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## Nata

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### Client:

LumCAT: 3-2116-N

Luminaire: 92.70.135.00

Report No: nata-0100

Test No: GC2018053113

LampCAT: NICHIA NFCWD084B-V3

Lamp flux(lm): 2168.8

Number of Lamps: 1

Length(mm): 80

Phm Type: C

Voltage(V): 34.2000

Current(A): 0.5000

Power (W): 17.1000

PF: 0.0000

Ballast type: DC

Width(mm): 80

Height(mm): 0

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## Photometric Results

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Lumens(lm): 1833.26, Efficiency(%): 84.53% , Luminous Efficacy(lm/W): 107.21

Central intensity(cd): 7570.255, Maximum intensity(cd): 7570.255

Angle of maximum intensity: C=0.0  $\gamma$ =0.0

Beam Angle(50%Imax): [C0/180]Total=24.4

[C90/270]Total=24.4

Field angle(10%Imax): [C0/180]Total=51.8

[C90/270]Total=51.8

Maximum s/h(1/2): C0\_180=0.42 C90\_270=0.42

Maximum s/h(1/4): C0\_180=0.41 C90\_270=0.41

Up flux rate of lamp(%): 0.00%

Down flux rate of lamp(%): 86.54%

Up flux rate of LUM(%): - -

Down flux rate of LUM(%): 100.00%

CIE Type : Direct lighting

Output flux ratio in  $\pi$  solid angle : 95.998%

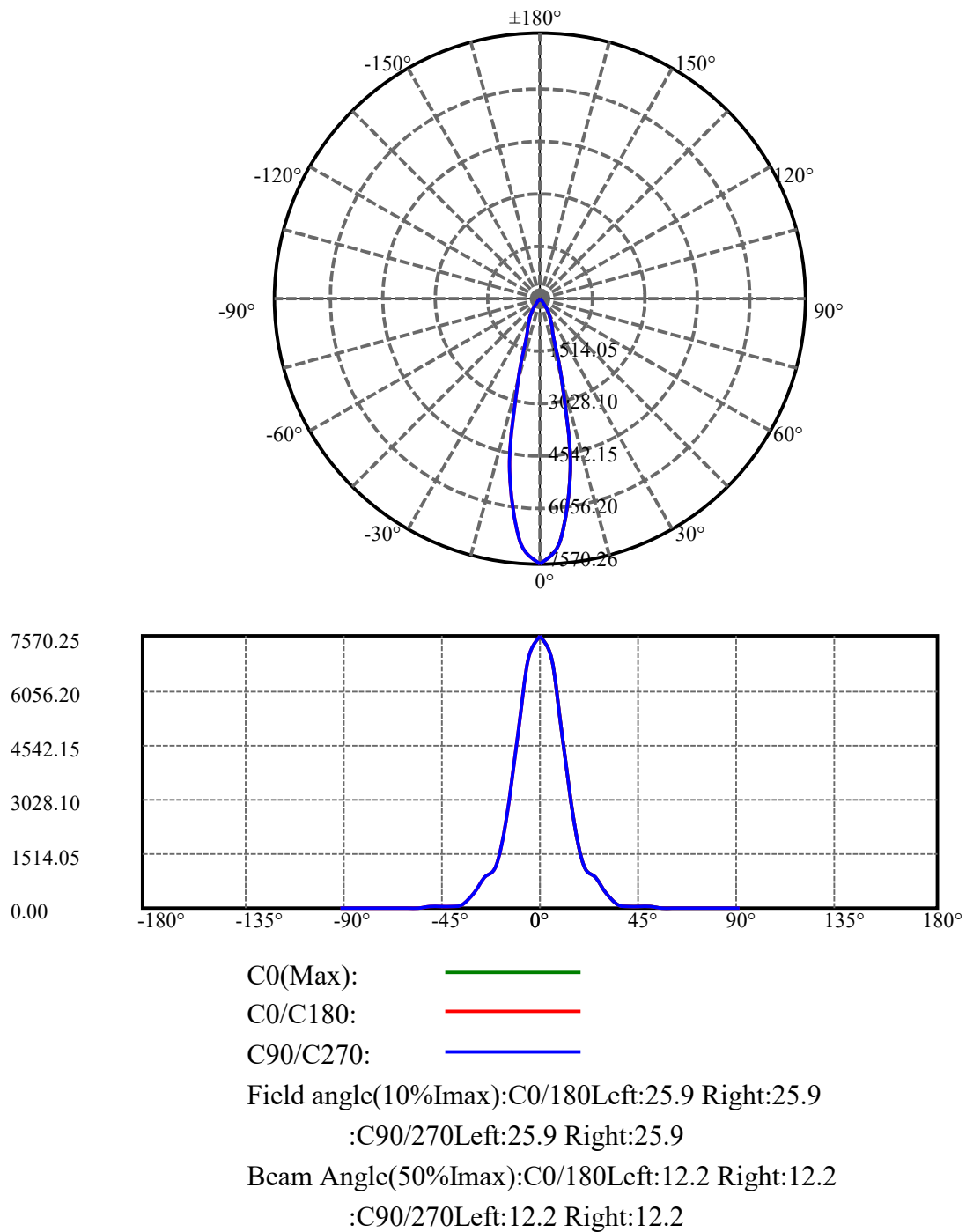
| $\gamma(^{\circ})$ | Average I(cd) | Zonal F(lm) | Sum F(lm) | Eff Flux(%) | Eff Sum(%) |
|--------------------|---------------|-------------|-----------|-------------|------------|
| 0.0                | 7570.255      | 45.272      | 45.272    | 2.087%      | 2.469%     |
| 5.0                | 6901.870      | 329.725     | 374.997   | 15.203%     | 20.455%    |
| 10.0               | 4860.723      | 462.658     | 837.655   | 21.333%     | 45.692%    |
| 15.0               | 2432.805      | 345.138     | 1182.793  | 15.914%     | 64.519%    |
| 20.0               | 1193.237      | 223.701     | 1406.495  | 10.315%     | 76.721%    |
| 25.0               | 828.640       | 191.957     | 1598.451  | 8.851%      | 87.192%    |
| 30.0               | 439.102       | 120.344     | 1718.796  | 5.549%      | 93.756%    |
| 35.0               | 80.197        | 25.214      | 1744.009  | 1.163%      | 95.132%    |
| 40.0               | 43.653        | 15.380      | 1759.39   | .709%       | 95.971%    |
| 45.0               | 34.335        | 13.308      | 1772.697  | .614%       | 96.696%    |
| 50.0               | 26.991        | 11.334      | 1784.031  | .523%       | 97.315%    |
| 55.0               | 20.908        | 9.388       | 1793.419  | .433%       | 97.827%    |
| 60.0               | 17.398        | 8.259       | 1801.678  | .381%       | 98.277%    |
| 65.0               | 14.679        | 7.292       | 1808.97   | .336%       | 98.675%    |
| 70.0               | 11.417        | 5.881       | 1814.851  | .271%       | 98.996%    |
| 75.0               | 10.681        | 5.655       | 1820.506  | .261%       | 99.304%    |
| 80.0               | 10.020        | 5.409       | 1825.915  | .249%       | 99.599%    |
| 85.0               | 9.366         | 5.115       | 1831.03   | .236%       | 99.878%    |
| 90.0               | 8.141         | 2.231       | 1833.261  | .103%       | 100.000%   |

