

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: P917043

Luminaire Tested: DFN2DIP-PN4F0-110D050US930-RLLONL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P917043  
REPORT IS A COMBINATION OF REPORTS P901162 AND P898053  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-PN4F0-110D050US930-RLLONL  
Description: 4 foot, Pentagon Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

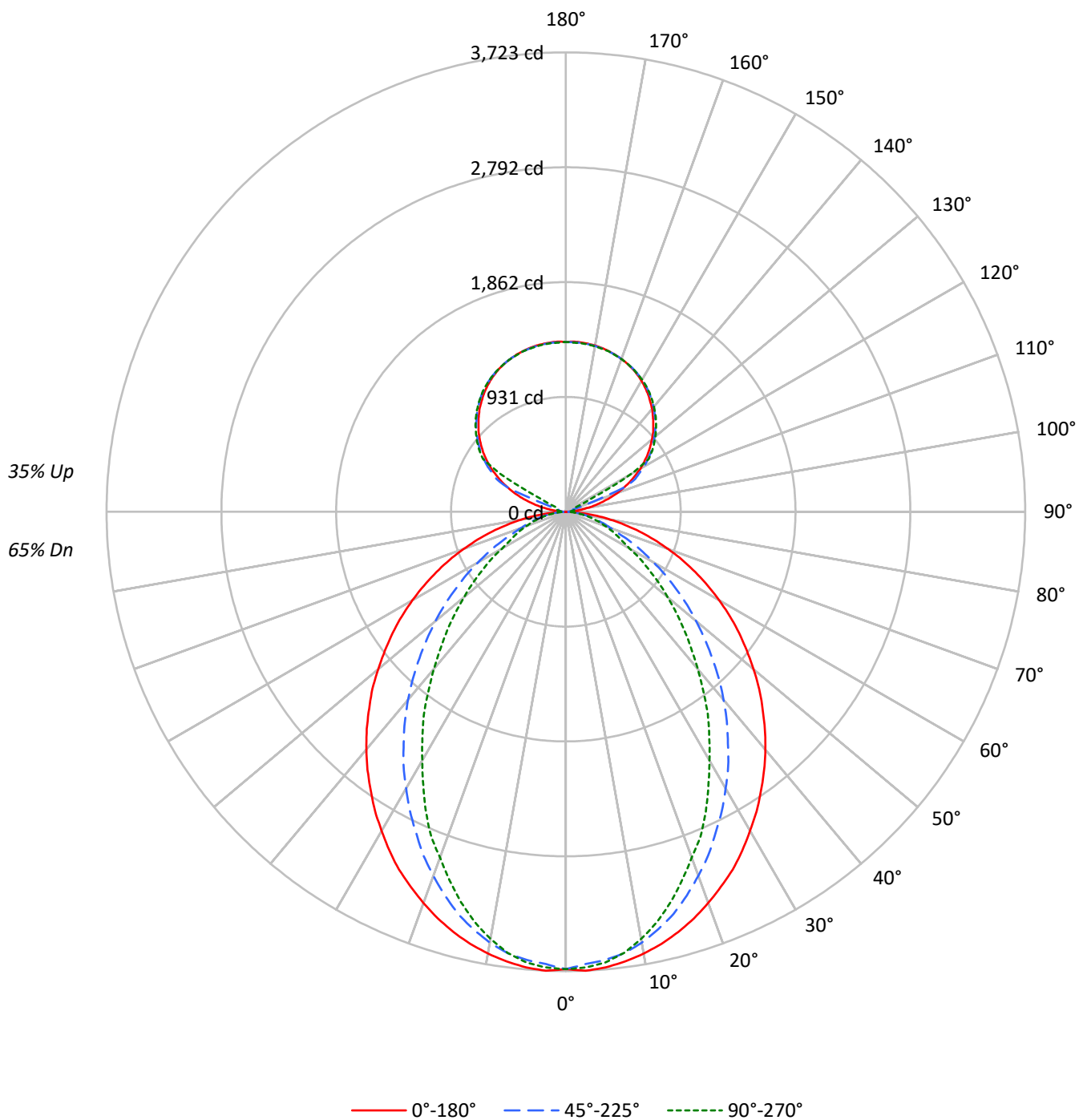
**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 11658.8 lumens  
Efficiency: N/A  
Efficacy: 76.8 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 0.99 / 1.16  
Luminous Opening: Rectangular w/ Sides (W: 3.74' x L: 3.94' x H: 0.1')  
CIE Type: Semi-Direct  
  
Input Watts (W): 151.9  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.996  
Total Harmonic Distortion (THDi): 0.064  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT

