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## NATA

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Client:

LumCAT: 1405-N

Luminaire: 92.70.064.00

Report No: nt0100

Test No: GC2019122417

LampCAT: LUMINUS CXM-9-AC40

Lamp flux(lm): 1077.0

Number of Lamps: 1

Length(mm): 0

Phm Type: C

Voltage(V): 33.5600

Current(A): 0.2970

Power (W): 9.9700

PF: 0.0000

Ballast type: DC

Width(mm): 0

Height(mm): 0

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## Photometric Results

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Lumens(lm): 892.84, Efficiency(%): 82.90% , Luminous Efficacy(lm/W): 89.55

Central intensity(cd): 1818.141, Maximum intensity(cd): 1818.141

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

Beam Angle(50%Imax): [C0/180]Total=26.0

[C90/270]Total=26.0

Field angle(10%Imax): [C0/180]Total=81.0

[C90/270]Total=81.0

Maximum s/h(1/2): C0\_180=0.43 C90\_270=0.43

Maximum s/h(1/4): C0\_180=0.50 C90\_270=0.50

Up flux rate of lamp(%): 0.00%

Down flux rate of lamp(%): 82.90%

Up flux rate of LUM(%): - -

Down flux rate of LUM(%): 100.00%

CIE Type : Direct lighting

Output flux ratio in  $\pi$  solid angle : 94.694%

| $\gamma(^{\circ})$ | Average I(cd) | Zonal F(lm) | Sum F(lm) | Eff Flux(%) | Eff Sum(%) |
|--------------------|---------------|-------------|-----------|-------------|------------|
| 0.0                | 1818.141      | 0.000       | 0         | .000%       | .000%      |
| 1.0                | 1809.844      | 1.736       | 1.736     | .161%       | .194%      |
| 2.0                | 1784.180      | 5.158       | 6.894     | .479%       | .772%      |
| 3.0                | 1740.586      | 8.430       | 15.324    | .783%       | 1.716%     |
| 4.0                | 1686.305      | 11.471      | 26.795    | 1.065%      | 3.001%     |
| 5.0                | 1615.359      | 14.204      | 40.999    | 1.319%      | 4.592%     |
| 6.0                | 1537.383      | 16.568      | 57.567    | 1.538%      | 6.448%     |
| 7.0                | 1448.016      | 18.530      | 76.098    | 1.721%      | 8.523%     |
| 8.0                | 1358.930      | 20.089      | 96.187    | 1.865%      | 10.773%    |
| 9.0                | 1255.268      | 21.187      | 117.373   | 1.967%      | 13.146%    |
| 10.0               | 1164.593      | 21.899      | 139.272   | 2.033%      | 15.599%    |
| 11.0               | 1074.312      | 22.371      | 161.643   | 2.077%      | 18.104%    |
| 12.0               | 992.602       | 22.594      | 184.238   | 2.098%      | 20.635%    |
| 13.0               | 909.654       | 22.575      | 206.813   | 2.096%      | 23.164%    |
| 14.0               | 832.177       | 22.295      | 229.108   | 2.070%      | 25.661%    |
| 15.0               | 765.809       | 21.938      | 251.046   | 2.037%      | 28.118%    |
| 16.0               | 703.554       | 21.530      | 272.576   | 1.999%      | 30.529%    |
| 17.0               | 650.320       | 21.083      | 293.659   | 1.958%      | 32.891%    |
| 18.0               | 601.481       | 20.639      | 314.299   | 1.916%      | 35.202%    |
| 19.0               | 561.551       | 20.234      | 334.533   | 1.879%      | 37.469%    |
| 20.0               | 523.849       | 19.866      | 354.399   | 1.845%      | 39.694%    |
| 21.0               | 490.732       | 19.482      | 373.881   | 1.809%      | 41.876%    |
| 22.0               | 464.941       | 19.205      | 393.086   | 1.783%      | 44.027%    |
| 23.0               | 440.810       | 19.005      | 412.091   | 1.765%      | 46.155%    |
| 24.0               | 418.423       | 18.786      | 430.877   | 1.744%      | 48.259%    |
| 25.0               | 399.734       | 18.603      | 449.48    | 1.727%      | 50.343%    |
| 26.0               | 383.041       | 18.477      | 467.957   | 1.716%      | 52.412%    |
| 27.0               | 366.673       | 18.342      | 486.299   | 1.703%      | 54.467%    |
| 28.0               | 352.624       | 18.211      | 504.51    | 1.691%      | 56.507%    |
| 29.0               | 338.316       | 18.077      | 522.587   | 1.678%      | 58.531%    |
| 30.0               | 325.315       | 17.918      | 540.505   | 1.664%      | 60.538%    |
| 31.0               | 311.681       | 17.727      | 558.232   | 1.646%      | 62.523%    |
| 32.0               | 298.287       | 17.475      | 575.707   | 1.623%      | 64.481%    |
| 33.0               | 285.680       | 17.204      | 592.911   | 1.597%      | 66.408%    |
| 34.0               | 273.473       | 16.922      | 609.832   | 1.571%      | 68.303%    |
| 35.0               | 259.566       | 16.554      | 626.387   | 1.537%      | 70.157%    |
| 36.0               | 243.577       | 16.020      | 642.407   | 1.487%      | 71.951%    |
| 37.0               | 230.681       | 15.468      | 657.874   | 1.436%      | 73.684%    |

| $\gamma(^{\circ})$ | Average I(cd) | Zonal F(lm) | Sum F(lm) | Eff Flux(%) | Eff Sum(%) |
|--------------------|---------------|-------------|-----------|-------------|------------|
| 38.0               | 215.965       | 14.908      | 672.783   | 1.384%      | 75.353%    |
| 39.0               | 201.417       | 14.246      | 687.029   | 1.323%      | 76.949%    |
| 40.0               | 188.248       | 13.590      | 700.619   | 1.262%      | 78.471%    |
| 41.0               | 174.825       | 12.929      | 713.548   | 1.200%      | 79.919%    |
| 42.0               | 160.875       | 12.197      | 725.745   | 1.132%      | 81.285%    |
| 43.0               | 148.092       | 11.445      | 737.19    | 1.063%      | 82.567%    |
| 44.0               | 136.062       | 10.725      | 747.914   | .996%       | 83.768%    |
| 45.0               | 124.369       | 10.009      | 757.923   | .929%       | 84.889%    |
| 46.0               | 113.920       | 9.319       | 767.242   | .865%       | 85.933%    |
| 47.0               | 103.662       | 8.654       | 775.896   | .804%       | 86.902%    |
| 48.0               | 94.957        | 8.029       | 783.925   | .746%       | 87.802%    |
| 49.0               | 86.112        | 7.436       | 791.361   | .690%       | 88.634%    |
| 50.0               | 78.497        | 6.863       | 798.224   | .637%       | 89.403%    |
| 51.0               | 71.775        | 6.358       | 804.582   | .590%       | 90.115%    |
| 52.0               | 65.834        | 5.905       | 810.487   | .548%       | 90.777%    |
| 53.0               | 60.258        | 5.485       | 815.972   | .509%       | 91.391%    |
| 54.0               | 55.252        | 5.091       | 821.063   | .473%       | 91.961%    |
| 55.0               | 51.117        | 4.748       | 825.811   | .441%       | 92.493%    |
| 56.0               | 47.180        | 4.442       | 830.253   | .412%       | 92.990%    |
| 57.0               | 43.833        | 4.161       | 834.414   | .386%       | 93.457%    |
| 58.0               | 40.634        | 3.906       | 838.32    | .363%       | 93.894%    |
| 59.0               | 38.011        | 3.677       | 841.997   | .341%       | 94.306%    |
| 60.0               | 35.416        | 3.469       | 845.466   | .322%       | 94.694%    |
| 61.0               | 33.012        | 3.266       | 848.731   | .303%       | 95.060%    |
| 62.0               | 31.036        | 3.086       | 851.817   | .287%       | 95.406%    |
| 63.0               | 29.152        | 2.927       | 854.744   | .272%       | 95.734%    |
| 64.0               | 27.288        | 2.769       | 857.514   | .257%       | 96.044%    |
| 65.0               | 25.664        | 2.621       | 860.135   | .243%       | 96.337%    |
| 66.0               | 24.131        | 2.484       | 862.619   | .231%       | 96.616%    |
| 67.0               | 22.690        | 2.354       | 864.973   | .219%       | 96.879%    |
| 68.0               | 21.403        | 2.234       | 867.207   | .207%       | 97.129%    |
| 69.0               | 20.095        | 2.117       | 869.324   | .197%       | 97.367%    |
| 70.0               | 18.956        | 2.006       | 871.33    | .186%       | 97.591%    |
| 71.0               | 17.817        | 1.901       | 873.23    | .176%       | 97.804%    |
| 72.0               | 16.692        | 1.794       | 875.025   | .167%       | 98.005%    |
| 73.0               | 15.638        | 1.691       | 876.715   | .157%       | 98.194%    |
| 74.0               | 14.632        | 1.591       | 878.307   | .148%       | 98.373%    |
| 75.0               | 13.641        | 1.494       | 879.8     | .139%       | 98.540%    |

