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## NATA

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Client:

LumCAT: 1406-N

Luminaire: 92.70.046.00

Report No: nt0100

Test No: GC2020010816

LampCAT: LUMINUS CLM-9-AA40

Lamp flux(lm): 1288.0

Number of Lamps: 1

Length(mm): 0

Phm Type: C

Voltage(V): 34.1700

Current(A): 0.3070

Power (W): 10.4900

PF: 0.0000

Ballast type: DC

Width(mm): 0

Height(mm): 0

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## Photometric Results

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Lumens(lm): 1048.25, Efficiency(%): 81.39% , Luminous Efficacy(lm/W): 99.93

Central intensity(cd): 1311.047, Maximum intensity(cd): 1311.047

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

Beam Angle(50%Imax): [C0/180]Total=42.0

[C90/270]Total=42.0

Field angle(10%Imax): [C0/180]Total=92.8

[C90/270]Total=92.8

Maximum s/h(1/2): C0\_180=0.66 C90\_270=0.66

Maximum s/h(1/4): C0\_180=0.73 C90\_270=0.73

Up flux rate of lamp(%): 0.00%

Down flux rate of lamp(%): 81.39%

Up flux rate of LUM(%): - -

Down flux rate of LUM(%): 100.00%

CIE Type : Direct lighting

Output flux ratio in  $\pi$  solid angle : 92.372%

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Equipment: GMS1980  
Temperature(°C): 25.0

Date: 2020/1/8  
Humidity(%): 65.0%

Operator: NT07  
Distance(m): 7.50

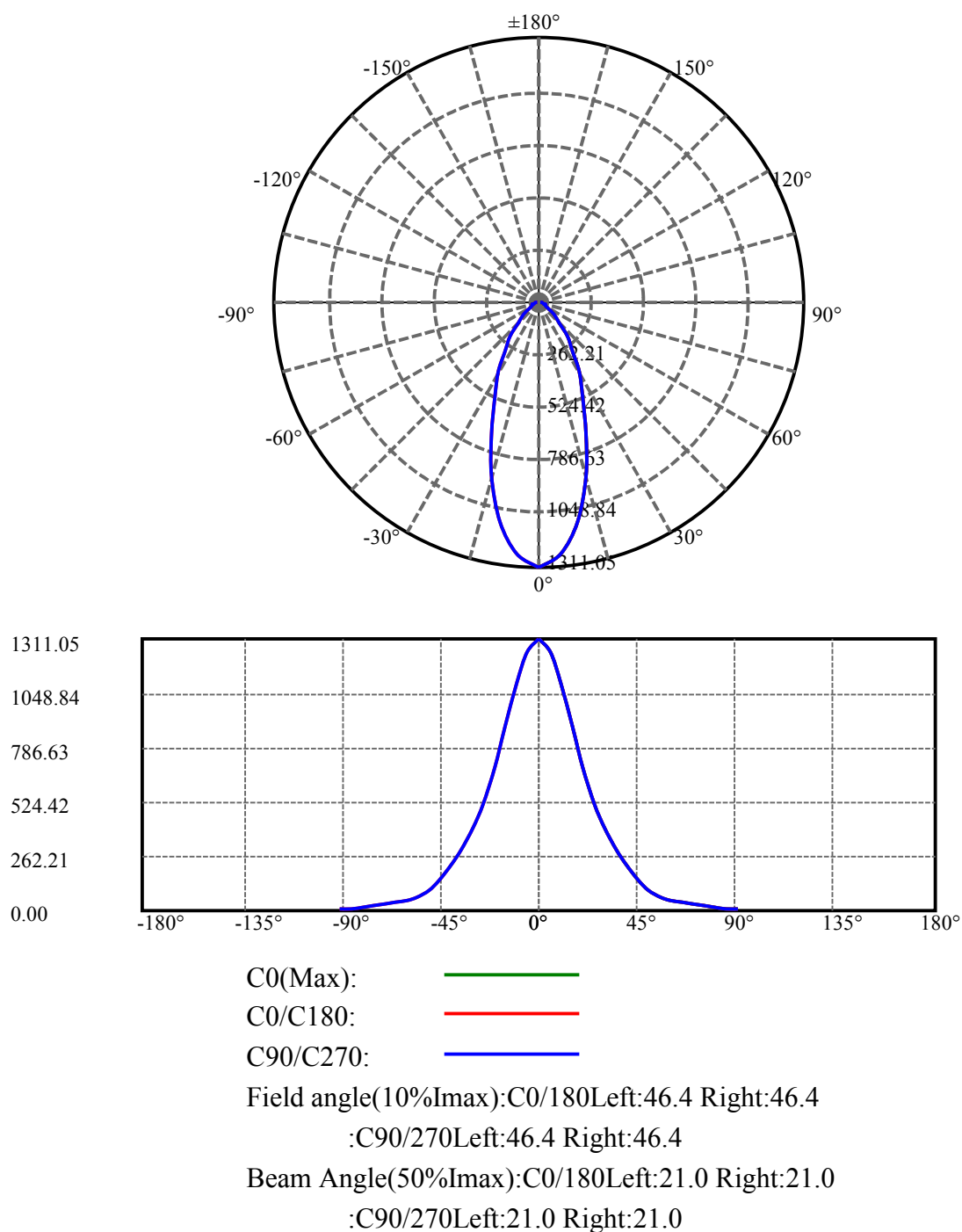
| $\gamma(^{\circ})$ | Average I(cd) | Zonal F(lm) | Sum F(lm) | Eff Flux(%) | Eff Sum(%) |
|--------------------|---------------|-------------|-----------|-------------|------------|
| 0.0                | 1311.047      | 0.000       | 0         | .000%       | .000%      |
| 5.0                | 1247.527      | 30.587      | 30.587    | 2.375%      | 2.918%     |
| 10.0               | 1098.408      | 83.921      | 114.508   | 6.516%      | 10.924%    |
| 15.0               | 887.815       | 117.821     | 232.33    | 9.148%      | 22.164%    |
| 20.0               | 689.098       | 129.960     | 362.29    | 10.090%     | 34.561%    |
| 25.0               | 517.071       | 126.505     | 488.794   | 9.822%      | 46.630%    |
| 30.0               | 396.415       | 115.602     | 604.397   | 8.975%      | 57.658%    |
| 35.0               | 297.000       | 102.110     | 706.507   | 7.928%      | 67.399%    |
| 40.0               | 216.921       | 85.744      | 792.251   | 6.657%      | 75.579%    |
| 45.0               | 144.345       | 66.891      | 859.142   | 5.193%      | 81.960%    |
| 50.0               | 96.005        | 48.566      | 907.708   | 3.771%      | 86.593%    |
| 55.0               | 64.069        | 34.805      | 942.514   | 2.702%      | 89.913%    |
| 60.0               | 47.447        | 25.777      | 968.29    | 2.001%      | 92.372%    |
| 65.0               | 38.728        | 20.949      | 989.239   | 1.626%      | 94.371%    |
| 70.0               | 34.235        | 18.475      | 1007.714  | 1.434%      | 96.133%    |
| 75.0               | 28.125        | 16.300      | 1024.014  | 1.266%      | 97.688%    |
| 80.0               | 16.573        | 11.960      | 1035.974  | .929%       | 98.829%    |
| 85.0               | 11.609        | 7.658       | 1043.631  | .595%       | 99.560%    |
| 90.0               | 5.245         | 4.615       | 1048.246  | .358%       | 100.000%   |

