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**IES INDOOR REPORT**  
**PHOTOMETRIC FILENAME : PNA-8601.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] PNA-8601

**CHARACTERISTICS**

Lumens Per Lamp	N.A. (absolute)
Total Lamp Lumens	N.A. (absolute)
Luminaire Lumens	458
Total Luminaire Efficiency	N.A.
Luminaire Efficacy Rating (LER)	24
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	1289	1191	773
55	1492	1418	1043
65	1654	1625	1386
75	1816	1827	1962
85	2010	2069	3017

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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>	0.723	0.723	0.723	0.723	0.723	0.723	0.723	0.723	0.723	0.723
<b>2.5</b>	4.140	3.715	1.488	2.185	1.360	0.816	0.748	0.442	0.434	0.527
<b>5.0</b>	7.829	7.429	4.488	3.800	2.423	1.692	1.428	0.672	0.383	0.604
<b>7.5</b>	11.611	11.356	7.820	5.780	3.528	2.576	1.998	0.901	0.408	0.740
<b>10.0</b>	15.700	15.470	11.229	8.245	4.633	3.545	2.720	1.182	0.374	0.901
<b>12.5</b>	19.703	19.525	14.688	10.719	5.712	4.437	3.366	1.437	0.451	1.054
<b>15.0</b>	23.715	23.622	18.029	13.141	6.826	5.364	4.012	1.743	0.349	1.122
<b>17.5</b>	27.829	27.795	21.437	15.538	7.990	6.333	4.616	1.972	0.332	1.369
<b>20.0</b>	32.054	32.079	24.973	18.088	9.121	7.259	5.296	2.270	0.425	1.513
<b>22.5</b>	36.253	36.321	28.458	20.545	10.294	8.237	5.908	2.533	0.417	1.624
<b>25.0</b>	40.443	40.562	32.028	22.933	11.365	9.299	6.588	2.839	0.408	1.802
<b>27.5</b>	44.574	44.651	35.479	25.305	12.436	10.209	7.157	3.069	0.383	1.947
<b>30.0</b>	48.510	48.544	38.862	27.464	13.456	11.135	7.761	3.290	0.374	2.100
<b>32.5</b>	52.437	52.411	42.126	29.614	14.467	11.968	8.296	3.596	0.383	2.227
<b>35.0</b>	56.338	56.228	45.348	31.620	15.368	12.810	8.866	3.791	0.417	2.389
<b>37.5</b>	60.410	60.078	48.612	33.711	16.371	13.753	9.435	4.012	0.451	2.474
<b>40.0</b>	64.473	64.048	51.952	35.836	17.459	14.688	10.005	4.327	0.417	2.678
<b>42.5</b>	68.570	68.043	55.446	37.927	18.530	15.640	10.608	4.539	0.417	2.754
<b>45.0</b>	72.505	71.868	58.786	40.112	19.533	16.490	11.220	4.803	0.383	2.916
<b>47.5</b>	76.373	75.446	62.050	42.050	20.477	17.357	11.824	5.083	0.451	3.086
<b>50.0</b>	80.028	78.855	65.161	44.005	21.403	18.284	12.351	5.296	0.383	3.188
<b>52.5</b>	83.521	82.212	68.306	45.807	22.330	19.032	12.929	5.551	0.527	3.332
<b>55.0</b>	86.853	85.408	71.230	47.685	23.273	19.907	13.456	5.763	0.527	3.511
<b>57.5</b>	89.871	88.324	74.069	49.368	24.030	20.638	13.949	6.018	0.493	3.613