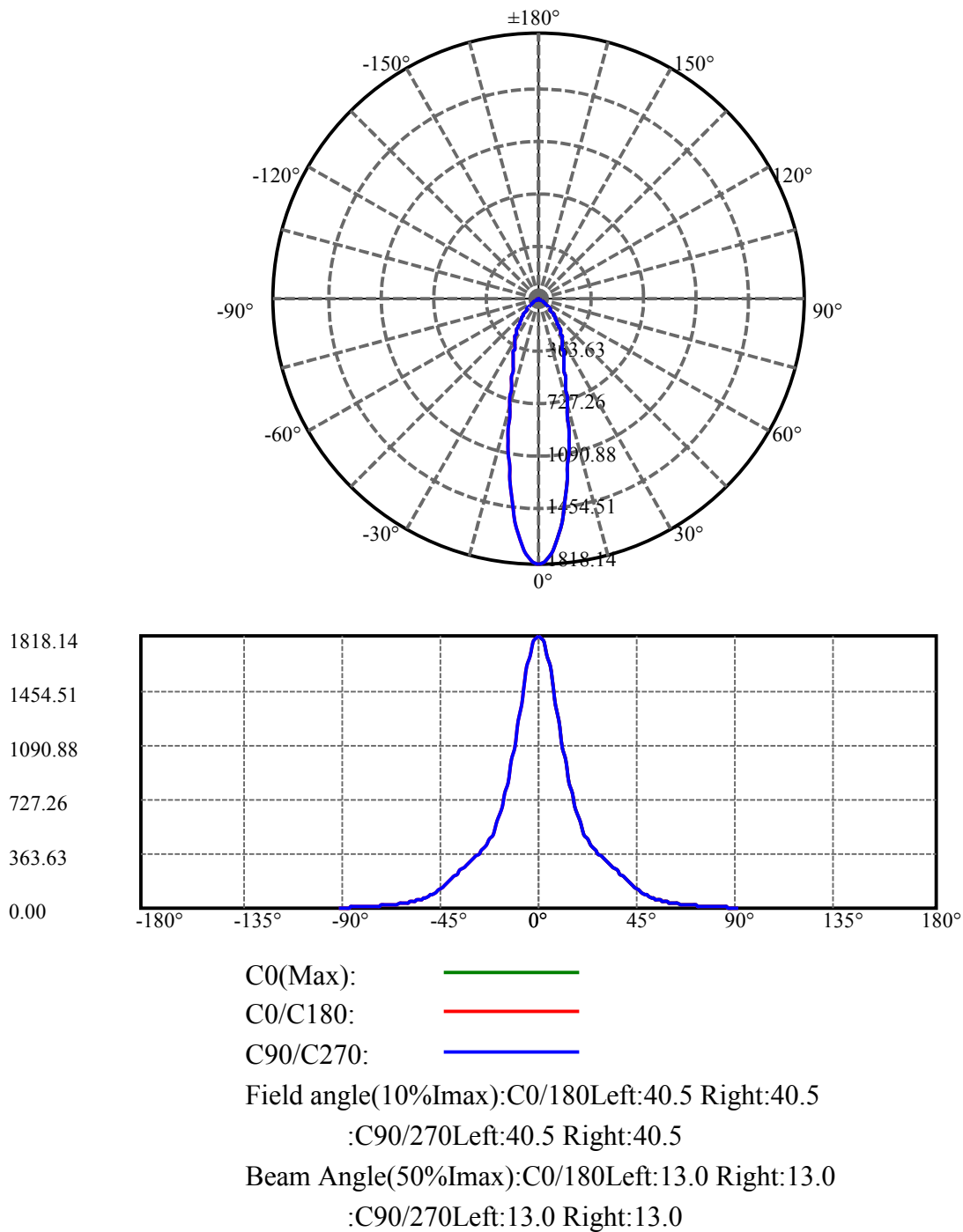
| $\gamma(^{\circ})$ | Average I(cd) | Zonal F(lm) | Sum F(lm) | Eff Flux(%) | Eff Sum(%) |
|--------------------|---------------|-------------|-----------|-------------|------------|
| 76.0               | 12.677        | 1.397       | 881.197   | .130%       | 98.696%    |
| 77.0               | 11.834        | 1.307       | 882.504   | .121%       | 98.843%    |
| 78.0               | 10.913        | 1.218       | 883.722   | .113%       | 98.979%    |
| 79.0               | 10.167        | 1.133       | 884.854   | .105%       | 99.106%    |
| 80.0               | 9.492         | 1.060       | 885.914   | .098%       | 99.225%    |
| 81.0               | 8.852         | 0.992       | 886.906   | .092%       | 99.336%    |
| 82.0               | 8.213         | 0.925       | 887.832   | .086%       | 99.440%    |
| 83.0               | 7.530         | 0.856       | 888.688   | .079%       | 99.535%    |
| 84.0               | 6.855         | 0.784       | 889.471   | .073%       | 99.623%    |
| 85.0               | 6.202         | 0.713       | 890.184   | .066%       | 99.703%    |
| 86.0               | 5.597         | 0.645       | 890.829   | .060%       | 99.775%    |
| 87.0               | 4.978         | 0.579       | 891.408   | .054%       | 99.840%    |
| 88.0               | 4.472         | 0.518       | 891.925   | .048%       | 99.898%    |
| 89.0               | 4.092         | 0.469       | 892.395   | .044%       | 99.951%    |
| 90.0               | 3.959         | 0.441       | 892.836   | .041%       | 100.000%   |

