

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: P922507

Luminaire Tested: DFN2DIP-PN4F0-110D070US940-RLLONL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P922507  
REPORT IS A COMBINATION OF REPORTS P901198 AND P898053  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-PN4F0-110D070US940-RLLONL  
Description: 4 foot, Pentagon Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

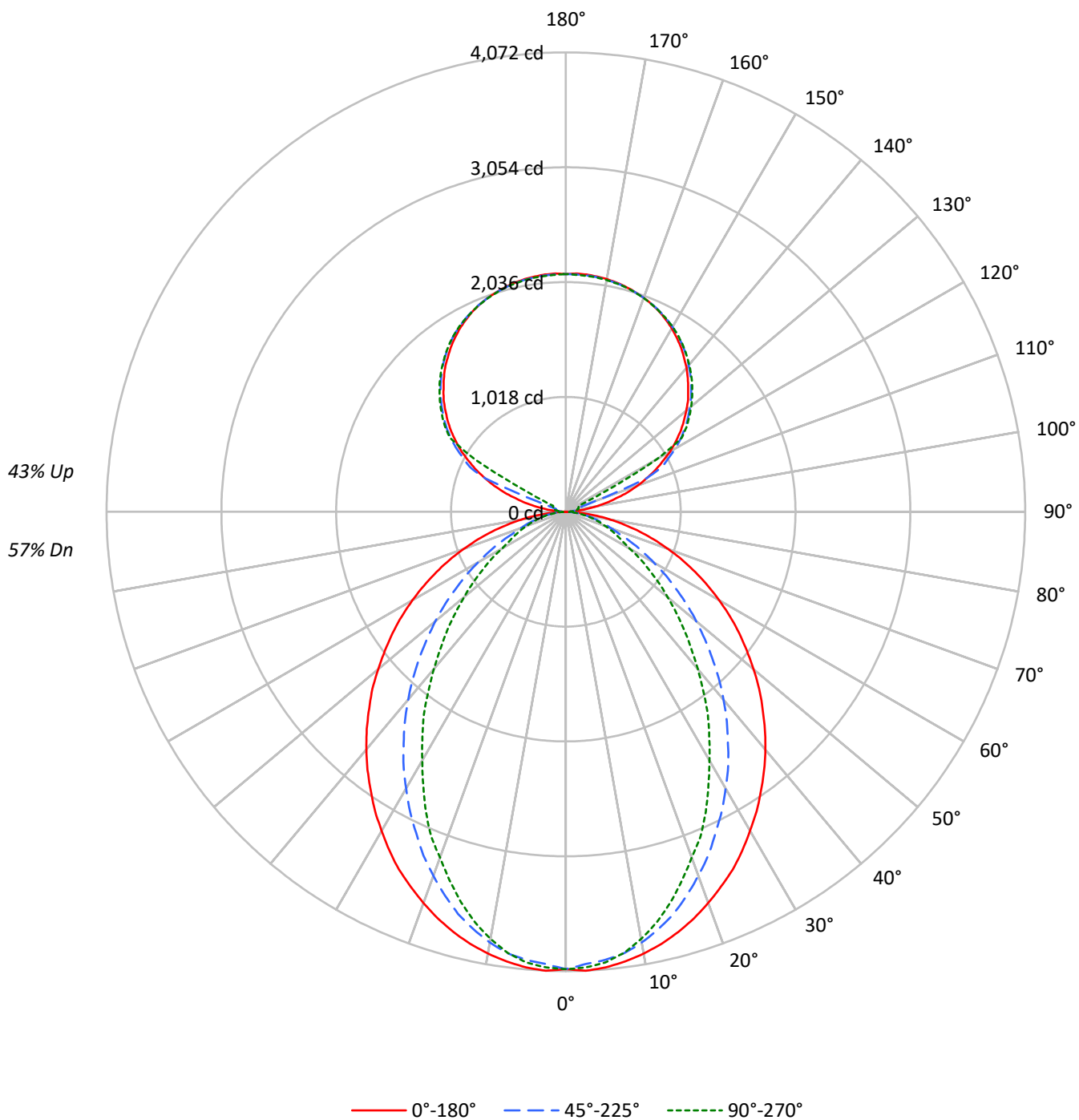
**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 14517.1 lumens  
Efficiency: N/A  
Efficacy: 87.0 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: General Diffuse  
  
Input Watts (W): 166.8  
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

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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 |    |  |    |    | 10 |
| RW  | 70  | 50  | 30  | 10  |  | 70  | 50  | 30  | 10  |  | 50 | 30 | 10 |  | 50 | 30 | 10 |  | 50 | 30 | 10 |
| RCR |     |     |     |     |  |     |     |     |     |  |    |    |    |  |    |    |    |  |    |    |    |
| 0   | 109 | 109 | 109 | 109 |  | 101 | 101 | 101 | 101 |  | 87 | 87 | 87 |  | 75 | 75 | 75 |  | 63 | 63 | 63 |
| 1   | 100 | 96  | 92  | 89  |  | 93  | 89  | 86  | 83  |  | 78 | 75 | 73 |  | 67 | 65 | 63 |  | 57 | 55 | 54 |
| 2   | 92  | 84  | 78  | 73  |  | 85  | 79  | 74  | 69  |  | 69 | 65 | 61 |  | 59 | 56 | 54 |  | 50 | 48 | 47 |
| 3   | 84  | 75  | 68  | 62  |  | 78  | 70  | 64  | 59  |  | 61 | 56 | 52 |  | 53 | 49 | 46 |  | 45 | 43 | 40 |
| 4   | 77  | 66  | 59  | 53  |  | 72  | 62  | 56  | 50  |  | 55 | 49 | 45 |  | 47 | 43 | 40 |  | 41 | 38 | 35 |
| 5   | 71  | 60  | 52  | 46  |  | 66  | 56  | 49  | 44  |  | 49 | 44 | 39 |  | 43 | 39 | 35 |  | 37 | 34 | 31 |
| 6   | 66  | 54  | 46  | 40  |  | 61  | 51  | 43  | 38  |  | 45 | 39 | 35 |  | 39 | 35 | 31 |  | 34 | 30 | 28 |
| 7   | 61  | 49  | 41  | 35  |  | 57  | 46  | 39  | 34  |  | 41 | 35 | 31 |  | 36 | 31 | 28 |  | 31 | 27 | 25 |
| 8   | 57  | 44  | 37  | 32  |  | 53  | 42  | 35  | 30  |  | 37 | 32 | 28 |  | 33 | 28 | 25 |  | 29 | 25 | 22 |
| 9   | 53  | 41  | 33  | 28  |  | 49  | 38  | 32  | 27  |  | 34 | 29 | 25 |  | 30 | 26 | 23 |  | 27 | 23 | 20 |
| 10  | 49  | 37  | 30  | 26  |  | 46  | 35  | 29  | 25  |  | 32 | 26 | 23 |  | 28 | 24 | 21 |  | 25 | 21 | 19 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 2959 | 2959 | 2959 |
