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IES INDOOR REPORT

PHOTOMETRIC FILENAME : FSN-8635-MROR.IES

DESCRIPTION INFORMATION (From Photometric File)

IESNA:LM-63-2002

[TEST] LM-79-08

[TESTLAB] Orb Optronix, Inc.

[ISSUE DATE] 07-22-2019

[MANUFACT] Justice Design

[LUMINAIRE] FSN-8635--MROR

CHARACTERISTICS

Lumens Per Lamp	N.A. (absolute)
Total Lamp Lumens	N.A. (absolute)
Luminaire Lumens	609
Total Luminaire Efficiency	N.A.
Luminaire Efficacy Rating (LER)	18
Total Luminaire Watts	33.78
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)	2.38 ft
Luminous Height	0.38 ft

LUMINANCE DATA (cd/sq.m)

Angle In Degrees	Average 0-Deg	Average 45-Deg	Average 90-Deg
45	1069	1012	677
55	1206	1150	878
65	1342	1295	1180
75	1486	1462	1712
85	1657	1664	3005

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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>
0.0	6.318	6.318	6.318	6.318	6.318	6.318	6.318	6.318	6.318	6.318
2.5	5.585	6.412	6.341	6.178	6.755	6.708	9.898	7.909	8.011	8.650
5.0	10.132	11.294	10.608	9.274	9.134	9.914	11.692	12.043	12.137	11.560
7.5	16.864	17.074	15.155	12.753	11.115	11.482	11.029	11.622	11.942	11.318
10.0	22.191	23.556	20.249	15.272	11.443	10.795	11.170	11.271	10.975	10.951
12.5	33.610	34.414	28.478	19.945	13.120	11.021	11.489	10.928	10.265	10.475
15.0	41.473	41.730	35.537	24.765	14.953	11.645	11.965	10.663	10.007	10.156
17.5	48.017	47.791	40.505	28.571	16.559	12.230	12.067	10.592	10.351	10.062
20.0	54.335	53.992	45.490	31.777	17.948	12.808	12.106	10.787	10.772	10.241
22.5	60.614	59.249	49.772	34.554	19.055	13.588	12.043	10.982	11.419	10.787
25.0	65.941	64.303	53.719	37.151	20.155	14.017	12.043	11.443	12.410	11.341
27.5	70.871	68.827	57.782	39.780	21.099	14.165	11.856	11.950	13.517	11.770
30.0	75.356	73.258	61.581	42.479	21.895	14.274	11.630	12.550	14.461	12.301
32.5	79.482	76.635	64.623	44.819	22.597	14.531	11.255	13.151	15.218	12.550
35.0	83.905	80.519	67.376	46.683	23.127	14.851	10.865	13.556	15.959	12.761
37.5	88.148	84.466	70.754	48.758	23.782	14.953	10.678	13.861	16.786	13.081
40.0	91.720	87.890	74.006	50.794	24.476	15.218	10.468	14.110	17.534	13.330
42.5	95.113	91.104	76.892	52.962	25.163	15.530	10.351	14.508	18.268	13.541
45.0	98.686	94.372	79.529	54.943	25.802	15.748	10.257	14.804	18.845	13.861
47.5	102.492	97.937	82.321	56.722	26.543	15.896	10.187	15.015	19.484	14.063
50.0	106.712	101.735	85.293	58.672	27.378	16.115	10.109	15.226	20.116	14.188
52.5	111.173	105.791	88.468	60.583	28.111	16.279	9.922	15.436	20.647	14.391