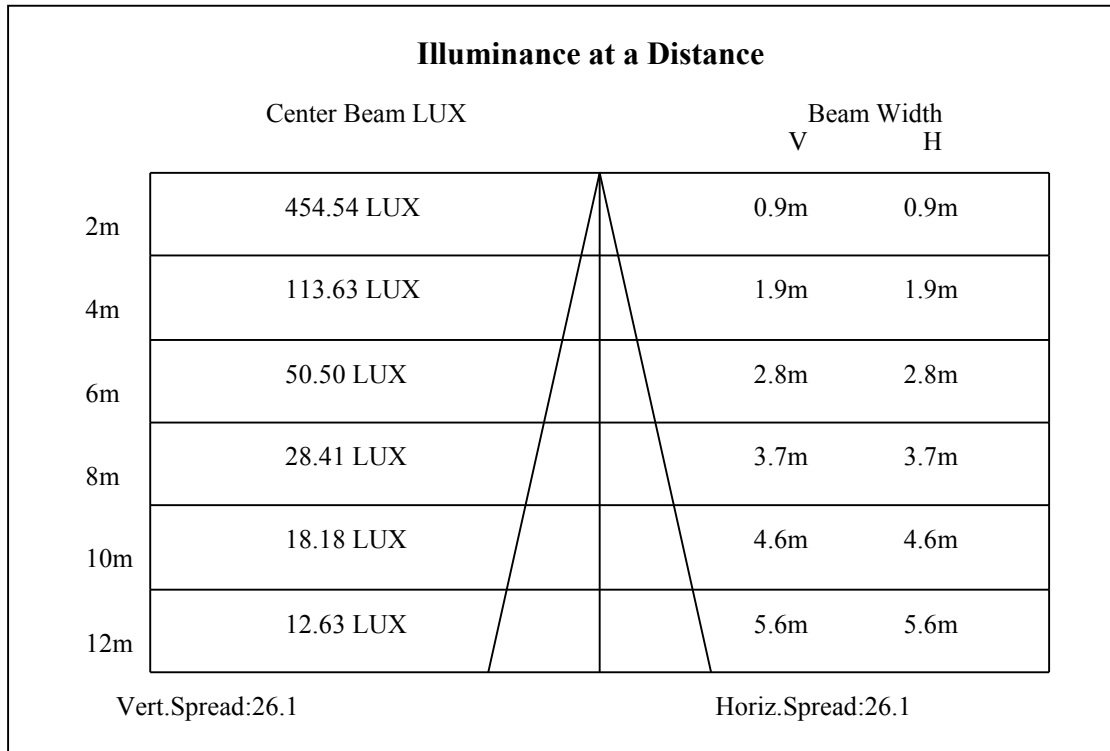
## ZONAL LUMEN SUMMARY

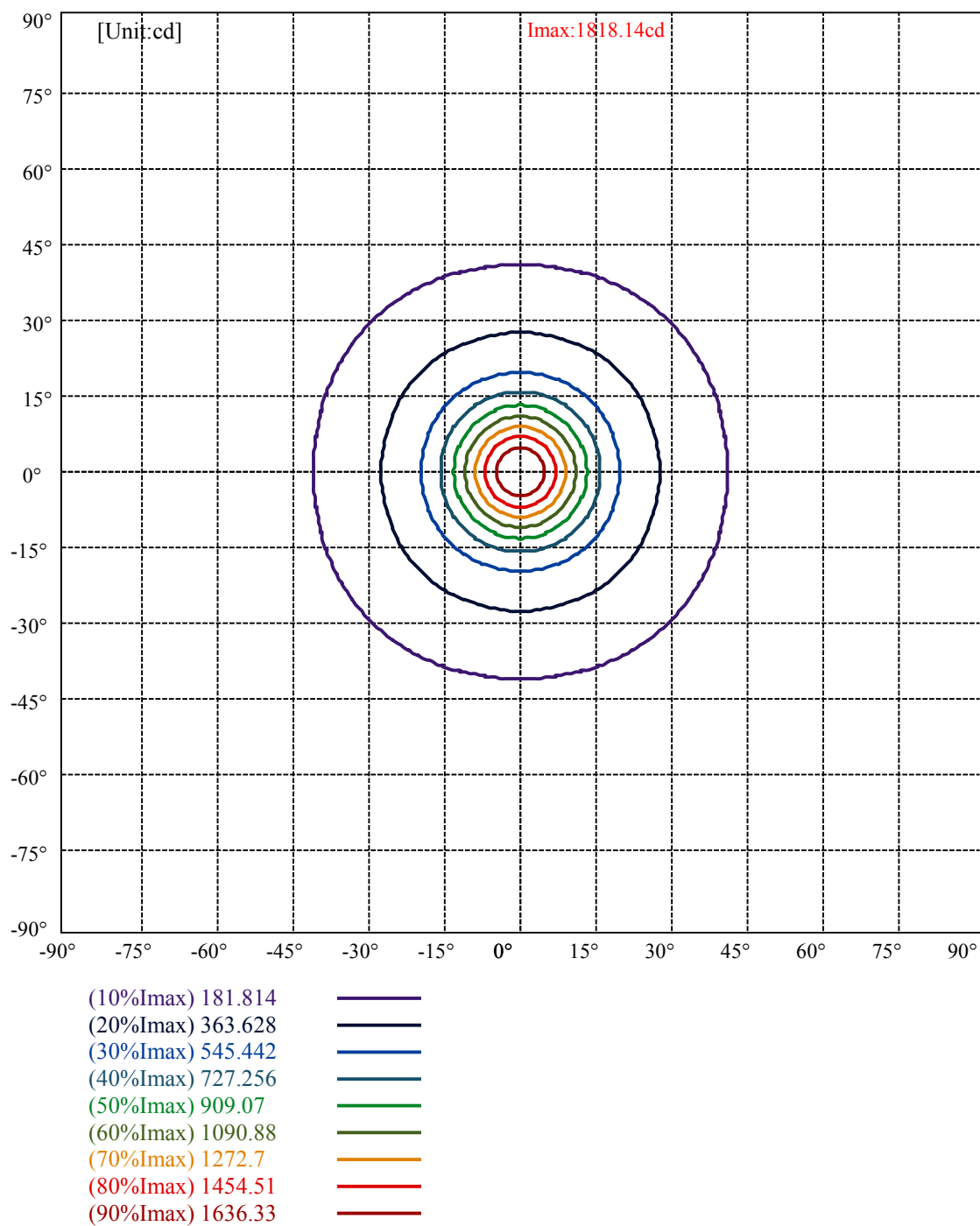
| Zone    | Lumens | %Lamp  | %Fixt   |
|---------|--------|--------|---------|
| 0-30    | 540.51 | 50.19% | 60.54%  |
| 0-40    | 700.62 | 65.05% | 78.47%  |
| 0-60    | 845.47 | 78.50% | 94.69%  |
| 0-90    | 892.39 | 82.86% | 99.95%  |
| 0-120   | 892.39 | 82.86% | 99.95%  |
| 0-180   | 892.84 | 82.90% | 100.00% |
| 60-90   | 50.40  | 4.68%  | 5.64%   |
| 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%   |
| 0-41.06 | 714.27 | 66.32% | 80.00%  |

## ZONAL LUMEN SUMMARY

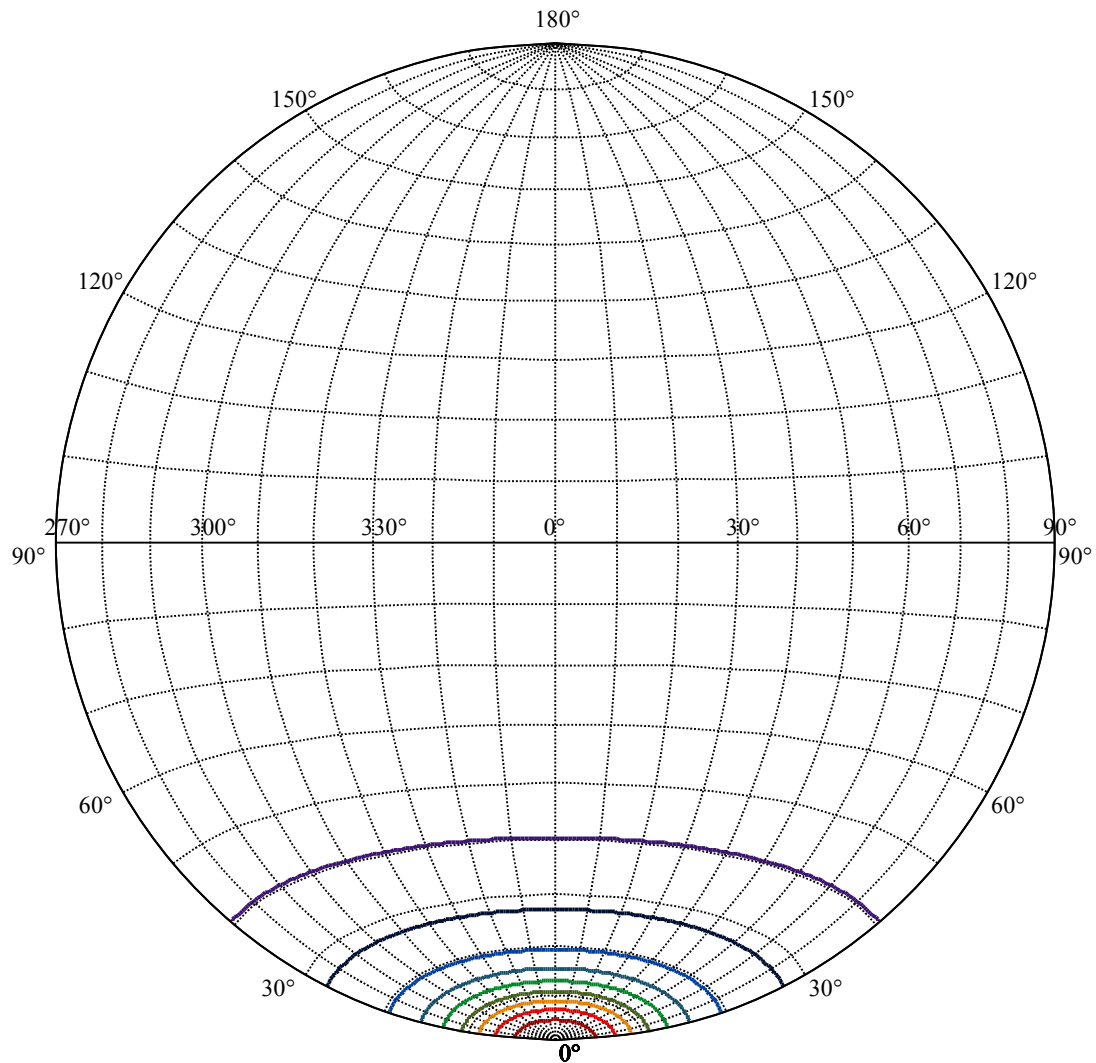
|         |        |
|---------|--------|
| 0-10    | 139.27 |
| 10-20   | 215.13 |
| 20-30   | 186.11 |
| 30-40   | 160.11 |
| 40-50   | 97.60  |
| 50-60   | 47.24  |
| 60-70   | 25.86  |
| 70-80   | 14.58  |
| 80-90   | 6.48   |
| 90-100  | 0.00   |
| 100-110 | 0.00   |
| 110-120 | 0.00   |
| 120-130 | 0.00   |
| 130-140 | 0.00   |
| 140-150 | 0.00   |
| 150-160 | 0.00   |
| 160-170 | 0.00   |
| 170-180 | 0.00   |