<b>60.0</b>	92.540	90.712	76.568	50.839	24.744	21.106	14.433	6.188	0.570	3.749
<b>62.5</b>	94.690	92.769	78.719	52.131	25.288	21.718	14.816	6.384	0.570	3.859
<b>65.0</b>	96.594	94.580	80.538	53.253	25.900	22.168	15.190	6.477	0.604	3.961
<b>67.5</b>	98.294	96.348	82.119	54.307	26.401	22.593	15.530	6.698	0.638	4.021
<b>70.0</b>	99.935	97.929	83.640	55.335	26.962	23.044	15.921	6.800	0.638	4.038
<b>72.5</b>	101.669	99.535	85.153	56.355	27.880	23.350	16.295	7.030	0.714	4.140
<b>75.0</b>	103.199	101.108	86.564	57.452	28.441	23.732	16.720	7.115	0.723	4.233
<b>77.5</b>	104.678	102.672	87.763	58.455	28.832	24.149	17.043	7.293	0.714	4.318
<b>80.0</b>	105.902	104.125	88.936	59.398	29.240	24.497	17.306	7.412	0.910	4.412
<b>82.5</b>	106.964	105.128	89.871	60.342	29.606	24.803	17.612	7.480	0.833	4.514
<b>85.0</b>	107.542	105.825	90.602	61.064	29.750	24.990	17.782	7.633	0.986	4.573
<b>87.5</b>	107.755	106.157	91.001	61.523	29.861	25.033	17.859	7.625	0.986	4.616
<b>90.0</b>	107.534	106.157	90.874	61.719	29.784	25.075	17.876	7.650	1.020	4.650
<b>92.5</b>	106.879	105.681	90.398	61.736	29.606	24.888	17.842	7.565	1.020	4.718
<b>95.0</b>	105.936	104.933	89.692	61.464	29.334	24.812	17.714	7.548	0.986	4.692
<b>97.5</b>	104.941	104.040	88.817	61.200	29.062	24.548	17.604	7.429	0.910	4.633
<b>100.0</b>	103.828	103.063	88.001	60.852	28.730	24.395	17.323	7.310	0.867	4.539
<b>102.5</b>	102.697	102.162	86.938	60.342	28.322	24.055	16.949	7.047	0.757	4.522
<b>105.0</b>	101.346	101.023	85.825	59.738	27.889	23.715	16.822	6.877	0.638	4.276
<b>107.5</b>	99.799	99.748	84.533	58.973	27.455	23.375	16.490	6.766	0.604	4.174
<b>110.0</b>	97.971	98.065	83.105	58.106	26.979	23.035	16.167	6.656	0.646	4.140
<b>112.5</b>	95.889	96.110	81.447	57.061	26.418	22.576	15.742	6.443	0.561	4.021
<b>115.0</b>	93.747	94.027	79.637	55.760	25.755	22.126	15.283	6.307	0.493	3.910
<b>117.5</b>	91.401	91.843	77.656	54.460	25.092	21.590	14.850	6.180	0.493	3.808
<b>120.0</b>	88.978	89.565	75.591	52.998	24.421	21.021	14.450	5.976	0.527	3.757
<b>122.5</b>	86.513	86.921	73.406	51.417	23.656	20.451	13.932	5.738	0.451	3.672
<b>125.0</b>	83.785	84.159	71.111	49.776	22.908	19.805	13.405	5.593	0.417	3.528
<b>127.5</b>	80.640	80.954	68.731	47.872	22.117	19.125	12.912	5.355	0.459	3.426
<b>130.0</b>	77.197	77.469	66.020	45.866	21.182	18.326	12.300	5.117	0.408	3.315
<b>132.5</b>	73.636	73.942	63.121	43.614	20.230	17.561	11.730	4.905	0.417	3.196

