



## IES INDOOR REPORT

PHOTOMETRIC FILENAME : MD4ARLG-4-L45-8TW-A-DALI-UNV BOTH ON 4000K\_.IES

### DESCRIPTION INFORMATION (From Photometric File)

IESNA:LM-63-2002

[TEST] GEN FROM BALLABS TEST NO. 20051.0

[TESTLAB] BUILDING ACOUSTICS & LIGHTING LABORATORIE, INC

[ISSUE DATE] 28-JUL-2020

[MANUFAC] WILLIAMS INDOOR

[OTHER] H.E. WILLIAMS, INC - CARTHAGE, MO

[LUMINAIRE] LED AMBIENT AND READING (LEFT) 4' MEDICAL ASYM TROFFER

[MORE] WHITE REFL w/FROSTED ACRYLIC RIBBED LENS IN DOOR & CLEAR

[MORE] ACRYLIC LENS

[LUMCAT] MD4ARLG-L45-8TW-A-DALI-UNV BOTH ON 4000k

### CHARACTERISTICS

|                                 |                 |
|---------------------------------|-----------------|
| Lumens Per Lamp                 | N.A. (absolute) |
| Total Lamp Lumens               | N.A. (absolute) |
| Luminaire Lumens                | 5485            |
| Total Luminaire Efficiency      | N.A.            |
| Luminaire Efficacy Rating (LER) | 87              |
| Total Luminaire Watts           | 63.4            |
| Ballast Factor                  | 1.00            |
| CIE Type                        | Direct          |
| Spacing Criterion (0-180)       | 0.94            |
| Spacing Criterion (90-270)      | 1.24            |
| Spacing Criterion (Diagonal)    | 1.18            |
| Basic Luminous Shape            | Rectangular     |
| Luminous Length (0-180)         | 0.44 ft         |
| Luminous Width (90-270)         | 3.77 ft         |
| Luminous Height                 | 0.00 ft         |

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

| Angle In<br>Degrees | Average<br>0-Deg | Average<br>45-Deg | Average<br>90-Deg |
|---------------------|------------------|-------------------|-------------------|
| 45                  | 9039             | 11827             | 14760             |
| 55                  | 7215             | 9454              | 11474             |
| 65                  | 4239             | 6634              | 8072              |
| 75                  | 1742             | 2877              | 4587              |
| 85                  | 182              | 480               | 921               |