| 5°  | 2964 | 2913 | 2931 |
| 10° | 2935 | 2856 | 2837 |
| 15° | 2894 | 2762 | 2690 |
| 20° | 2841 | 2632 | 2509 |
| 25° | 2786 | 2487 | 2335 |
| 30° | 2713 | 2337 | 2113 |
| 35° | 2641 | 2177 | 1919 |
| 40° | 2567 | 2011 | 1696 |
| 45° | 2482 | 1826 | 1494 |
| 50° | 2394 | 1640 | 1296 |
| 55° | 2302 | 1441 | 1107 |
| 60° | 2196 | 1233 | 911  |
| 65° | 2073 | 1022 | 821  |
| 70° | 1925 | 824  | 744  |
| 75° | 1739 | 728  | 678  |
| 80° | 1469 | 612  | 590  |
| 85° | 1024 | 410  | 447  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 2482 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 379.9   | 2.6       |
| 10°-20°   | 1043.0  | 7.2       |
| 20°-30°   | 1464.4  | 10.1      |
| 30°-40°   | 1596.2  | 11.0      |
| 40°-50°   | 1467.1  | 10.1      |
| 50°-60°   | 1152.2  | 7.9       |
| 60°-70°   | 750.0   | 5.2       |
| 70°-80°   | 386.0   | 2.7       |
| 80°-90°   | 102.3   | 0.7       |
| 90°-100°  | 69.5    | 0.5       |
| 100°-110° | 259.0   | 1.8       |
| 110°-120° | 686.8   | 4.7       |
| 120°-130° | 1139.1  | 7.8       |
| 130°-140° | 1209.9  | 8.3       |
| 140°-150° | 1124.5  | 7.7       |
| 150°-160° | 904.1   | 6.2       |
| 160°-170° | 582.6   | 4.0       |
| 170°-180° | 200.5   | 1.4       |
| 0°-30°    | 2887.3  | 19.9      |
| 0°-40°    | 4483.6  | 30.9      |
| 0°-60°    | 7102.9  | 48.9      |
| 0°-90°    | 8341.2  | 57.5      |
| 90°-120°  | 1015.2  | 7.0       |
| 90°-150°  | 4488.7  | 30.9      |
| 90°-180°  | 6176.0  | 42.5      |
| 0°-180°   | 14517.1 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 4054 | 4054  | 4054 | 4054  | 4054 |      |
| 5°   | 4054 | 4036  | 3988 | 4021  | 4010 | 384  |
| 15°  | 3856 | 3815  | 3691 | 3621  | 3584 | 1087 |
| 25°  | 3500 | 3382  | 3140 | 2990  | 2935 | 1610 |
| 35°  | 3016 | 2829  | 2506 | 2275  | 2194 | 1888 |
| 45°  | 2466 | 2220  | 1834 | 1574  | 1486 | 1904 |
| 55°  | 1875 | 1588  | 1192 | 972   | 903  | 1675 |
| 65°  | 1266 | 968   | 638  | 514   | 502  | 1255 |
| 75°  | 675  | 418   | 294  | 268   | 264  | 714  |
| 85°  | 158  | 81    | 70   | 70    | 70   | 181  |
| 90°  | 1    | 18    | 30   | 38    | 41   | 14   |
| 95°  | 99   | 49    | 59   | 67    | 66   | 117  |
| 105° | 463  | 509   | 93   | 110   | 116  | 495  |
| 115° | 876  | 902   | 940  | 235   | 125  | 863  |