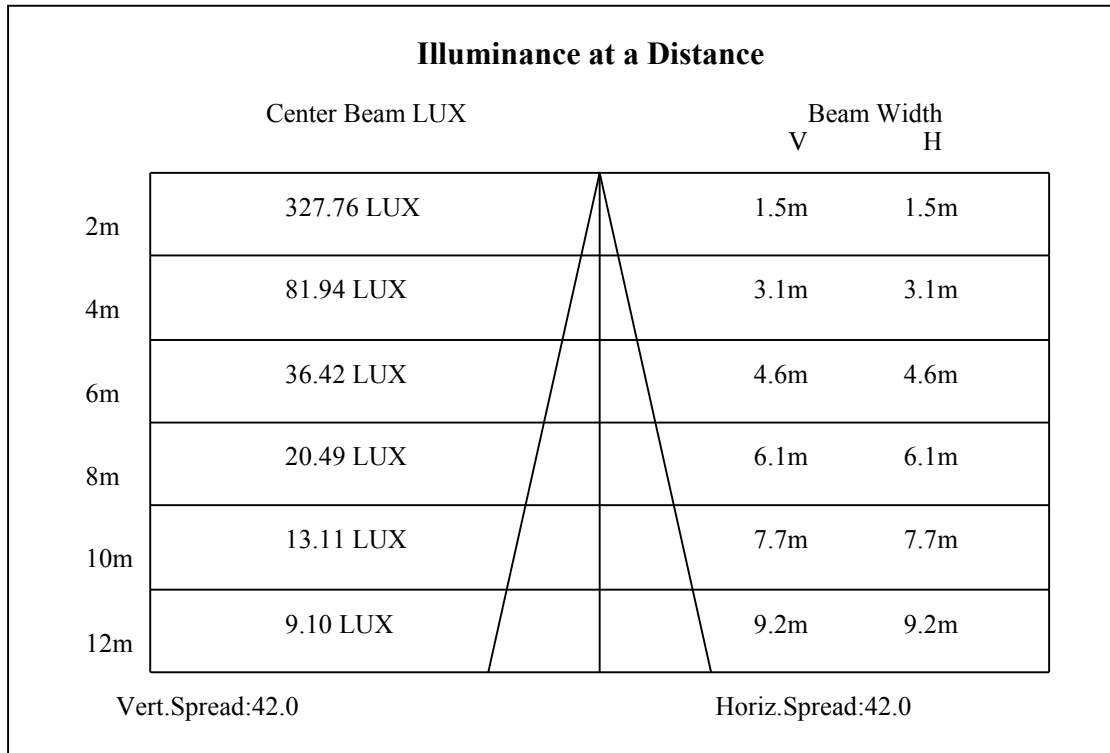
## ZONAL LUMEN SUMMARY

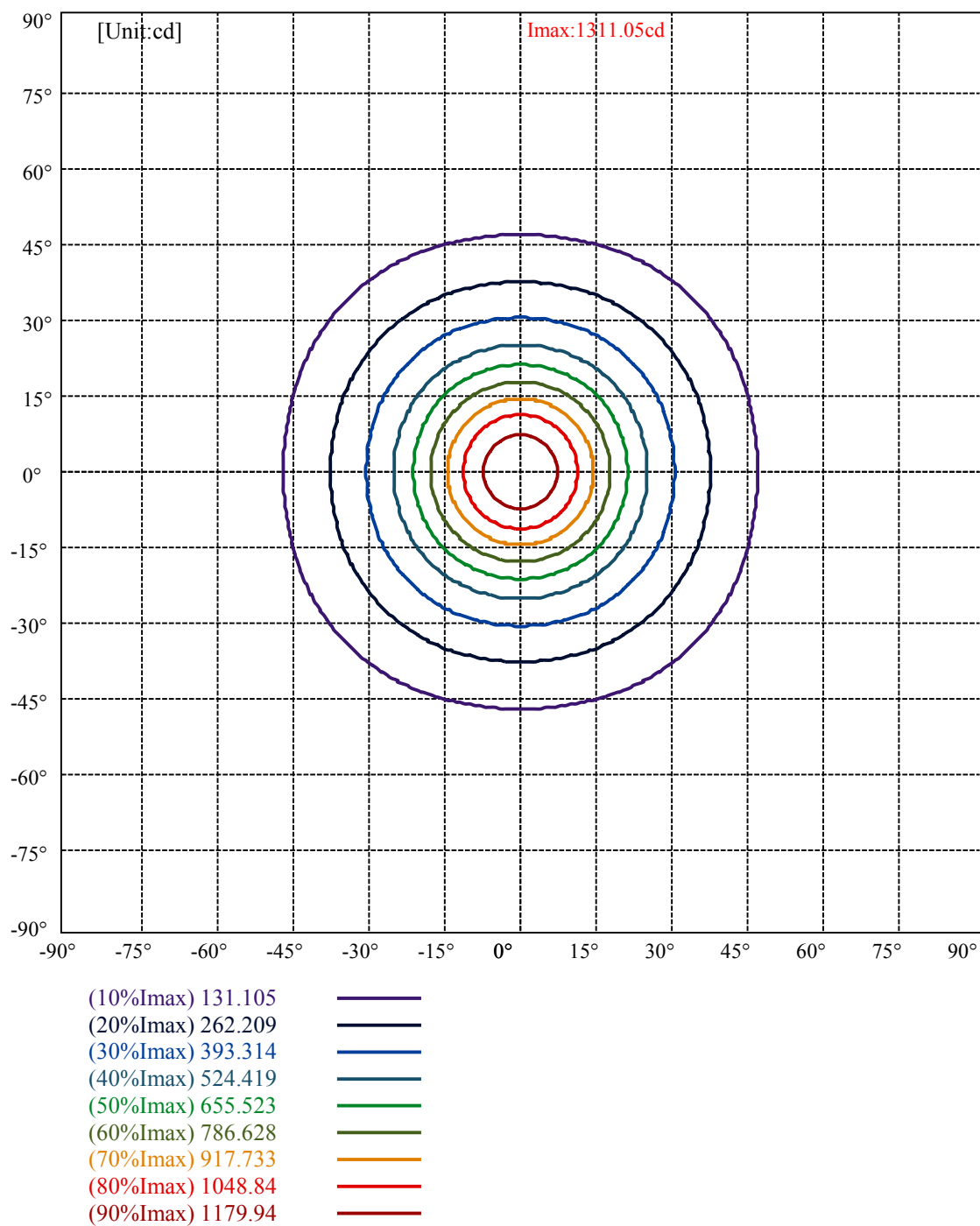
| Zone    | Lumens  | %Lamp  | %Fixt   |
|---------|---------|--------|---------|
| 0-30    | 604.40  | 46.93% | 57.66%  |
| 0-40    | 792.25  | 61.51% | 75.58%  |
| 0-60    | 968.29  | 75.18% | 92.37%  |
| 0-90    | 1043.63 | 81.03% | 99.56%  |
| 0-120   | 1043.63 | 81.03% | 99.56%  |
| 0-180   | 1048.25 | 81.39% | 100.00% |
| 60-90   | 101.12  | 7.85%  | 9.65%   |
| 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%   |
| 0-43.46 | 838.60  | 65.11% | 80.00%  |