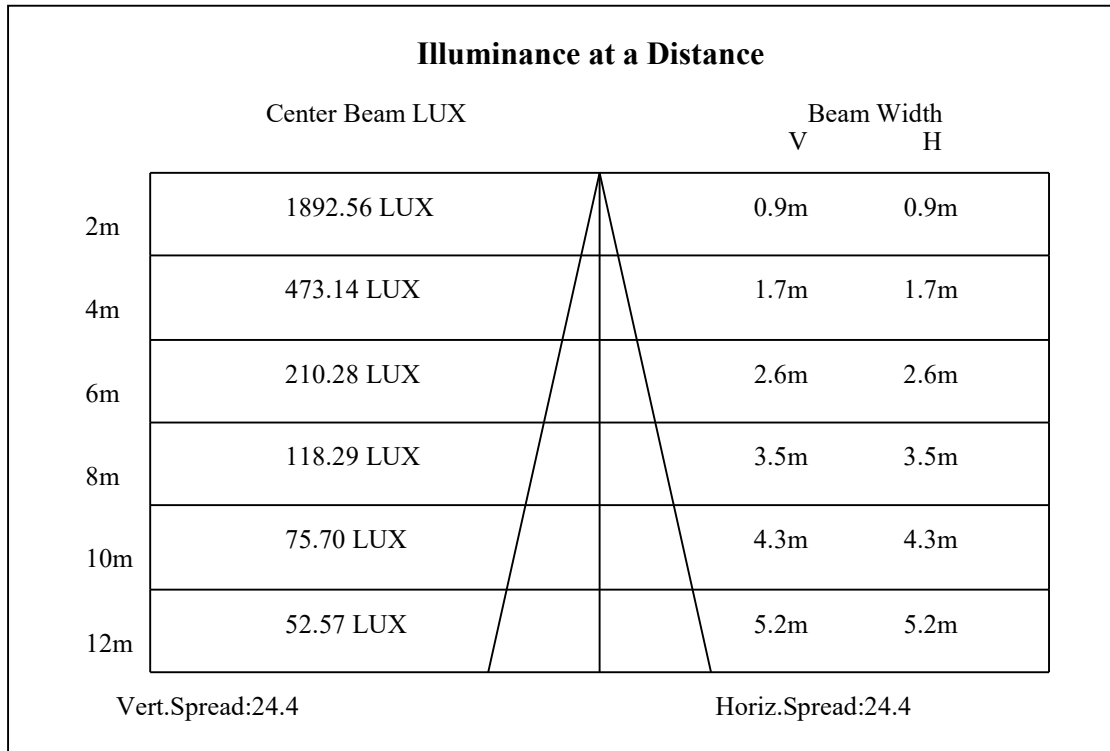
## ZONAL LUMEN SUMMARY

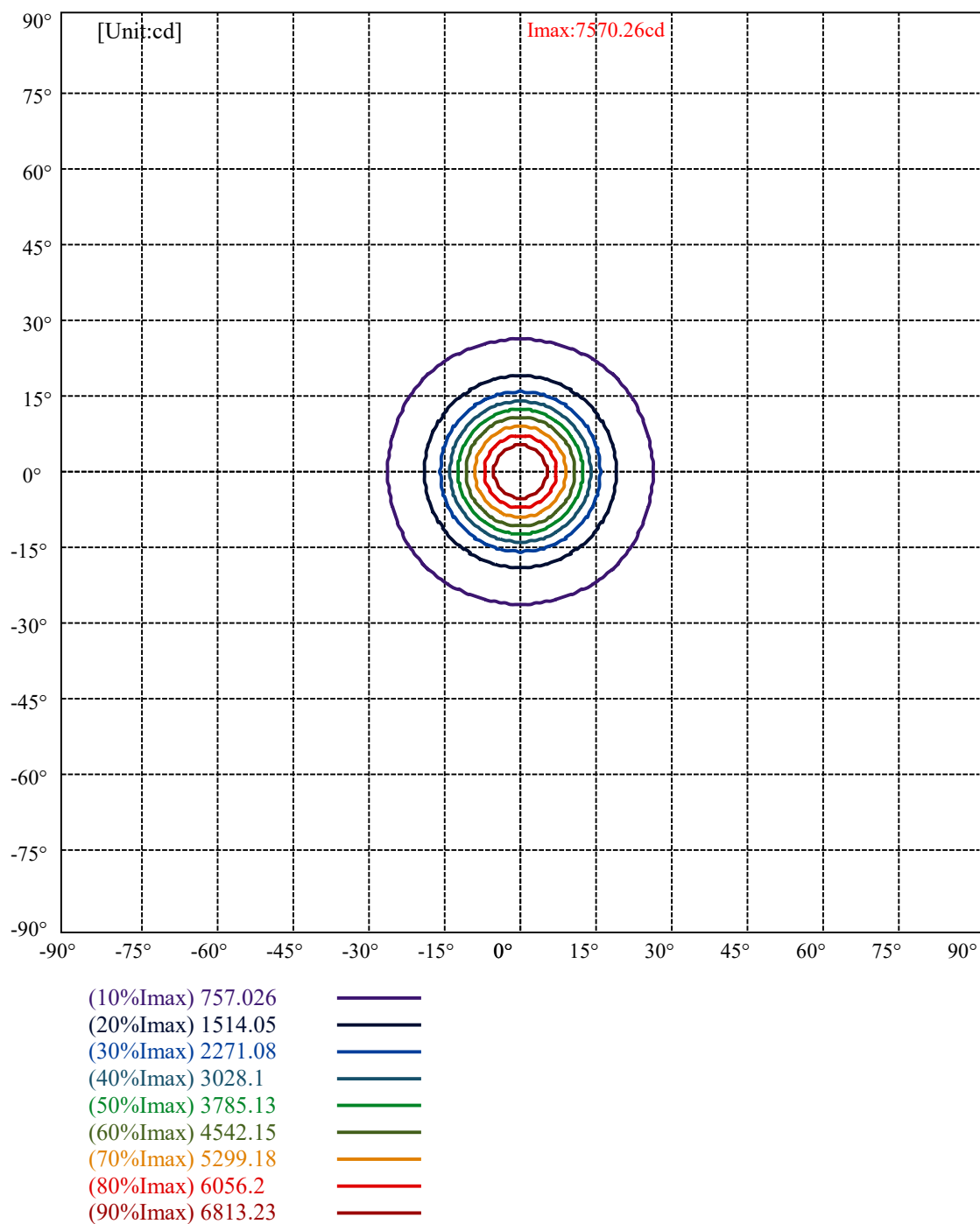
| Zone    | Lumens  | %Lamp  | %Fixt   |
|---------|---------|--------|---------|
| 0-30    | 1718.80 | 79.25% | 93.76%  |
| 0-40    | 1759.39 | 81.12% | 95.97%  |
| 0-60    | 1801.68 | 83.07% | 98.28%  |
| 0-90    | 1831.03 | 84.43% | 99.88%  |
| 0-120   | 1831.03 | 84.43% | 99.88%  |
| 0-180   | 1833.26 | 84.53% | 100.00% |
| 60-90   | 37.61   | 1.73%  | 2.05%   |
| 90-120  | 0.00    | 0.00%  | 0.00%   |
| 90-130  | 0.00    | 0.00%  | 0.00%   |
| 90-150  | 0.00    | 0.00%  | 0.00%   |
| 90-180  | 0.00    | 0.00%  | 0.00%   |
| 0-21.57 | 1466.61 | 67.62% | 80.00%  |

