

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: P923075

Luminaire Tested: DFN2DIP-SQ4F0-070D070US940-RLLONL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P923075  
REPORT IS A COMBINATION OF REPORTS P901600 AND P898471  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-SQ4F0-070D070US940-RLLONL  
Description: 4 foot, Square Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

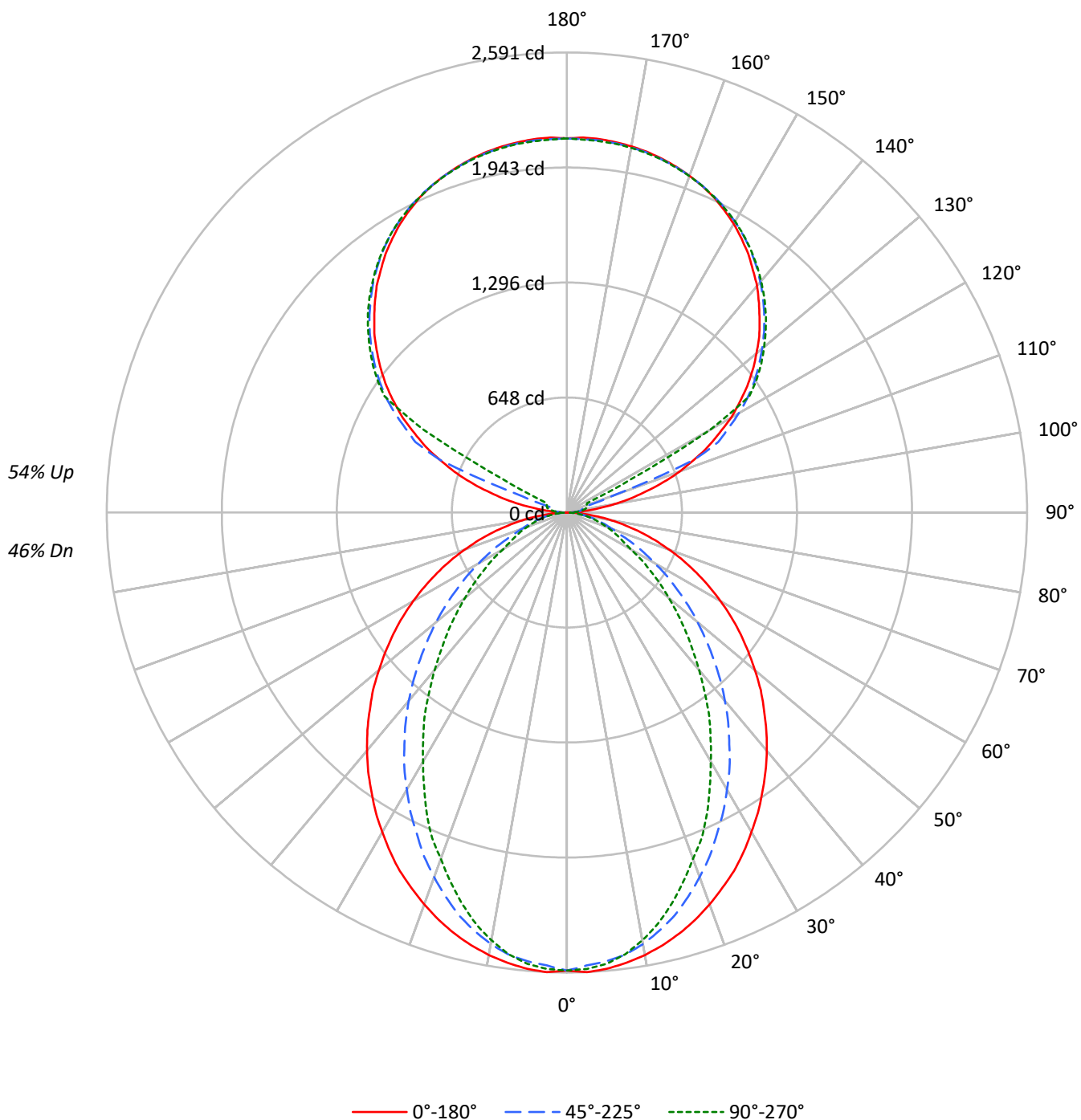
Lumens per Lamp: N/A  
Luminaire Lumens: 11485.2 lumens  
Efficiency: N/A  
Efficacy: 101.2 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 0.99 / 1.16  
Luminous Opening: Rectangular w/ Sides (W: 3.92' x L: 3.92' x H: 0.1')  
CIE Type: General Diffuse

