.830	13.430	6.790	6.250	3.530	1.240	0.470	1.130
167.5	19.040	17.790	17.590	10.490	5.660	5.300	2.450	0.800	0.400	0.860
170.0	14.970	11.800	12.390	7.140	4.230	3.880	1.360	0.460	0.490	0.670
172.5	8.660	5.560	6.970	3.960	2.640	2.290	0.500	0.410	0.440	0.620
175.0	2.630	0.740	2.290	1.560	1.010	0.980	0.380	0.340	0.460	0.580
177.5	0.430	0.490	0.410	0.380	0.310	0.300	0.340	0.420	0.410	0.530
180.0	0.549	0.549	0.549	0.549	0.549	0.549	0.549	0.549	0.549	0.549

**Vert. Angles**      **Horizontal Angles**

	<u>225.0</u>	<u>247.5</u>	<u>270.0</u>	<u>292.5</u>	<u>315.0</u>	<u>337.5</u>	<u>360.0</u>
0.0	0.850	0.850	0.850	0.850	0.850	0.850	0.850
2.5	0.830	1.100	1.260	1.480	3.920	4.460	4.870
5.0	1.340	1.940	2.260	3.690	7.660	8.800	9.210
7.5	1.910	2.880	3.380	6.210	11.560	13.440	13.660
10.0	2.580	3.820	4.550	8.970	15.620	18.140	18.470
12.5	3.200	4.890	5.750	11.700	19.720	22.820	23.180
15.0	3.870	5.870	6.910	14.470	23.750	27.420	27.900
17.5	4.540	6.850	8.100	17.190	27.850	32.150	32.740
20.0	5.180	7.880	9.320	20.030	32.050	36.880	37.710
22.5	5.840	8.900	10.540	22.870	36.160	41.620	42.650
25.0	6.460	9.980	11.770	25.620	40.230	46.210	47.580
27.5	7.140	10.910	13.010	28.320	44.330	50.760	52.440
30.0	7.800	11.980	14.160	30.970	48.150	55.180	57.070
32.5	8.390	13.010	15.310	33.550	51.950	59.460	61.690
35.0	9.020	13.990	16.570	36.100	55.810	63.700	66.280
37.5	9.540	14.930	17.810	38.540	56.790	68.040	71.070
40.0	10.170	15.910	19.050	40.930	59.450	72.600	75.850
42.5	10.760	16.900	20.240	43.420	63.250	77.110	80.670
45.0	11.340	17.880	21.440	45.950	67.090	81.520	85.300
47.5	11.880	18.770	22.600	48.210	70.760	85.810	89.850
50.0	12.420	19.660	23.780	50.370	74.350	90.040	94.150
52.5	12.910	20.460	24.890	52.450	77.830	94.260	98.260
55.0	13.440	21.350	25.930	54.360	81.320	98.250	102.180
57.5	13.900	22.060	26.870	56.220	84.580	101.940	105.730
60.0	14.250	22.680	27.830	57.940	87.460	105.330	108.870
62.5	14.570	23.210	28.520	59.360	90.100	108.260	111.400
65.0	14.940	23.700	29.290	60.510	92.480	111.060	113.640
67.5	15.200	24.190	29.900	61.630	94.670	113.590	115.640
70.0	15.520	24.590	30.430	62.730	96.640	116.080	117.570
72.5	15.740	24.990	31.070	63.650	98.600	118.530	119.610
75.0	16.050	25.430	31.590	64.710	100.440	120.950	121.410
77.5	16.270	25.800	32.100	65.650	102.270	123.170	123.150
80.0	16.580	26.150	32.530	66.670	104.100	125.290	124.590

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**CANDELA TABULATION - (Cont.)**

