

Cooper Lighting Solutions Photometric Lab  
1121 Highway 74 South  
Peachtree City, GA 30269



Scaled data based on original data using  
LM-79-2019 Approved Method: Electrical and Photometric Measurements of Solid-  
State Lighting Products

Test Report Prepared for  
Cooper Lighting Solutions

Brand: NEO-RAY

Report Number: P909420

Luminaire Tested: DFN2DIP-SQ4F0-060D140US840-FLLFLL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P909420  
REPORT IS A COMBINATION OF REPORTS P900185 AND P896915  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-SQ4F0-060D140US840-FLLFLL  
Description: 4 foot, Square Define Geo, with Direct Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

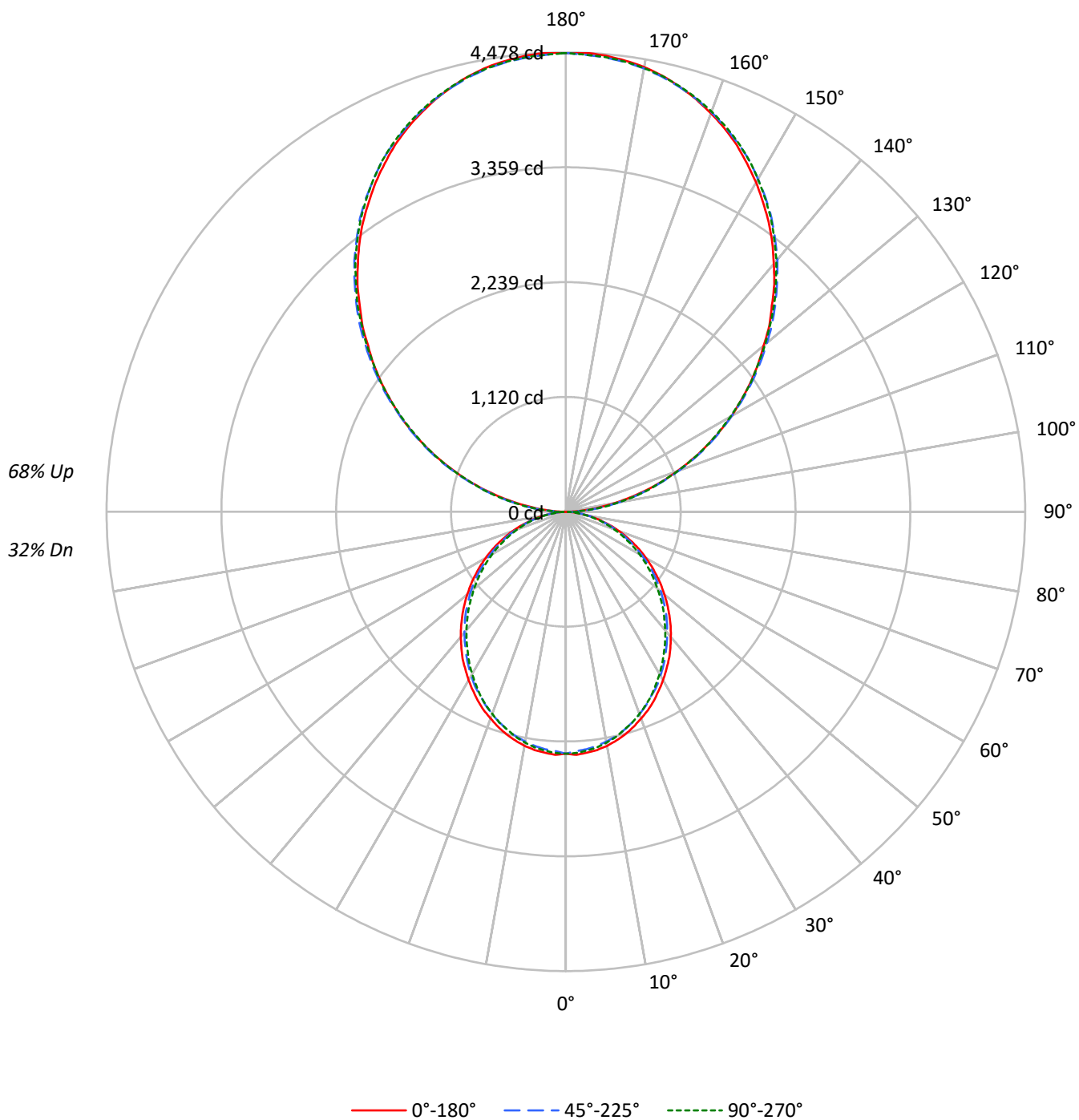
Lumens per Lamp: N/A  
Luminaire Lumens: 18510.9 lumens  
Efficiency: N/A  
Efficacy: 118.8 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 3.92' x L: 3.92' x H: 0.1')  
CIE Type: Semi-Indirect