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**CANDELA TABULATION - (Cont.)**

135.0	70.057	70.295	60.138	41.395	19.253	16.737	11.135	4.718	0.383	3.035
137.5	66.326	66.547	57.222	39.151	18.224	16.099	10.651	4.497	0.442	2.924
140.0	62.518	62.679	54.137	36.899	17.289	14.943	9.971	4.208	0.383	2.771
142.5	58.421	58.582	51.111	34.485	16.252	14.144	9.282	3.927	0.374	2.584
145.0	53.856	53.890	47.668	32.003	15.156	13.192	8.602	3.638	0.383	2.465
147.5	49.334	49.368	43.860	29.274	13.923	12.121	7.897	3.366	0.408	2.253
150.0	45.025	45.042	40.205	26.631	12.733	11.101	7.276	3.145	0.383	2.168
152.5	40.664	40.715	36.729	24.200	11.526	10.115	6.622	2.856	0.332	1.913
155.0	36.414	36.312	33.082	21.650	10.421	9.206	5.959	2.533	0.425	1.853
157.5	31.943	31.909	29.504	19.151	9.248	8.186	5.304	2.287	0.374	1.675
160.0	27.591	27.472	25.781	16.567	8.067	7.234	4.582	1.845	0.408	1.411
162.5	23.188	23.222	22.075	13.974	6.936	6.205	3.885	1.471	0.349	1.190
165.0	19.729	19.618	18.556	11.416	5.772	5.313	3.001	1.054	0.400	0.961
167.5	16.184	15.122	14.952	8.917	4.811	4.505	2.083	0.680	0.340	0.731
170.0	12.725	10.030	10.532	6.069	3.596	3.298	1.156	0.391	0.417	0.570
172.5	7.361	4.726	5.925	3.366	2.244	1.947	0.425	0.349	0.374	0.527
175.0	2.236	0.629	1.947	1.326	0.859	0.833	0.323	0.289	0.391	0.493
177.5	0.366	0.417	0.349	0.323	0.264	0.255	0.289	0.357	0.349	0.451
180.0	0.417	0.374	0.357	0.272	0.264	0.298	0.366	0.417	0.374	0.451

**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	0.723	0.723	0.723	0.723	0.723	0.723	0.723
2.5	0.706	0.935	1.071	1.258	3.332	3.791	4.140
5.0	1.139	1.649	1.921	3.137	6.511	7.480	7.829
7.5	1.624	2.448	2.873	5.279	9.826	11.424	11.611
10.0	2.193	3.247	3.868	7.625	13.277	15.419	15.700
12.5	2.720	4.157	4.888	9.945	16.762	19.397	19.703
15.0	3.290	4.990	5.874	12.300	20.188	23.307	23.715
17.5	3.859	5.823	6.885	14.612	23.673	27.328	27.829
20.0	4.403	6.698	7.922	17.026	27.243	31.348	32.054
22.5	4.964	7.565	8.959	19.440	30.736	35.377	36.253
25.0	5.491	8.483	10.005	21.777	34.196	39.279	40.443
27.5	6.069	9.274	11.059	24.072	37.681	43.146	44.574
30.0	6.630	10.183	12.036	26.325	40.928	46.903	48.510
32.5	7.132	11.059	13.014	28.518	44.158	50.541	52.437
35.0	7.667	11.892	14.085	30.685	47.439	54.145	56.338
37.5	8.109	12.691	15.139	32.759	48.272	57.834	60.410
40.0	8.645	13.524	16.193	34.791	50.533	61.710	64.473
42.5	9.146	14.365	17.204	36.907	53.763	65.544	68.570
45.0	9.639	15.198	18.224	39.058	57.027	69.292	72.505
47.5	10.098	15.955	19.210	40.979	60.146	72.939	76.373
50.0	10.557	16.711	20.213	42.815	63.198	76.534	80.028
52.5	10.974	17.391	21.157	44.583	66.156	80.121	83.521
55.0	11.424	18.148	22.041	46.206	69.122	83.513	86.853
57.5	11.815	18.751	22.840	47.787	71.893	86.649	89.871
60.0	12.113	19.278	23.656	49.249	74.341	89.531	92.540
62.5	12.385	19.729	24.242	50.456	76.585	92.021	94.690
65.0	12.699	20.145	24.897	51.434	78.608	94.401	96.594
67.5	12.920	20.562	25.415	52.386	80.470	96.552	98.294
70.0	13.192	20.902	25.866	53.321	82.144	98.668	99.935
72.5	13.379	21.242	26.410	54.103	83.810	100.751	101.669
75.0	13.643	21.616	26.852	55.004	85.374	102.808	103.199
77.5	13.830	21.930	27.285	55.803	86.930	104.695	104.678
80.0	14.093	22.228	27.651	56.670	88.485	106.497	105.902