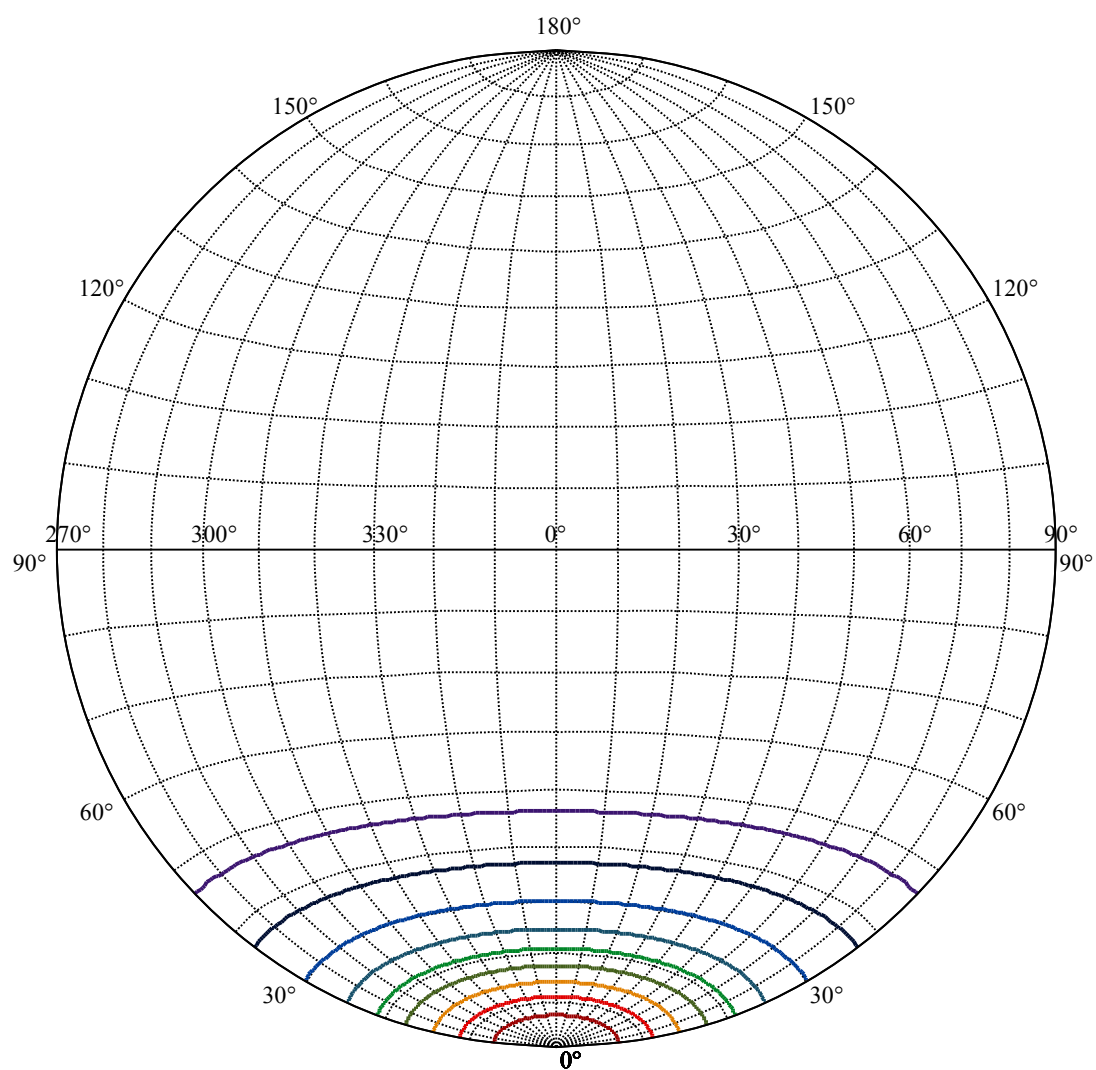
## ZONAL LUMEN SUMMARY

|         |        |
|---------|--------|
| 0-10    | 114.51 |
| 10-20   | 247.78 |
| 20-30   | 242.11 |
| 30-40   | 187.85 |
| 40-50   | 115.46 |
| 50-60   | 60.58  |
| 60-70   | 39.42  |
| 70-80   | 28.26  |
| 80-90   | 7.66   |
| 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:1311.05