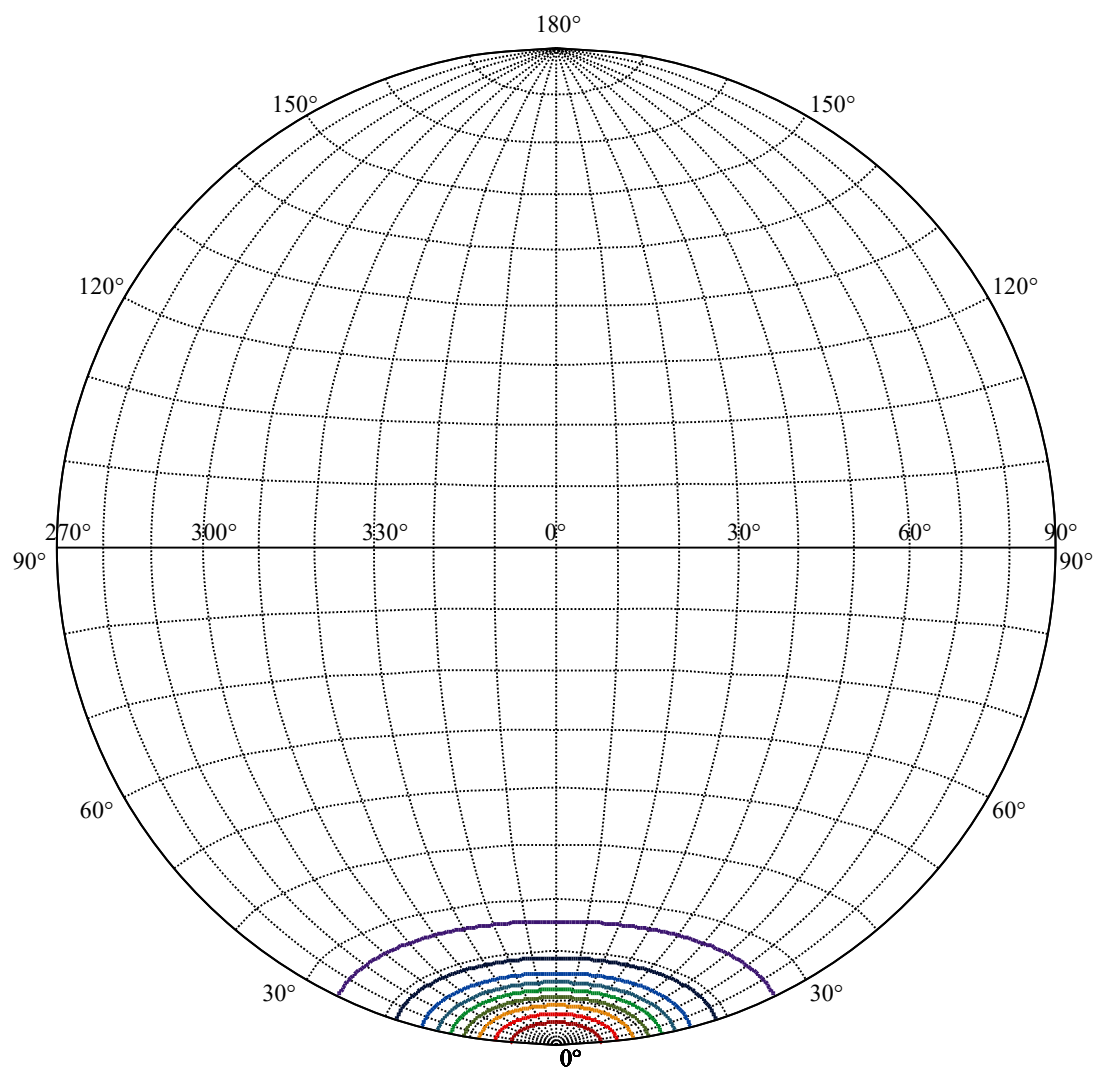
## ZONAL LUMEN SUMMARY

|         |        |
|---------|--------|
| 0-10    | 837.66 |
| 10-20   | 568.84 |
| 20-30   | 312.30 |
| 30-40   | 40.59  |
| 40-50   | 24.64  |
| 50-60   | 17.65  |
| 60-70   | 13.17  |
| 70-80   | 11.06  |
| 80-90   | 5.11   |
| 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   |