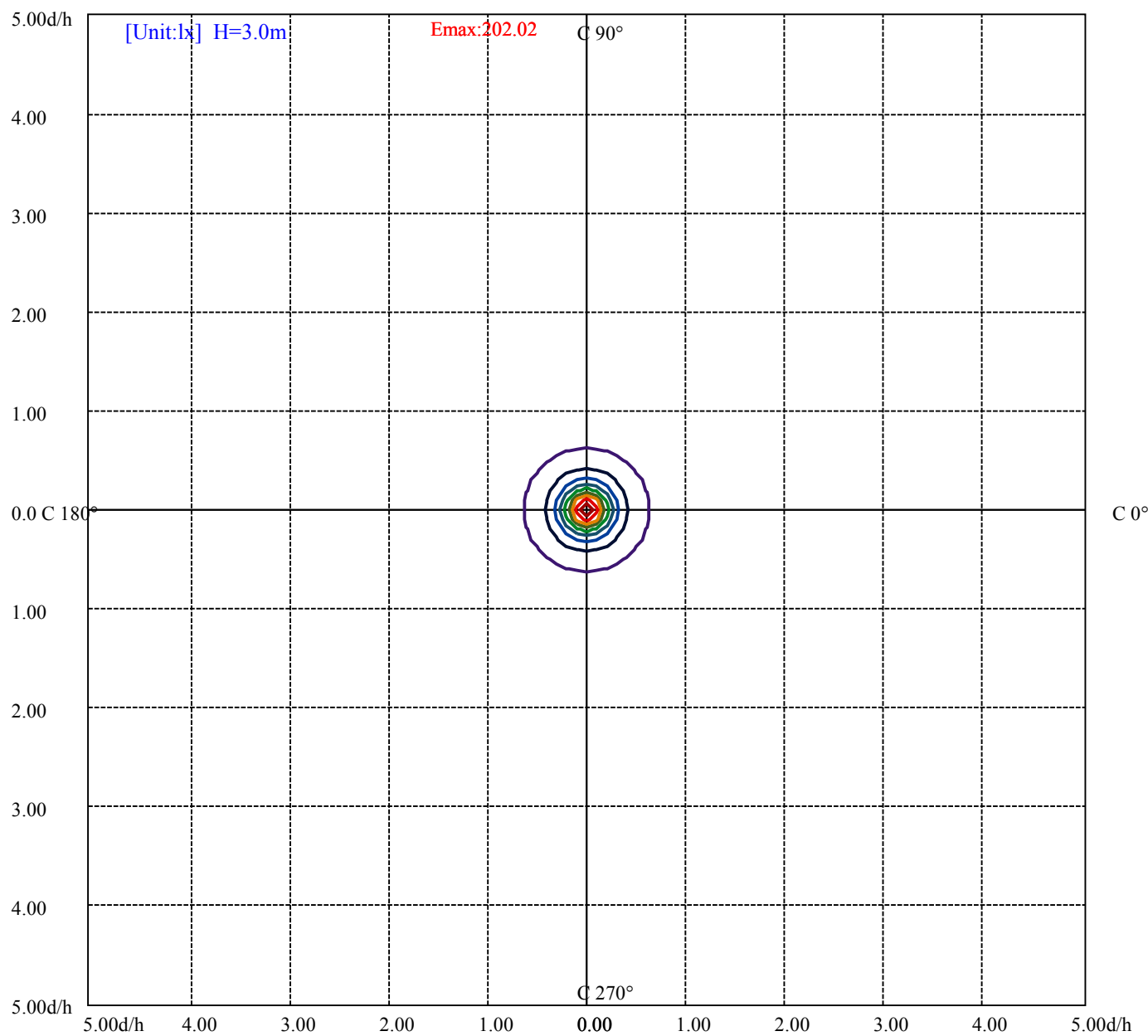
House

[Unit:cd]

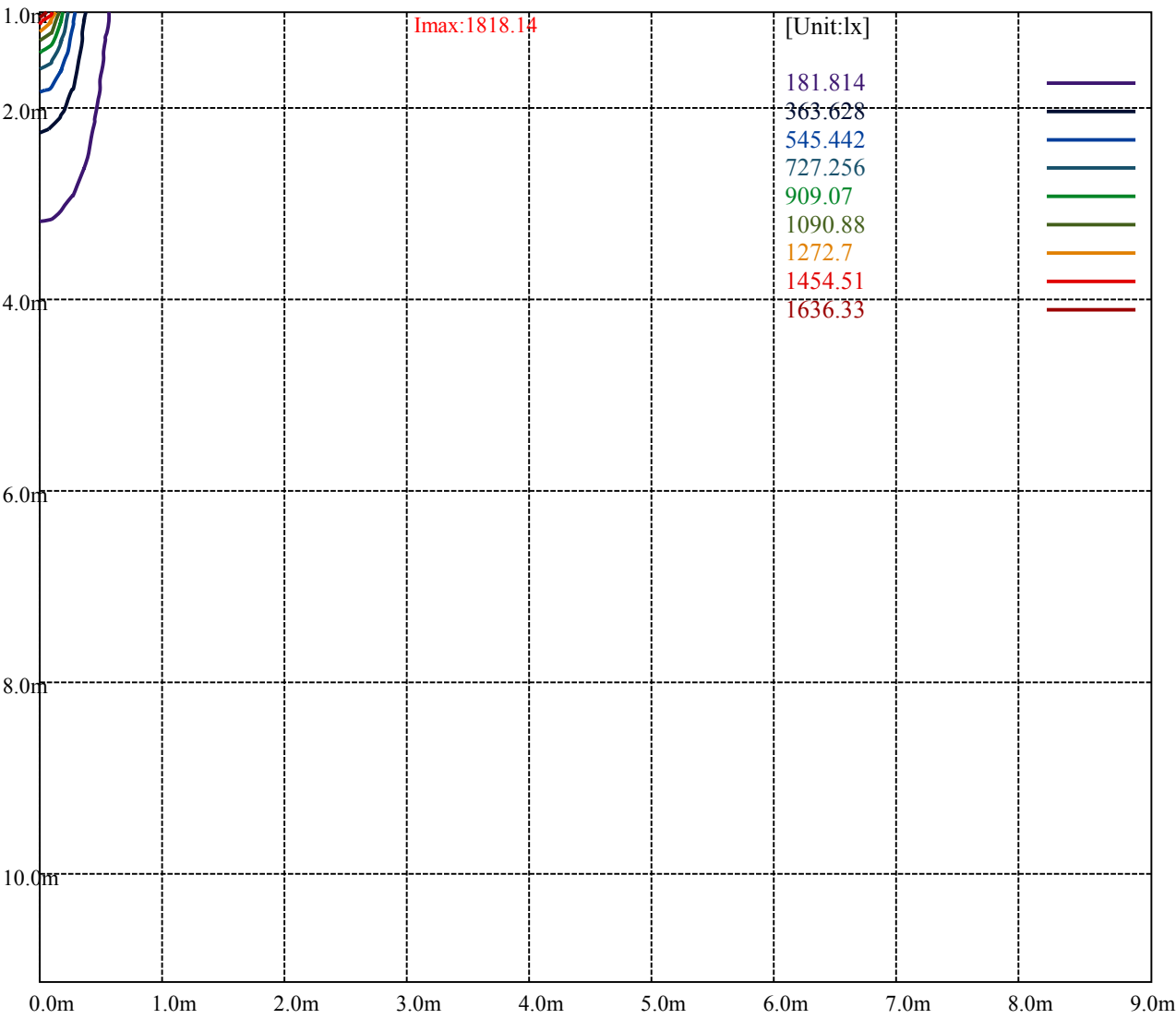
Road

Imax:1818.14

|           |         |   |
|-----------|---------|---|
| (10%Imax) | 181.814 | — |
| (20%Imax) | 363.628 | — |
| (30%Imax) | 545.442 | — |
| (40%Imax) | 727.256 | — |
| (50%Imax) | 909.07  | — |
| (60%Imax) | 1090.88 | — |
| (70%Imax) | 1272.7  | — |
| (80%Imax) | 1454.51 | — |
| (90%Imax) | 1636.33 | — |



|           |          |   |
|-----------|----------|---|
| (10%Emax) | 20.20156 | — |
| (20%Emax) | 40.40311 | — |
| (30%Emax) | 60.60467 | — |
| (40%Emax) | 80.80622 | — |
| (50%Emax) | 101.0078 | — |
| (60%Emax) | 121.2089 | — |
| (70%Emax) | 141.4111 | — |
| (80%Emax) | 161.6122 | — |
| (90%Emax) | 181.8144 | — |