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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   | 2834.485   | 2834.485    | 2834.485    | 2834.485    | 2834.485    | 2834.485     | 2834.485     | 2834.485     | 2834.485     | 2834.485     |
| 5   | 2846.246   | 2915.264    | 2941.036    | 2967.372    | 2888.721    | 2758.828     | 2692.876     | 2658.910     | 2641.192     | 2662.199     |
| 10  | 2458.080   | 2581.468    | 2801.286    | 2955.869    | 2859.968    | 2671.978     | 2601.603     | 2593.090     | 2580.969     | 2608.341     |
| 15  | 2315.726   | 2395.914    | 2471.028    | 2863.500    | 2798.594    | 2585.206     | 2532.240     | 2513.993     | 2505.654     | 2527.150     |
| 20  | 2107.158   | 2200.170    | 2329.382    | 2606.590    | 2686.299    | 2476.927     | 2434.542     | 2383.480     | 2364.605     | 2393.746     |
| 25  | 1880.503   | 1960.388    | 2165.167    | 2313.053    | 2536.399    | 2338.011     | 2279.647     | 2192.101     | 2158.015     | 2200.275     |
| 30  | 1642.719   | 1715.242    | 1966.154    | 2123.051    | 2377.747    | 2168.862     | 2061.101     | 1965.715     | 1926.356     | 1968.705     |
| 35  | 1397.185   | 1487.102    | 1755.508    | 1919.662    | 2153.240    | 1946.389     | 1818.875     | 1696.964     | 1662.569     | 1695.768     |
| 40  | 1187.246   | 1270.001    | 1524.482    | 1705.538    | 1896.123    | 1707.628     | 1557.442     | 1439.333     | 1404.928     | 1427.770     |
| 45  | 981.649    | 1068.436    | 1284.515    | 1485.646    | 1603.072    | 1452.529     | 1278.664     | 1212.404     | 1168.953     | 1195.159     |
| 50  | 805.737    | 878.658     | 1037.834    | 1253.324    | 1306.561    | 1180.300     | 1022.189     | 994.511      | 948.463      | 974.974      |
| 55  | 635.641    | 699.950     | 832.905     | 1010.033    | 1010.823    | 927.973      | 781.101      | 773.708      | 747.347      | 752.975      |
| 60  | 443.670    | 511.707     | 640.665     | 781.140     | 751.573     | 683.984      | 581.161      | 569.781      | 550.787      | 551.440      |
| 65  | 275.154    | 343.122     | 430.612     | 534.061     | 523.952     | 462.463      | 406.854      | 388.786      | 380.353      | 379.217      |
| 70  | 151.331    | 201.041     | 237.355     | 339.553     | 334.250     | 269.566      | 239.097      | 246.667      | 245.390      | 235.901      |
| 75  | 69.268     | 98.530      | 114.369     | 160.138     | 182.356     | 115.519      | 123.398      | 146.364      | 143.478      | 136.097      |
| 80  | 28.593     | 36.712      | 37.794      | 38.337      | 66.363      | 33.313       | 45.045       | 35.112       | 27.193       | 30.597       |
| 85  | 2.442      | 5.268       | 6.429       | 9.260       | 12.331      | 4.002        | 4.341        | 4.291        | 4.221        | 3.982        |
| 90  | 0.000      | 0.000       | 0.000       | 0.000       | 0.000       | 0.000        | 0.000        | 0.000        | 0.000        | 0.000        |
| 95  | 0.000      | 0.000       | 0.000       | 0.000       | 0.000       | 0.000        | 0.000        | 0.000        | 0.000        | 0.000        |
| 100 | 0.000      | 0.000       | 0.000       | 0.000       | 0.000       | 0.000        | 0.000        | 0.000        | 0.000        | 0.000        |
| 105 | 0.000      | 0.000       | 0.000       | 0.000       | 0.000       | 0.000        | 0.000        | 0.000        | 0.000        | 0.000        |
| 110 | 0.000      | 0.000       | 0.000       | 0.000       | 0.000       | 0.000        | 0.000        | 0.000        | 0.000        | 0.000        |
| 115 | 0.000      | 0.000       | 0.000       | 0.000       | 0.000       | 0.000        | 0.000        | 0.000        | 0.000        | 0.000        |
| 120 | 0.000      | 0.000       | 0.000       | 0.000       | 0.000       | 0.000        | 0.000        | 0.000        | 0.000        | 0.000        |
| 125 | 0.000      | 0.000       | 0.000       | 0.000       | 0.000       | 0.000        | 0.000        | 0.000        | 0.000        | 0.000        |
| 130 | 0.000      | 0.000       | 0.000       | 0.000       | 0.000       | 0.000        | 0.000        | 0.000        | 0.000        | 0.000        |
| 135 | 0.000      | 0.000       | 0.000       | 0.000       | 0.000       | 0.000        | 0.000        | 0.000        | 0.000        | 0.000        |
| 140 | 0.000      | 0.000       | 0.000       | 0.000       | 0.000       | 0.000        | 0.000        | 0.000        | 0.000        | 0.000        |
| 145 | 0.000      | 0.000       | 0.000       | 0.000       | 0.000       | 0.000        | 0.000        | 0.000        | 0.000        | 0.000        |
| 150 | 0.000      | 0.000       | 0.000       | 0.000       | 0.000       | 0.000        | 0.000        | 0.000        | 0.000        | 0.000        |
| 155 | 0.000      | 0.000       | 0.000       | 0.000       | 0.000       | 0.000        | 0.000        | 0.000        | 0.000        | 0.000        |
| 160 | 0.000      | 0.000       | 0.000       | 0.000       | 0.000       | 0.000        | 0.000        | 0.000        | 0.000        | 0.000        |
| 165 | 0.000      | 0.000       | 0.000       | 0.000       | 0.000       | 0.000        | 0.000        | 0.000        | 0.000        | 0.000        |
| 170 | 0.000      | 0.000       | 0.000       | 0.000       | 0.000       | 0.000        | 0.000        | 0.000        | 0.000        | 0.000        |
| 175 | 0.000      | 0.000       | 0.000       | 0.000       | 0.000       | 0.000        | 0.000        | 0.000        | 0.000        | 0.000        |
| 180 | 0.000      | 0.000       | 0.000       | 0.000       | 0.000       | 0.000        | 0.000        | 0.000        | 0.000        | 0.000        |