(10%Imax) 131.105

(20%Imax) 262.209

(30%Imax) 393.314

(40%Imax) 524.419

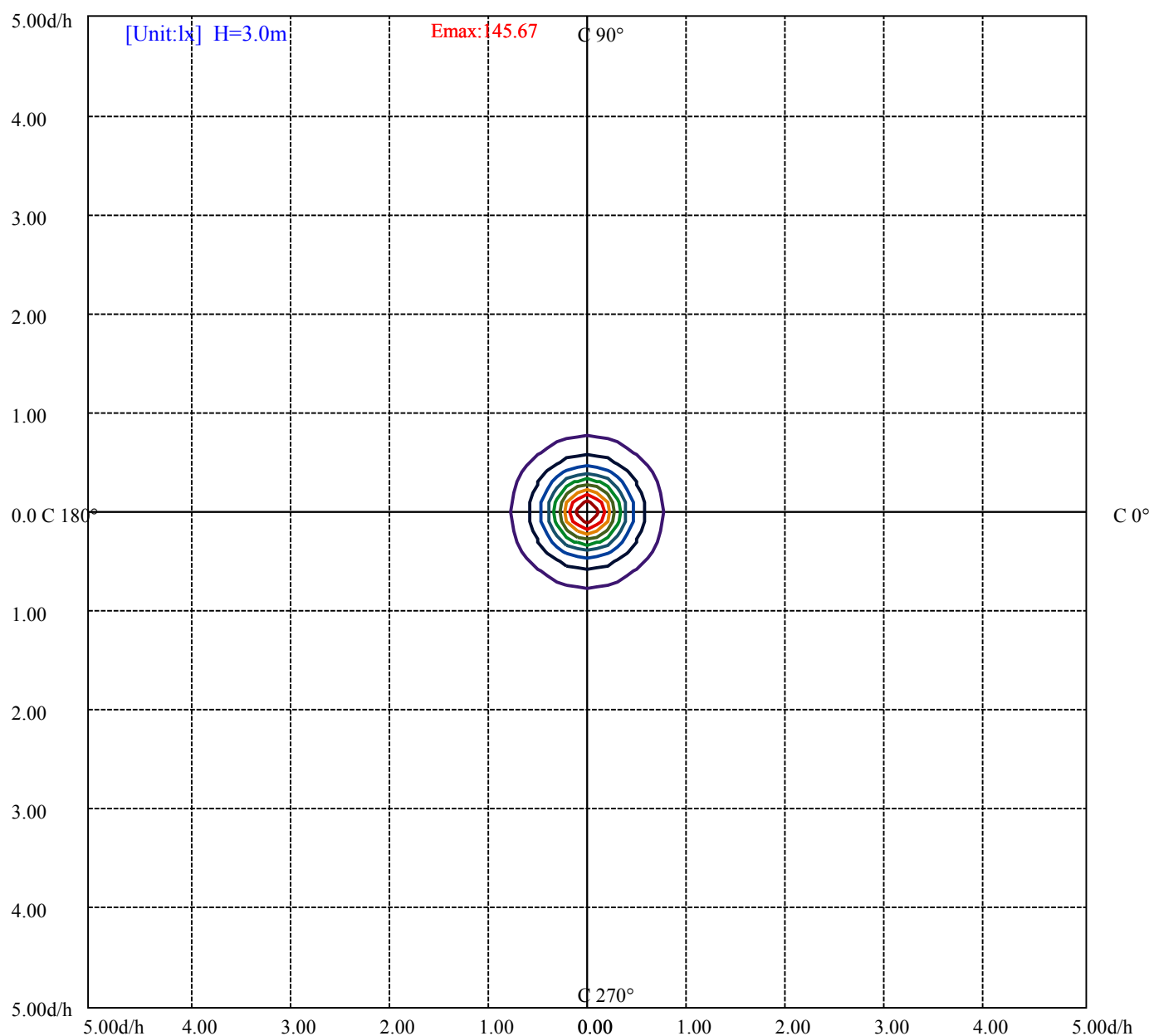
(50%Imax) 655.523

(60%Imax) 786.628

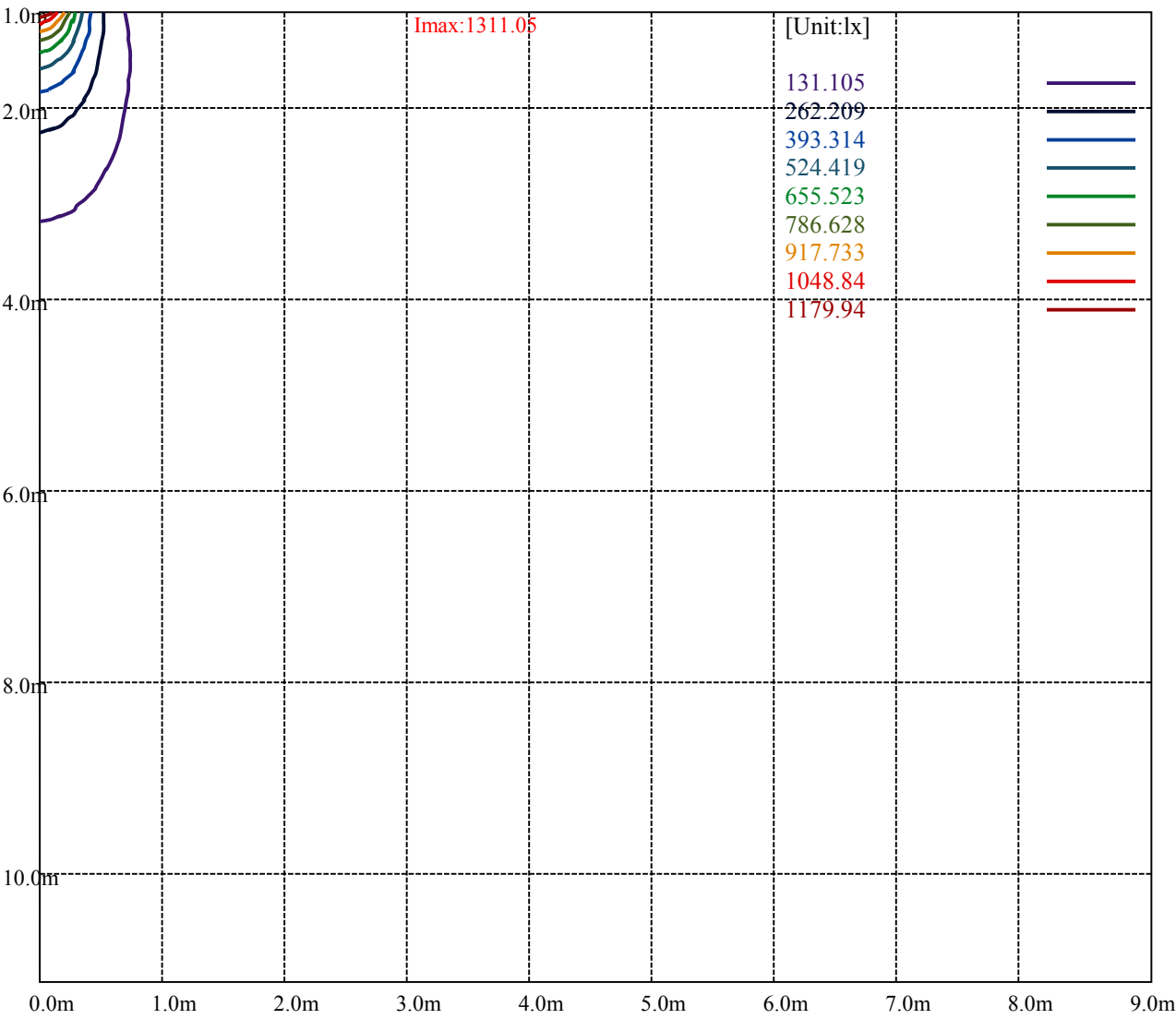
(70%Imax) 917.733

(80%Imax) 1048.84

(90%Imax) 1179.94



|                                 |   |
|---------------------------------|---|
| (10%E <sub>max</sub> ) 14.56711 | — |
| (20%E <sub>max</sub> ) 29.13433 | — |
| (30%E <sub>max</sub> ) 43.70144 | — |
| (40%E <sub>max</sub> ) 58.26867 | — |
| (50%E <sub>max</sub> ) 72.83578 | — |
| (60%E <sub>max</sub> ) 87.403   | — |
| (70%E <sub>max</sub> ) 101.9701 | — |
| (80%E <sub>max</sub> ) 116.5378 | — |
| (90%E <sub>max</sub> ) 131.1044 | — |



Luminance Table

| $\gamma$ | 45 | 50 | 55 | 60 | 65 | 70 | 75 | 80 | 85 |
|----------|----|----|----|----|----|----|----|----|----|
| C0       | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  |
| C45      | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  |
| C90      | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  |