Input Watts (W): 155.8  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.946  
Total Harmonic Distortion (THDi): 0.132  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT

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CATALOG NUMBER: DFN2DIP-SQ4F0-060D140US840-FLLFLL

### Luminous Intensity Polar Plot



TEST NUMBER: P909420

CATALOG NUMBER: DFN2DIP-SQ4F0-060D140US840-FLLFL

**COEFFICIENT OF UTILIZATION - ZONAL CAVITY METHOD:**

|     |     |     |     |     |    |    |    |    |    |    |    |    |    |    |    |    |    |
|-----|-----|-----|-----|-----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| RF  | 20  |     |     |     | 20 |    |    |    | 20 |    |    |    | 20 |    |    |    | 20 |
| RC  | 80  |     |     |     | 70 |    |    |    | 50 |    |    |    | 30 |    |    |    | 10 |
| RW  | 70  | 50  | 30  | 10  | 70 | 50 | 30 | 10 | 50 | 30 | 10 | 50 | 30 | 10 | 50 | 30 | 10 |
| RCR |     |     |     |     |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 0   | 103 | 103 | 103 | 103 | 93 | 93 | 93 | 93 | 74 | 74 | 74 | 56 | 56 | 56 | 40 | 40 | 40 |
| 1   | 94  | 90  | 86  | 82  | 84 | 81 | 78 | 75 | 64 | 62 | 60 | 49 | 48 | 47 | 35 | 34 | 34 |
| 2   | 85  | 78  | 72  | 67  | 77 | 71 | 66 | 61 | 56 | 53 | 50 | 43 | 41 | 39 | 31 | 30 | 28 |
| 3   | 78  | 69  | 62  | 56  | 70 | 62 | 56 | 51 | 50 | 45 | 42 | 38 | 35 | 33 | 28 | 26 | 24 |
| 4   | 71  | 61  | 53  | 47  | 64 | 55 | 48 | 43 | 44 | 39 | 36 | 34 | 31 | 28 | 25 | 23 | 21 |
| 5   | 65  | 54  | 46  | 40  | 59 | 49 | 42 | 37 | 39 | 34 | 31 | 30 | 27 | 24 | 22 | 20 | 18 |
| 6   | 60  | 48  | 40  | 35  | 54 | 44 | 37 | 32 | 35 | 30 | 27 | 27 | 24 | 21 | 20 | 18 | 16 |
| 7   | 55  | 43  | 36  | 30  | 50 | 40 | 33 | 28 | 32 | 27 | 23 | 25 | 21 | 19 | 18 | 16 | 14 |
| 8   | 51  | 39  | 32  | 27  | 46 | 36 | 29 | 25 | 29 | 24 | 21 | 23 | 19 | 17 | 17 | 14 | 13 |
| 9   | 48  | 36  | 29  | 24  | 43 | 33 | 26 | 22 | 27 | 22 | 18 | 21 | 17 | 15 | 15 | 13 | 11 |
| 10  | 44  | 33  | 26  | 21  | 40 | 30 | 24 | 20 | 24 | 20 | 16 | 19 | 16 | 13 | 14 | 12 | 10 |