55.0	115.198	109.512	91.627	62.572	28.743	16.520	9.922	15.639	20.966	14.648
57.5	118.942	112.874	94.419	64.412	29.273	16.692	9.758	15.678	21.442	14.672
60.0	122.281	115.924	96.782	66.035	29.913	16.903	9.688	15.733	21.863	14.812
62.5	125.486	118.872	99.154	67.571	30.490	17.051	9.500	15.896	22.277	14.921
65.0	128.606	121.688	101.408	68.874	31.114	17.371	9.555	16.146	22.698	15.241
67.5	131.095	123.848	103.163	69.997	31.489	17.371	9.571	16.302	23.228	15.382
70.0	133.341	126.118	104.972	71.206	31.964	17.597	9.641	16.419	23.595	15.460
72.5	136.079	128.692	107.203	72.540	32.432	18.010	9.781	16.606	24.125	15.709
75.0	138.567	130.798	108.950	73.811	32.861	18.353	9.828	16.809	24.593	15.959
77.5	140.572	131.921	110.573	74.825	33.392	18.658	10.039	16.957	24.859	16.099
80.0	142.451	133.864	111.914	75.715	33.766	19.001	10.148	17.090	25.389	16.208
82.5	144.245	135.502	113.225	76.510	34.133	19.172	10.210	17.152	25.646	16.325
85.0	145.564	136.773	113.989	77.103	34.390	19.375	10.280	17.152	25.857	16.255
87.5	146.312	137.631	114.449	77.337	34.554	19.469	10.304	17.098	26.013	16.255
90.0	146.734	137.873	114.543	77.267	34.616	19.414	10.280	16.957	26.013	16.185
92.5	146.461	137.623	114.184	77.306	34.601	19.352	10.218	16.809	26.013	15.896
95.0	145.782	137.077	113.732	77.017	34.616	19.149	10.280	16.645	25.802	15.748
97.5	144.885	136.328	113.084	76.604	34.507	19.024	10.218	16.567	25.740	15.530
100.0	143.824	135.314	112.156	76.019	34.343	18.767	10.241	16.520	25.740	15.561
102.5	142.233	133.840	110.822	75.192	33.977	18.572	9.945	16.060	25.147	14.945
105.0	140.439	132.109	109.551	74.428	33.766	17.995	9.641	15.639	24.905	14.711
107.5	138.551	130.408	108.170	73.476	33.673	17.667	9.547	15.452	24.515	14.508
110.0	136.477	128.536	106.400	72.517	33.462	17.183	9.321	15.194	23.993	14.329
112.5	133.887	126.181	104.294	71.175	33.033	16.747	9.087	14.968	23.525	13.954
115.0	130.939	123.482	102.102	69.810	32.666	16.723	8.853	14.695	23.104	13.744
117.5	128.209	120.853	99.934	68.500	32.191	16.645	8.900	14.399	22.628	13.439
120.0	125.190	118.139	97.445	66.971	31.613	16.544	9.134	14.118	21.996	13.221
122.5	121.992	115.144	94.926	65.364	31.138	16.279	9.415	14.110	21.473	13.174
125.0	119.028	112.234	92.251	63.679	30.654	16.060	9.594	14.048	20.935	13.104
127.5	115.245	108.771	89.193	61.885	29.921	15.873	9.664	14.063	20.069	12.831
130.0	111.517	105.261	87.649	62.782	29.453	15.662	9.828	14.001	19.297	12.386
132.5	108.724	102.905	87.142	60.458	28.860	15.475	9.750	13.673	18.455	12.457

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CANDELA TABULATION - (Cont.)