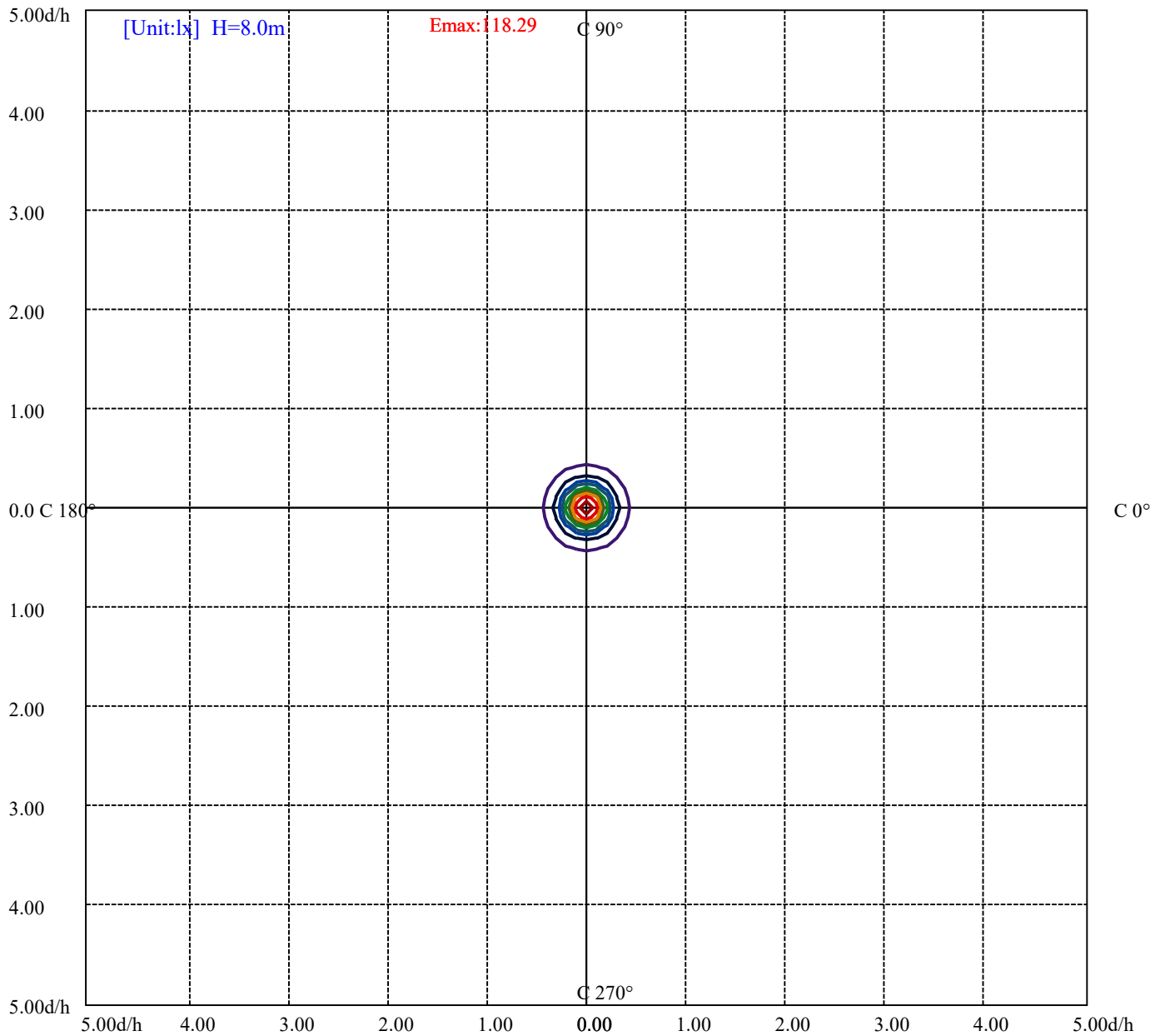
House

[Unit:cd]