## Vert. 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  | 2834.485     | 2834.485     | 2834.485     | 2834.485     | 2834.485     | 2834.485     | 2834.485     |
| 5  | 2693.972     | 2765.008     | 2884.435     | 2928.099     | 2892.692     | 2872.103     | 2846.246     |
| 10 | 2616.655     | 2677.360     | 2854.386     | 2895.164     | 2672.600     | 2513.089     | 2458.080     |
| 15 | 2542.208     | 2584.907     | 2789.922     | 2750.165     | 2451.491     | 2381.161     | 2315.726     |
| 20 | 2432.947     | 2471.046     | 2677.029     | 2461.956     | 2312.835     | 2187.611     | 2107.158     |
| 25 | 2272.669     | 2330.137     | 2530.916     | 2281.854     | 2150.913     | 1949.722     | 1880.503     |
| 30 | 2051.033     | 2158.496     | 2370.370     | 2110.293     | 1954.990     | 1705.872     | 1642.719     |
| 35 | 1806.116     | 1942.302     | 2156.231     | 1911.987     | 1749.129     | 1480.324     | 1397.185     |
| 40 | 1543.088     | 1695.666     | 1904.197     | 1700.454     | 1520.994     | 1264.589     | 1187.246     |
| 45 | 1271.287     | 1439.072     | 1623.905     | 1481.659     | 1280.000     | 1063.313     | 981.649      |
| 50 | 1010.327     | 1176.313     | 1331.680     | 1251.530     | 1034.336     | 874.602      | 805.737      |
| 55 | 772.827      | 927.375      | 1049.498     | 1010.711     | 831.091      | 695.833      | 635.641      |
| 60 | 574.881      | 689.566      | 802.110      | 783.493      | 639.997      | 507.401      | 443.670      |

**IES INDOOR REPORT****PHOTOMETRIC FILENAME : MD4ARLG-4-L45-8TW-A-DALI-UNV BOTH ON 4000K\_.IES****CANDELA TABULATION - (Cont.)**

|            |         |         |         |         |         |         |         |
|------------|---------|---------|---------|---------|---------|---------|---------|
| <b>65</b>  | 403.764 | 472.929 | 578.377 | 537.889 | 430.433 | 338.726 | 275.154 |
| <b>70</b>  | 238.698 | 284.528 | 387.658 | 344.926 | 237.246 | 196.715 | 151.331 |
| <b>75</b>  | 127.036 | 132.146 | 223.434 | 166.158 | 113.432 | 95.798  | 69.268  |
| <b>80</b>  | 51.913  | 48.933  | 90.285  | 42.524  | 37.624  | 34.928  | 28.593  |
| <b>85</b>  | 5.587   | 12.674  | 19.946  | 10.935  | 6.599   | 4.560   | 2.442   |
| <b>90</b>  | 0.000   | 0.000   | 0.000   | 0.000   | 0.000   | 0.000   | 0.000   |
| <b>95</b>  | 0.000   | 0.000   | 0.000   | 0.000   | 0.000   | 0.000   | 0.000   |
| <b>100</b> | 0.000   | 0.000   | 0.000   | 0.000   | 0.000   | 0.000   | 0.000   |
| <b>105</b> | 0.000   | 0.000   | 0.000   | 0.000   | 0.000   | 0.000   | 0.000   |
| <b>110</b> | 0.000   | 0.000   | 0.000   | 0.000   | 0.000   | 0.000   | 0.000   |
| <b>115</b> | 0.000   | 0.000   | 0.000   | 0.000   | 0.000   | 0.000   | 0.000   |
| <b>120</b> | 0.000   | 0.000   | 0.000   | 0.000   | 0.000   | 0.000   | 0.000   |
| <b>125</b> | 0.000   | 0.000   | 0.000   | 0.000   | 0.000   | 0.000   | 0.000   |
| <b>130</b> | 0.000   | 0.000   | 0.000   | 0.000   | 0.000   | 0.000   | 0.000   |
| <b>135</b> | 0.000   | 0.000   | 0.000   | 0.000   | 0.000   | 0.000   | 0.000   |
| <b>140</b> | 0.000   | 0.000   | 0.000   | 0.000   | 0.000   | 0.000   | 0.000   |
| <b>145</b> | 0.000   | 0.000   | 0.000   | 0.000   | 0.000   | 0.000   | 0.000   |
| <b>150</b> | 0.000   | 0.000   | 0.000   | 0.000   | 0.000   | 0.000   | 0.000   |
| <b>155</b> | 0.000   | 0.000   | 0.000   | 0.000   | 0.000   | 0.000   | 0.000   |
| <b>160</b> | 0.000   | 0.000   | 0.000   | 0.000   | 0.000   | 0.000   | 0.000   |
| <b>165</b> | 0.000   | 0.000   | 0.000   | 0.000   | 0.000   | 0.000   | 0.000   |
| <b>170</b> | 0.000   | 0.000   | 0.000   | 0.000   | 0.000   | 0.000   | 0.000   |
| <b>175</b> | 0.000   | 0.000   | 0.000   | 0.000   | 0.000   | 0.000   | 0.000   |
| <b>180</b> | 0.000   | 0.000   | 0.000   | 0.000   | 0.000   | 0.000   | 0.000   |