TEST NUMBER: P917043

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### Luminous Intensity Polar Plot



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

|     |     |     |     |     |     |     |     |     |    |    |    |    |    |    |    |    |    |    |    |    |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|----|----|----|----|----|----|----|----|----|----|----|----|
| RF  | 20  |     |     |     | 20  |     |     |     |    | 20 |    |    |    |    | 20 |    |    |    |    | 20 |
| RC  | 80  |     |     |     | 70  |     |     |     |    | 50 |    |    |    |    | 30 |    |    |    |    | 0  |
| RW  | 70  | 50  | 30  | 10  | 70  | 50  | 30  | 10  | 50 | 30 | 10 | 50 | 30 | 10 | 50 | 30 | 10 | 50 | 30 | 10 |
| RCR |     |     |     |     |     |     |     |     |    |    |    |    |    |    |    |    |    |    |    |    |
| 0   | 111 | 111 | 111 | 111 | 104 | 104 | 104 | 104 | 92 | 92 | 92 | 81 | 81 | 81 | 70 | 70 | 70 | 65 |    |    |
| 1   | 102 | 98  | 94  | 91  | 96  | 92  | 89  | 86  | 82 | 79 | 77 | 72 | 70 | 69 | 63 | 62 | 61 | 56 |    |    |
| 2   | 93  | 86  | 80  | 75  | 88  | 81  | 76  | 72  | 72 | 68 | 65 | 64 | 61 | 58 | 56 | 54 | 52 | 48 |    |    |
| 3   | 86  | 76  | 69  | 63  | 80  | 72  | 66  | 61  | 64 | 59 | 55 | 57 | 53 | 50 | 50 | 48 | 45 | 42 |    |    |
| 4   | 79  | 68  | 60  | 54  | 74  | 64  | 57  | 52  | 58 | 52 | 48 | 51 | 47 | 43 | 46 | 42 | 39 | 36 |    |    |
| 5   | 72  | 61  | 53  | 47  | 68  | 58  | 51  | 45  | 52 | 46 | 42 | 46 | 42 | 38 | 41 | 38 | 35 | 32 |    |    |
| 6   | 67  | 55  | 47  | 41  | 63  | 52  | 45  | 40  | 47 | 41 | 37 | 42 | 37 | 34 | 38 | 34 | 31 | 28 |    |    |
| 7   | 62  | 50  | 42  | 37  | 59  | 48  | 40  | 35  | 43 | 37 | 33 | 39 | 34 | 30 | 35 | 31 | 28 | 25 |    |    |
| 8   | 58  | 46  | 38  | 33  | 55  | 44  | 36  | 32  | 39 | 34 | 29 | 36 | 31 | 27 | 32 | 28 | 25 | 23 |    |    |
| 9   | 54  | 42  | 34  | 29  | 51  | 40  | 33  | 28  | 36 | 31 | 27 | 33 | 28 | 25 | 30 | 26 | 23 | 21 |    |    |
| 10  | 51  | 39  | 31  | 27  | 48  | 37  | 30  | 26  | 34 | 28 | 24 | 31 | 26 | 23 | 28 | 24 | 21 | 19 |    |    |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 2706 | 2706 | 2706 |
| 5°  | 2710 | 2663 | 2680 |
| 10° | 2683 | 2611 | 2594 |
| 15° | 2646 | 2525 | 2459 |
| 20° | 2597 | 2407 | 2294 |
| 25° | 2547 | 2274 | 2135 |
| 30° | 2480 | 2137 | 1932 |
| 35° | 2414 | 1990 | 1755 |
| 40° | 2347 | 1839 | 1551 |
| 45° | 2269 | 1670 | 1366 |
| 50° | 2189 | 1500 | 1185 |
| 55° | 2105 | 1318 | 1012 |
| 60° | 2008 | 1128 | 833  |
| 65° | 1896 | 934  | 751  |
| 70° | 1760 | 754  | 680  |
| 75° | 1590 | 665  | 620  |
| 80° | 1343 | 559  | 539  |
| 85° | 935  | 375  | 409  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 2269 cd/sqm