<b>82.5</b>	16.860	26.590	32.900	67.610	105.620	127.020	125.840
<b>85.0</b>	16.990	26.760	33.160	68.250	106.780	128.200	126.520
<b>87.5</b>	17.170	26.890	33.190	68.740	107.230	128.820	126.770
<b>90.0</b>	17.260	26.970	33.230	68.840	107.320	128.900	126.510
<b>92.5</b>	17.260	26.840	33.040	68.780	107.010	128.410	125.740
<b>95.0</b>	17.140	26.760	32.750	68.500	106.380	127.460	124.630
<b>97.5</b>	17.000	26.450	32.370	68.070	105.350	126.170	123.460
<b>100.0</b>	16.870	26.220	31.920	67.520	104.180	124.840	122.150
<b>102.5</b>	16.560	25.740	31.550	66.910	102.670	122.870	120.820
<b>105.0</b>	16.330	25.550	31.080	66.220	101.140	119.480	119.230
<b>107.5</b>	16.060	25.160	30.560	65.410	99.360	118.240	117.410
<b>110.0</b>	15.840	24.680	30.030	64.450	97.600	116.460	115.260
<b>112.5</b>	15.570	24.260	29.360	63.340	95.270	114.430	112.810
<b>115.0</b>	15.260	23.780	28.610	62.110	92.860	112.030	110.290
<b>117.5</b>	14.950	23.200	27.880	60.610	90.220	109.570	107.530
<b>120.0</b>	14.550	22.670	27.150	59.100	87.540	106.750	104.680
<b>122.5</b>	14.190	22.070	26.350	57.500	84.900	103.890	101.780
<b>125.0</b>	13.790	21.360	25.610	55.820	82.070	100.860	98.570
<b>127.5</b>	13.340	20.670	24.630	53.970	78.940	97.320	94.870
<b>130.0</b>	12.760	19.860	23.600	51.740	75.530	93.450	90.820
<b>132.5</b>	12.270	19.020	22.630	49.430	71.950	89.160	86.630
<b>135.0</b>	11.820	18.150	21.540	46.940	68.380	84.860	82.420
<b>137.5</b>	11.060	17.270	20.550	44.610	64.890	80.380	78.030
<b>140.0</b>	10.480	16.300	19.420	42.030	61.250	75.890	73.550
<b>142.5</b>	9.810	15.210	18.360	39.410	57.220	71.180	68.730
<b>145.0</b>	9.180	14.140	17.010	36.550	53.170	65.860	63.360
<b>147.5</b>	8.560	13.100	15.700	33.620	49.180	60.670	58.040
<b>150.0</b>	7.890	11.970	14.450	30.700	45.010	55.390	52.970
<b>152.5</b>	7.310	10.990	13.240	27.850	41.110	50.280	47.840
<b>155.0</b>	6.720	9.930	11.940	25.040	37.090	45.270	42.840
<b>157.5</b>	6.110	8.890	10.690	22.100	32.960	40.100	37.580
<b>160.0</b>	5.420	7.820	9.440	19.140	28.780	35.000	32.460
<b>162.5</b>	4.720	6.670	8.110	16.200	24.810	29.870	27.280
<b>165.0</b>	4.030	5.840	7.100	13.300	20.800	25.240	23.210
<b>167.5</b>	3.080	4.580	5.830	10.390	16.440	20.780	19.040
<b>170.0</b>	2.060	3.040	4.480	7.320	11.420	14.780	14.970
<b>172.5</b>	1.270	1.580	2.620	4.360	6.060	8.310	8.660
<b>175.0</b>	0.780	0.800	1.080	1.940	2.020	2.550	2.630
<b>177.5</b>	0.760	0.820	0.830	0.850	0.730	0.610	0.430
<b>180.0</b>	0.549	0.549	0.549	0.549	0.549	0.549	0.549

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**ZONAL LUMEN SUMMARY**

Zone	Lumens	%Lamp	%Fixt
0-20	4.13	N.A.	0.80
0-30	14.01	N.A.	2.60
0-40	32.50	N.A.	6.00
0-60	101.49	N.A.	18.80
0-80	208.29	N.A.	38.60
0-90	270.18	N.A.	50.10
10-90	269.69	N.A.	50.00
20-40	28.37	N.A.	5.30
20-50	57.29	N.A.	10.60
40-70	118.68	N.A.	22.00
60-80	106.80	N.A.	19.80
70-80	57.11	N.A.	10.60
80-90	61.89	N.A.	11.50
90-110	118.72	N.A.	22.00
90-120	168.44	N.A.	31.20
90-130	208.56	N.A.	38.70
90-150	256.17	N.A.	47.50
90-180	269.13	N.A.	49.90
110-180	150.41	N.A.	27.90
0-180	539.32	N.A.	100.00