135.0	105.986	100.144	81.760	57.127	28.119	15.124	9.781	13.517	17.784	11.848
137.5	102.983	97.352	78.944	55.013	27.440	15.038	9.688	13.463	16.676	11.053
140.0	99.060	93.889	75.644	53.095	26.411	14.375	9.430	12.129	14.781	9.781
142.5	94.310	89.599	73.375	49.397	25.116	14.024	8.954	10.397	13.533	8.806
145.0	83.171	82.594	68.102	48.555	24.671	13.580	8.206	9.321	12.230	7.777
147.5	84.349	81.143	67.111	45.302	23.252	12.496	7.449	8.424	10.327	6.568
150.0	78.624	75.442	62.002	41.605	21.778	11.411	6.341	6.833	8.050	4.594
152.5	73.484	70.044	57.221	38.587	20.452	10.218	4.664	4.976	5.577	3.221
155.0	69.334	65.785	53.563	36.395	18.517	8.307	3.806	3.502	3.526	2.278
157.5	64.771	61.955	50.240	33.251	15.920	5.561	3.159	2.691	2.239	1.771
160.0	58.079	56.433	45.638	28.813	12.691	3.994	2.652	2.215	1.700	1.310
162.5	51.925	50.193	40.154	22.784	8.650	3.089	1.794	1.474	1.248	1.045
165.0	43.204	42.580	30.724	14.344	6.458	2.161	1.295	0.998	0.741	0.858
167.5	28.431	27.292	19.851	10.663	4.290	1.505	0.920	0.733	0.601	0.757
170.0	18.385	18.338	13.814	6.302	2.379	0.991	0.733	0.624	0.593	0.686
172.5	10.787	11.029	7.355	3.003	1.599	0.827	0.554	0.577	0.468	0.710
175.0	3.947	4.563	3.338	1.108	0.577	0.515	0.445	0.421	0.530	0.710
177.5	0.530	1.123	0.640	0.468	0.624	0.554	0.530	0.624	0.593	0.764
180.0	0.659	0.659	0.659	0.659	0.659	0.659	0.659	0.659	0.659	0.659

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	6.318	6.318	6.318	6.318	6.318	6.318	6.318
2.5	7.800	7.402	7.082	5.655	5.070	5.491	5.047
5.0	11.099	10.397	9.578	8.791	9.181	10.444	10.881
7.5	11.029	10.959	11.318	12.386	14.063	16.715	17.573
10.0	11.029	11.021	12.332	15.054	18.447	22.628	23.509
12.5	11.279	11.552	14.071	19.422	25.763	32.620	34.897
15.0	11.770	12.067	15.265	23.361	31.894	39.484	42.416
17.5	11.895	12.363	16.325	26.567	36.527	45.115	48.571
20.0	11.801	12.862	17.152	29.227	41.262	51.106	55.123
22.5	11.856	13.338	17.963	31.489	45.318	56.417	61.168
25.0	11.809	13.861	18.728	33.657	49.062	61.238	66.464
27.5	11.809	14.227	19.321	36.005	52.985	65.481	71.230
30.0	11.716	14.648	19.726	38.236	56.394	69.607	75.808
32.5	11.692	15.015	20.163	40.342	59.506	73.577	79.810
35.0	11.443	15.436	20.756	42.284	62.759	77.665	84.256
37.5	11.435	15.701	21.294	44.218	66.144	81.549	88.390
40.0	11.326	16.232	21.801	46.121	69.038	84.973	91.985
42.5	11.279	16.700	22.331	48.017	71.885	88.195	95.503
45.0	11.232	16.910	22.862	49.842	74.779	91.907	99.169
47.5	11.216	17.386	23.462	51.597	77.930	95.667	103.124
50.0	11.170	17.878	23.985	53.539	81.026	99.676	107.414
52.5	11.123	18.283	24.547	55.520	84.341	103.787	111.836
55.0	11.115	18.751	25.116	57.314	87.454	107.663	115.892
57.5	11.021	19.172	25.459	59.069	90.254	110.955	119.558
60.0	10.912	19.539	25.857	60.567	92.672	113.989	122.811
62.5	10.811	19.851	26.341	62.088	95.144	117.055	126.017
65.0	10.811	20.202	26.762	63.328	97.406	119.870	129.176
67.5	10.795	20.257	27.058	64.342	99.263	122.171	131.539
70.0	10.858	20.530	27.308	65.294	100.948	124.207	133.731
72.5	10.904	20.857	27.659	66.542	102.890	126.664	136.383
75.0	10.904	21.271	27.885	67.470	104.731	128.903	138.801
77.5	10.959	21.536	28.259	68.429	106.205	130.681	140.813
80.0	11.068	22.004	28.595	69.217	107.570	132.413	142.693

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CANDELA TABULATION - (Cont.)