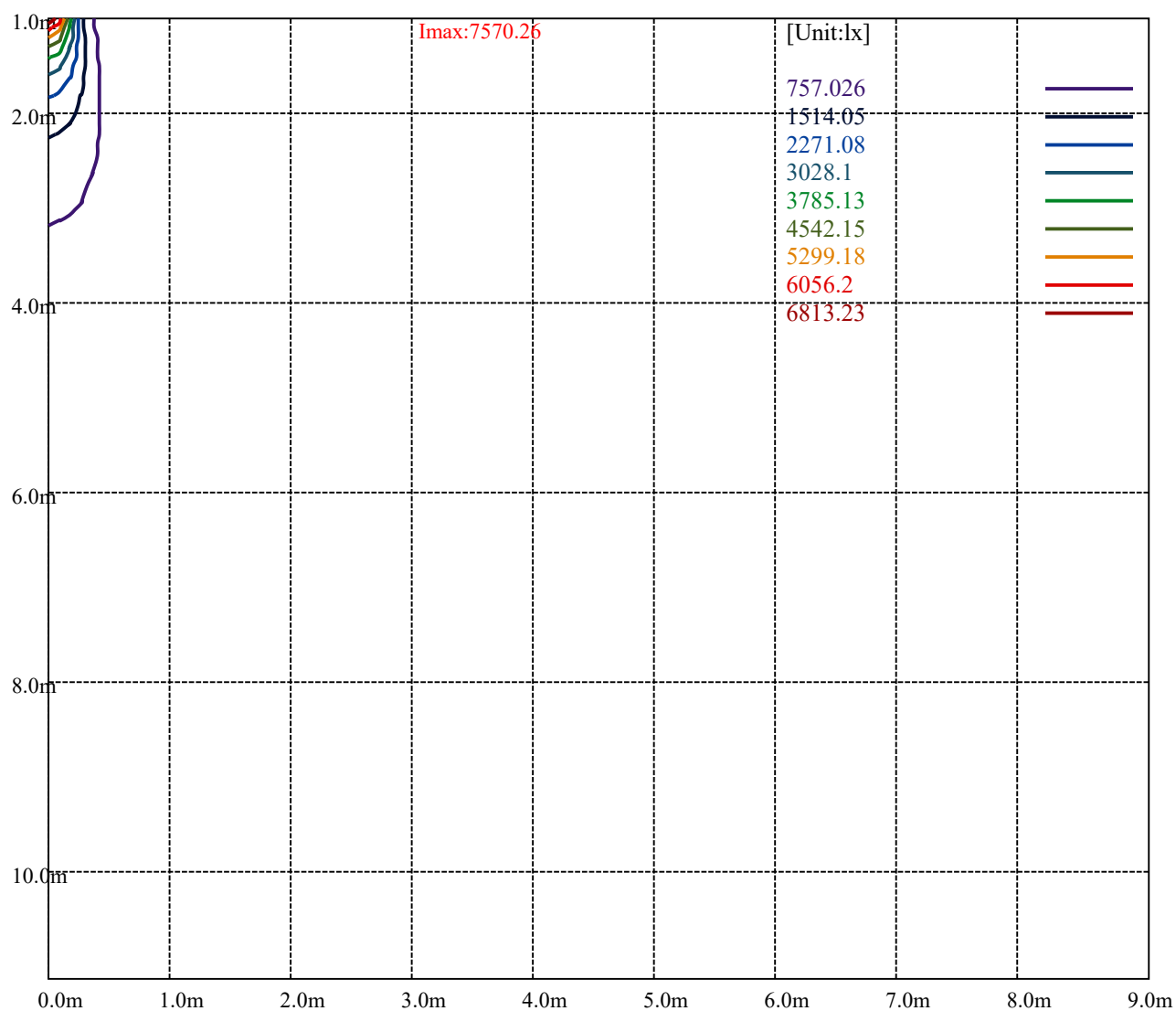
Road

**Imax:7570.26**

|           |         |   |
|-----------|---------|---|
| (10%Imax) | 757.026 | — |
| (20%Imax) | 1514.05 | — |
| (30%Imax) | 2271.08 | — |
| (40%Imax) | 3028.1  | — |
| (50%Imax) | 3785.13 | — |
| (60%Imax) | 4542.15 | — |
| (70%Imax) | 5299.18 | — |
| (80%Imax) | 6056.2  | — |
| (90%Imax) | 6813.23 | — |



|           |          |   |
|-----------|----------|---|
| (10%Emax) | 11.82848 | — |
| (20%Emax) | 23.65703 | — |
| (30%Emax) | 35.48547 | — |
| (40%Emax) | 47.31391 | — |
| (50%Emax) | 59.1425  | — |
| (60%Emax) | 70.97094 | — |
| (70%Emax) | 82.79938 | — |
| (80%Emax) | 94.62797 | — |
| (90%Emax) | 106.4564 | — |



Luminance Table

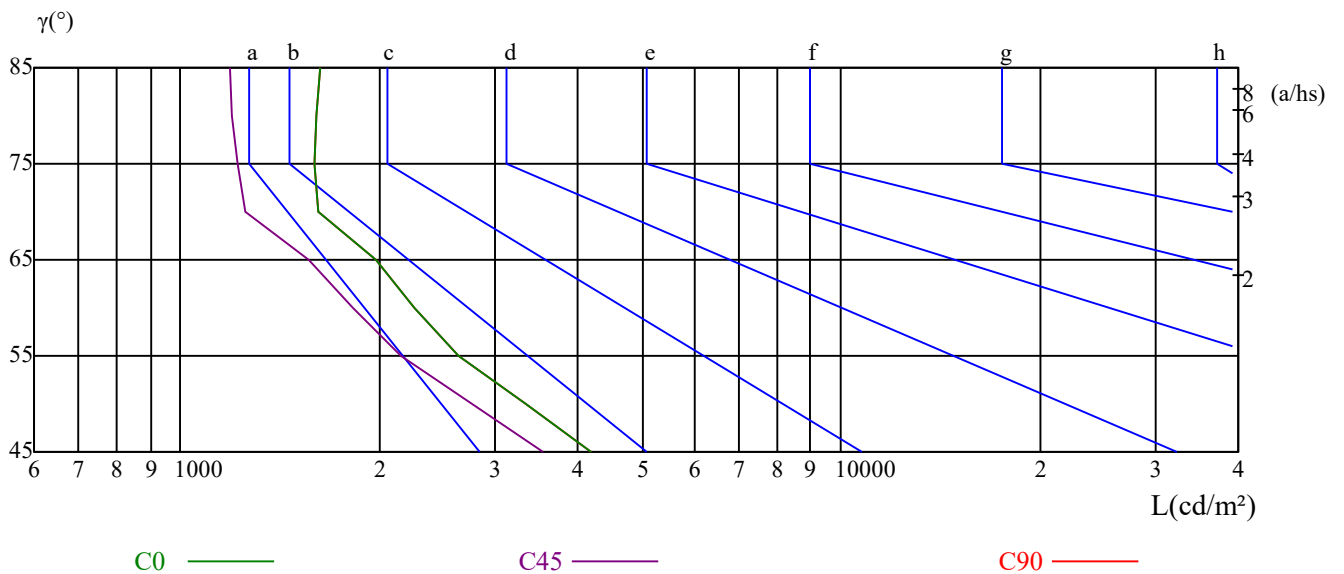
| $\gamma$ | 45   | 50   | 55   | 60   | 65   | 70   | 75   | 80   | 85   |
|----------|------|------|------|------|------|------|------|------|------|
| C0       | 4186 | 3333 | 2636 | 2258 | 1979 | 1614 | 1599 | 1608 | 1632 |
| C45      | 3530 | 2769 | 2157 | 1818 | 1567 | 1255 | 1219 | 1200 | 1188 |
| C90      | 4186 | 3333 | 2636 | 2258 | 1979 | 1614 | 1599 | 1608 | 1632 |