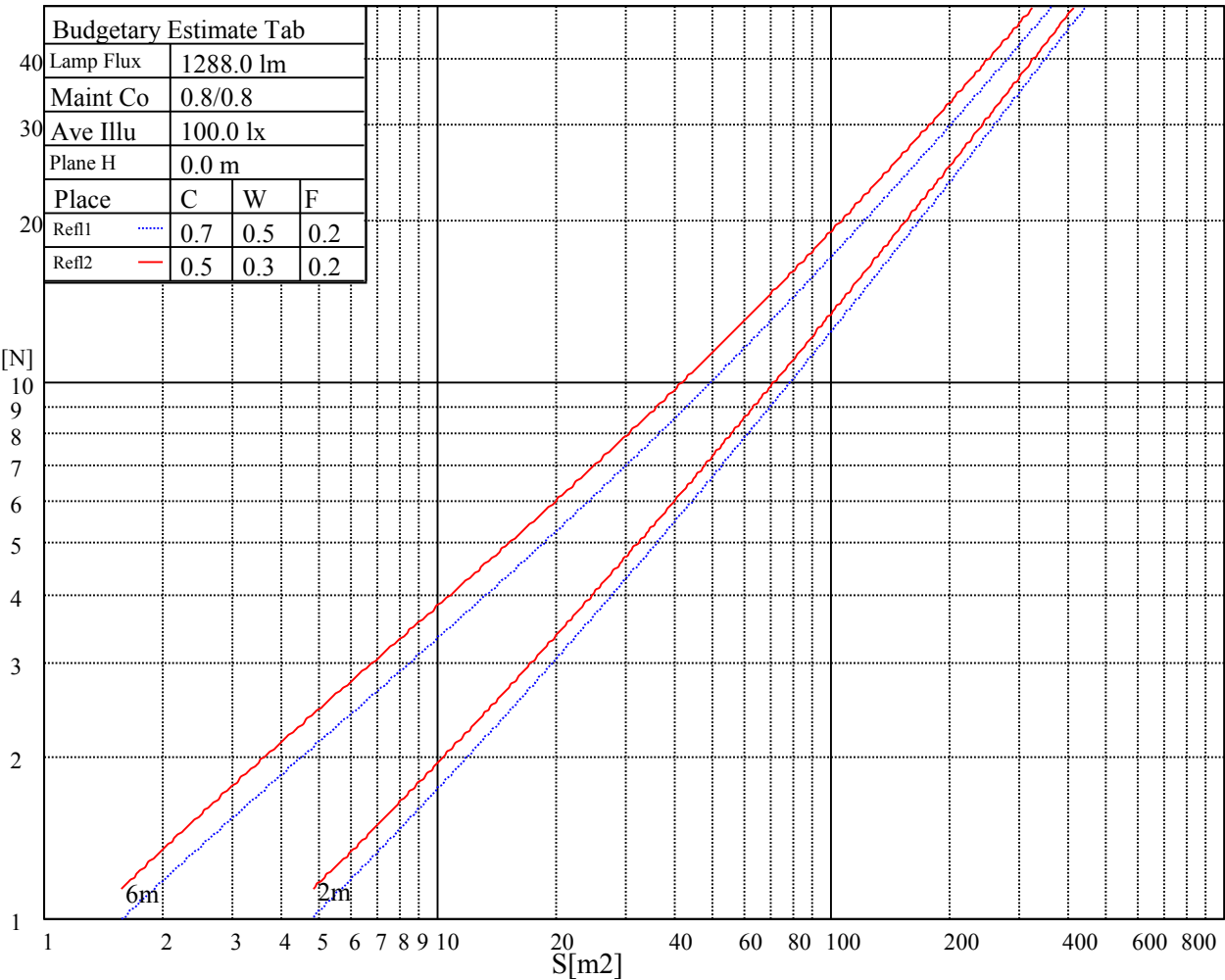
| L(Hor)(65) | L(Ver)(65) | L45(65) | L(Hor)(75) | L(Ver)(75) | L45(75) | L(Hor)(85) | L(Ver)(85) | L45(85) |
|------------|------------|---------|------------|------------|---------|------------|------------|---------|
| 0          | 0          | 0       | 0          | 0          | 0       | 0          | 0          | 0       |

Glare Table

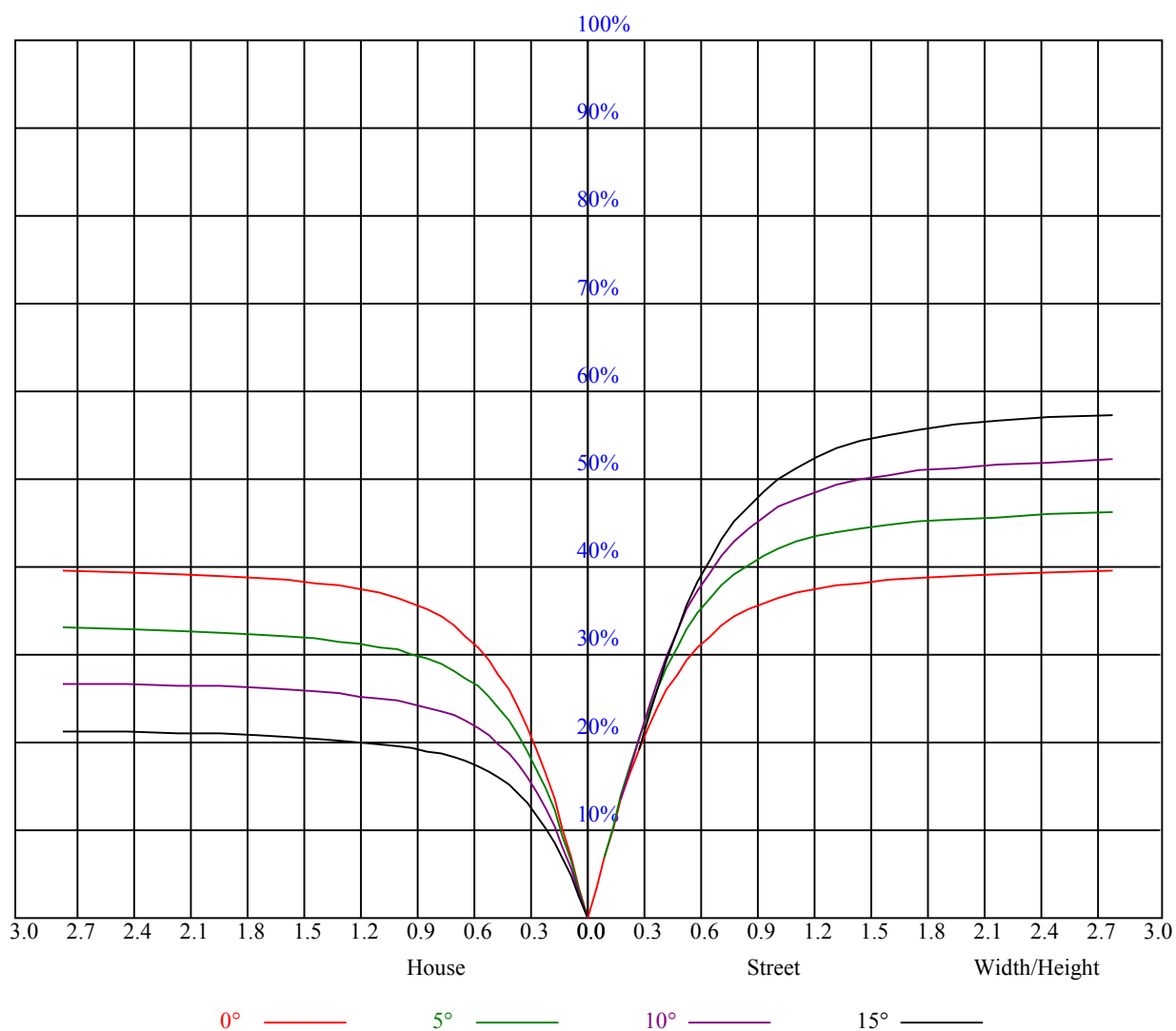
| Glare | Quality | Service Values Illuminance(lx) |      |      |            |            |            |            |            |
|-------|---------|--------------------------------|------|------|------------|------------|------------|------------|------------|
| 1.15  | A       | 2000                           | 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          |

