



## IES INDOOR REPORT

PHOTOMETRIC FILENAME : VWMV-L20-730-T3-XXX-SDGL-DIM-UNV\_.IES

### DESCRIPTION INFORMATION (From Photometric File)

IESNA:LM-63-2002  
[TEST] GEN FROM ATAL009402  
[TESTLAB] ATAL-LABS  
[ISSUEDATE] 09/29/2022  
[MANUFAC] WILLIAMS OUTDOOR  
[OTHER] H.E. WILLIAMS, INC. - CARTHAGE, MO.  
[LUMCAT] VWMV-L20-730-T3-xxx-SDGL-DIM-UNV  
[LUMINAIRE] VERTICAL MINI ARCHITECTURAL WALL PACK WITH TYPE III  
[MORE] MOLDED REFRACTIVE CLEAR ACRYLIC LED LENS AND A SOLITE GLASS  
[MORE] LENS.  
[LAMPCAT]X4-LUXEON M 3000K  
[LAMP](4) LUXEON M 3000K LEDS  
[SEARCH\_SOURCETYPE] LED  
[SEARCH\_APPLICATION] Outdoor, Architectural, Commercial, Facade, Direct, Wet Location  
[SEARCH\_MOUNTING] Wall

### CHARACTERISTICS

Lumens Per Lamp	N.A. (absolute)
Total Lamp Lumens	N.A. (absolute)
Luminaire Lumens	2486
Total Luminaire Efficiency	N.A.
Luminaire Efficacy Rating (LER)	96
Total Luminaire Watts	26
Ballast Factor	1.00
CIE Type	Direct
Spacing Criterion (0-180)	1.72
Spacing Criterion (90-270)	1.72
Spacing Criterion (Diagonal)	1.48
Basic Luminous Shape	Rectangular
Luminous Length (0-180)	0.19 ft
Luminous Width (90-270)	0.68 ft
Luminous Height	0.00 ft

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

Angle In Degrees	Average 0-Deg	Average 45-Deg	Average 90-Deg
45	80185	116156	102367
55	42312	111971	123611
65	20312	85512	141434
75	10237	54460	126937
85	4864	25536	66879