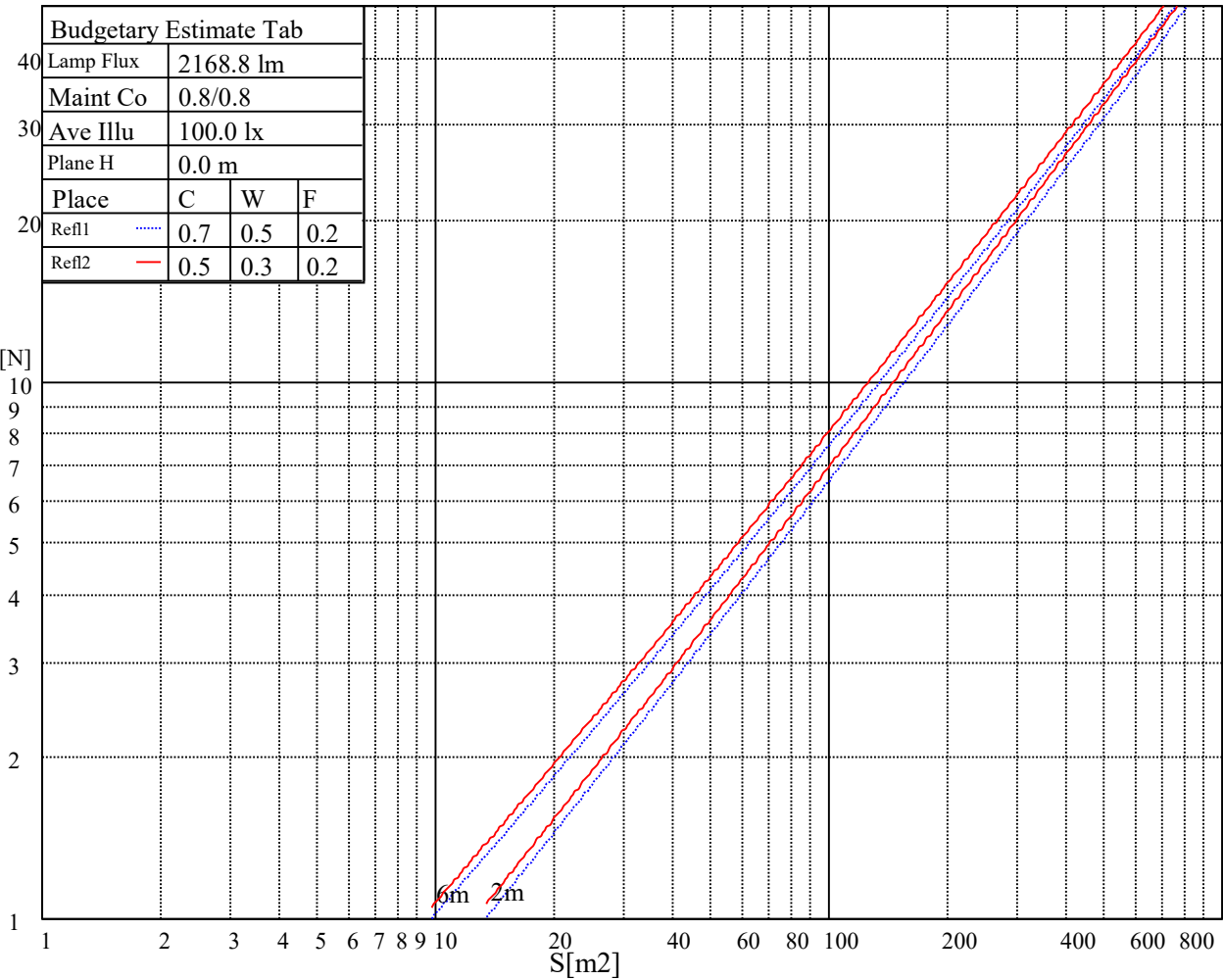
| L(Hor)(65) | L(Ver)(65) | L45(65) | L(Hor)(75) | L(Ver)(75) | L45(75) | L(Hor)(85) | L(Ver)(85) | L45(85) |
|------------|------------|---------|------------|------------|---------|------------|------------|---------|
| 5427       | 5427       | 5427    | 6448       | 6448       | 6448    | 16792      | 16792      | 16792   |

Glare Table

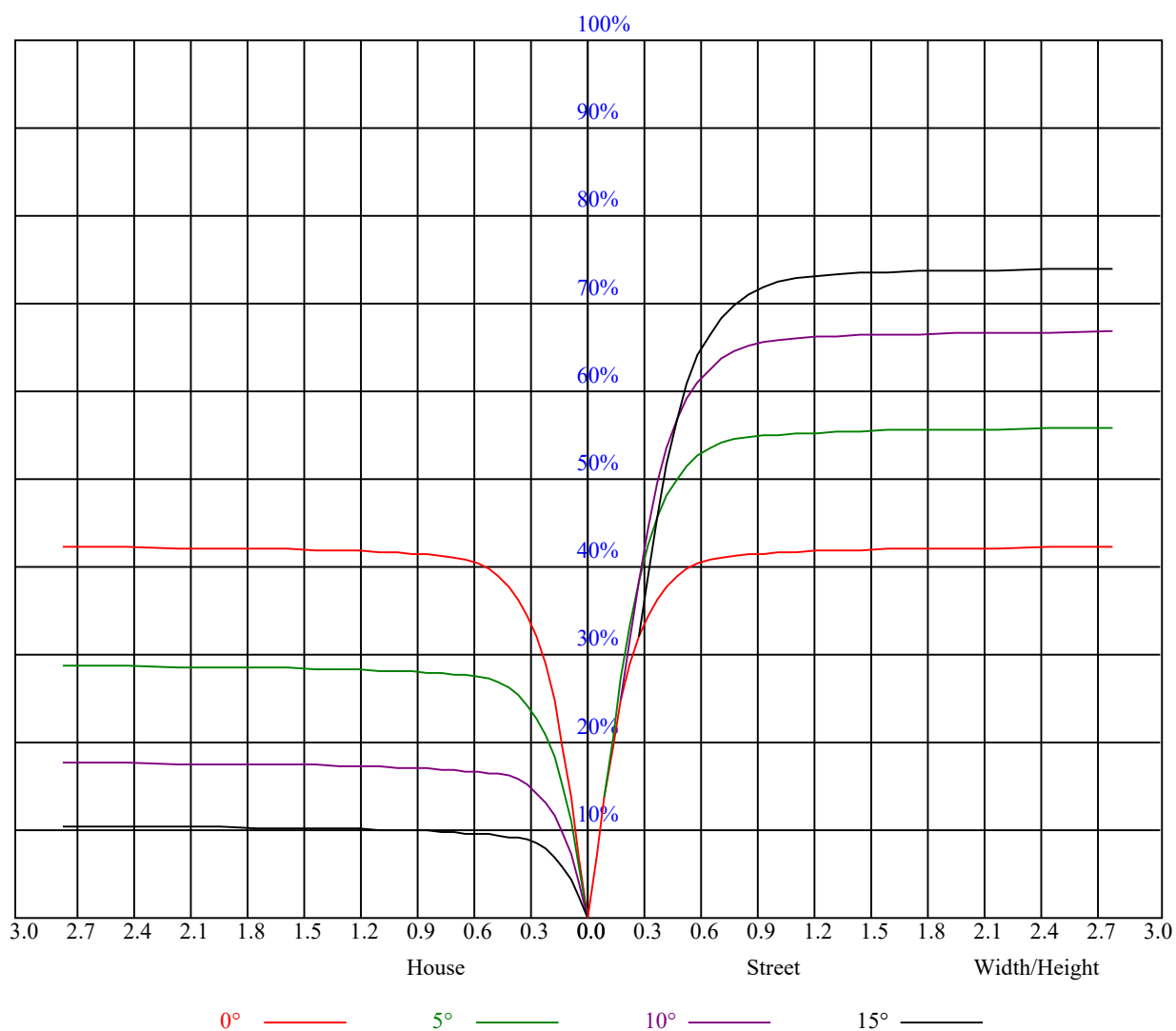
| Glare | Quality | Service Values Illuminance(lx) |      |      |            |            |            |            |            |
|-------|---------|--------------------------------|------|------|------------|------------|------------|------------|------------|
| 1.15  | A       | 2000                           | 1000 | 500  | $\leq 300$ |            |            |            |            |
| 1.5   | B       |                                | 2000 | 1000 | 500        | $\leq 300$ |            |            |            |
| 1.85  | C       |                                |      | 2000 | 1000       | 500        | $\leq 300$ |            |            |
| 2.2   | D       |                                |      |      | 2000       | 1000       | 500        | $\leq 300$ |            |
| 2.55  | E       |                                |      |      |            | 2000       | 1000       | 500        | $\leq 300$ |
|       |         | a                              | b    | c    | d          | e          | f          | g          | h          |