82.5	11.068	22.207	28.735	69.982	108.982	134.043	144.378
85.0	11.170	22.526	28.852	70.481	109.769	135.041	145.556
87.5	11.170	22.628	28.922	70.832	110.401	135.728	146.289
90.0	11.115	22.760	28.993	70.964	110.752	135.938	146.484
92.5	10.959	22.667	28.946	71.011	110.643	135.634	146.133
95.0	10.811	22.581	28.876	70.668	110.042	134.831	145.439
97.5	10.592	22.487	28.735	70.270	109.418	133.949	144.433
100.0	10.491	22.300	28.571	69.810	108.615	132.826	143.278
102.5	10.062	22.019	28.306	68.991	107.437	131.274	141.632
105.0	9.805	21.614	28.018	68.149	106.025	129.457	139.792
107.5	9.485	21.356	27.776	67.298	104.497	127.709	137.896
110.0	9.337	20.966	27.901	66.269	102.843	125.603	135.759
112.5	9.064	20.576	27.682	65.177	100.885	123.045	133.084
115.0	8.908	20.670	27.425	63.960	98.826	120.393	130.283
117.5	8.861	20.686	27.097	62.852	96.728	117.842	127.413
120.0	9.071	20.592	26.848	61.558	94.497	114.933	124.363
122.5	9.391	20.413	26.450	60.294	92.235	112.133	121.321
125.0	9.594	20.140	26.185	58.773	89.747	109.138	118.248
127.5	9.602	19.703	25.810	57.299	87.048	105.557	114.442
130.0	9.680	19.352	25.436	57.431	84.942	102.445	110.854
132.5	9.680	18.689	24.929	55.466	83.772	100.051	108.311
135.0	10.031	18.291	24.352	52.814	80.777	97.032	105.472
137.5	9.758	17.581	23.782	51.012	76.986	94.099	102.500
140.0	8.541	17.527	22.924	49.031	73.765	90.223	98.514
142.5	7.823	16.255	22.667	46.839	69.607	84.178	93.733
145.0	7.129	15.007	21.489	44.257	66.768	79.849	85.246
147.5	6.295	13.439	20.023	42.019	62.026	76.128	83.788
150.0	5.047	11.599	18.478	39.733	57.915	70.918	77.836
152.5	4.181	9.415	16.372	37.393	54.366	66.628	72.727
155.0	3.409	6.778	13.681	34.944	51.082	63.008	68.531
157.5	2.995	4.563	11.341	31.528	46.496	58.149	63.788
160.0	2.301	3.744	9.071	27.698	41.098	51.831	55.099
162.5	1.630	2.948	6.786	21.224	35.217	45.302	45.552
165.0	1.287	2.278	5.398	14.765	26.060	36.145	37.799
167.5	1.084	1.708	3.549	11.973	17.527	22.581	25.654
170.0	0.881	1.334	2.168	7.613	11.419	14.828	16.513
172.5	0.850	1.217	1.630	4.196	5.881	7.745	9.227
175.0	0.920	0.928	1.061	2.449	2.746	3.502	3.744
177.5	0.881	0.998	1.100	1.045	0.850	0.616	0.647
180.0	0.659	0.659	0.659	0.659	0.659	0.659	0.659

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ZONAL LUMEN SUMMARY

Zone	Lumens	%Lamp	%Fixt
0-20	7.33	N.A.	1.20
0-30	21.60	N.A.	3.50
0-40	45.24	N.A.	7.40
0-60	123.37	N.A.	20.30
0-80	238.83	N.A.	39.20
0-90	305.14	N.A.	50.10
10-90	304.01	N.A.	49.90
20-40	37.92	N.A.	6.20
20-50	71.63	N.A.	11.80
40-70	132.07	N.A.	21.70
60-80	115.46	N.A.	19.00
70-80	61.52	N.A.	10.10
80-90	66.31	N.A.	10.90
90-110	128.21	N.A.	21.10
90-120	182.58	N.A.	30.00
90-130	227.69	N.A.	37.40
90-150	286.33	N.A.	47.00
90-180	303.60	N.A.	49.90
110-180	175.39	N.A.	28.80
0-180	608.74	N.A.	100.00