Total Luminaire Efficiency = N.A. %

**ZONAL LUMEN SUMMARY**

Zone	Lumens
0-10	0.50
10-20	3.63
20-30	9.88
30-40	18.49
40-50	28.91
50-60	40.07
60-70	49.69
70-80	57.11
80-90	61.89
90-100	61.62
100-110	57.10
110-120	49.71
120-130	40.13
130-140	29.17
140-150	18.44
150-160	9.41
160-170	3.25
170-180	0.29

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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	
0	107	107	107	107	99	99	99	99	83	83	83	69	69	69	56	56	56	50
1	92	85	79	73	84	78	72	68	64	60	56	52	49	46	40	38	36	30
2	81	71	63	55	74	65	57	51	53	47	42	42	38	34	32	29	26	21
3	73	61	51	44	66	55	47	40	45	38	33	36	30	26	27	23	19	15
4	66	52	43	35	60	48	39	32	39	32	26	31	25	21	23	19	15	11
5	60	46	36	29	54	42	33	27	34	27	22	27	21	17	20	16	12	9
6	55	41	31	24	50	37	28	22	30	23	18	24	18	14	18	13	10	7
7	50	36	27	21	46	33	25	19	27	20	15	21	16	12	16	12	9	6
8	47	33	24	18	42	30	22	16	24	18	13	19	14	10	14	10	7	5
9	43	29	21	15	39	27	19	14	22	16	11	17	12	9	13	9	6	4
10	40	27	19	14	36	25	17	12	20	14	10	16	11	8	12	8	5	3