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**CANDELA TABULATION - (Cont.)**

<b>82.5</b>	14.331	22.602	27.965	57.469	89.777	107.967	106.964
<b>85.0</b>	14.442	22.746	28.186	58.013	90.763	108.970	107.542
<b>87.5</b>	14.595	22.857	28.212	58.429	91.146	109.497	107.755
<b>90.0</b>	14.671	22.925	28.246	58.514	91.222	109.565	107.534
<b>92.5</b>	14.671	22.814	28.084	58.463	90.959	109.149	106.879
<b>95.0</b>	14.569	22.746	27.838	58.225	90.423	108.341	105.936
<b>97.5</b>	14.450	22.483	27.515	57.860	89.548	107.245	104.941
<b>100.0</b>	14.340	22.287	27.132	57.392	88.553	106.114	103.828
<b>102.5</b>	14.076	21.879	26.818	56.874	87.270	104.440	102.697
<b>105.0</b>	13.881	21.718	26.418	56.287	85.969	101.558	101.346
<b>107.5</b>	13.651	21.386	25.976	55.599	84.456	100.504	99.799
<b>110.0</b>	13.464	20.978	25.526	54.783	82.960	98.991	97.971
<b>112.5</b>	13.235	20.621	24.956	53.839	80.980	97.266	95.889
<b>115.0</b>	12.971	20.213	24.319	52.794	78.931	95.226	93.747
<b>117.5</b>	12.708	19.720	23.698	51.519	76.687	93.135	91.401
<b>120.0</b>	12.368	19.270	23.078	50.235	74.409	90.738	88.978
<b>122.5</b>	12.062	18.760	22.398	48.875	72.165	88.307	86.513
<b>125.0</b>	11.722	18.156	21.769	47.447	69.760	85.731	83.785
<b>127.5</b>	11.339	17.570	20.936	45.875	67.099	82.722	80.640
<b>130.0</b>	10.846	16.881	20.060	43.979	64.201	79.433	77.197
<b>132.5</b>	10.430	16.167	19.236	42.016	61.158	75.786	73.636
<b>135.0</b>	10.047	15.428	18.309	39.899	58.123	72.131	70.057
<b>137.5</b>	9.401	14.680	17.468	37.919	55.157	68.323	66.326
<b>140.0</b>	8.908	13.855	16.507	35.726	52.063	64.507	62.518
<b>142.5</b>	8.339	12.929	15.606	33.499	48.637	60.503	58.421
<b>145.0</b>	7.803	12.019	14.459	31.068	45.195	55.981	53.856
<b>147.5</b>	7.276	11.135	13.345	28.577	41.803	51.570	49.334
<b>150.0</b>	6.707	10.175	12.283	26.095	38.259	47.082	45.025
<b>152.5</b>	6.214	9.342	11.254	23.673	34.944	42.738	40.664
<b>155.0</b>	5.712	8.441	10.149	21.284	31.527	38.480	36.414
<b>157.5</b>	5.194	7.557	9.087	18.785	28.016	34.085	31.943
<b>160.0</b>	4.607	6.647	8.024	16.269	24.463	29.750	27.591
<b>162.5</b>	4.012	5.670	6.894	13.770	21.089	25.390	23.188
<b>165.0</b>	3.426	4.964	6.035	11.305	17.680	21.454	19.729
<b>167.5</b>	2.618	3.893	4.956	8.832	13.974	17.663	16.184
<b>170.0</b>	1.751	2.584	3.808	6.222	9.707	12.563	12.725
<b>172.5</b>	1.080	1.343	2.227	3.706	5.151	7.064	7.361
<b>175.0</b>	0.663	0.680	0.918	1.649	1.717	2.168	2.236
<b>177.5</b>	0.646	0.697	0.706	0.723	0.621	0.519	0.366
<b>180.0</b>	0.646	0.748	0.655	0.680	0.646	0.553	0.417