TEST NUMBER: P917043

CATALOG NUMBER: DFN2DIP-PN4F0-110D050US930-RLONL

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 347.4   | 3.0       |
| 10°-20°   | 953.6   | 8.2       |
| 20°-30°   | 1338.9  | 11.5      |
| 30°-40°   | 1459.5  | 12.5      |
| 40°-50°   | 1341.4  | 11.5      |
| 50°-60°   | 1053.5  | 9.0       |
| 60°-70°   | 685.7   | 5.9       |
| 70°-80°   | 353.0   | 3.0       |
| 80°-90°   | 92.5    | 0.8       |
| 90°-100°  | 45.4    | 0.4       |
| 100°-110° | 169.1   | 1.5       |
| 110°-120° | 448.5   | 3.8       |
| 120°-130° | 743.9   | 6.4       |
| 130°-140° | 790.2   | 6.8       |
| 140°-150° | 734.4   | 6.3       |
| 150°-160° | 590.4   | 5.1       |
| 160°-170° | 380.5   | 3.3       |
| 170°-180° | 130.9   | 1.1       |
| 0°-30°    | 2639.9  | 22.6      |
| 0°-40°    | 4099.4  | 35.2      |
| 0°-60°    | 6494.2  | 55.7      |
| 0°-90°    | 7625.5  | 65.4      |
| 90°-120°  | 663.0   | 5.7       |
| 90°-150°  | 2931.5  | 25.1      |
| 90°-180°  | 4033.0  | 34.6      |
| 0°-180°   | 11658.8 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 3707 | 3707  | 3707 | 3707  | 3707 |      |
| 5°   | 3707 | 3690  | 3646 | 3676  | 3666 | 351  |
| 15°  | 3525 | 3488  | 3374 | 3311  | 3277 | 993  |
| 25°  | 3200 | 3093  | 2871 | 2734  | 2683 | 1472 |
| 35°  | 2757 | 2586  | 2291 | 2080  | 2006 | 1726 |
| 45°  | 2254 | 2029  | 1677 | 1439  | 1358 | 1741 |
| 55°  | 1714 | 1452  | 1090 | 889   | 825  | 1532 |
| 65°  | 1157 | 885   | 584  | 470   | 459  | 1147 |
| 75°  | 617  | 382   | 268  | 245   | 242  | 653  |
| 85°  | 144  | 74    | 64   | 64    | 64   | 165  |
| 90°  | 1    | 12    | 20   | 25    | 27   | 11   |
| 95°  | 65   | 32    | 39   | 44    | 43   | 77   |
| 105° | 303  | 333   | 61   | 72    | 76   | 323  |
| 115° | 572  | 589   | 614  | 153   | 82   | 564  |
| 125° | 809  | 822   | 841  | 848   | 851  | 722  |
| 135° | 1002 | 1018  | 1026 | 1036  | 1034 | 774  |
| 145° | 1162 | 1161  | 1178 | 1185  | 1180 | 727  |
| 155° | 1279 | 1270  | 1282 | 1288  | 1280 | 589  |
| 165° | 1348 | 1342  | 1345 | 1352  | 1345 | 381  |
| 175° | 1379 | 1372  | 1374 | 1381  | 1371 | 131  |
| 180° | 1376 | 1376  | 1376 | 1376  | 1376 |      |