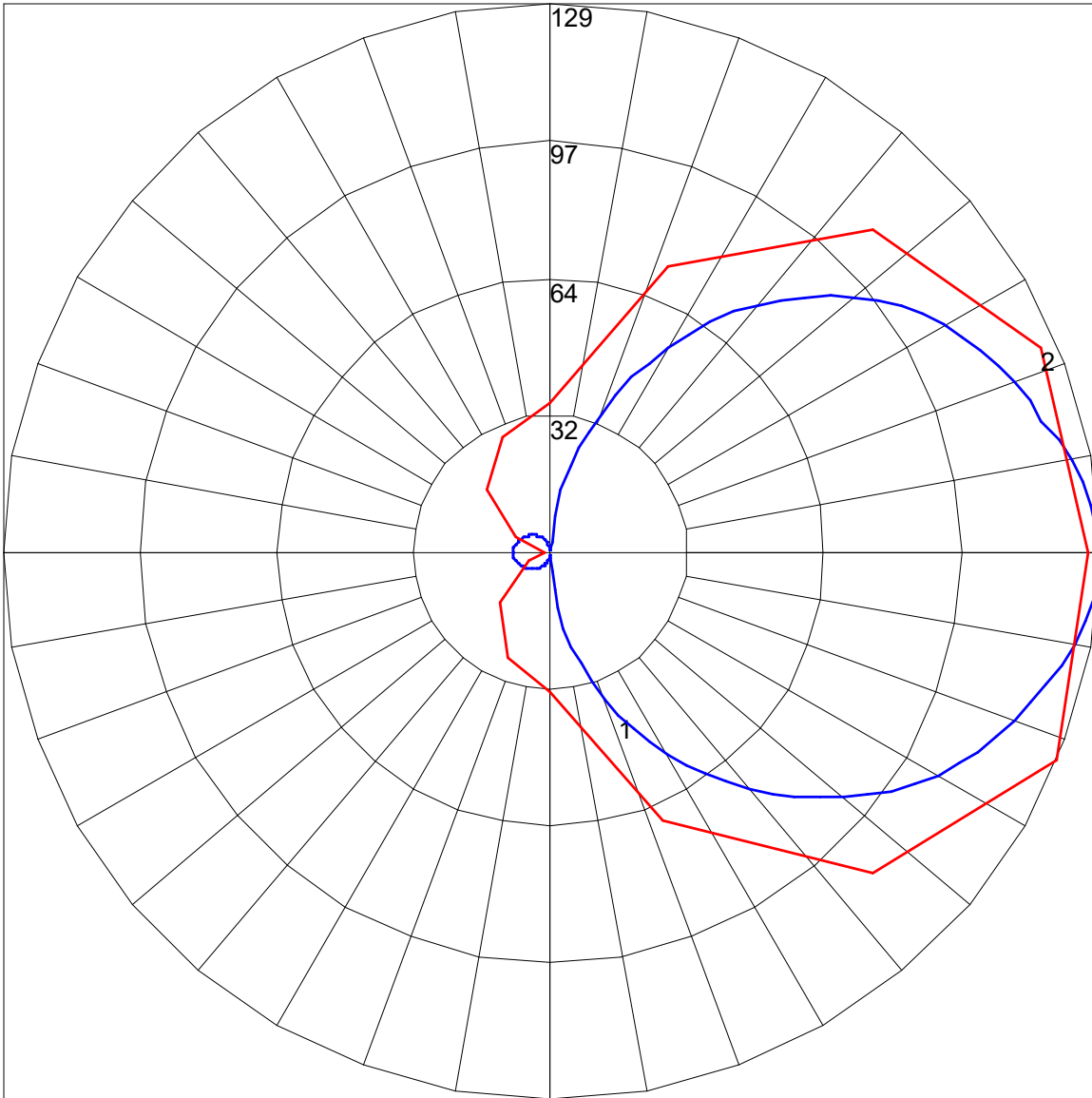
**IES INDOOR REPORT**  
**PHOTOMETRIC FILENAME : FSN-8601-OPAL.IES**

**UGR TABLE - CORRECTED**

Reflectances											
Ceiling Cavity	70	70	50	50	30	70	70	50	50	30	
Walls	50	30	50	30	30	50	30	50	30	30	
Floor Cavity	20	20	20	20	20	20	20	20	20	20	
Room Size		UGR Viewed Crosswise					UGR Viewed Endwise				
X=2H	Y=2H	14.9	15.9	15.8	16.9	18.2	6.7	7.8	7.6	8.7	10.0
	3H	18.7	19.6	19.6	20.6	21.9	9.3	10.2	10.2	11.2	12.5
	4H	20.6	21.5	21.5	22.5	23.8	10.5	11.4	11.5	12.4	13.7
	6H	22.6	23.5	23.5	24.4	25.7	11.7	12.6	12.7	13.6	14.9
	8H	23.6	24.4	24.6	25.4	26.7	12.3	13.1	13.3	14.1	15.4
	12H	24.6	25.4	25.6	26.4	27.7	12.9	13.7	13.8	14.7	16.0
4H	2H	15.3	16.2	16.2	17.2	18.5	9.2	10.1	10.1	11.1	12.3
	3H	19.3	20.1	20.2	21.1	22.4	11.8	12.6	12.7	13.6	14.9
	4H	21.4	22.1	22.3	23.1	24.4	13.0	13.8	14.0	14.8	16.1
	6H	23.6	24.2	24.5	25.3	26.6	14.3	14.9	15.2	16.0	17.3
	8H	24.7	25.3	25.6	26.3	27.7	14.8	15.5	15.8	16.5	17.8
	12H	25.8	26.4	26.8	27.4	28.8	15.4	16.0	16.4	17.0	18.3
8H	4H	21.6	22.3	22.6	23.3	24.6	14.7	15.3	15.6	16.3	17.6
	6H	24.0	24.5	25.0	25.6	26.9	16.1	16.7	17.1	17.7	19.0
	8H	25.3	25.8	26.3	26.8	28.1	16.8	17.3	17.8	18.3	19.7
	12H	26.6	27.0	27.6	28.1	29.5	17.5	17.9	18.5	18.9	20.3
12H	4H	21.6	22.2	22.6	23.2	24.6	15.1	15.7	16.1	16.8	18.1
	6H	24.1	24.6	25.1	25.6	27.0	16.8	17.3	17.8	18.3	19.7
	8H	25.4	25.8	26.4	26.9	28.2	17.6	18.0	18.6	19.1	20.4

Maximum UGR = 29.5

POLAR GRAPH



Maximum Candela = 128.9 Located At Horizontal Angle = 337.5, Vertical Angle = 90  
# 1 - Vertical Plane Through Horizontal Angles (337.5 - 157.5) (Through Max. Cd.)  
# 2 - Horizontal Cone Through Vertical Angle (90) (Through Max. Cd.)