| 125° | 1239 | 1259  | 1288 | 1299  | 1303 | 1105 |
| 135° | 1534 | 1558  | 1572 | 1587  | 1584 | 1185 |
| 145° | 1779 | 1777  | 1803 | 1814  | 1806 | 1113 |
| 155° | 1959 | 1945  | 1963 | 1972  | 1960 | 903  |
| 165° | 2064 | 2055  | 2059 | 2070  | 2059 | 583  |
| 175° | 2111 | 2100  | 2104 | 2114  | 2099 | 201  |
| 180° | 2107 | 2107  | 2107 | 2107  | 2107 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 4054.0 | 4054.0 | 4054.0 | 4054.0 | 4054.0 |
| 2.5°   | 4072.3 | 4054.0 | 4013.5 | 4050.5 | 4043.1 |
| 5°     | 4054.0 | 4035.7 | 3987.8 | 4020.9 | 4010.0 |
| 7.5°   | 4020.9 | 3999.1 | 3947.7 | 3962.1 | 3943.8 |
| 10°    | 3976.9 | 3951.2 | 3878.0 | 3866.7 | 3845.0 |
| 12.5°  | 3922.0 | 3888.9 | 3789.7 | 3767.8 | 3727.3 |
| 15°    | 3855.8 | 3815.4 | 3690.8 | 3621.1 | 3584.5 |
| 17.5°  | 3778.8 | 3720.0 | 3565.9 | 3485.2 | 3426.5 |
| 20°    | 3690.8 | 3617.2 | 3433.9 | 3342.4 | 3261.4 |
| 22.5°  | 3595.5 | 3510.9 | 3298.1 | 3173.5 | 3118.6 |
| 25°    | 3500.1 | 3382.5 | 3140.4 | 2990.2 | 2934.9 |
| 27.5°  | 3386.4 | 3261.4 | 2993.7 | 2821.2 | 2736.7 |
| 30°    | 3265.4 | 3125.6 | 2832.2 | 2645.3 | 2546.0 |
| 32.5°  | 3147.8 | 2978.8 | 2678.3 | 2458.1 | 2366.2 |
| 35°    | 3015.9 | 2828.6 | 2506.0 | 2274.8 | 2193.8 |
| 37.5°  | 2887.4 | 2685.4 | 2344.4 | 2091.0 | 1999.6 |
| 40°    | 2751.6 | 2531.7 | 2175.5 | 1915.0 | 1819.7 |
| 42.5°  | 2612.2 | 2377.5 | 2007.0 | 1735.3 | 1643.8 |
| 45°    | 2465.5 | 2219.5 | 1834.5 | 1573.7 | 1485.8 |
| 47.5°  | 2326.1 | 2065.7 | 1669.5 | 1408.6 | 1328.1 |
| 50°    | 2171.9 | 1911.6 | 1508.0 | 1254.5 | 1177.9 |
| 52.5°  | 2021.3 | 1746.1 | 1353.8 | 1111.7 | 1042.0 |
| 55°    | 1874.6 | 1588.5 | 1192.2 | 972.3  | 902.7  |
| 57.5°  | 1724.4 | 1430.8 | 1049.4 | 843.9  | 785.1  |
| 60°    | 1570.2 | 1276.8 | 898.8  | 711.9  | 653.2  |
| 62.5°  | 1420.0 | 1126.5 | 770.3  | 594.4  | 565.2  |
| 65°    | 1265.8 | 968.4  | 638.4  | 513.8  | 502.5  |
| 67.5°  | 1119.1 | 821.7  | 513.8  | 451.1  | 440.2  |
| 70°    | 964.9  | 678.9  | 425.4  | 388.9  | 374.1  |
| 72.5°  | 818.1  | 546.5  | 355.8  | 326.5  | 319.1  |
| 75°    | 674.9  | 418.0  | 293.5  | 267.8  | 264.3  |
| 77.5°  | 532.1  | 297.0  | 231.2  | 216.4  | 209.0  |
| 80°    | 399.8  | 212.9  | 175.9  | 161.6  | 161.6  |
| 82.5°  | 278.7  | 143.2  | 121.1  | 113.7  | 113.7  |
| 85°    | 157.7  | 80.6   | 69.6   | 69.6   | 69.6   |