TEST NUMBER: P917043

CATALOG NUMBER: DFN2DIP-PN4F0-110D050US930-RLLONL

**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 3706.6 | 3706.6 | 3706.6 | 3706.6 | 3706.6 |
| 2.5°   | 3723.3 | 3706.6 | 3669.6 | 3703.4 | 3696.6 |
| 5°     | 3706.6 | 3689.9 | 3646.1 | 3676.3 | 3666.4 |
| 7.5°   | 3676.3 | 3656.4 | 3609.4 | 3622.6 | 3605.8 |
| 10°    | 3636.1 | 3612.6 | 3545.7 | 3535.4 | 3515.5 |
| 12.5°  | 3585.9 | 3555.7 | 3464.9 | 3445.0 | 3407.9 |
| 15°    | 3525.4 | 3488.4 | 3374.5 | 3310.8 | 3277.3 |
| 17.5°  | 3455.0 | 3401.3 | 3260.3 | 3186.6 | 3132.9 |
| 20°    | 3374.5 | 3307.3 | 3139.6 | 3056.0 | 2982.0 |
| 22.5°  | 3287.4 | 3210.1 | 3015.5 | 2901.6 | 2851.3 |
| 25°    | 3200.1 | 3092.7 | 2871.3 | 2733.9 | 2683.4 |
| 27.5°  | 3096.3 | 2982.0 | 2737.1 | 2579.4 | 2502.2 |
| 30°    | 2985.5 | 2857.8 | 2589.5 | 2418.6 | 2327.8 |
| 32.5°  | 2878.1 | 2723.6 | 2448.8 | 2247.5 | 2163.5 |
| 35°    | 2757.4 | 2586.2 | 2291.2 | 2079.8 | 2005.8 |
| 37.5°  | 2640.0 | 2455.3 | 2143.5 | 1911.8 | 1828.2 |
| 40°    | 2515.8 | 2314.7 | 1989.1 | 1750.9 | 1663.8 |
| 42.5°  | 2388.3 | 2173.7 | 1835.0 | 1586.6 | 1502.9 |
| 45°    | 2254.2 | 2029.3 | 1677.3 | 1438.8 | 1358.4 |
| 47.5°  | 2126.8 | 1888.7 | 1526.4 | 1287.9 | 1214.3 |
| 50°    | 1985.8 | 1747.8 | 1378.8 | 1147.0 | 1076.9 |
| 52.5°  | 1848.1 | 1596.5 | 1237.8 | 1016.4 | 952.7  |
| 55°    | 1713.9 | 1452.4 | 1090.1 | 889.0  | 825.3  |
| 57.5°  | 1576.6 | 1308.2 | 959.4  | 771.6  | 717.8  |
| 60°    | 1435.7 | 1167.3 | 821.7  | 650.9  | 597.2  |
| 62.5°  | 1298.3 | 1030.0 | 704.3  | 543.5  | 516.7  |
| 65°    | 1157.3 | 885.4  | 583.7  | 469.8  | 459.4  |
| 67.5°  | 1023.2 | 751.3  | 469.8  | 412.5  | 402.5  |
| 70°    | 882.2  | 620.7  | 389.0  | 355.6  | 342.0  |
| 72.5°  | 748.0  | 499.7  | 325.3  | 298.6  | 291.8  |
| 75°    | 617.1  | 382.2  | 268.3  | 244.8  | 241.7  |
| 77.5°  | 486.5  | 271.6  | 211.4  | 197.9  | 191.1  |
| 80°    | 365.5  | 194.7  | 160.9  | 147.7  | 147.7  |
| 82.5°  | 254.8  | 130.9  | 110.7  | 104.0  | 104.0  |
| 85°    | 144.1  | 73.7   | 63.7   | 63.7   | 63.7   |
| 87.5°  | 53.7   | 26.7   | 26.7   | 23.5   | 23.5   |
| 90°    | 1.0    | 11.9   | 19.9   | 24.9   | 26.8   |
| 92.5°  | 24.9   | 21.0   | 23.9   | 25.9   | 26.8   |
| 95°    | 64.7   | 31.8   | 38.8   | 43.9   | 42.8   |
| 97.5°  | 116.4  | 34.9   | 50.7   | 53.8   | 54.7   |
| 100°   | 176.3  | 39.9   | 56.7   | 64.7   | 66.7   |
| 102.5° | 241.9  | 239.9  | 58.8   | 69.6   | 72.7   |
| 105°   | 302.6  | 332.6  | 60.7   | 71.7   | 75.7   |
| 107.5° | 373.3  | 398.1  | 62.8   | 73.6   | 77.7   |
| 110°   | 441.1  | 461.9  | 174.2  | 74.7   | 78.6   |

TEST NUMBER: P917043

CATALOG NUMBER: DFN2DIP-PN4F0-110D050US930-RLLONL

**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 504.8  | 522.6  | 505.7  | 76.6   | 79.7   |
| 115°   | 572.4  | 589.3  | 614.2  | 153.4  | 81.7   |
| 117.5° | 631.1  | 651.0  | 668.1  | 525.5  | 264.8  |
| 120°   | 696.8  | 711.8  | 729.7  | 741.7  | 607.2  |
| 122.5° | 752.5  | 768.5  | 788.5  | 794.4  | 795.5  |
| 125°   | 809.3  | 822.3  | 841.2  | 848.2  | 851.2  |
| 127.5° | 861.0  | 875.0  | 890.1  | 899.9  | 900.9  |
| 130°   | 909.9  | 925.9  | 936.7  | 947.7  | 946.8  |
| 132.5° | 959.7  | 972.7  | 983.5  | 992.5  | 991.6  |
| 135°   | 1001.5 | 1017.5 | 1026.3 | 1036.4 | 1034.4 |
| 137.5° | 1045.2 | 1057.2 | 1067.2 | 1077.2 | 1074.2 |
| 140°   | 1088.0 | 1096.1 | 1106.9 | 1115.9 | 1111.0 |
| 142.5° | 1124.0 | 1131.0 | 1143.9 | 1151.8 | 1146.8 |
| 145°   | 1161.8 | 1160.7 | 1177.6 | 1184.6 | 1179.7 |
| 147.5° | 1194.6 | 1191.6 | 1208.5 | 1213.5 | 1209.6 |
| 150°   | 1226.5 | 1219.5 | 1235.4 | 1241.4 | 1236.4 |
| 152.5° | 1253.3 | 1245.4 | 1260.3 | 1266.3 | 1259.3 |
| 155°   | 1279.2 | 1270.3 | 1282.2 | 1288.2 | 1280.3 |
| 157.5° | 1300.1 | 1292.2 | 1301.1 | 1308.1 | 1300.1 |
| 160°   | 1318.1 | 1312.1 | 1318.1 | 1324.0 | 1317.0 |
| 162.5° | 1333.9 | 1328.0 | 1332.9 | 1339.9 | 1331.0 |
| 165°   | 1347.9 | 1342.0 | 1344.9 | 1351.8 | 1344.9 |
| 167.5° | 1358.9 | 1352.8 | 1355.9 | 1362.9 | 1353.9 |
| 170°   | 1367.8 | 1361.8 | 1363.8 | 1370.8 | 1361.8 |
| 172.5° | 1373.8 | 1367.8 | 1369.9 | 1376.8 | 1367.8 |
| 175°   | 1378.8 | 1371.7 | 1373.8 | 1380.7 | 1370.8 |
| 177.5° | 1380.7 | 1373.8 | 1374.8 | 1381.8 | 1372.8 |
| 180°   | 1375.7 | 1375.7 | 1375.7 | 1375.7 | 1375.7 |