**IES INDOOR REPORT**  
**PHOTOMETRIC FILENAME : VWMV-L20-730-T3-XXX-SDGL-DIM-UNV\_.IES**

**CANDELA TABULATION**

	<u>0.0</u>	<u>2.5</u>	<u>5.0</u>	<u>10.0</u>	<u>15.0</u>	<u>20.0</u>	<u>25.0</u>	<u>30.0</u>	<u>35.0</u>	<u>40.0</u>
0.0	755.684	755.684	755.684	755.684	755.684	755.684	755.684	755.684	755.684	755.684
2.5	766.944	768.195	770.697	775.702	780.706	778.204	773.200	773.200	771.948	768.195
5.0	785.711	786.962	789.464	793.218	799.473	798.222	793.218	790.715	789.464	786.962
7.5	809.482	809.482	811.985	816.989	821.994	818.240	814.487	810.734	813.236	809.482
10.0	832.003	832.003	834.505	840.761	844.514	840.761	838.258	835.756	837.007	832.003
12.5	852.021	853.272	855.774	863.281	863.281	864.532	862.030	857.025	862.030	863.281
15.0	878.295	878.295	879.546	880.797	880.797	878.295	873.290	874.541	880.797	879.546
17.5	910.824	910.824	910.824	903.317	905.820	895.811	890.806	894.559	890.806	888.304
20.0	944.605	945.856	947.107	939.600	937.098	924.587	919.582	908.322	907.071	905.820
22.5	979.636	979.636	982.139	979.636	969.627	954.614	939.600	928.340	927.089	925.838
25.0	1022.175	1022.175	1023.426	1014.668	1000.906	982.139	965.874	957.116	944.605	934.596
27.5	1055.955	1055.955	1055.955	1039.691	1020.924	1003.408	983.390	978.385	964.623	943.354
30.0	1070.969	1070.969	1067.216	1049.700	1030.933	1017.170	1005.910	1003.408	982.139	967.125
32.5	1054.704	1057.207	1055.955	1040.942	1027.179	1018.421	1019.673	1015.919	1002.157	987.143
35.0	1025.928	1025.928	1024.677	1018.421	1012.166	1014.668	1020.924	1018.421	1018.421	1000.906
37.5	964.623	965.874	973.381	970.878	972.130	988.394	1005.910	1017.170	1023.426	1012.166
40.0	887.053	884.550	890.806	890.806	899.564	934.596	968.376	993.399	1009.664	1013.417
42.5	778.204	779.455	786.962	790.715	818.240	859.528	908.322	957.116	989.645	999.654
45.0	669.356	668.104	671.858	679.365	720.652	768.195	825.747	894.559	950.860	974.632
47.5	561.758	560.507	566.763	580.525	620.561	670.607	731.912	811.985	889.555	932.093
50.0	460.417	464.170	472.928	486.690	527.978	578.023	646.835	731.912	811.985	870.788
52.5	369.084	371.586	381.595	397.860	435.394	487.941	563.009	653.091	726.908	790.715
55.0	286.509	289.011	299.021	316.536	354.070	405.367	487.941	570.516	649.338	711.894
57.5	226.455	223.953	231.459	251.478	282.756	335.303	415.376	492.946	565.512	624.315
60.0	173.907	171.405	177.661	193.925	221.450	270.245	342.810	412.874	477.932	539.238
62.5	132.620	130.118	135.122	148.885	177.661	221.450	281.505	341.559	401.613	456.663
65.0	101.342	97.588	101.342	113.853	136.373	177.661	228.957	277.751	326.545	377.842
67.5	75.068	73.817	76.319	85.077	103.844	140.127	182.665	222.701	261.487	302.774
70.0	55.050	53.799	56.301	63.808	78.821	108.848	142.629	176.410	210.190	238.966
72.5	41.287	41.287	42.538	50.045	61.305	83.826	110.100	136.373	163.898	185.168
75.0	31.278	30.027	31.278	37.534	45.041	62.557	83.826	105.095	123.862	138.876
77.5	22.520	21.269	22.520	26.274	32.529	45.041	60.054	76.319	90.082	100.091
80.0	15.014	15.014	15.014	17.516	21.269	30.027	40.036	51.296	62.557	68.812
82.5	8.758	8.758	8.758	11.260	12.511	18.767	25.023	31.278	38.785	42.538
85.0	5.005	5.005	5.005	6.256	6.256	10.009	12.511	16.265	20.018	22.520
87.5	1.251	1.251	1.251	2.502	2.502	3.753	3.753	5.005	6.256	7.507
90.0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

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

	<u>45.0</u>	<u>50.0</u>	<u>55.0</u>	<u>60.0</u>	<u>65.0</u>	<u>70.0</u>	<u>75.0</u>	<u>80.0</u>	<u>85.0</u>	<u>90.0</u>
0.0	755.684	755.684	755.684	755.684	755.684	755.684	755.684	755.684	755.684	755.684
2.5	766.944	763.191	760.688	760.688	758.186	758.186	754.433	754.433	751.930	750.679
5.0	784.460	780.706	776.953	774.451	773.200	769.446	764.442	761.939	758.186	754.433
7.5	805.729	803.227	796.971	795.720	791.967	789.464	783.209	779.455	773.200	768.195
10.0	828.249	828.249	826.998	825.747	821.994	818.240	810.734	803.227	794.469	784.460
12.5	859.528	854.523	849.519	844.514	840.761	837.007	829.501	821.994	809.482	799.473
15.0	874.541	872.039	872.039	870.788	863.281	857.025	848.268	843.263	832.003	820.743
17.5	889.555	897.062	895.811	893.308	888.304	880.797	870.788	859.528	844.514	830.752
20.0	909.573	908.322	909.573	905.820	900.815	892.057	879.546	870.788	853.272	835.756
22.5	919.582	912.075	908.322	910.824	913.326	904.568	892.057	879.546	859.528	838.258
25.0	920.833	922.084	922.084	918.331	915.829	913.326	903.317	887.053	868.286	844.514
27.5	937.098	932.093	927.089	922.084	924.587	929.591	919.582	905.820	885.801	860.779
30.0	952.111	938.349	934.596	938.349	947.107	952.111	942.102	925.838	903.317	873.290