**AVERAGE LUMINANCE (cd/sqm):**

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 1654 | 1654 | 1654 |
| 5°  | 1657 | 1632 | 1643 |
| 10° | 1643 | 1610 | 1621 |
| 15° | 1619 | 1584 | 1587 |
| 20° | 1587 | 1547 | 1552 |
| 25° | 1554 | 1504 | 1511 |
| 30° | 1513 | 1463 | 1459 |
| 35° | 1475 | 1415 | 1404 |
| 40° | 1427 | 1366 | 1352 |
| 45° | 1380 | 1318 | 1299 |
| 50° | 1328 | 1267 | 1237 |
| 55° | 1274 | 1208 | 1180 |
| 60° | 1212 | 1138 | 1115 |
| 65° | 1146 | 1066 | 1038 |
| 70° | 1061 | 977  | 956  |
| 75° | 942  | 872  | 881  |
| 80° | 801  | 737  | 736  |
| 85° | 578  | 504  | 495  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 90°

Vertical Angle: 90°

Luminance: 3520 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 221.9   | 1.2       |
| 10°-20°   | 624.4   | 3.4       |
| 20°-30°   | 917.5   | 5.0       |
| 30°-40°   | 1065.7  | 5.8       |
| 40°-50°   | 1064.4  | 5.7       |
| 50°-60°   | 928.1   | 5.0       |
| 60°-70°   | 686.1   | 3.7       |
| 70°-80°   | 388.2   | 2.1       |
| 80°-90°   | 115.2   | 0.6       |
| 90°-100°  | 276.7   | 1.5       |
| 100°-110° | 879.1   | 4.7       |
| 110°-120° | 1504.5  | 8.1       |
| 120°-130° | 1978.6  | 10.7      |
| 130°-140° | 2220.9  | 12.0      |
| 140°-150° | 2177.8  | 11.8      |
| 150°-160° | 1826.9  | 9.9       |
| 160°-170° | 1211.6  | 6.5       |
| 170°-180° | 423.5   | 2.3       |
| 0°-30°    | 1763.8  | 9.5       |
| 0°-40°    | 2829.5  | 15.3      |
| 0°-60°    | 4821.9  | 26.0      |
| 0°-90°    | 6011.3  | 32.5      |
| 90°-120°  | 2660.3  | 14.4      |
| 90°-150°  | 9037.6  | 48.8      |
| 90°-180°  | 12500.0 | 67.5      |
| 0°-180°   | 18510.9 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 2358 | 2358  | 2358 | 2358  | 2358 |      |
| 5°   | 2358 | 2349  | 2324 | 2342  | 2337 | 224  |
| 15°  | 2244 | 2231  | 2201 | 2210  | 2199 | 632  |
| 25°  | 2031 | 2013  | 1975 | 1979  | 1975 | 935  |
| 35°  | 1752 | 1730  | 1694 | 1680  | 1668 | 1094 |
| 45°  | 1426 | 1410  | 1376 | 1351  | 1342 | 1101 |
| 55°  | 1079 | 1066  | 1038 | 1011  | 1000 | 965  |
| 65°  | 728  | 714   | 692  | 671   | 660  | 720  |
| 75°  | 381  | 376   | 365  | 351   | 356  | 406  |
| 85°  | 93   | 91    | 88   | 82    | 79   | 104  |
| 90°  | 4    | 49    | 132  | 124   | 128  | 18   |
| 95°  | 197  | 235   | 241  | 241   | 235  | 219  |