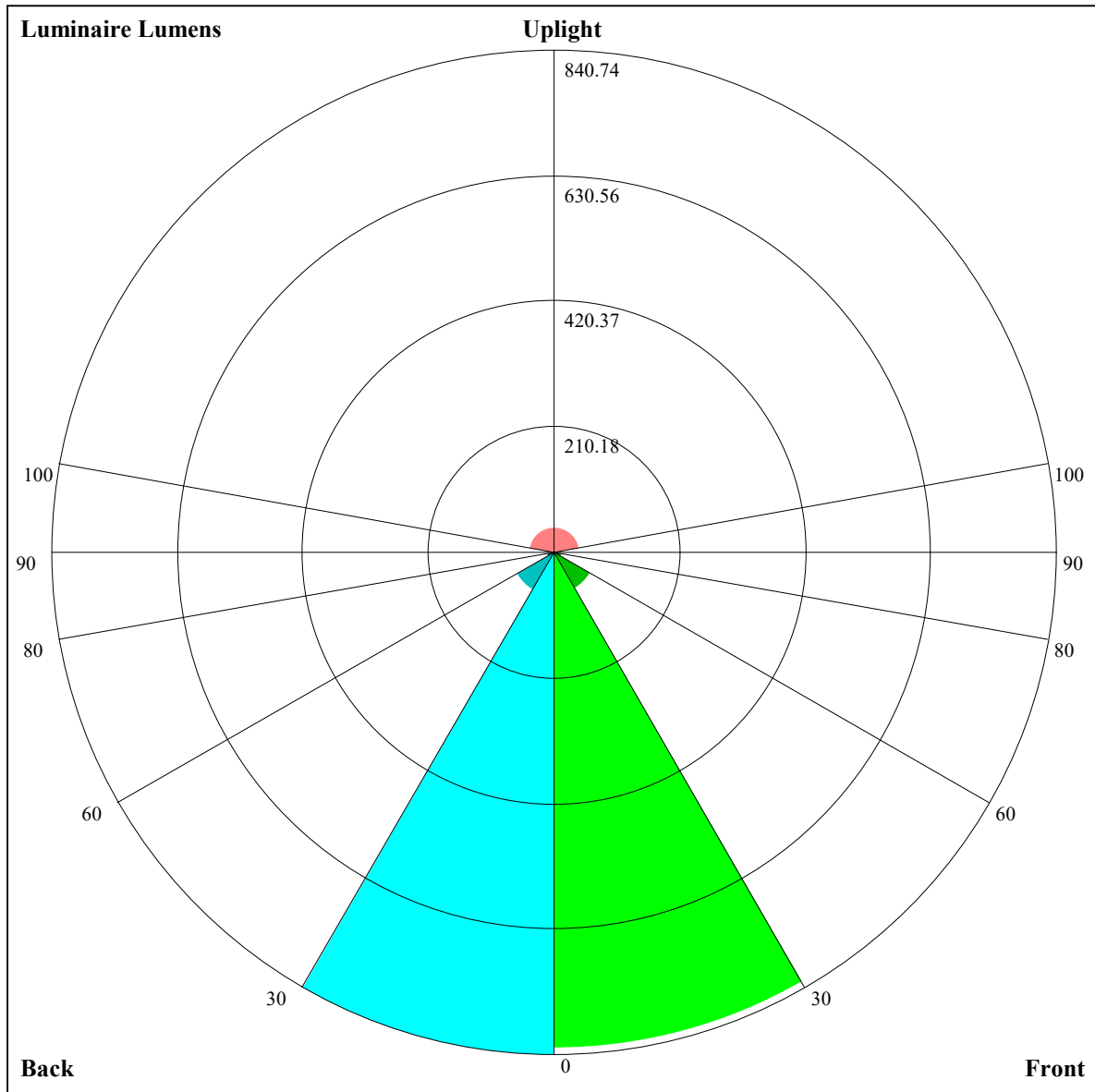
Luminance Limiting Curve





| RHOC | 80                                      |      |      | 70   |      |      | 50   |      |      | 30   |      |      | 10   |      |      | 0    |
|------|-----------------------------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| RHOW | 50                                      | 30   | 10   | 50   | 30   | 10   | 50   | 30   | 10   | 50   | 30   | 10   | 50   | 30   | 10   | 0    |
| RCR  | COEFFICIENTS OF UTILIZATION RHOFC=20 CU |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| 0    | 1.03                                    | 1.03 | 1.03 | 1.01 | 1.01 | 1.01 | 0.96 | 0.96 | 0.96 | 0.92 | 0.92 | 0.92 | 0.88 | 0.88 | 0.88 | 0.87 |
| 1    | 0.95                                    | 0.92 | 0.90 | 0.93 | 0.91 | 0.89 | 0.89 | 0.87 | 0.86 | 0.86 | 0.85 | 0.83 | 0.83 | 0.82 | 0.81 | 0.79 |
| 2    | 0.90                                    | 0.87 | 0.84 | 0.89 | 0.86 | 0.83 | 0.86 | 0.83 | 0.81 | 0.83 | 0.81 | 0.79 | 0.81 | 0.79 | 0.78 | 0.76 |
| 3    | 0.86                                    | 0.82 | 0.79 | 0.85 | 0.82 | 0.79 | 0.83 | 0.80 | 0.78 | 0.81 | 0.78 | 0.76 | 0.79 | 0.77 | 0.75 | 0.74 |
| 4    | 0.83                                    | 0.79 | 0.76 | 0.82 | 0.78 | 0.75 | 0.80 | 0.77 | 0.74 | 0.78 | 0.76 | 0.74 | 0.77 | 0.75 | 0.73 | 0.72 |
| 5    | 0.80                                    | 0.76 | 0.73 | 0.79 | 0.75 | 0.73 | 0.78 | 0.74 | 0.72 | 0.76 | 0.73 | 0.71 | 0.75 | 0.73 | 0.71 | 0.70 |
| 6    | 0.77                                    | 0.73 | 0.70 | 0.76 | 0.73 | 0.70 | 0.75 | 0.72 | 0.70 | 0.74 | 0.71 | 0.69 | 0.73 | 0.71 | 0.69 | 0.68 |
| 7    | 0.75                                    | 0.71 | 0.68 | 0.74 | 0.71 | 0.68 | 0.73 | 0.70 | 0.68 | 0.72 | 0.69 | 0.67 | 0.71 | 0.69 | 0.67 | 0.66 |
| 8    | 0.73                                    | 0.69 | 0.66 | 0.72 | 0.69 | 0.66 | 0.71 | 0.68 | 0.66 | 0.71 | 0.68 | 0.66 | 0.70 | 0.67 | 0.65 | 0.64 |
| 9    | 0.71                                    | 0.67 | 0.64 | 0.70 | 0.67 | 0.64 | 0.70 | 0.66 | 0.64 | 0.69 | 0.66 | 0.64 | 0.68 | 0.66 | 0.64 | 0.63 |
| 10   | 0.69                                    | 0.65 | 0.63 | 0.69 | 0.65 | 0.63 | 0.68 | 0.65 | 0.63 | 0.67 | 0.65 | 0.62 | 0.67 | 0.64 | 0.62 | 0.62 |





Luminaire Lumens:

FL=830.67,FM=70.94,FH=12.85,FVH=5.03

BL=840.74,BM=73.34,BH=12.85,BVH=5.03

UL=8.88,UH=42.27

BUG Rating:B2-U2-G0

| Intensity data(cd) |         |         |         |         |         |        |        |        |       | Appendix Page: 15 Total:15 |  |
|--------------------|---------|---------|---------|---------|---------|--------|--------|--------|-------|----------------------------|--|
| C/ $\gamma$ (°)    | 0.0     | 5.0     | 10.0    | 15.0    | 20.0    | 25.0   | 30.0   | 35.0   | 40.0  |                            |  |
| 0.0                | 7566.40 | 6880.40 | 4869.74 | 2402.11 | 1266.85 | 836.86 | 434.39 | 65.52  | 41.57 |                            |  |
| 45.0               | 7583.47 | 6855.07 | 4780.55 | 2401.56 | 1216.75 | 795.01 | 402.46 | 63.65  | 42.72 |                            |  |
| 90.0               | 7559.79 | 6521.98 | 4359.37 | 2047.55 | 1087.09 | 753.89 | 332.82 | 58.36  | 41.79 |                            |  |
| 135.0              | 7571.36 | 7057.13 | 5033.81 | 2610.22 | 1263.54 | 836.31 | 465.23 | 68.99  | 44.98 |                            |  |