**IES INDOOR REPORT**  
**PHOTOMETRIC FILENAME : VWMV-L20-730-T3-XXX-SDGL-DIM-UNV\_.IES**

**CANDELA TABULATION - (Cont.)**

32.5	964.623	947.107	950.860	955.865	963.372	964.623	955.865	938.349	908.322	872.039
35.0	987.143	972.130	963.372	958.367	962.121	964.623	958.367	934.596	907.071	869.537
37.5	999.654	979.636	964.623	960.869	958.367	960.869	954.614	937.098	907.071	863.281
40.0	998.403	980.887	962.121	955.865	960.869	967.125	959.618	938.349	904.568	855.774
42.5	989.645	967.125	949.609	947.107	953.363	960.869	954.614	942.102	903.317	853.272
45.0	969.627	945.856	934.596	935.847	940.851	949.609	955.865	942.102	905.820	854.523
47.5	934.596	927.089	914.578	915.829	925.838	943.354	953.363	943.354	905.820	850.770
50.0	892.057	894.559	888.304	893.308	909.573	932.093	952.111	945.856	907.071	847.016
52.5	833.254	849.519	859.528	875.792	889.555	917.080	938.349	935.847	904.568	839.510
55.0	758.186	803.227	829.501	852.021	877.044	898.313	920.833	927.089	897.062	837.007
57.5	680.616	743.172	783.209	815.738	837.007	867.034	892.057	903.317	874.541	814.487
60.0	596.790	668.104	719.401	761.939	793.218	828.249	855.774	872.039	845.765	785.711
62.5	507.960	586.781	646.835	701.885	739.419	779.455	808.231	830.752	811.985	748.177
65.0	426.636	502.955	568.014	628.068	681.867	725.657	759.437	778.204	763.191	705.638
67.5	346.564	416.627	485.439	546.745	610.552	663.100	693.127	718.150	703.136	648.086
70.0	277.751	336.555	401.613	465.421	530.480	581.776	614.306	639.328	626.817	576.772
72.5	220.199	265.240	324.043	382.846	441.650	489.193	521.722	542.991	530.480	490.444
75.0	166.401	201.432	251.478	304.025	351.568	390.353	420.380	427.887	420.380	387.851
77.5	120.109	146.382	187.670	228.957	265.240	292.765	311.532	317.788	310.281	286.509
80.0	83.826	101.342	130.118	160.145	186.419	205.186	216.446	220.199	215.195	198.930
82.5	51.296	62.557	82.575	101.342	121.360	128.867	138.876	138.876	135.122	125.113
85.0	26.274	32.529	42.538	52.548	63.808	66.310	73.817	72.566	71.315	68.812
87.5	8.758	10.009	15.014	17.516	21.269	23.772	26.274	25.023	26.274	25.023
90.0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