Total Luminaire Efficiency = N.A. %

ZONAL LUMEN SUMMARY

Zone	Lumens
0-10	1.13
10-20	6.20
20-30	14.27
30-40	23.64
40-50	33.71
50-60	44.41
60-70	53.94
70-80	61.52
80-90	66.31
90-100	66.32
100-110	61.89
110-120	54.37
120-130	45.10
130-140	35.08
140-150	23.57
150-160	12.75
160-170	4.20
170-180	0.31

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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	107	107	107	107	99	99	99	99	83	83	83	69	69	69	56	56	56	50
1	92	86	80	74	84	78	73	68	65	61	57	52	49	46	41	39	36	31
2	82	72	63	56	74	66	58	52	54	48	43	43	39	35	33	30	27	22
3	73	61	52	44	67	56	48	41	46	39	34	36	31	27	28	24	20	16
4	66	53	44	36	60	48	40	33	40	33	27	31	26	22	24	20	16	12
5	60	47	37	30	55	43	34	27	35	28	23	28	22	18	21	17	13	10
6	55	41	32	25	50	38	29	23	31	24	19	24	19	15	18	14	11	8
7	51	37	28	22	46	34	26	20	28	21	16	22	17	13	17	13	9	7
8	47	33	25	19	43	30	23	17	25	19	14	20	15	11	15	11	8	5
9	44	30	22	16	40	28	20	15	23	17	12	18	13	10	14	10	7	5
10	41	27	19	14	37	25	18	13	21	15	11	17	12	8	13	9	6	4

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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

X=2H	Y=2H	13.7	14.7	14.6	15.7	17.0	5.0	6.1	5.9	7.0	8.3
	3H	17.6	18.6	18.6	19.6	20.8	7.4	8.4	8.4	9.4	10.6
	4H	19.7	20.6	20.6	21.6	22.8	8.6	9.5	9.6	10.5	11.8
	6H	21.8	22.7	22.8	23.6	24.9	9.8	10.6	10.7	11.6	12.9
	8H	22.9	23.7	23.9	24.7	26.0	10.3	11.1	11.3	12.1	13.4
	12H	24.0	24.8	25.0	25.8	27.2	10.8	11.6	11.8	12.6	13.9