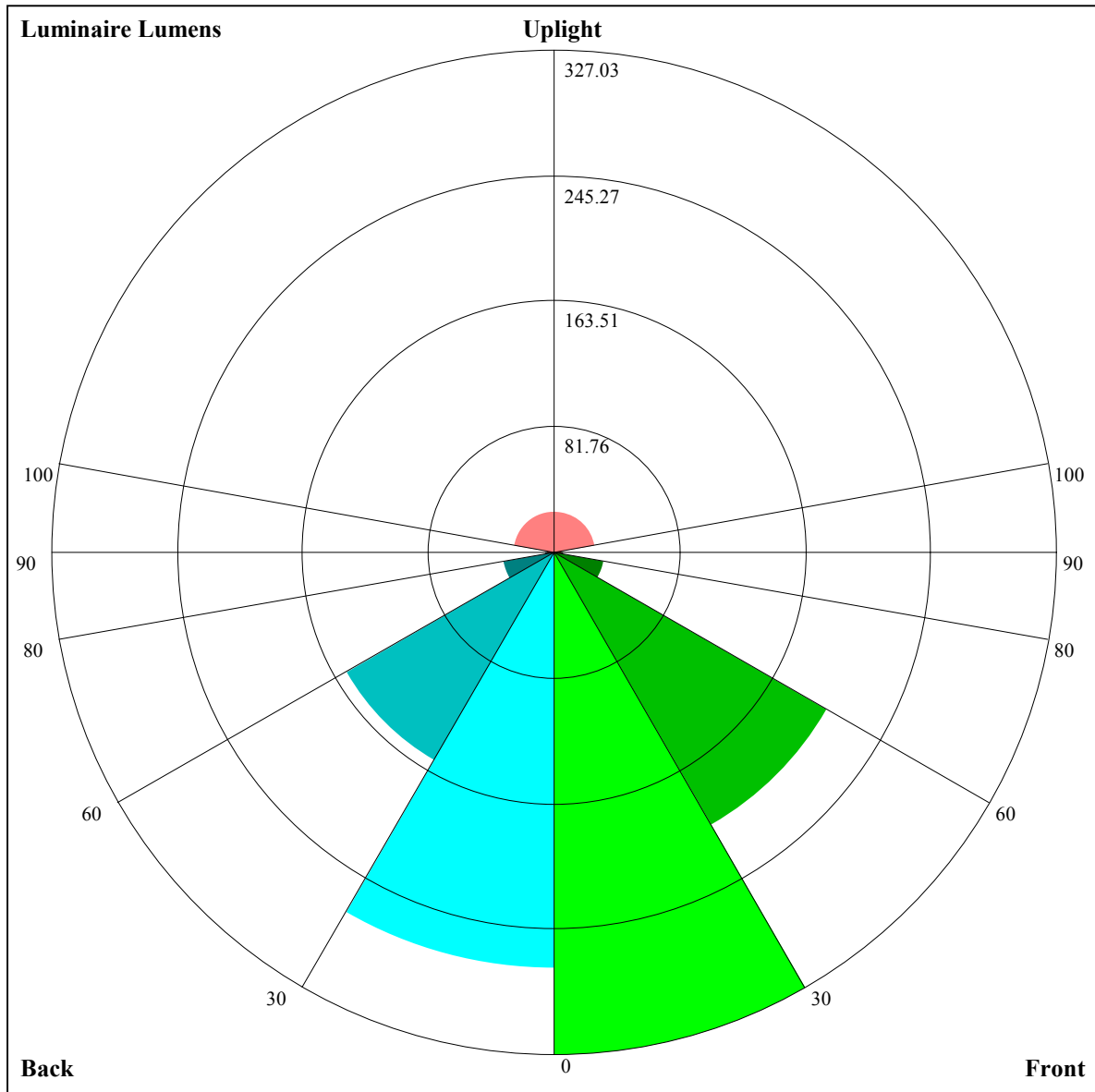
Luminance Limiting Curve





| 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    | 0.97                                    | 0.97 | 0.97 | 0.95 | 0.95 | 0.95 | 0.90 | 0.90 | 0.90 | 0.87 | 0.87 | 0.87 | 0.83 | 0.83 | 0.83 | 0.81 |
| 1    | 0.88                                    | 0.86 | 0.83 | 0.86 | 0.84 | 0.82 | 0.83 | 0.81 | 0.79 | 0.80 | 0.78 | 0.77 | 0.77 | 0.76 | 0.75 | 0.73 |
| 2    | 0.81                                    | 0.77 | 0.73 | 0.79 | 0.75 | 0.72 | 0.76 | 0.73 | 0.71 | 0.74 | 0.71 | 0.69 | 0.72 | 0.70 | 0.68 | 0.66 |
| 3    | 0.74                                    | 0.69 | 0.65 | 0.73 | 0.68 | 0.65 | 0.71 | 0.67 | 0.64 | 0.68 | 0.65 | 0.63 | 0.67 | 0.64 | 0.62 | 0.60 |
| 4    | 0.68                                    | 0.63 | 0.59 | 0.67 | 0.62 | 0.59 | 0.65 | 0.61 | 0.58 | 0.64 | 0.60 | 0.57 | 0.62 | 0.59 | 0.56 | 0.55 |
| 5    | 0.63                                    | 0.58 | 0.54 | 0.63 | 0.57 | 0.53 | 0.61 | 0.56 | 0.53 | 0.60 | 0.56 | 0.52 | 0.58 | 0.55 | 0.52 | 0.51 |
| 6    | 0.59                                    | 0.53 | 0.49 | 0.58 | 0.53 | 0.49 | 0.57 | 0.52 | 0.49 | 0.56 | 0.52 | 0.49 | 0.55 | 0.51 | 0.48 | 0.47 |
| 7    | 0.55                                    | 0.50 | 0.46 | 0.55 | 0.49 | 0.46 | 0.53 | 0.49 | 0.45 | 0.52 | 0.48 | 0.45 | 0.51 | 0.48 | 0.45 | 0.44 |
| 8    | 0.52                                    | 0.46 | 0.43 | 0.51 | 0.46 | 0.42 | 0.50 | 0.46 | 0.42 | 0.49 | 0.45 | 0.42 | 0.49 | 0.45 | 0.42 | 0.41 |
| 9    | 0.49                                    | 0.43 | 0.40 | 0.48 | 0.43 | 0.40 | 0.47 | 0.43 | 0.40 | 0.47 | 0.42 | 0.39 | 0.46 | 0.42 | 0.39 | 0.38 |
| 10   | 0.46                                    | 0.41 | 0.37 | 0.46 | 0.41 | 0.37 | 0.45 | 0.40 | 0.37 | 0.44 | 0.40 | 0.37 | 0.44 | 0.40 | 0.37 | 0.36 |