**Vert.  
Angles**

**Horizontal Angles**

	<u>95.0</u>	<u>100.0</u>	<u>105.0</u>	<u>110.0</u>	<u>115.0</u>	<u>120.0</u>	<u>125.0</u>	<u>130.0</u>	<u>135.0</u>	<u>140.0</u>
0.0	755.684	755.684	755.684	755.684	755.684	755.684	755.684	755.684	755.684	755.684
2.5	749.428	748.177	746.926	745.675	744.424	743.172	743.172	740.670	738.168	738.168
5.0	749.428	746.926	741.921	738.168	733.163	730.661	728.159	723.154	716.899	713.145
7.5	761.939	751.930	741.921	734.414	726.908	719.401	710.643	704.387	696.881	690.625
10.0	774.451	763.191	753.181	744.424	733.163	723.154	710.643	699.383	685.620	674.360
12.5	786.962	770.697	760.688	748.177	736.917	724.405	709.392	695.629	676.862	659.347
15.0	805.729	785.711	769.446	750.679	739.419	720.652	701.885	684.369	665.602	644.333
17.5	810.734	791.967	770.697	753.181	734.414	716.899	696.881	675.611	645.584	618.059
20.0	813.236	790.715	768.195	745.675	725.657	706.890	679.365	649.338	611.804	576.772
22.5	813.236	789.464	760.688	736.917	714.396	689.374	656.844	614.306	566.763	524.224
25.0	815.738	789.464	760.688	733.163	703.136	670.607	623.064	573.018	517.969	465.421
27.5	828.249	794.469	760.688	730.661	691.876	644.333	588.032	527.978	461.668	401.613
30.0	837.007	799.473	764.442	728.159	680.616	615.557	551.749	476.681	401.613	350.317
32.5	830.752	793.218	753.181	714.396	659.347	586.781	511.713	427.887	355.321	312.783
35.0	828.249	783.209	744.424	690.625	624.315	549.247	464.170	380.344	316.536	282.756
37.5	815.738	768.195	725.657	669.356	595.539	501.704	411.622	335.303	286.509	263.989
40.0	806.980	754.433	703.136	641.831	561.758	460.417	362.828	292.765	255.231	241.468
42.5	801.976	745.675	686.871	613.055	517.969	410.371	317.788	256.482	228.957	226.455
45.0	790.715	729.410	663.100	580.525	477.932	364.079	279.002	223.953	202.683	205.186
47.5	781.958	716.899	643.082	545.494	436.645	322.792	238.966	192.674	177.661	183.916
50.0	778.204	705.638	621.813	526.727	406.618	286.509	207.688	165.149	156.392	162.647
52.5	763.191	691.876	606.799	501.704	379.093	256.482	180.163	141.378	133.871	140.127
55.0	756.935	673.109	585.530	475.430	354.070	231.459	157.643	121.360	115.104	121.360
57.5	739.419	650.589	561.758	445.403	321.541	208.939	137.625	103.844	97.588	100.091
60.0	710.643	624.315	529.229	415.376	292.765	185.168	120.109	90.082	81.324	80.072
62.5	673.109	588.032	490.444	382.846	263.989	163.898	105.095	77.570	67.561	66.310
65.0	631.822	549.247	454.161	345.312	237.715	146.382	91.333	66.310	57.552	53.799
67.5	580.525	502.955	412.874	310.281	210.190	127.615	78.821	56.301	47.543	43.790

# IES INDOOR REPORT

PHOTOMETRIC FILENAME : VWMV-L20-730-T3-XXX-SDGL-DIM-UNV\_.IES

## CANDELA TABULATION - (Cont.)

70.0	514.215	447.905	364.079	268.993	180.163	108.848	66.310	47.543	40.036	35.032
72.5	435.394	377.842	307.778	226.455	150.136	90.082	56.301	38.785	32.529	27.525
75.0	352.819	301.523	245.222	183.916	120.109	72.566	45.041	31.278	25.023	21.269
77.5	261.487	223.953	185.168	140.127	90.082	55.050	33.781	23.772	20.018	16.265
80.0	183.916	155.140	130.118	98.839	63.808	40.036	25.023	17.516	13.762	11.260
82.5	117.606	98.839	82.575	65.059	41.287	26.274	16.265	11.260	10.009	7.507
85.0	62.557	52.548	45.041	35.032	22.520	15.014	10.009	7.507	5.005	5.005
87.5	22.520	18.767	16.265	13.762	8.758	6.256	3.753	2.502	2.502	2.502
90.0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