**IES INDOOR REPORT****PHOTOMETRIC FILENAME : MD4ARLG-4-L45-8TW-A-DALI-UNV BOTH ON 4000K\_.IES****ZONAL LUMEN SUMMARY**

| Zone    | Lumens  | %Lamp | %Fixt  |
|---------|---------|-------|--------|
| 0-20    | 985.08  | N.A.  | 18.00  |
| 0-30    | 2006.9  | N.A.  | 36.60  |
| 0-40    | 3122.99 | N.A.  | 56.90  |
| 0-60    | 4885.57 | N.A.  | 89.10  |
| 0-80    | 5469.31 | N.A.  | 99.70  |
| 0-90    | 5484.93 | N.A.  | 100.00 |
| 10-90   | 5220.77 | N.A.  | 95.20  |
| 20-40   | 2137.92 | N.A.  | 39.00  |
| 20-50   | 3145.62 | N.A.  | 57.40  |
| 40-70   | 2195.41 | N.A.  | 40.00  |
| 60-80   | 583.73  | N.A.  | 10.60  |
| 70-80   | 150.91  | N.A.  | 2.80   |
| 80-90   | 15.62   | N.A.  | 0.30   |
| 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   | 5484.93 | N.A.  | 100.00 |

Total Luminaire Efficiency = N.A. %

**ZONAL LUMEN SUMMARY**

| Zone    | Lumens  |
|---------|---------|
| 0-10    | 264.16  |
| 10-20   | 720.92  |
| 20-30   | 1021.82 |
| 30-40   | 1116.1  |
| 40-50   | 1007.71 |
| 50-60   | 754.87  |
| 60-70   | 432.83  |
| 70-80   | 150.91  |
| 80-90   | 15.62   |
| 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    |

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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  | 119 | 119 | 119 | 119 | 116 | 116 | 116 | 116 | 111 | 111 | 111 | 106 | 106 | 106 | 102 | 102 | 102 | 100 |
| 1  | 111 | 107 | 103 | 100 | 108 | 105 | 101 | 99  | 100 | 98  | 95  | 97  | 95  | 93  | 93  | 91  | 90  | 88  |
| 2  | 102 | 95  | 89  | 85  | 100 | 93  | 88  | 84  | 90  | 85  | 82  | 87  | 83  | 80  | 84  | 81  | 78  | 76  |
| 3  | 94  | 85  | 78  | 72  | 92  | 84  | 77  | 72  | 81  | 75  | 70  | 78  | 73  | 69  | 76  | 72  | 68  | 66  |
| 4  | 87  | 76  | 69  | 63  | 85  | 75  | 68  | 62  | 73  | 66  | 61  | 71  | 65  | 61  | 68  | 64  | 60  | 58  |
| 5  | 81  | 69  | 61  | 55  | 79  | 68  | 60  | 55  | 66  | 59  | 54  | 64  | 58  | 54  | 62  | 57  | 53  | 51  |
| 6  | 75  | 63  | 55  | 49  | 73  | 62  | 54  | 49  | 60  | 53  | 48  | 59  | 52  | 48  | 57  | 52  | 47  | 46  |
| 7  | 70  | 57  | 49  | 44  | 68  | 57  | 49  | 44  | 55  | 48  | 43  | 54  | 48  | 43  | 52  | 47  | 43  | 41  |
| 8  | 65  | 53  | 45  | 39  | 64  | 52  | 45  | 39  | 51  | 44  | 39  | 50  | 43  | 39  | 48  | 43  | 39  | 37  |
| 9  | 61  | 49  | 41  | 36  | 60  | 48  | 41  | 36  | 47  | 40  | 36  | 46  | 40  | 35  | 45  | 39  | 35  | 34  |
| 10 | 58  | 45  | 38  | 33  | 56  | 45  | 38  | 33  | 44  | 37  | 33  | 43  | 37  | 32  | 42  | 36  | 32  | 31  |