| 180.0              | 7566.40 | 6954.17 | 4798.72 | 2350.91 | 1095.51 | 823.09 | 411.49 | 70.14  | 43.60 |                            |  |
| 225.0              | 7583.47 | 6996.57 | 4919.29 | 2425.78 | 1070.41 | 859.82 | 471.45 | 77.96  | 44.65 |                            |  |
| 270.0              | 7559.79 | 7185.96 | 5467.10 | 2876.15 | 1451.84 | 911.18 | 569.83 | 170.07 | 46.80 |                            |  |
| 315.0              | 7571.36 | 6763.68 | 4657.22 | 2348.16 | 1093.92 | 812.96 | 425.15 | 66.89  | 43.11 |                            |  |
| 360.0              | 7566.40 | 6880.40 | 4869.74 | 2402.11 | 1266.85 | 836.86 | 434.39 | 65.52  | 41.57 |                            |  |
| C/ $\gamma$ (°)    | 45.0    | 50.0    | 55.0    | 60.0    | 65.0    | 70.0   | 75.0   | 80.0   | 85.0  |                            |  |
| 0.0                | 33.09   | 26.87   | 20.48   | 17.29   | 14.81   | 11.45  | 10.68  | 10.08  | 9.41  |                            |  |
| 45.0               | 33.75   | 26.76   | 20.76   | 17.40   | 15.09   | 11.40  | 10.63  | 9.97   | 9.19  |                            |  |
| 90.0               | 32.59   | 25.77   | 20.21   | 17.01   | 13.49   | 11.23  | 10.57  | 9.97   | 9.08  |                            |  |
| 135.0              | 35.02   | 27.31   | 21.47   | 17.84   | 14.98   | 11.51  | 10.74  | 10.08  | 9.36  |                            |  |
| 180.0              | 34.25   | 27.09   | 20.76   | 17.12   | 14.48   | 11.34  | 10.57  | 9.86   | 9.36  |                            |  |
| 225.0              | 35.07   | 27.20   | 21.09   | 17.29   | 14.70   | 11.40  | 10.68  | 9.97   | 9.41  |                            |  |
| 270.0              | 37.00   | 28.74   | 22.08   | 18.11   | 15.36   | 11.67  | 10.96  | 10.19  | 9.69  |                            |  |
| 315.0              | 33.91   | 26.21   | 20.43   | 17.12   | 14.53   | 11.34  | 10.63  | 10.08  | 9.41  |                            |  |
| 360.0              | 33.09   | 26.87   | 20.48   | 17.29   | 14.81   | 11.45  | 10.68  | 10.08  | 9.41  |                            |  |
| C/ $\gamma$ (°)    | 90.0    |         |         |         |         |        |        |        |       |                            |  |
| 0.0                | 8.15    |         |         |         |         |        |        |        |       |                            |  |
| 45.0               | 8.09    |         |         |         |         |        |        |        |       |                            |  |
| 90.0               | 8.15    |         |         |         |         |        |        |        |       |                            |  |
| 135.0              | 8.20    |         |         |         |         |        |        |        |       |                            |  |
| 180.0              | 8.15    |         |         |         |         |        |        |        |       |                            |  |
| 225.0              | 8.09    |         |         |         |         |        |        |        |       |                            |  |
| 270.0              | 8.15    |         |         |         |         |        |        |        |       |                            |  |
| 315.0              | 8.15    |         |         |         |         |        |        |        |       |                            |  |
| 360.0              | 8.15    |         |         |         |         |        |        |        |       |                            |  |