| 87.5°  | 58.8   | 29.2   | 29.2   | 25.7   | 25.7   |
| 90°    | 1.4    | 18.3   | 30.4   | 38.2   | 41.1   |
| 92.5°  | 38.2   | 32.0   | 36.6   | 39.7   | 41.1   |
| 95°    | 99.0   | 48.7   | 59.4   | 67.1   | 65.5   |
| 97.5°  | 178.3  | 53.4   | 77.7   | 82.4   | 83.8   |
| 100°   | 269.9  | 61.0   | 86.9   | 99.0   | 102.1  |
| 102.5° | 370.3  | 367.5  | 90.0   | 106.6  | 111.3  |
| 105°   | 463.4  | 509.2  | 93.0   | 109.7  | 115.8  |
| 107.5° | 571.6  | 609.7  | 96.1   | 112.8  | 119.0  |
| 110°   | 675.4  | 707.2  | 266.8  | 114.4  | 120.4  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 772.9  | 800.2  | 774.4  | 117.3  | 122.0  |
| 115°   | 876.5  | 902.3  | 940.5  | 234.8  | 125.1  |
| 117.5° | 966.4  | 996.8  | 1022.9 | 804.8  | 405.5  |
| 120°   | 1067.0 | 1089.8 | 1117.4 | 1135.7 | 929.9  |
| 122.5° | 1152.3 | 1176.7 | 1207.4 | 1216.4 | 1218.0 |
| 125°   | 1239.2 | 1259.1 | 1288.1 | 1298.8 | 1303.2 |
| 127.5° | 1318.5 | 1339.8 | 1362.8 | 1378.0 | 1379.5 |
| 130°   | 1393.2 | 1417.6 | 1434.3 | 1451.2 | 1449.7 |
| 132.5° | 1469.4 | 1489.3 | 1506.0 | 1519.7 | 1518.3 |
| 135°   | 1533.5 | 1557.9 | 1571.6 | 1586.9 | 1583.9 |
| 137.5° | 1600.4 | 1618.8 | 1634.1 | 1649.4 | 1644.8 |
| 140°   | 1666.0 | 1678.3 | 1695.0 | 1708.7 | 1701.1 |
| 142.5° | 1721.0 | 1731.7 | 1751.4 | 1763.5 | 1756.0 |
| 145°   | 1779.0 | 1777.4 | 1803.2 | 1813.9 | 1806.3 |
| 147.5° | 1829.1 | 1824.6 | 1850.5 | 1858.1 | 1852.1 |
| 150°   | 1877.9 | 1867.3 | 1891.8 | 1900.8 | 1893.2 |
| 152.5° | 1919.0 | 1906.9 | 1929.8 | 1938.9 | 1928.3 |
| 155°   | 1958.7 | 1945.1 | 1963.4 | 1972.5 | 1960.3 |
| 157.5° | 1990.7 | 1978.6 | 1992.3 | 2003.0 | 1990.7 |
| 160°   | 2018.3 | 2009.0 | 2018.3 | 2027.3 | 2016.6 |
| 162.5° | 2042.6 | 2033.5 | 2041.0 | 2051.7 | 2038.0 |
| 165°   | 2063.9 | 2054.9 | 2059.3 | 2070.0 | 2059.3 |
| 167.5° | 2080.7 | 2071.4 | 2076.2 | 2086.9 | 2073.1 |
| 170°   | 2094.4 | 2085.3 | 2088.3 | 2099.0 | 2085.3 |
| 172.5° | 2103.5 | 2094.4 | 2097.6 | 2108.2 | 2094.4 |
| 175°   | 2111.1 | 2100.4 | 2103.5 | 2114.2 | 2099.0 |
| 177.5° | 2114.2 | 2103.5 | 2105.1 | 2115.9 | 2102.0 |
| 180°   | 2106.6 | 2106.6 | 2106.6 | 2106.6 | 2106.6 |

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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 | 11.59            | 12.49 | 12.49 | 13.40 | 14.56 | 7.56           | 8.45  | 8.46  | 9.37  | 10.53 |