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**ZONAL LUMEN SUMMARY**

Zone	Lumens	%Lamp	%Fixt
0-20	3.51	N.A.	0.80
0-30	11.91	N.A.	2.60
0-40	27.63	N.A.	6.00
0-60	86.27	N.A.	18.80
0-80	177.05	N.A.	38.60
0-90	229.66	N.A.	50.10
10-90	229.23	N.A.	50.00
20-40	24.12	N.A.	5.30
20-50	48.69	N.A.	10.60
40-70	100.88	N.A.	22.00
60-80	90.78	N.A.	19.80
70-80	48.54	N.A.	10.60
80-90	52.61	N.A.	11.50
90-110	100.91	N.A.	22.00
90-120	143.17	N.A.	31.20
90-130	177.28	N.A.	38.70
90-150	217.75	N.A.	47.50
90-180	228.76	N.A.	49.90
110-180	127.85	N.A.	27.90
0-180	458.42	N.A.	100.00

Total Luminaire Efficiency = N.A. %

**ZONAL LUMEN SUMMARY**

Zone	Lumens
0-10	0.42
10-20	3.09
20-30	8.40
30-40	15.72
40-50	24.58
50-60	34.06
60-70	42.24
70-80	48.54
80-90	52.61
90-100	52.37
100-110	48.54
110-120	42.26
120-130	34.11
130-140	24.79
140-150	15.68
150-160	8.00
160-170	2.76
170-180	0.25

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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	20	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	30	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