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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 | 17.7 | 19.2 | 18.1 | 19.5 | 19.8 | 20.3 | 21.7 | 20.6 | 22.1 | 22.4 |
|      | 3H   | 18.4 | 19.7 | 18.7 | 20.0 | 20.4 | 21.3 | 22.6 | 21.6 | 22.9 | 23.3 |
|      | 4H   | 18.4 | 19.7 | 18.8 | 20.0 | 20.4 | 21.5 | 22.7 | 21.9 | 23.0 | 23.4 |
|      | 6H   | 18.5 | 19.6 | 18.9 | 19.9 | 20.3 | 21.5 | 22.6 | 21.9 | 23.0 | 23.4 |
|      | 8H   | 18.4 | 19.5 | 18.8 | 19.9 | 20.3 | 21.5 | 22.6 | 21.9 | 23.0 | 23.4 |
|      | 12H  | 18.4 | 19.4 | 18.8 | 19.8 | 20.2 | 21.5 | 22.5 | 21.9 | 22.9 | 23.3 |

### UGR Viewed Endwise

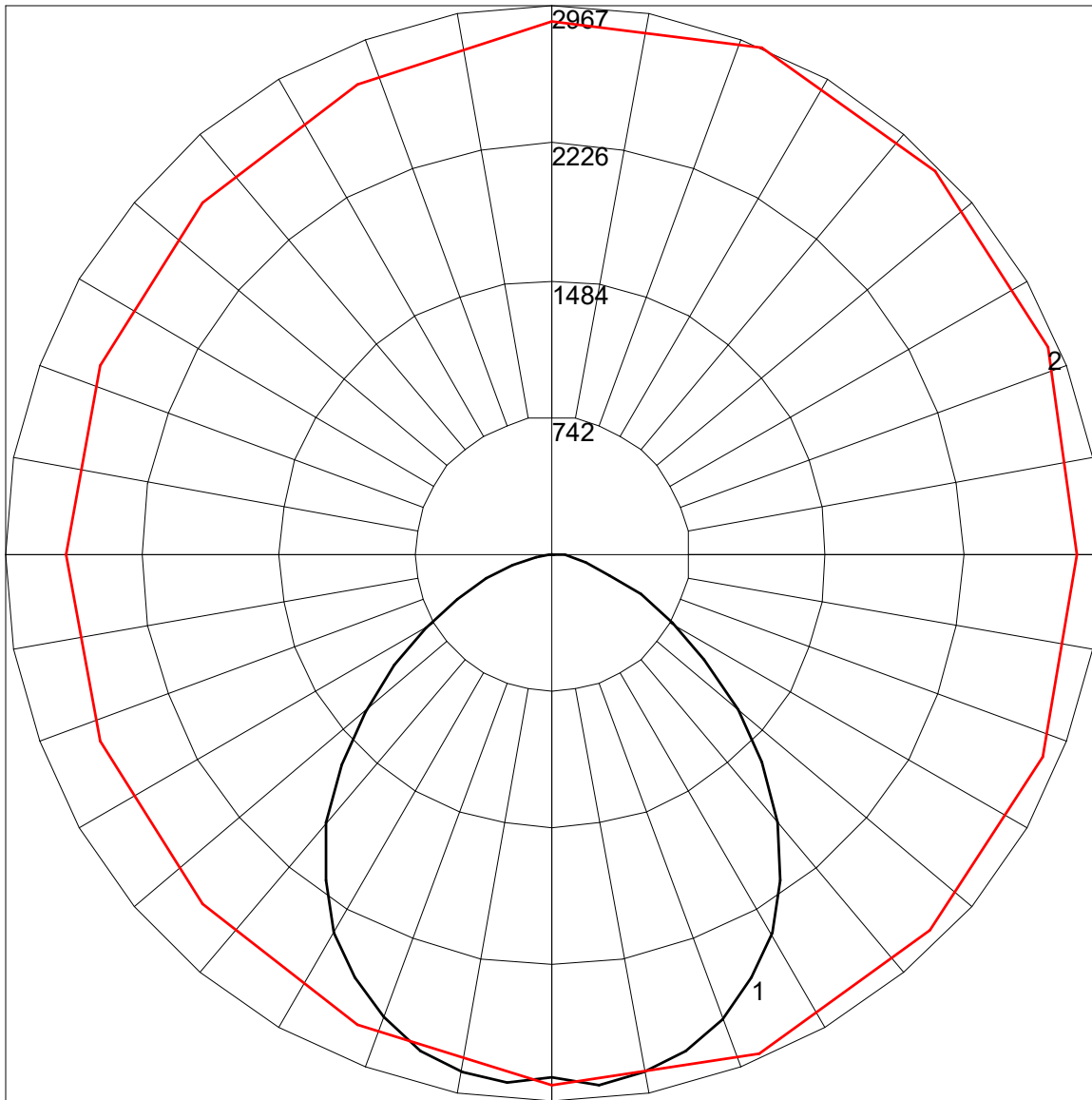
|    |     |      |      |      |      |      |      |      |      |      |      |
|----|-----|------|------|------|------|------|------|------|------|------|------|
| 4H | 2H  | 18.3 | 19.5 | 18.7 | 19.9 | 20.3 | 20.5 | 21.7 | 20.9 | 22.0 | 22.4 |
|    | 3H  | 19.1 | 20.1 | 19.5 | 20.5 | 20.9 | 21.6 | 22.6 | 22.0 | 23.0 | 23.4 |
|    | 4H  | 19.2 | 20.1 | 19.7 | 20.6 | 21.0 | 21.8 | 22.7 | 22.3 | 23.1 | 23.6 |
|    | 6H  | 19.3 | 20.0 | 19.7 | 20.5 | 20.9 | 21.9 | 22.7 | 22.4 | 23.1 | 23.6 |
|    | 8H  | 19.2 | 20.0 | 19.7 | 20.4 | 20.9 | 21.9 | 22.6 | 22.4 | 23.1 | 23.5 |
|    | 12H | 19.2 | 19.8 | 19.7 | 20.3 | 20.8 | 21.9 | 22.5 | 22.4 | 23.0 | 23.5 |