Luminance Table

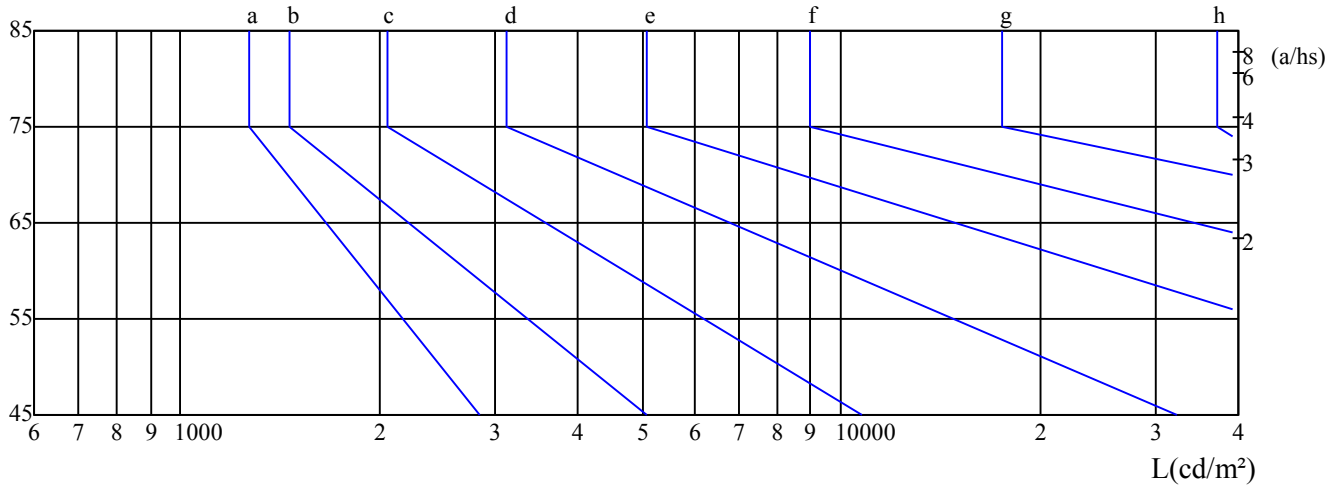
| $\gamma$ | 45 | 50 | 55 | 60 | 65 | 70 | 75 | 80 | 85 |
|----------|----|----|----|----|----|----|----|----|----|
| C0       | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  |
| C45      | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  |
| C90      | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  |