TEST NUMBER: P917043

CATALOG NUMBER: DFN2DIP-PN4F0-110D050US930-RLONL

**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 | 11.94            | 12.92 | 12.76 | 13.75 | 14.79 | 7.91           | 8.88  | 8.73  | 9.72  | 10.75 |
|                 | 3H   | 13.63            | 14.50 | 14.47 | 15.35 | 16.42 | 9.11           | 9.98  | 9.94  | 10.83 | 11.89 |
|                 | 4H   | 14.25            | 15.07 | 15.10 | 15.93 | 17.00 | 9.56           | 10.39 | 10.41 | 11.24 | 12.32 |
|                 | 6H   | 14.68            | 15.44 | 15.54 | 16.30 | 17.39 | 9.89           | 10.65 | 10.76 | 11.51 | 12.60 |
|                 | 8H   | 14.81            | 15.53 | 15.68 | 16.41 | 17.50 | 9.99           | 10.71 | 10.86 | 11.59 | 12.68 |
|                 | 12H  | 14.88            | 15.57 | 15.76 | 16.44 | 17.55 | 10.04          | 10.72 | 10.91 | 11.60 | 12.71 |
| 4H              | 2H   | 11.98            | 12.80 | 12.83 | 13.65 | 14.73 | 8.52           | 9.34  | 9.38  | 10.20 | 11.27 |
|                 | 3H   | 13.82            | 14.51 | 14.69 | 15.39 | 16.48 | 9.89           | 10.57 | 10.75 | 11.45 | 12.54 |
|                 | 4H   | 14.52            | 15.14 | 15.40 | 16.03 | 17.14 | 10.44          | 11.06 | 11.32 | 11.94 | 13.06 |
|                 | 6H   | 15.05            | 15.58 | 15.94 | 16.49 | 17.61 | 10.87          | 11.40 | 11.76 | 12.31 | 13.43 |
|                 | 8H   | 15.23            | 15.73 | 16.12 | 16.63 | 17.76 | 11.00          | 11.50 | 11.90 | 12.40 | 13.53 |
|                 | 12H  | 15.33            | 15.78 | 16.25 | 16.70 | 17.84 | 11.07          | 11.52 | 11.99 | 12.44 | 13.58 |
| 8H              | 4H   | 14.50            | 15.00 | 15.40 | 15.90 | 17.04 | 10.73          | 11.23 | 11.63 | 12.13 | 13.27 |
|                 | 6H   | 15.08            | 15.49 | 16.00 | 16.43 | 17.57 | 11.26          | 11.67 | 12.18 | 12.61 | 13.75 |
|                 | 8H   | 15.29            | 15.66 | 16.23 | 16.60 | 17.75 | 11.45          | 11.82 | 12.38 | 12.75 | 13.90 |
|                 | 12H  | 15.44            | 15.76 | 16.38 | 16.69 | 17.89 | 11.58          | 11.90 | 12.51 | 12.83 | 14.03 |
| 12H             | 4H   | 14.46            | 14.91 | 15.37 | 15.83 | 16.97 | 10.74          | 11.19 | 11.66 | 12.11 | 13.25 |
|                 | 6H   | 15.05            | 15.42 | 15.98 | 16.35 | 17.50 | 11.31          | 11.67 | 12.24 | 12.61 | 13.76 |
|                 | 8H   | 15.28            | 15.60 | 16.22 | 16.53 | 17.73 | 11.53          | 11.85 | 12.46 | 12.78 | 13.98 |

END OF REPORT