| 105° | 812  | 822   | 830  | 837   | 837  | 856  |
| 115° | 1510 | 1531  | 1525 | 1521  | 1510 | 1493 |
| 125° | 2196 | 2230  | 2219 | 2207  | 2203 | 1962 |
| 135° | 2840 | 2882  | 2890 | 2886  | 2875 | 2195 |
| 145° | 3448 | 3475  | 3497 | 3501  | 3486 | 2154 |
| 155° | 3943 | 3954  | 3966 | 3985  | 3973 | 1815 |
| 165° | 4289 | 4285  | 4285 | 4312  | 4293 | 1210 |
| 175° | 4463 | 4452  | 4444 | 4471  | 4448 | 424  |
| 180° | 4471 | 4471  | 4471 | 4471  | 4471 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 2357.6 | 2357.6 | 2357.6 | 2357.6 | 2357.6 |
| 2.5°   | 2371.4 | 2360.1 | 2335.0 | 2357.6 | 2353.3 |
| 5°     | 2357.6 | 2348.7 | 2323.7 | 2341.8 | 2337.4 |
| 7.5°   | 2341.8 | 2328.3 | 2303.3 | 2321.6 | 2317.0 |
| 10°    | 2317.0 | 2301.2 | 2273.9 | 2292.0 | 2285.2 |
| 12.5°  | 2282.9 | 2269.4 | 2242.2 | 2253.5 | 2249.0 |
| 15°    | 2244.3 | 2230.9 | 2201.3 | 2210.5 | 2199.2 |
| 17.5°  | 2196.8 | 2183.3 | 2153.7 | 2164.9 | 2153.7 |
| 20°    | 2144.6 | 2131.1 | 2099.3 | 2106.1 | 2097.2 |
| 22.5°  | 2092.6 | 2072.1 | 2042.6 | 2042.6 | 2038.0 |
| 25°    | 2031.2 | 2013.3 | 1974.7 | 1979.0 | 1974.7 |
| 27.5°  | 1963.2 | 1947.3 | 1917.9 | 1911.3 | 1900.0 |
| 30°    | 1895.4 | 1877.0 | 1843.2 | 1836.4 | 1827.3 |
| 32.5°  | 1822.7 | 1809.3 | 1772.9 | 1759.2 | 1750.1 |
| 35°    | 1752.5 | 1729.9 | 1693.5 | 1679.8 | 1668.5 |
| 37.5°  | 1673.1 | 1652.6 | 1616.4 | 1600.4 | 1589.1 |
| 40°    | 1591.5 | 1573.3 | 1537.0 | 1516.8 | 1507.6 |
| 42.5°  | 1512.2 | 1493.9 | 1457.8 | 1435.0 | 1421.5 |
| 45°    | 1426.1 | 1410.2 | 1376.0 | 1351.3 | 1342.1 |
| 47.5°  | 1342.1 | 1326.3 | 1290.0 | 1265.0 | 1251.4 |
| 50°    | 1253.6 | 1242.3 | 1210.6 | 1178.8 | 1167.5 |
| 52.5°  | 1167.5 | 1151.7 | 1122.3 | 1097.3 | 1081.5 |
| 55°    | 1079.2 | 1065.5 | 1038.3 | 1011.2 | 999.9  |
| 57.5°  | 990.8  | 979.5  | 949.9  | 922.7  | 913.5  |
| 60°    | 902.2  | 893.3  | 861.6  | 836.6  | 829.8  |
| 62.5°  | 816.1  | 800.2  | 777.6  | 755.0  | 745.9  |
| 65°    | 727.8  | 714.2  | 691.6  | 671.1  | 659.7  |
| 67.5°  | 637.1  | 625.6  | 605.4  | 589.6  | 580.4  |
| 70°    | 553.2  | 544.1  | 523.6  | 507.8  | 498.9  |
| 72.5°  | 467.1  | 458.0  | 446.7  | 430.8  | 424.0  |
| 75°    | 380.7  | 376.5  | 364.9  | 351.4  | 356.0  |
| 77.5°  | 303.8  | 294.7  | 290.0  | 283.4  | 276.6  |