Luminaire Lumens:

FL=327.03,FM=205.41,FH=32.68,FVH=6.3

BL=270.53,BM=156.87,BH=34.55,BVH=5.99

UL=5.72,UH=27.23

BUG Rating:B1-U2-G0

# NATA 1406-N

| Intensity data(cd) |         |         |         |         |        |        |        |        |        | Appendix Page: 15 Total:15 |  |
|--------------------|---------|---------|---------|---------|--------|--------|--------|--------|--------|----------------------------|--|
| C/γ(°)             | 0.0     | 5.0     | 10.0    | 15.0    | 20.0   | 25.0   | 30.0   | 35.0   | 40.0   |                            |  |
| 0.0                | 1302.75 | 1365.19 | 1302.75 | 1136.25 | 893.81 | 667.13 | 495.00 | 377.44 | 291.94 |                            |  |
| 45.0               | 1308.94 | 1290.38 | 1151.44 | 943.31  | 717.19 | 524.81 | 403.31 | 317.81 | 238.33 |                            |  |
| 90.0               | 1303.31 | 1121.51 | 953.55  | 707.29  | 541.97 | 403.54 | 310.22 | 228.54 | 155.25 |                            |  |
| 135.0              | 1329.19 | 1168.31 | 929.25  | 716.63  | 532.69 | 411.19 | 329.63 | 226.91 | 146.48 |                            |  |
| 180.0              | 1302.75 | 1121.51 | 908.89  | 688.11  | 527.12 | 413.16 | 318.99 | 223.65 | 145.74 |                            |  |
| 225.0              | 1308.94 | 1211.06 | 1024.20 | 800.27  | 625.16 | 479.42 | 378.17 | 283.33 | 201.88 |                            |  |
| 270.0              | 1303.31 | 1324.69 | 1219.50 | 1013.06 | 801.00 | 599.06 | 461.25 | 362.81 | 284.63 |                            |  |
| 315.0              | 1329.19 | 1377.56 | 1297.69 | 1097.61 | 873.84 | 638.27 | 474.75 | 355.50 | 271.13 |                            |  |
| 360.0              | 1302.75 | 1365.19 | 1302.75 | 1136.25 | 893.81 | 667.13 | 495.00 | 377.44 | 291.94 |                            |  |
| C/γ(°)             | 45.0    | 50.0    | 55.0    | 60.0    | 65.0   | 70.0   | 75.0   | 80.0   | 85.0   |                            |  |
| 0.0                | 211.50  | 142.37  | 90.51   | 61.14   | 42.41  | 31.16  | 23.23  | 17.10  | 12.04  |                            |  |
| 45.0               | 160.65  | 107.61  | 69.08   | 48.71   | 36.23  | 28.74  | 24.19  | 18.23  | 12.49  |                            |  |
| 90.0               | 98.10   | 67.33   | 47.98   | 37.91   | 36.17  | 37.97  | 35.49  | 16.76  | 14.12  |                            |  |
| 135.0              | 90.06   | 60.24   | 44.10   | 41.74   | 45.11  | 47.70  | 40.11  | 19.24  | 14.57  |                            |  |
| 180.0              | 91.29   | 61.26   | 44.04   | 40.05   | 41.01  | 43.03  | 36.62  | 16.43  | 8.44   |                            |  |
| 225.0              | 126.96  | 78.13   | 54.51   | 39.54   | 30.77  | 27.28  | 23.18  | 14.01  | 9.84   |                            |  |
| 270.0              | 187.54  | 124.93  | 78.53   | 53.16   | 37.80  | 28.52  | 20.48  | 15.41  | 10.35  |                            |  |
| 315.0              | 188.66  | 126.17  | 83.81   | 57.32   | 40.33  | 29.48  | 21.71  | 15.41  | 11.03  |                            |  |
| 360.0              | 211.50  | 142.37  | 90.51   | 61.14   | 42.41  | 31.16  | 23.23  | 17.10  | 12.04  |                            |  |
| C/γ(°)             | 90.0    |         |         |         |        |        |        |        |        |                            |  |
| 0.0                | 6.97    |         |         |         |        |        |        |        |        |                            |  |
| 45.0               | 5.18    |         |         |         |        |        |        |        |        |                            |  |
| 90.0               | 4.67    |         |         |         |        |        |        |        |        |                            |  |
| 135.0              | 4.56    |         |         |         |        |        |        |        |        |                            |  |
| 180.0              | 4.50    |         |         |         |        |        |        |        |        |                            |  |
| 225.0              | 4.44    |         |         |         |        |        |        |        |        |                            |  |
| 270.0              | 5.23    |         |         |         |        |        |        |        |        |                            |  |
| 315.0              | 6.41    |         |         |         |        |        |        |        |        |                            |  |
| 360.0              | 6.97    |         |         |         |        |        |        |        |        |                            |  |