| 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          |

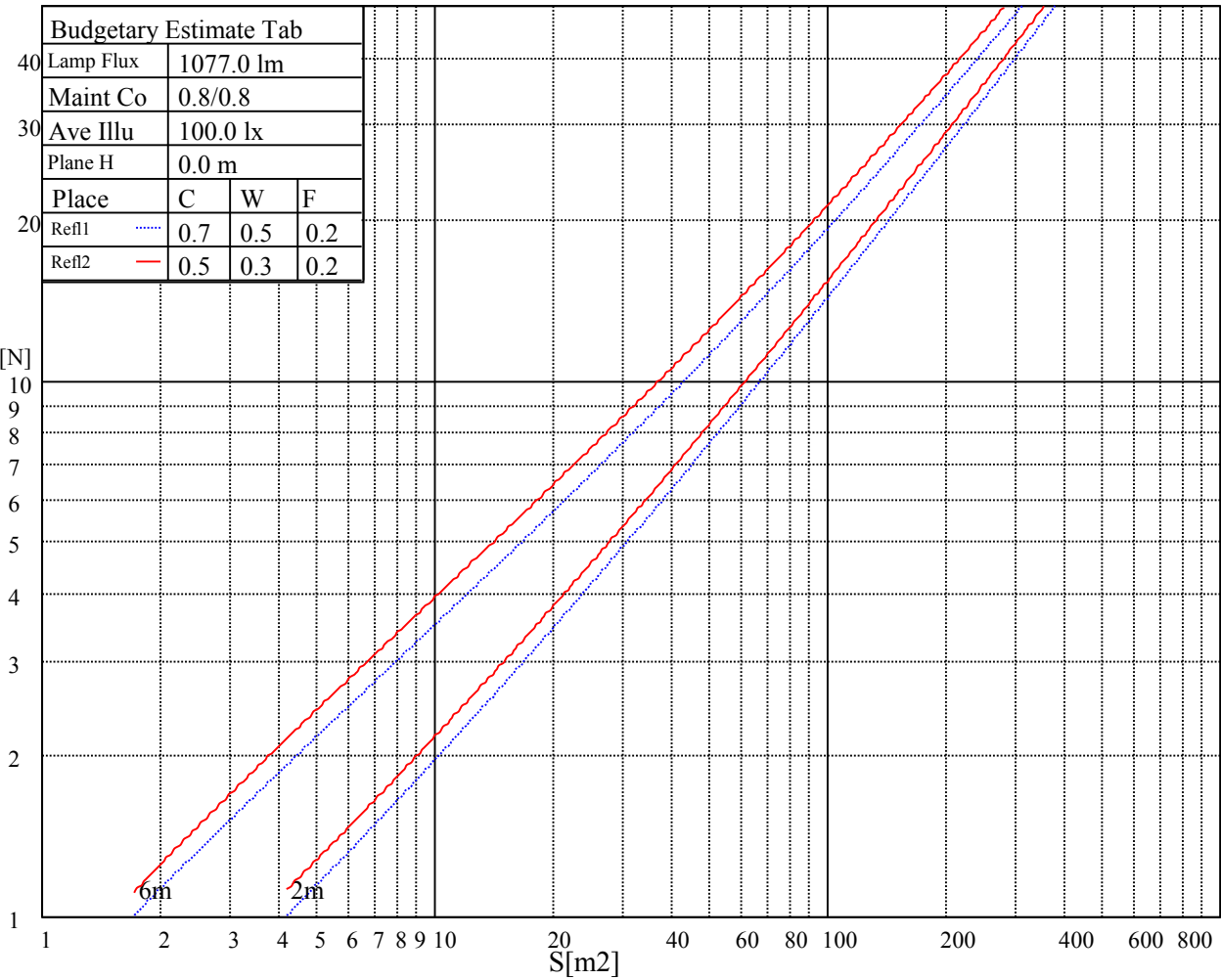
Luminance Limiting Curve

 $\gamma(^{\circ})$ 

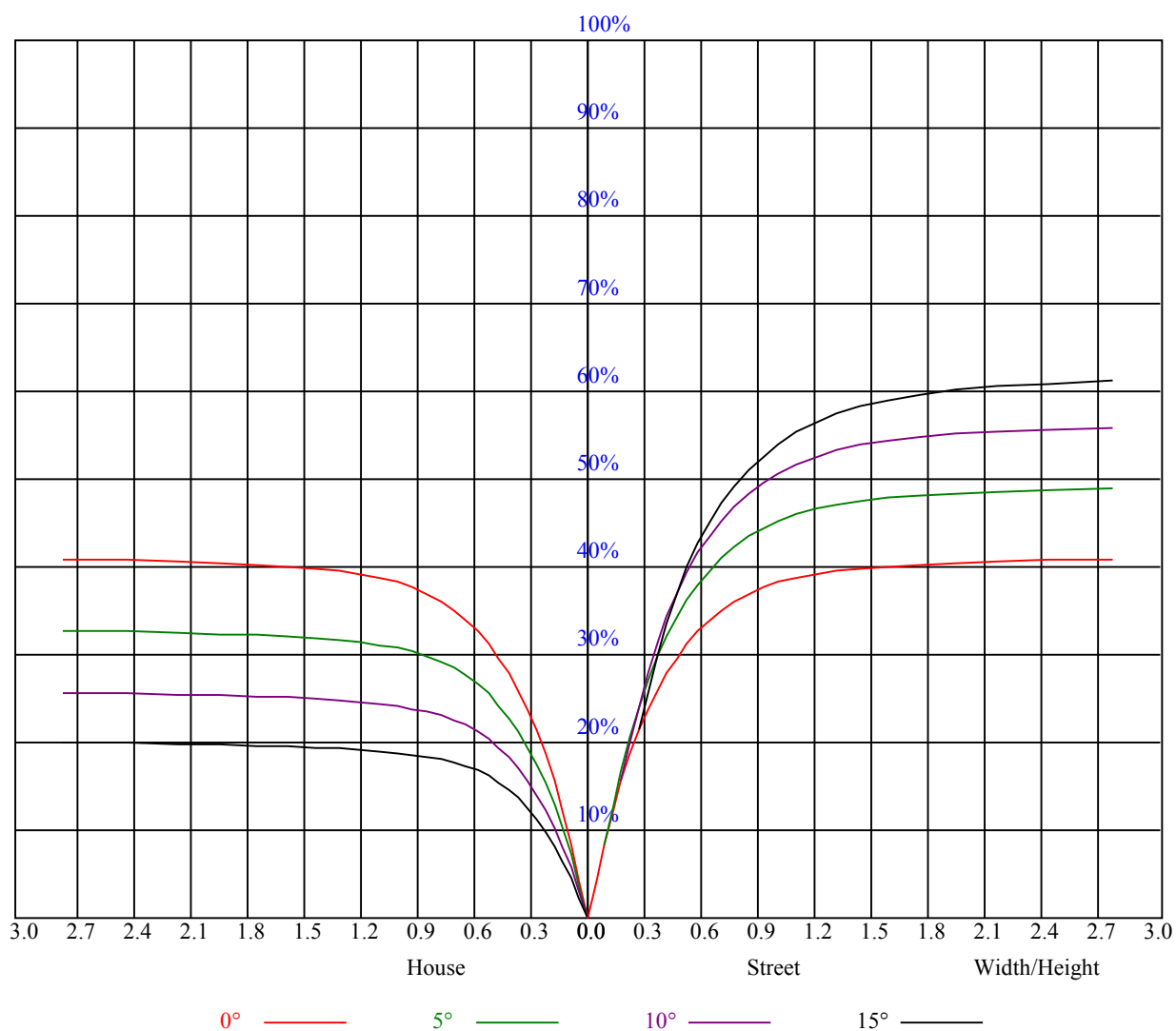
C0 ———

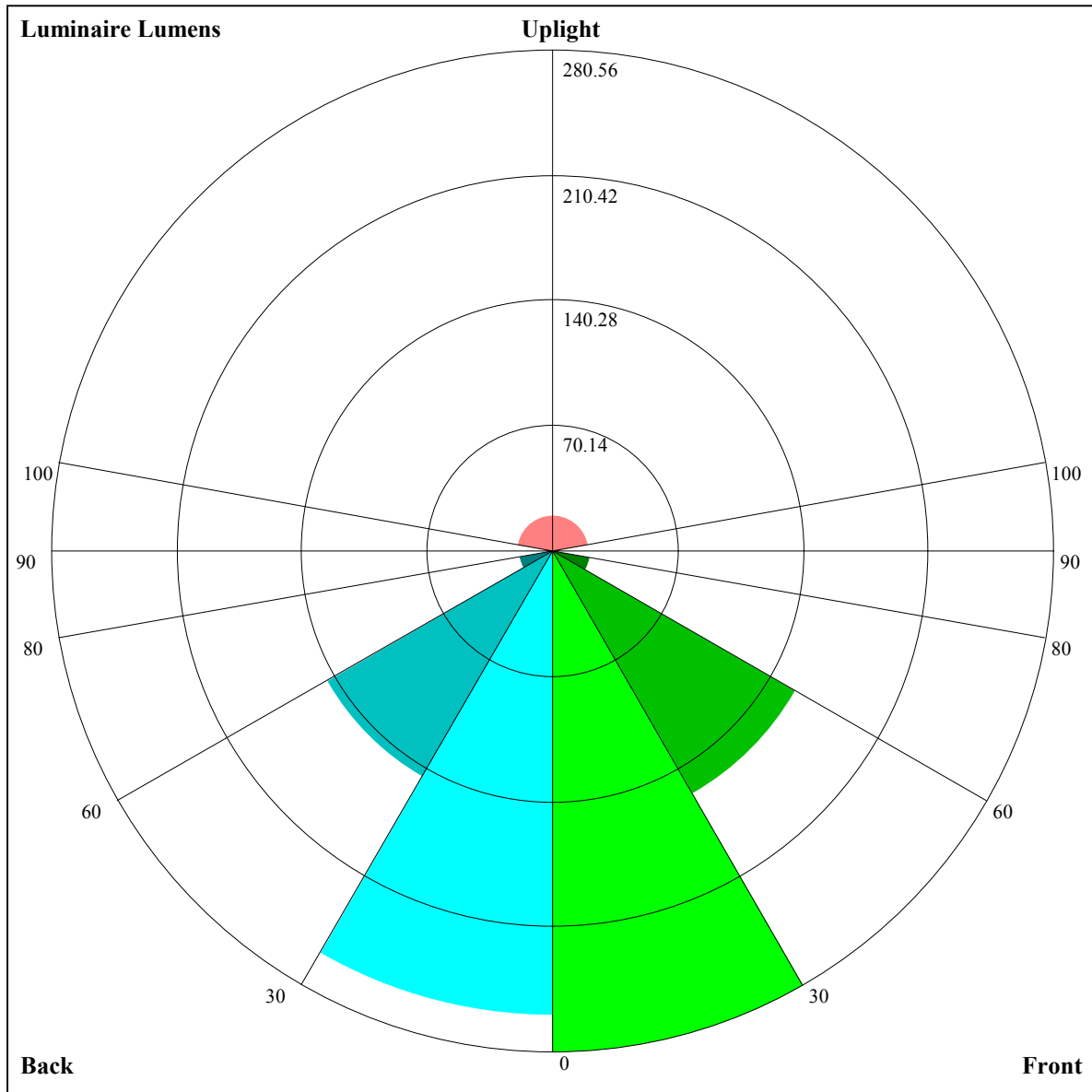
C45 ———

C90 ———



| 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    | 0.99                                    | 0.99 | 0.99 | 0.96 | 0.96 | 0.96 | 0.92 | 0.92 | 0.92 | 0.88 | 0.88 | 0.88 | 0.85 | 0.85 | 0.85 | 0.83 |
| 1    | 0.91                                    | 0.88 | 0.86 | 0.89 | 0.87 | 0.85 | 0.85 | 0.84 | 0.82 | 0.82 | 0.81 | 0.80 | 0.79 | 0.78 | 0.77 | 0.76 |
| 2    | 0.83                                    | 0.80 | 0.76 | 0.82 | 0.78 | 0.75 | 0.79 | 0.76 | 0.74 | 0.77 | 0.74 | 0.72 | 0.74 | 0.72 | 0.71 | 0.69 |
| 3    | 0.77                                    | 0.72 | 0.69 | 0.76 | 0.72 | 0.68 | 0.74 | 0.70 | 0.67 | 0.72 | 0.68 | 0.66 | 0.70 | 0.67 | 0.65 | 0.63 |
| 4    | 0.71                                    | 0.66 | 0.63 | 0.70 | 0.66 | 0.62 | 0.69 | 0.65 | 0.61 | 0.67 | 0.63 | 0.61 | 0.65 | 0.62 | 0.60 | 0.59 |
| 5    | 0.67                                    | 0.61 | 0.57 | 0.66 | 0.61 | 0.57 | 0.64 | 0.60 | 0.57 | 0.63 | 0.59 | 0.56 | 0.62 | 0.58 | 0.56 | 0.54 |
| 6    | 0.62                                    | 0.57 | 0.53 | 0.62 | 0.57 | 0.53 | 0.60 | 0.56 | 0.53 | 0.59 | 0.55 | 0.52 | 0.58 | 0.55 | 0.52 | 0.51 |
| 7    | 0.59                                    | 0.53 | 0.50 | 0.58 | 0.53 | 0.49 | 0.57 | 0.52 | 0.49 | 0.56 | 0.52 | 0.49 | 0.55 | 0.51 | 0.49 | 0.47 |
| 8    | 0.55                                    | 0.50 | 0.46 | 0.55 | 0.50 | 0.46 | 0.54 | 0.49 | 0.46 | 0.53 | 0.49 | 0.46 | 0.52 | 0.48 | 0.46 | 0.44 |
| 9    | 0.52                                    | 0.47 | 0.44 | 0.52 | 0.47 | 0.44 | 0.51 | 0.47 | 0.43 | 0.50 | 0.46 | 0.43 | 0.50 | 0.46 | 0.43 | 0.42 |
| 10   | 0.50                                    | 0.45 | 0.41 | 0.49 | 0.44 | 0.41 | 0.49 | 0.44 | 0.41 | 0.48 | 0.44 | 0.41 | 0.47 | 0.44 | 0.41 | 0.40 |





Luminaire Lumens:

FL=280.56,FM=157.42,FH=21.08,FVH=3.63

BL=259.99,BM=146.01,BH=19.5,BVH=3.31

UL=4.32,UH=20.55

BUG Rating:B1-U2-G0



## NATA 1405-N

| Intensity data(cd) |         |         |         |         |         |         |         |         |         | Appendix Page: 17 Total:19 |  |
|--------------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|----------------------------|--|
| C/ $\gamma$ (°)    | 0.0     | 1.0     | 2.0     | 3.0     | 4.0     | 5.0     | 6.0     | 7.0     | 8.0     |                            |  |
| 0.0                | 1820.25 | 1830.38 | 1821.94 | 1792.69 | 1750.50 | 1686.94 | 1610.44 | 1533.94 | 1453.50 |                            |  |
| 45.0               | 1817.44 | 1817.44 | 1796.06 | 1761.19 | 1714.50 | 1638.00 | 1564.88 | 1483.31 | 1387.13 |                            |  |
| 90.0               | 1813.50 | 1794.94 | 1761.75 | 1703.25 | 1643.63 | 1574.44 | 1486.13 | 1390.50 | 1302.19 |                            |  |
| 135.0              | 1821.38 | 1801.69 | 1763.44 | 1716.19 | 1649.25 | 1571.63 | 1493.44 | 1397.81 | 1310.06 |                            |  |
| 180.0              | 1820.25 | 1791.56 | 1750.50 | 1689.75 | 1614.94 | 1539.00 | 1454.06 | 1339.88 | 1247.06 |                            |  |
| 225.0              | 1817.44 | 1801.69 | 1767.38 | 1717.88 | 1661.06 | 1584.00 | 1507.50 | 1415.81 | 1319.06 |                            |  |
| 270.0              | 1813.50 | 1818.00 | 1803.94 | 1774.69 | 1733.63 | 1665.56 | 1599.19 | 1526.06 | 1437.75 |                            |  |
| 315.0              | 1821.38 | 1823.06 | 1808.44 | 1769.06 | 1722.94 | 1663.31 | 1583.44 | 1496.81 | 1414.69 |                            |  |
| 360.0              | 1820.25 | 1830.38 | 1821.94 | 1792.69 | 1750.50 | 1686.94 | 1610.44 | 1533.94 | 1453.50 |                            |  |
| C/ $\gamma$ (°)    | 9.0     | 10.0    | 11.0    | 12.0    | 13.0    | 14.0    | 15.0    | 16.0    | 17.0    |                            |  |
| 0.0                | 1348.88 | 1264.50 | 1181.81 | 1102.50 | 1006.31 | 934.31  | 859.50  | 790.31  | 735.19  |                            |  |
| 45.0               | 1290.38 | 1202.63 | 1107.00 | 1014.75 | 938.81  | 859.50  | 794.81  | 729.56  | 668.25  |                            |  |
| 90.0               | 1181.25 | 1102.11 | 1019.14 | 931.39  | 858.77  | 783.11  | 714.43  | 660.04  | 611.38  |                            |  |
| 135.0              | 1211.06 | 1112.06 | 1025.44 | 943.31  | 848.81  | 780.19  | 718.31  | 650.81  | 601.88  |                            |  |
| 180.0              | 1116.39 | 1038.43 | 953.94  | 875.70  | 795.66  | 724.28  | 668.14  | 613.63  | 571.50  |                            |  |
| 225.0              | 1230.75 | 1115.83 | 1029.38 | 946.69  | 868.44  | 780.08  | 717.24  | 660.21  | 608.96  |                            |  |
| 270.0              | 1344.38 | 1258.88 | 1162.69 | 1080.56 | 990.00  | 903.94  | 833.06  | 761.06  | 695.81  |                            |  |
| 315.0              | 1319.06 | 1222.31 | 1115.10 | 1045.91 | 970.43  | 892.01  | 820.97  | 762.81  | 709.59  |                            |  |
| 360.0              | 1348.88 | 1264.50 | 1181.81 | 1102.50 | 1006.31 | 934.31  | 859.50  | 790.31  | 735.19  |                            |  |
| C/ $\gamma$ (°)    | 18.0    | 19.0    | 20.0    | 21.0    | 22.0    | 23.0    | 24.0    | 25.0    | 26.0    |                            |  |
| 0.0                | 685.13  | 636.19  | 592.31  | 552.94  | 522.00  | 494.44  | 463.50  | 440.44  | 420.19  |                            |  |
| 45.0               | 623.81  | 582.19  | 538.88  | 507.94  | 480.94  | 452.81  | 429.75  | 412.31  | 394.31  |                            |  |
| 90.0               | 557.61  | 520.54  | 488.76  | 454.61  | 431.21  | 410.57  | 390.26  | 372.38  | 357.58  |                            |  |
| 135.0              | 563.63  | 524.25  | 490.50  | 465.19  | 441.00  | 421.31  | 403.31  | 387.56  | 375.19  |                            |  |
| 180.0              | 529.99  | 495.11  | 468.73  | 443.25  | 421.48  | 404.55  | 389.59  | 372.83  | 360.51  |                            |  |
| 225.0              | 554.63  | 517.44  | 484.59  | 449.33  | 425.08  | 403.93  | 383.29  | 365.34  | 351.34  |                            |  |
| 270.0              | 645.19  | 605.25  | 551.81  | 517.50  | 491.06  | 457.31  | 431.44  | 413.44  | 389.81  |                            |  |
| 315.0              | 651.88  | 611.44  | 575.21  | 535.11  | 506.76  | 481.56  | 456.24  | 433.58  | 415.41  |                            |  |
| 360.0              | 685.13  | 636.19  | 592.31  | 552.94  | 522.00  | 494.44  | 463.50  | 440.44  | 420.19  |                            |  |
| C/ $\gamma$ (°)    | 27.0    | 28.0    | 29.0    | 30.0    | 31.0    | 32.0    | 33.0    | 34.0    | 35.0    |                            |  |
| 0.0                | 398.25  | 379.13  | 363.38  | 349.88  | 330.19  | 316.69  | 304.88  | 285.75  | 284.06  |                            |  |
| 45.0               | 378.00  | 363.38  | 348.75  | 335.81  | 321.19  | 307.69  | 295.31  | 284.63  | 265.67  |                            |  |
| 90.0               | 342.39  | 329.46  | 315.45  | 301.44  | 289.24  | 275.74  | 262.01  | 249.81  | 237.49  |                            |  |
| 135.0              | 361.69  | 349.88  | 338.63  | 327.94  | 315.00  | 303.75  | 291.94  | 284.63  | 262.46  |                            |  |
| 180.0              | 348.92  | 336.66  | 324.62  | 313.59  | 301.28  | 288.51  | 276.92  | 263.25  | 250.71  |                            |  |
| 225.0              | 336.83  | 324.45  | 311.63  | 299.08  | 288.17  | 275.79  | 263.08  | 251.55  | 239.74  |                            |  |
| 270.0              | 370.69  | 357.19  | 339.75  | 326.25  | 313.31  | 298.13  | 286.31  | 276.64  | 258.24  |                            |  |
| 315.0              | 396.62  | 380.87  | 364.33  | 348.53  | 335.08  | 320.01  | 304.99  | 291.54  | 278.16  |                            |  |
| 360.0              | 398.25  | 379.13  | 363.38  | 349.88  | 330.19  | 316.69  | 304.88  | 285.75  | 284.06  |                            |  |
| C/ $\gamma$ (°)    | 36.0    | 37.0    | 38.0    | 39.0    | 40.0    | 41.0    | 42.0    | 43.0    | 44.0    |                            |  |
| 0.0                | 257.18  | 241.99  | 226.80  | 213.41  | 198.73  | 186.08  | 172.18  | 158.85  | 147.32  |                            |  |
| 45.0               | 253.07  | 240.47  | 224.49  | 211.73  | 198.62  | 185.68  | 169.93  | 157.78  | 144.79  |                            |  |
| 90.0               | 222.13  | 209.76  | 197.21  | 181.52  | 169.26  | 157.16  | 144.23  | 132.02  | 121.84  |                            |  |
| 135.0              | 249.41  | 237.71  | 218.81  | 204.92  | 192.54  | 174.99  | 159.69  | 148.22  | 132.81  |                            |  |
| 180.0              | 236.19  | 221.23  | 207.73  | 192.43  | 177.24  | 164.14  | 151.48  | 136.63  | 125.78  |                            |  |
| 225.0              | 224.72  | 212.40  | 199.97  | 184.11  | 171.90  | 159.75  | 146.48  | 133.76  | 123.08  |                            |  |
| 270.0              | 246.21  | 233.94  | 218.36  | 205.93  | 193.61  | 179.89  | 166.67  | 155.03  | 142.43  |                            |  |
| 315.0              | 259.71  | 247.95  | 234.34  | 217.29  | 204.08  | 190.91  | 176.34  | 162.45  | 150.47  |                            |  |
| 360.0              | 257.18  | 241.99  | 226.80  | 213.41  | 198.73  | 186.08  | 172.18  | 158.85  | 147.32  |                            |  |