## Vert. Angles

## Horizontal Angles

	<u>145.0</u>	<u>150.0</u>	<u>155.0</u>	<u>160.0</u>	<u>165.0</u>	<u>170.0</u>	<u>175.0</u>	<u>180.0</u>
0.0	755.684	755.684	755.684	755.684	755.684	755.684	755.684	755.684
2.5	734.414	733.163	730.661	731.912	733.163	734.414	741.921	743.172
5.0	706.890	703.136	698.132	698.132	696.881	699.383	706.890	709.392
7.5	683.118	675.611	669.356	666.853	664.351	666.853	671.858	674.360
10.0	663.100	653.091	644.333	638.077	631.822	634.324	639.328	643.082
12.5	640.580	629.319	616.808	608.050	599.292	599.292	603.046	603.046
15.0	623.064	600.543	579.274	565.512	549.247	541.740	542.991	539.238
17.5	588.032	558.005	527.978	507.960	485.439	475.430	471.677	465.421
20.0	539.238	500.453	464.170	436.645	409.120	391.604	386.600	382.846
22.5	479.184	432.892	390.353	359.075	335.303	319.039	314.034	307.778
25.0	410.371	367.833	329.048	305.276	289.011	276.500	271.496	267.742
27.5	351.568	316.536	292.765	273.998	265.240	260.235	255.231	252.729
30.0	311.532	284.007	268.993	261.487	258.984	258.984	257.733	256.482
32.5	285.258	267.742	262.738	263.989	266.491	267.742	270.245	268.993
35.0	265.240	258.984	263.989	271.496	276.500	279.002	279.002	277.751
37.5	252.729	258.984	266.491	273.998	279.002	282.756	285.258	282.756
40.0	245.222	247.724	257.733	270.245	273.998	277.751	280.254	280.254
42.5	232.711	237.715	247.724	261.487	270.245	275.249	276.500	276.500
45.0	213.944	226.455	238.966	253.980	262.738	266.491	266.491	267.742
47.5	197.679	211.441	225.204	233.962	241.468	247.724	245.222	251.478
50.0	178.912	190.172	198.930	206.437	207.688	211.441	208.939	212.692
52.5	153.889	161.396	166.401	168.903	166.401	166.401	162.647	166.401
55.0	128.867	131.369	133.871	131.369	126.364	126.364	123.862	125.113
57.5	101.342	102.593	102.593	98.839	95.086	95.086	92.584	92.584
60.0	80.072	80.072	77.570	73.817	70.063	70.063	67.561	67.561
62.5	65.059	62.557	58.803	55.050	51.296	50.045	47.543	48.794
65.0	51.296	47.543	43.790	40.036	36.283	35.032	33.781	33.781
67.5	40.036	36.283	32.529	28.776	26.274	25.023	25.023	23.772
70.0	31.278	27.525	23.772	21.269	20.018	18.767	18.767	18.767
72.5	23.772	20.018	18.767	16.265	15.014	15.014	13.762	13.762
75.0	18.767	16.265	13.762	12.511	11.260	11.260	11.260	11.260
77.5	13.762	11.260	10.009	10.009	8.758	8.758	8.758	8.758
80.0	10.009	8.758	7.507	7.507	6.256	6.256	6.256	6.256
82.5	6.256	6.256	5.005	5.005	5.005	5.005	3.753	3.753
85.0	3.753	3.753	3.753	2.502	2.502	2.502	2.502	2.502
87.5	2.502	1.251	1.251	1.251	1.251	1.251	1.251	1.251
90.0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

**IES INDOOR REPORT**  
**PHOTOMETRIC FILENAME : VWMV-L20-730-T3-XXX-SDGL-DIM-UNV\_.IES**

**ZONAL LUMEN SUMMARY**

Zone	Lumens	%Lamp	%Fixt
0-20	287.94	N.A.	11.60
0-30	628.19	N.A.	25.30
0-40	1075.44	N.A.	43.30
0-60	1980.44	N.A.	79.70
0-80	2451.52	N.A.	98.60
0-90	2485.53	N.A.	100.00
10-90	2413.59	N.A.	97.10
20-40	787.51	N.A.	31.70
20-50	1268.73	N.A.	51.00
40-70	1214.56	N.A.	48.90
60-80	471.08	N.A.	19.00
70-80	161.51	N.A.	6.50
80-90	34.01	N.A.	1.40
90-110	0.00	N.A.	0.00
90-120	0.00	N.A.	0.00
90-130	0.00	N.A.	0.00
90-150	0.00	N.A.	0.00
90-180	0.00	N.A.	0.00
110-180	0.00	N.A.	0.00
0-180	2485.53	N.A.	100.00

Total Luminaire Efficiency = N.A. %

**ZONAL LUMEN SUMMARY**

Zone	Lumens
0-10	71.94
10-20	216.00
20-30	340.25
30-40	447.25
40-50	481.23
50-60	423.77
60-70	309.57
70-80	161.51
80-90	34.01
90-100	0.00
100-110	0.00
110-120	0.00
120-130	0.00
130-140	0.00
140-150	0.00
150-160	0.00
160-170	0.00
170-180	0.00