|    |     |      |      |      |      |      |      |      |      |      |      |
|----|-----|------|------|------|------|------|------|------|------|------|------|
| 8H | 4H  | 19.3 | 20.1 | 19.8 | 20.5 | 21.0 | 21.8 | 22.5 | 22.3 | 23.0 | 23.4 |
|    | 6H  | 19.4 | 20.0 | 19.9 | 20.5 | 20.9 | 21.9 | 22.5 | 22.4 | 23.0 | 23.4 |
|    | 8H  | 19.4 | 19.9 | 19.9 | 20.4 | 20.9 | 21.9 | 22.4 | 22.4 | 22.9 | 23.4 |
|    | 12H | 19.3 | 19.8 | 19.8 | 20.3 | 20.9 | 21.8 | 22.3 | 22.4 | 22.8 | 23.4 |

|     |    |      |      |      |      |      |      |      |      |      |      |
|-----|----|------|------|------|------|------|------|------|------|------|------|
| 12H | 4H | 19.3 | 20.0 | 19.8 | 20.4 | 20.9 | 21.8 | 22.4 | 22.3 | 22.9 | 23.4 |
|     | 6H | 19.4 | 19.9 | 19.9 | 20.4 | 20.9 | 21.8 | 22.4 | 22.4 | 22.8 | 23.4 |
|     | 8H | 19.3 | 19.8 | 19.9 | 20.3 | 20.9 | 21.8 | 22.3 | 22.4 | 22.8 | 23.4 |

Maximum UGR = 23.6

POLAR GRAPH



Maximum Candela = 2967.372 Located At Horizontal Angle = 67.5, Vertical Angle = 5  
# 1 - Vertical Plane Through Horizontal Angles (90 - 270)  
# 2 - Horizontal Cone Through Vertical Angle (5) (Through Max. Cd.)