## NATA 1405-N

| Intensity data(cd) |        |        |        |        |       |       |       |       |       | Appendix Page: 18 Total:19 |  |
|--------------------|--------|--------|--------|--------|-------|-------|-------|-------|-------|----------------------------|--|
| C/ $\gamma$ (°)    | 45.0   | 46.0   | 47.0   | 48.0   | 49.0  | 50.0  | 51.0  | 52.0  | 53.0  |                            |  |
| 0.0                | 135.06 | 123.41 | 113.85 | 104.79 | 94.22 | 86.57 | 79.71 | 72.79 | 66.60 |                            |  |
| 45.0               | 132.47 | 122.18 | 111.38 | 102.43 | 93.09 | 85.50 | 77.63 | 71.27 | 64.01 |                            |  |
| 90.0               | 111.21 | 102.43 | 93.26  | 85.05  | 78.24 | 71.21 | 64.97 | 59.96 | 55.41 |                            |  |
| 135.0              | 119.81 | 110.53 | 98.16  | 89.33  | 80.33 | 72.39 | 66.21 | 60.69 | 54.84 |                            |  |
| 180.0              | 115.48 | 103.61 | 94.95  | 86.96  | 77.91 | 71.44 | 65.53 | 59.01 | 55.01 |                            |  |
| 225.0              | 111.66 | 102.32 | 92.64  | 84.09  | 77.12 | 70.14 | 64.01 | 59.18 | 54.90 |                            |  |
| 270.0              | 130.28 | 120.09 | 109.52 | 100.58 | 91.18 | 82.74 | 76.05 | 70.03 | 63.34 |                            |  |
| 315.0              | 138.99 | 126.79 | 115.54 | 106.43 | 96.81 | 87.98 | 80.10 | 73.74 | 67.95 |                            |  |
| 360.0              | 135.06 | 123.41 | 113.85 | 104.79 | 94.22 | 86.57 | 79.71 | 72.79 | 66.60 |                            |  |
| C/ $\gamma$ (°)    | 54.0   | 55.0   | 56.0   | 57.0   | 58.0  | 59.0  | 60.0  | 61.0  | 62.0  |                            |  |
| 0.0                | 61.59  | 56.70  | 52.20  | 48.60  | 44.94 | 42.02 | 38.93 | 36.17 | 33.92 |                            |  |
| 45.0               | 58.95  | 54.51  | 49.50  | 45.96  | 42.81 | 39.99 | 37.07 | 34.65 | 32.74 |                            |  |
| 90.0               | 50.34  | 46.86  | 43.71  | 40.28  | 37.80 | 35.55 | 33.13 | 31.39 | 29.76 |                            |  |
| 135.0              | 50.74  | 47.14  | 43.26  | 40.50  | 37.97 | 35.44 | 33.19 | 31.16 | 29.19 |                            |  |
| 180.0              | 50.34  | 45.90  | 43.09  | 40.22  | 36.68 | 34.65 | 32.57 | 29.93 | 28.35 |                            |  |
| 225.0              | 50.06  | 46.63  | 43.54  | 40.33  | 37.52 | 35.33 | 33.02 | 30.88 | 29.08 |                            |  |
| 270.0              | 58.50  | 54.34  | 49.56  | 46.13  | 43.03 | 39.88 | 36.96 | 34.65 | 32.23 |                            |  |
| 315.0              | 61.48  | 56.87  | 52.59  | 48.66  | 44.33 | 41.23 | 38.48 | 35.27 | 33.02 |                            |  |
| 360.0              | 61.59  | 56.70  | 52.20  | 48.60  | 44.94 | 42.02 | 38.93 | 36.17 | 33.92 |                            |  |
| C/ $\gamma$ (°)    | 63.0   | 64.0   | 65.0   | 66.0   | 67.0  | 68.0  | 69.0  | 70.0  | 71.0  |                            |  |
| 0.0                | 31.89  | 29.48  | 27.90  | 26.33  | 24.53 | 23.12 | 21.77 | 20.42 | 19.18 |                            |  |
| 45.0               | 30.60  | 28.63  | 27.11  | 25.54  | 24.02 | 22.73 | 21.43 | 20.25 | 19.01 |                            |  |
| 90.0               | 27.84  | 26.61  | 25.09  | 23.40  | 22.28 | 21.04 | 19.46 | 18.51 | 17.49 |                            |  |
| 135.0              | 27.56  | 25.76  | 24.24  | 22.89  | 21.49 | 20.14 | 19.07 | 18.00 | 16.82 |                            |  |
| 180.0              | 26.72  | 25.03  | 23.51  | 22.16  | 20.81 | 19.63 | 18.45 | 17.33 | 16.31 |                            |  |
| 225.0              | 27.34  | 25.88  | 24.30  | 22.84  | 21.60 | 20.42 | 19.01 | 18.00 | 16.99 |                            |  |
| 270.0              | 30.32  | 28.13  | 26.27  | 24.75  | 23.18 | 21.88 | 20.76 | 19.69 | 18.39 |                            |  |
| 315.0              | 30.94  | 28.80  | 26.89  | 25.14  | 23.63 | 22.28 | 20.81 | 19.46 | 18.34 |                            |  |
| 360.0              | 31.89  | 29.48  | 27.90  | 26.33  | 24.53 | 23.12 | 21.77 | 20.42 | 19.18 |                            |  |
| C/ $\gamma$ (°)    | 72.0   | 73.0   | 74.0   | 75.0   | 76.0  | 77.0  | 78.0  | 79.0  | 80.0  |                            |  |
| 0.0                | 18.00  | 16.88  | 15.92  | 14.85  | 13.84 | 12.94 | 11.98 | 11.08 | 10.35 |                            |  |
| 45.0               | 17.83  | 16.82  | 15.69  | 14.63  | 13.67 | 12.88 | 11.70 | 10.97 | 10.46 |                            |  |
| 90.0               | 16.37  | 15.30  | 14.40  | 13.33  | 12.32 | 11.48 | 10.58 | 9.90  | 9.23  |                            |  |
| 135.0              | 15.86  | 14.91  | 13.89  | 12.94  | 12.15 | 11.25 | 10.41 | 9.84  | 9.51  |                            |  |
| 180.0              | 15.30  | 14.29  | 13.39  | 12.54  | 11.53 | 10.80 | 10.01 | 9.28  | 8.49  |                            |  |
| 225.0              | 15.81  | 14.63  | 13.61  | 12.66  | 11.76 | 10.97 | 10.07 | 9.39  | 8.61  |                            |  |
| 270.0              | 17.27  | 16.37  | 15.24  | 14.23  | 13.39 | 12.43 | 11.48 | 10.69 | 9.90  |                            |  |
| 315.0              | 17.10  | 15.92  | 14.91  | 13.95  | 12.77 | 11.93 | 11.08 | 10.18 | 9.39  |                            |  |
| 360.0              | 18.00  | 16.88  | 15.92  | 14.85  | 13.84 | 12.94 | 11.98 | 11.08 | 10.35 |                            |  |
| C/ $\gamma$ (°)    | 81.0   | 82.0   | 83.0   | 84.0   | 85.0  | 86.0  | 87.0  | 88.0  | 89.0  |                            |  |
| 0.0                | 9.62   | 8.94   | 8.38   | 7.76   | 6.81  | 6.24  | 5.85  | 5.57  | 4.28  |                            |  |
| 45.0               | 10.07  | 9.73   | 9.11   | 7.82   | 6.69  | 6.30  | 6.02  | 4.39  | 4.11  |                            |  |
| 90.0               | 8.55   | 7.88   | 7.09   | 6.53   | 6.13  | 5.74  | 4.50  | 4.22  | 3.99  |                            |  |
| 135.0              | 8.94   | 7.99   | 6.98   | 6.53   | 6.08  | 5.01  | 4.56  | 4.33  | 4.05  |                            |  |
| 180.0              | 7.88   | 7.20   | 6.69   | 6.19   | 5.40  | 4.84  | 4.50  | 4.28  | 4.05  |                            |  |
| 225.0              | 7.93   | 7.48   | 6.69   | 6.19   | 5.79  | 4.67  | 4.39  | 4.11  | 3.88  |                            |  |
| 270.0              | 9.11   | 8.38   | 7.71   | 7.09   | 6.47  | 6.13  | 4.67  | 4.33  | 4.11  |                            |  |
| 315.0              | 8.72   | 8.10   | 7.59   | 6.75   | 6.24  | 5.85  | 5.34  | 4.56  | 4.28  |                            |  |
| 360.0              | 9.62   | 8.94   | 8.38   | 7.76   | 6.81  | 6.24  | 5.85  | 5.57  | 4.28  |                            |  |

## NATA 1405-N

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### Intensity data(cd)

Appendix Page: 19 Total:19

|                 |      |
|-----------------|------|
| C/ $\gamma$ (°) | 90.0 |
| 0.0             | 3.99 |
| 45.0            | 3.88 |
| 90.0            | 3.88 |
| 135.0           | 3.94 |
| 180.0           | 3.99 |
| 225.0           | 3.88 |
| 270.0           | 3.94 |
| 315.0           | 4.16 |
| 360.0           | 3.99 |