|                 | 3H   | 13.28            | 14.08 | 14.19 | 15.00 | 16.19 | 8.75           | 9.55  | 9.66  | 10.47 | 11.66 |
|                 | 4H   | 13.89            | 14.65 | 14.82 | 15.57 | 16.77 | 9.21           | 9.96  | 10.13 | 10.89 | 12.09 |
|                 | 6H   | 14.32            | 15.01 | 15.26 | 15.95 | 17.16 | 9.53           | 10.23 | 10.47 | 11.16 | 12.37 |
|                 | 8H   | 14.45            | 15.11 | 15.39 | 16.06 | 17.27 | 9.62           | 10.29 | 10.57 | 11.24 | 12.45 |
|                 | 12H  | 14.51            | 15.14 | 15.46 | 16.09 | 17.32 | 9.67           | 10.30 | 10.62 | 11.24 | 12.48 |
| 4H              | 2H   | 11.62            | 12.37 | 12.55 | 13.30 | 14.50 | 8.16           | 8.92  | 9.09  | 9.85  | 11.04 |
|                 | 3H   | 13.46            | 14.09 | 14.40 | 15.04 | 16.26 | 9.52           | 10.15 | 10.46 | 11.11 | 12.32 |
|                 | 4H   | 14.15            | 14.73 | 15.10 | 15.68 | 16.92 | 10.07          | 10.64 | 11.02 | 11.60 | 12.83 |
|                 | 6H   | 14.68            | 15.17 | 15.64 | 16.14 | 17.38 | 10.50          | 10.99 | 11.46 | 11.96 | 13.20 |
|                 | 8H   | 14.85            | 15.31 | 15.82 | 16.28 | 17.53 | 10.63          | 11.09 | 11.59 | 12.06 | 13.31 |
|                 | 12H  | 14.95            | 15.37 | 15.94 | 16.35 | 17.61 | 10.69          | 11.11 | 11.68 | 12.10 | 13.35 |
| 8H              | 4H   | 14.13            | 14.59 | 15.09 | 15.56 | 16.81 | 10.36          | 10.82 | 11.32 | 11.79 | 13.04 |
|                 | 6H   | 14.70            | 15.08 | 15.69 | 16.09 | 17.34 | 10.88          | 11.26 | 11.87 | 12.27 | 13.52 |
|                 | 8H   | 14.92            | 15.25 | 15.92 | 16.25 | 17.52 | 11.07          | 11.41 | 12.07 | 12.41 | 13.68 |
|                 | 12H  | 15.06            | 15.36 | 16.06 | 16.35 | 17.66 | 11.19          | 11.49 | 12.20 | 12.48 | 13.80 |
| 12H             | 4H   | 14.08            | 14.50 | 15.07 | 15.48 | 16.74 | 10.37          | 10.78 | 11.35 | 11.77 | 13.02 |
|                 | 6H   | 14.67            | 15.01 | 15.67 | 16.01 | 17.28 | 10.93          | 11.27 | 11.93 | 12.27 | 13.53 |
|                 | 8H   | 14.90            | 15.19 | 15.90 | 16.19 | 17.50 | 11.14          | 11.44 | 12.15 | 12.43 | 13.75 |

END OF REPORT