**IES INDOOR REPORT**  
**PHOTOMETRIC FILENAME : VWMV-L20-730-T3-XXX-SDGL-DIM-UNV\_.IES**

**COEFFICIENTS OF UTILIZATION - ZONAL CAVITY METHOD**

Effective Floor Cavity Reflectance 0.20

RC	80				70				50			30			10			0
RW	70	50	30	10	70	50	30	10	50	30	10	50	30	10	50	30	10	0
0	119	119	119	119	116	116	116	116	111	111	111	106	106	106	102	102	102	100
1	109	104	100	96	106	102	98	94	98	94	91	94	91	89	90	88	86	84
2	99	91	84	78	96	89	82	77	85	80	75	82	77	74	79	75	72	70
3	90	79	71	65	87	78	70	64	75	68	63	72	66	62	69	65	61	58
4	82	70	61	54	80	69	60	54	66	59	53	64	58	52	62	56	52	50
5	75	62	53	47	73	61	53	46	59	52	46	57	50	45	55	49	45	43
6	69	56	47	40	68	55	46	40	53	46	40	51	45	39	50	44	39	37
7	64	51	42	35	63	50	41	35	48	41	35	47	40	35	45	39	34	32
8	60	46	37	31	58	45	37	31	44	36	31	43	36	31	41	35	31	29
9	56	42	34	28	54	41	33	28	40	33	28	39	33	28	38	32	28	26
10	52	39	31	25	51	38	30	25	37	30	25	36	30	25	35	29	25	23

# IES INDOOR REPORT

PHOTOMETRIC FILENAME : VWMV-L20-730-T3-XXX-SDGL-DIM-UNV\_.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

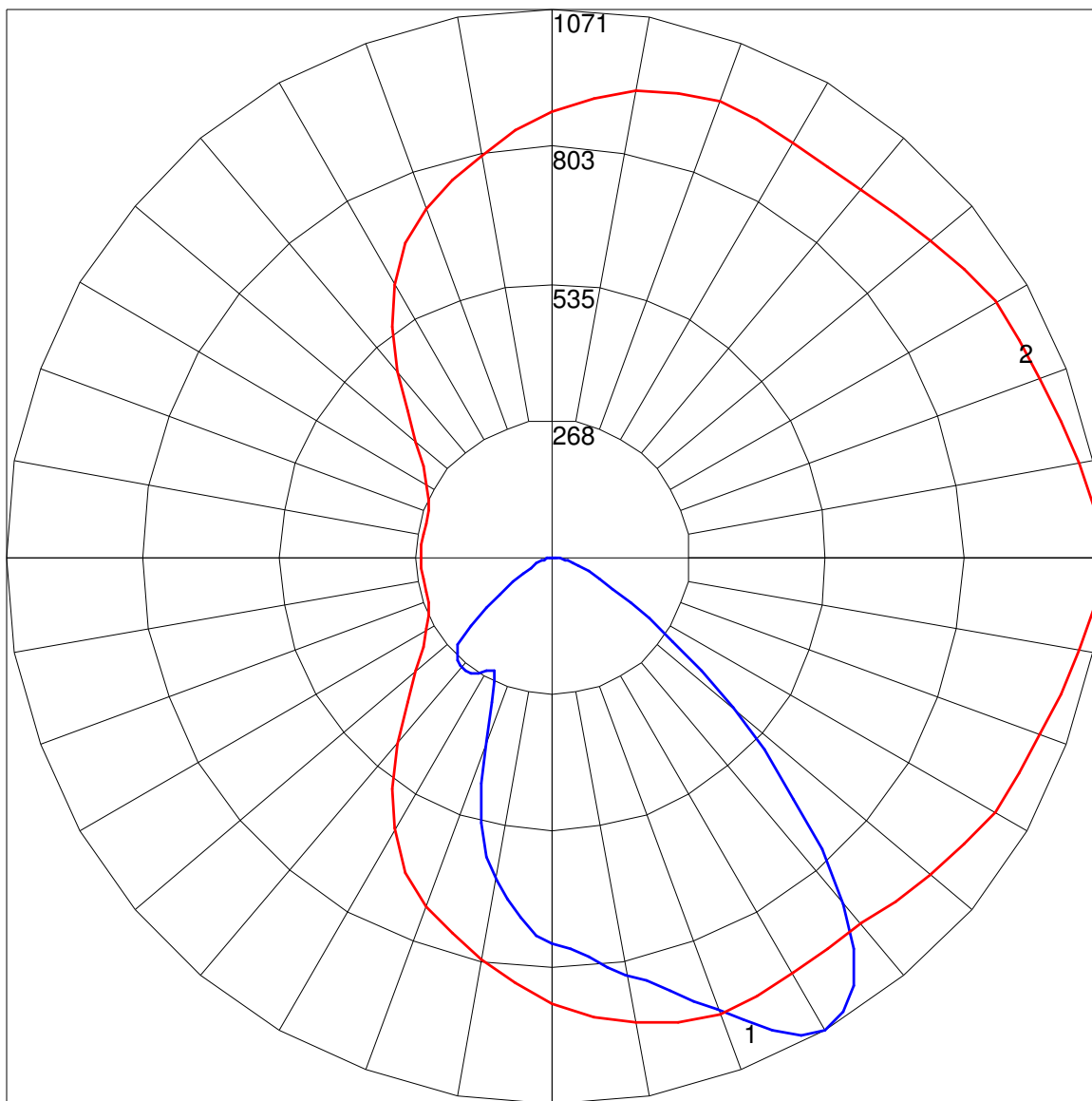
X=2H	Y=2H	24.9	26.5	25.2	26.8	27.1	30.5	32.1	30.8	32.4	32.8
	3H	25.2	26.6	25.5	27.0	27.3	33.2	34.7	33.6	35.1	35.4
	4H	25.2	26.6	25.6	26.9	27.3	34.2	35.6	34.6	35.9	36.3
	6H	25.2	26.5	25.6	26.9	27.2	34.7	36.0	35.1	36.4	36.8
	8H	25.2	26.4	25.6	26.8	27.2	34.8	36.1	35.3	36.5	36.9
	12H	25.2	26.3	25.6	26.7	27.2	34.9	36.1	35.3	36.5	36.9