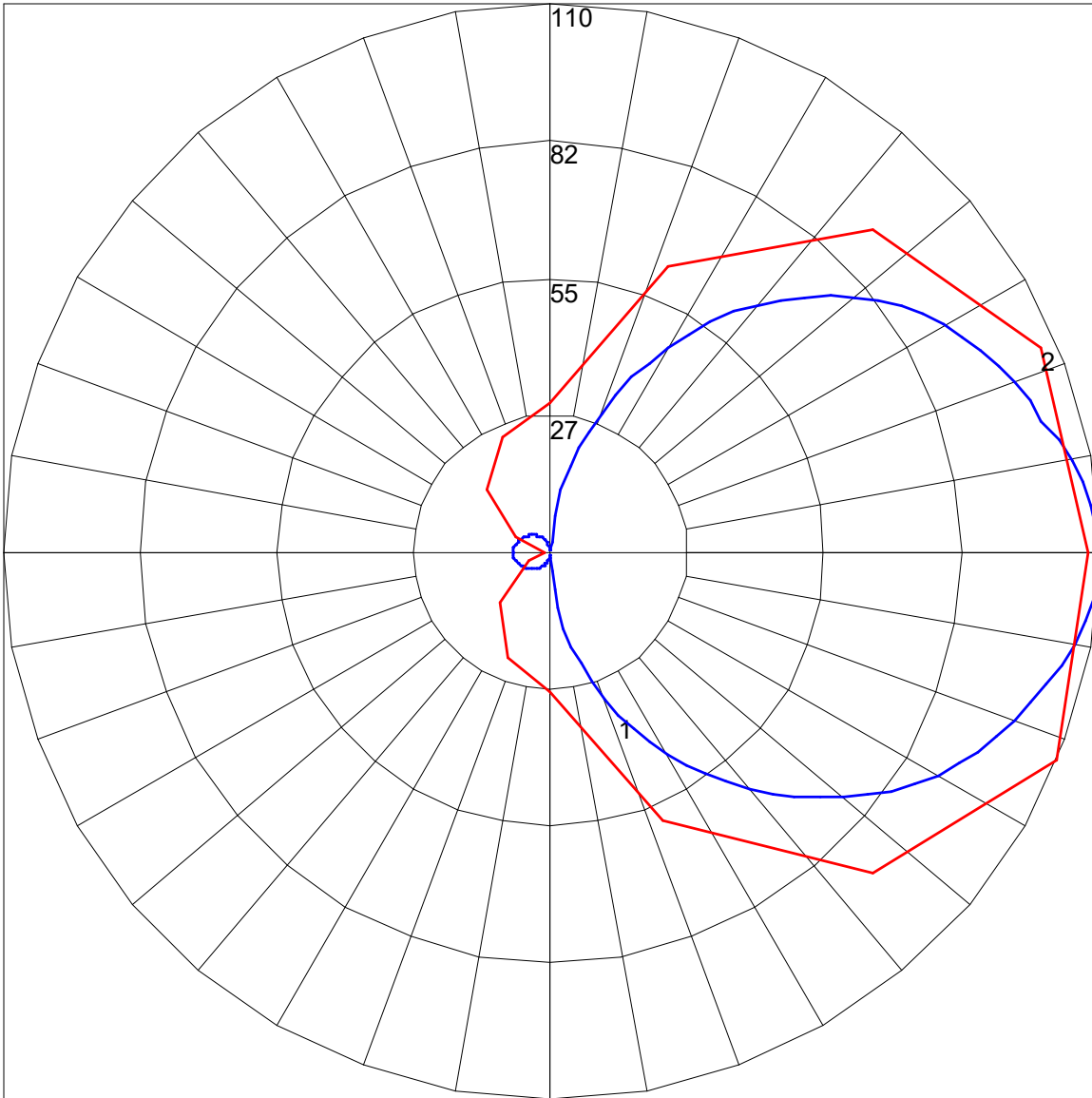
**IES INDOOR REPORT**  
**PHOTOMETRIC FILENAME : PNA-8601.IES**

**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	14.4	15.4	15.3	16.4	17.6	6.2	7.2	7.1	8.2	9.5
	3H	18.2	19.1	19.1	20.1	21.4	8.8	9.7	9.7	10.7	12.0
	4H	20.1	21.0	21.0	22.0	23.3	10.0	10.9	10.9	11.9	13.2
	6H	22.1	23.0	23.0	23.9	25.2	11.2	12.1	12.2	13.1	14.4
	8H	23.1	23.9	24.0	24.9	26.2	11.8	12.6	12.8	13.6	14.9
	12H	24.1	24.9	25.1	25.9	27.2	12.4	13.2	13.3	14.2	15.5
4H	2H	14.8	15.7	15.7	16.7	18.0	8.7	9.6	9.6	10.6	11.8
	3H	18.8	19.6	19.7	20.6	21.9	11.3	12.1	12.2	13.1	14.4
	4H	20.9	21.6	21.8	22.6	23.9	12.5	13.3	13.5	14.3	15.6
	6H	23.1	23.7	24.0	24.7	26.1	13.8	14.4	14.7	15.4	16.8
	8H	24.2	24.8	25.1	25.8	27.1	14.3	15.0	15.3	16.0	17.3
	12H	25.3	25.9	26.3	26.9	28.3	14.9	15.5	15.9	16.5	17.8
8H	4H	21.1	21.7	22.1	22.8	24.1	14.1	14.8	15.1	15.8	17.1
	6H	23.5	24.0	24.5	25.1	26.4	15.6	16.2	16.6	17.2	18.5
	8H	24.7	25.2	25.7	26.3	27.6	16.3	16.8	17.3	17.8	19.2
	12H	26.1	26.5	27.1	27.6	28.9	16.9	17.4	18.0	18.4	19.8
12H	4H	21.1	21.7	22.1	22.7	24.1	14.6	15.2	15.6	16.3	17.6
	6H	23.5	24.0	24.6	25.1	26.4	16.2	16.7	17.3	17.8	19.1
	8H	24.9	25.3	25.9	26.4	27.7	17.1	17.5	18.1	18.5	19.9

Maximum UGR = 28.9

POLAR GRAPH



Maximum Candela = 109.565 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.)