UGR Viewed Endwise

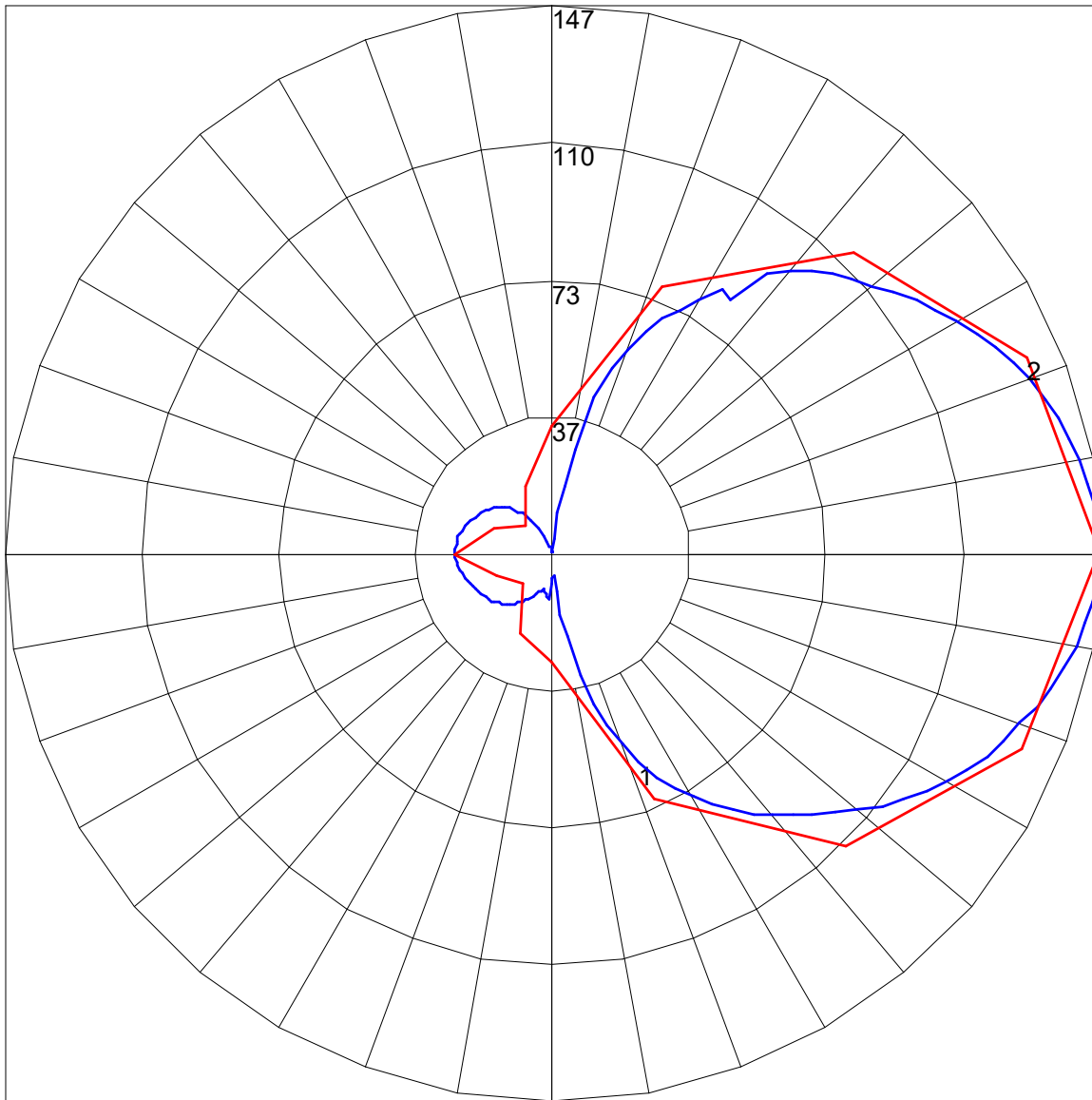
4H	2H	14.0	15.0	15.0	15.9	17.2	7.6	8.5	8.5	9.4	10.7
	3H	18.2	19.0	19.1	20.0	21.3	10.1	10.9	11.0	11.9	13.2
	4H	20.3	21.1	21.3	22.1	23.4	11.3	12.0	12.2	13.0	14.3
	6H	22.7	23.3	23.6	24.3	25.7	12.4	13.1	13.4	14.1	15.4
	8H	23.8	24.5	24.8	25.5	26.8	13.0	13.6	13.9	14.6	15.9
	12H	25.1	25.7	26.1	26.7	28.1	13.5	14.0	14.5	15.1	16.4

8H	4H	20.5	21.2	21.5	22.2	23.5	13.0	13.7	14.0	14.7	16.0
	6H	23.0	23.6	24.0	24.6	25.9	14.4	15.0	15.4	16.0	17.3
	8H	24.4	24.8	25.4	25.9	27.2	15.1	15.5	16.1	16.6	17.9
	12H	25.8	26.2	26.8	27.3	28.6	15.7	16.1	16.7	17.1	18.5

12H	4H	20.5	21.1	21.5	22.1	23.5	13.6	14.2	14.6	15.2	16.5
	6H	23.1	23.6	24.1	24.6	26.0	15.1	15.6	16.1	16.6	18.0
	8H	24.4	24.9	25.5	25.9	27.3	15.9	16.3	16.9	17.4	18.7

Maximum UGR = 28.6

POLAR GRAPH



Maximum Candela = 146.734 Located At Horizontal Angle = 0, Vertical Angle = 90
1 - Vertical Plane Through Horizontal Angles (0 - 180) (Through Max. Cd.)
2 - Horizontal Cone Through Vertical Angle (90) (Through Max. Cd.)