### UGR Viewed Endwise

4H	2H	26.9	28.3	27.3	28.7	29.0	30.6	32.0	31.0	32.3	32.7
	3H	27.5	28.7	28.0	29.1	29.5	33.5	34.7	33.9	35.1	35.5
	4H	27.7	28.7	28.1	29.1	29.6	34.6	35.6	35.0	36.0	36.5
	6H	27.7	28.6	28.1	29.0	29.5	35.3	36.2	35.7	36.6	37.1
	8H	27.7	28.5	28.1	29.0	29.4	35.4	36.3	35.9	36.8	37.2
	12H	27.7	28.4	28.1	28.9	29.4	35.6	36.4	36.1	36.8	37.3
8H	4H	28.7	29.6	29.2	30.1	30.5	34.5	35.4	35.0	35.9	36.3
	6H	28.8	29.6	29.3	30.1	30.5	35.3	36.0	35.8	36.5	37.0
	8H	28.8	29.5	29.4	30.0	30.5	35.6	36.2	36.1	36.7	37.2
	12H	28.8	29.4	29.4	29.9	30.5	35.7	36.3	36.2	36.8	37.4
12H	4H	29.0	29.8	29.5	30.2	30.7	34.5	35.3	35.0	35.8	36.3
	6H	29.1	29.8	29.6	30.2	30.8	35.3	35.9	35.8	36.4	36.9
	8H	29.2	29.7	29.7	30.2	30.8	35.6	36.1	36.1	36.6	37.2

Maximum UGR = 37.4

POLAR GRAPH



Maximum Candela = 1070.969 Located At Horizontal Angle = 0, Vertical Angle = 30  
# 1 - Vertical Plane Through Horizontal Angles (0 - 180) (Through Max. Cd.)  
# 2 - Horizontal Cone Through Vertical Angle (30) (Through Max. Cd.)