| 80°    | 226.8  | 224.4  | 219.8  | 213.1  | 208.5  |
| 82.5°  | 154.2  | 154.2  | 152.0  | 142.9  | 142.9  |
| 85°    | 92.8   | 90.7   | 88.5   | 81.5   | 79.4   |
| 87.5°  | 40.9   | 36.4   | 31.7   | 25.0   | 22.6   |
| 90°    | 4.0    | 48.6   | 132.1  | 124.0  | 128.1  |
| 92.5°  | 83.6   | 113.2  | 117.2  | 121.3  | 121.3  |
| 95°    | 196.8  | 234.6  | 241.3  | 241.3  | 234.6  |
| 97.5°  | 327.6  | 362.6  | 377.5  | 377.5  | 377.5  |
| 100°   | 478.6  | 509.6  | 520.3  | 520.3  | 516.2  |
| 102.5° | 637.6  | 660.6  | 675.4  | 679.4  | 675.4  |
| 105°   | 811.5  | 822.3  | 830.4  | 837.1  | 837.1  |
| 107.5° | 984.0  | 1000.3 | 1000.3 | 1002.9 | 984.0  |
| 110°   | 1151.2 | 1172.8 | 1172.8 | 1172.8 | 1162.0 |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 1331.8 | 1354.7 | 1350.7 | 1339.9 | 1331.8 |
| 115°   | 1509.7 | 1531.4 | 1524.6 | 1520.6 | 1509.7 |
| 117.5° | 1686.4 | 1716.1 | 1697.2 | 1686.4 | 1675.6 |
| 120°   | 1864.3 | 1894.0 | 1864.3 | 1864.3 | 1852.2 |
| 122.5° | 2026.1 | 2063.8 | 2045.0 | 2034.2 | 2026.1 |
| 125°   | 2196.0 | 2229.6 | 2218.8 | 2206.7 | 2202.6 |
| 127.5° | 2361.7 | 2403.5 | 2388.6 | 2372.5 | 2361.7 |
| 130°   | 2516.7 | 2565.3 | 2558.5 | 2550.4 | 2535.6 |
| 132.5° | 2690.6 | 2728.4 | 2731.1 | 2712.2 | 2701.4 |
| 135°   | 2840.2 | 2882.1 | 2890.1 | 2886.1 | 2875.3 |
| 137.5° | 3007.4 | 3041.1 | 3047.9 | 3045.1 | 3029.0 |
| 140°   | 3154.3 | 3188.0 | 3206.9 | 3206.9 | 3192.1 |
| 142.5° | 3305.3 | 3339.0 | 3349.8 | 3353.9 | 3339.0 |
| 145°   | 3448.2 | 3475.1 | 3496.8 | 3500.8 | 3486.0 |
| 147.5° | 3576.2 | 3610.0 | 3626.1 | 3632.9 | 3618.0 |
| 150°   | 3708.3 | 3731.3 | 3746.1 | 3758.2 | 3746.1 |
| 152.5° | 3825.7 | 3848.6 | 3867.5 | 3882.2 | 3867.5 |
| 155°   | 3942.9 | 3953.7 | 3965.8 | 3984.7 | 3972.6 |
| 157.5° | 4044.0 | 4052.1 | 4058.9 | 4085.8 | 4066.9 |
| 160°   | 4134.4 | 4142.5 | 4146.5 | 4169.4 | 4153.2 |
| 162.5° | 4217.9 | 4217.9 | 4221.9 | 4247.6 | 4228.7 |
| 165°   | 4289.4 | 4285.4 | 4285.4 | 4312.3 | 4293.4 |
| 167.5° | 4354.0 | 4341.9 | 4341.9 | 4368.9 | 4350.0 |
| 170°   | 4402.6 | 4391.8 | 4387.8 | 4414.7 | 4391.8 |
| 172.5° | 4436.3 | 4425.5 | 4421.5 | 4448.5 | 4425.5 |
| 175°   | 4463.3 | 4452.5 | 4444.4 | 4471.4 | 4448.5 |
| 177.5° | 4478.0 | 4467.3 | 4459.3 | 4482.1 | 4459.3 |
| 180°   | 4471.4 | 4471.4 | 4471.4 | 4471.4 | 4471.4 |

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**CIE UGR TABLE:**

| Reflectances:   |      |                  |       |       |       |       |                |       |       |       |       |
|-----------------|------|------------------|-------|-------|-------|-------|----------------|-------|-------|-------|-------|
| Ceiling         |      | 0.7              | 0.7   | 0.5   | 0.5   | 0.3   | 0.7            | 0.7   | 0.5   | 0.5   | 0.3   |
| Wall            |      | 0.5              | 0.3   | 0.5   | 0.3   | 0.3   | 0.5            | 0.3   | 0.5   | 0.3   | 0.3   |
| Reference plane |      | 0.2              | 0.2   | 0.2   | 0.2   | 0.2   | 0.2            | 0.2   | 0.2   | 0.2   | 0.2   |
| Room dimensions |      | Viewed crosswise |       |       |       |       | Viewed endwise |       |       |       |       |
| X=2H            | Y=2H | 7.14             | 7.87  | 8.24  | 8.96  | 10.46 | 6.70           | 7.42  | 7.79  | 8.51  | 10.02 |
|                 | 3H   | 8.80             | 9.45  | 9.90  | 10.55 | 12.06 | 8.31           | 8.96  | 9.41  | 10.06 | 11.57 |
|                 | 4H   | 9.38             | 10.00 | 10.50 | 11.10 | 12.62 | 8.89           | 9.50  | 10.00 | 10.60 | 12.13 |
|                 | 6H   | 9.78             | 10.34 | 10.90 | 11.45 | 12.98 | 9.28           | 9.84  | 10.40 | 10.95 | 12.48 |
|                 | 8H   | 9.88             | 10.42 | 11.01 | 11.54 | 13.07 | 9.38           | 9.92  | 10.50 | 11.04 | 12.57 |
|                 | 12H  | 9.93             | 10.44 | 11.06 | 11.55 | 13.10 | 9.42           | 9.93  | 10.55 | 11.04 | 12.59 |
| 4H              | 2H   | 7.59             | 8.20  | 8.71  | 9.31  | 10.83 | 7.23           | 7.85  | 8.35  | 8.95  | 10.47 |
|                 | 3H   | 9.45             | 9.96  | 10.57 | 11.09 | 12.62 | 9.04           | 9.55  | 10.17 | 10.68 | 12.22 |
|                 | 4H   | 10.16            | 10.63 | 11.29 | 11.75 | 13.30 | 9.73           | 10.21 | 10.86 | 11.32 | 12.88 |
|                 | 6H   | 10.67            | 11.07 | 11.81 | 12.21 | 13.76 | 10.24          | 10.64 | 11.37 | 11.78 | 13.33 |
|                 | 8H   | 10.82            | 11.20 | 11.95 | 12.33 | 13.89 | 10.38          | 10.76 | 11.52 | 11.89 | 13.46 |
|                 | 12H  | 10.89            | 11.23 | 12.04 | 12.37 | 13.94 | 10.44          | 10.78 | 11.59 | 11.92 | 13.49 |
| 8H              | 4H   | 10.34            | 10.72 | 11.48 | 11.85 | 13.42 | 9.97           | 10.34 | 11.10 | 11.48 | 13.04 |
|                 | 6H   | 10.97            | 11.29 | 12.13 | 12.46 | 14.02 | 10.59          | 10.90 | 11.75 | 12.08 | 13.64 |
|                 | 8H   | 11.20            | 11.47 | 12.36 | 12.62 | 14.20 | 10.80          | 11.08 | 11.97 | 12.23 | 13.81 |
|                 | 12H  | 11.32            | 11.56 | 12.49 | 12.71 | 14.33 | 10.91          | 11.15 | 12.08 | 12.30 | 13.92 |
| 12H             | 4H   | 10.32            | 10.67 | 11.48 | 11.81 | 13.38 | 9.95           | 10.30 | 11.11 | 11.44 | 13.01 |
|                 | 6H   | 11.00            | 11.28 | 12.17 | 12.43 | 14.01 | 10.63          | 10.90 | 11.79 | 12.06 | 13.64 |
|                 | 8H   | 11.24            | 11.48 | 12.41 | 12.63 | 14.25 | 10.86          | 11.10 | 12.03 | 12.25 | 13.87 |

END OF REPORT