Input Watts (W): 113.5  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9967  
Total Harmonic Distortion (THDi): 0.063  
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   | 106 | 106 | 106 | 106 | 98 | 98 | 98 | 98 | 81 | 81 | 81 | 66 | 66 | 66 | 53 | 53 | 53 |
| 1   | 97  | 93  | 90  | 86  | 89 | 86 | 83 | 80 | 72 | 70 | 68 | 59 | 58 | 56 | 47 | 46 | 45 |
| 2   | 89  | 82  | 76  | 71  | 82 | 76 | 70 | 66 | 63 | 60 | 57 | 52 | 50 | 48 | 42 | 40 | 39 |
| 3   | 81  | 72  | 65  | 60  | 75 | 67 | 61 | 56 | 56 | 52 | 48 | 47 | 43 | 41 | 38 | 35 | 34 |
| 4   | 75  | 64  | 57  | 51  | 68 | 60 | 53 | 48 | 50 | 45 | 41 | 42 | 38 | 35 | 34 | 31 | 29 |
| 5   | 69  | 58  | 50  | 44  | 63 | 53 | 46 | 41 | 45 | 40 | 36 | 38 | 34 | 31 | 31 | 28 | 26 |
| 6   | 63  | 52  | 44  | 38  | 58 | 48 | 41 | 36 | 41 | 36 | 32 | 34 | 30 | 27 | 28 | 25 | 23 |
| 7   | 59  | 47  | 39  | 34  | 54 | 44 | 37 | 32 | 37 | 32 | 28 | 31 | 27 | 24 | 26 | 23 | 21 |
| 8   | 55  | 43  | 35  | 30  | 50 | 40 | 33 | 28 | 34 | 29 | 25 | 29 | 25 | 22 | 24 | 21 | 19 |
| 9   | 51  | 39  | 32  | 27  | 47 | 36 | 30 | 25 | 31 | 26 | 22 | 27 | 23 | 20 | 22 | 19 | 17 |
| 10  | 48  | 36  | 29  | 24  | 44 | 33 | 27 | 23 | 29 | 24 | 20 | 25 | 21 | 18 | 20 | 18 | 15 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 1810 | 1810 | 1810 |
| 5°  | 1813 | 1782 | 1793 |
| 10° | 1795 | 1747 | 1736 |
| 15° | 1770 | 1690 | 1646 |
| 20° | 1738 | 1611 | 1536 |
| 25° | 1704 | 1522 | 1429 |
| 30° | 1659 | 1430 | 1294 |
| 35° | 1615 | 1332 | 1175 |
| 40° | 1570 | 1231 | 1038 |
| 45° | 1518 | 1118 | 915  |
| 50° | 1464 | 1004 | 794  |
| 55° | 1408 | 883  | 678  |
| 60° | 1343 | 755  | 559  |
| 65° | 1268 | 626  | 503  |
| 70° | 1177 | 505  | 456  |
| 75° | 1063 | 446  | 416  |
| 80° | 898  | 376  | 363  |
| 85° | 625  | 252  | 276  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 1518 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 241.8   | 2.1       |
| 10°-20°   | 663.7   | 5.8       |
| 20°-30°   | 931.9   | 8.1       |
| 30°-40°   | 1015.8  | 8.8       |
| 40°-50°   | 933.6   | 8.1       |
| 50°-60°   | 733.2   | 6.4       |
| 60°-70°   | 477.3   | 4.2       |
| 70°-80°   | 245.7   | 2.1       |
| 80°-90°   | 66.4    | 0.6       |
| 90°-100°  | 69.5    | 0.6       |
| 100°-110° | 259.0   | 2.3       |
| 110°-120° | 686.8   | 6.0       |
| 120°-130° | 1139.1  | 9.9       |
| 130°-140° | 1209.9  | 10.5      |
| 140°-150° | 1124.5  | 9.8       |
| 150°-160° | 904.1   | 7.9       |
| 160°-170° | 582.6   | 5.1       |
| 170°-180° | 200.5   | 1.7       |
| 0°-30°    | 1837.4  | 16.0      |
| 0°-40°    | 2853.2  | 24.8      |
| 0°-60°    | 4520.0  | 39.4      |
| 0°-90°    | 5309.4  | 46.2      |
| 90°-120°  | 1015.2  | 8.8       |
| 90°-150°  | 4488.7  | 39.1      |
| 90°-180°  | 6176.0  | 53.8      |
| 0°-180°   | 11485.2 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 2580 | 2580  | 2580 | 2580  | 2580 |      |
| 5°   | 2580 | 2568  | 2538 | 2559  | 2552 | 245  |
| 15°  | 2454 | 2428  | 2349 | 2304  | 2281 | 691  |
| 25°  | 2227 | 2152  | 1998 | 1903  | 1868 | 1024 |
| 35°  | 1919 | 1800  | 1595 | 1448  | 1396 | 1201 |
| 45°  | 1569 | 1412  | 1167 | 1002  | 946  | 1212 |
| 55°  | 1193 | 1011  | 759  | 619   | 574  | 1066 |
| 65°  | 806  | 616   | 406  | 327   | 320  | 799  |
| 75°  | 430  | 266   | 187  | 170   | 168  | 454  |
| 85°  | 100  | 51    | 44   | 44    | 44   | 115  |
| 90°  | 1    | 18    | 30   | 38    | 41   | 11   |
| 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 |      |

TEST NUMBER: P923075

CATALOG NUMBER: DFN2DIP-SQ4F0-070D070US940-RLLONL

**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 2579.8 | 2579.8 | 2579.8 | 2579.8 | 2579.8 |
| 2.5°   | 2591.4 | 2579.8 | 2554.0 | 2577.6 | 2572.9 |
| 5°     | 2579.8 | 2568.1 | 2537.7 | 2558.8 | 2551.8 |
| 7.5°   | 2558.8 | 2544.9 | 2512.2 | 2521.3 | 2509.7 |
| 10°    | 2530.8 | 2514.4 | 2467.8 | 2460.7 | 2446.8 |
| 12.5°  | 2495.8 | 2474.8 | 2411.6 | 2397.7 | 2371.9 |
| 15°    | 2453.7 | 2427.9 | 2348.7 | 2304.4 | 2281.1 |
| 17.5°  | 2404.7 | 2367.3 | 2269.2 | 2217.9 | 2180.5 |
| 20°    | 2348.7 | 2301.9 | 2185.2 | 2127.0 | 2075.5 |
| 22.5°  | 2288.0 | 2234.3 | 2098.7 | 2019.5 | 1984.6 |
| 25°    | 2227.3 | 2152.5 | 1998.4 | 1902.8 | 1867.7 |
| 27.5°  | 2155.0 | 2075.5 | 1905.1 | 1795.4 | 1741.6 |
| 30°    | 2078.0 | 1989.0 | 1802.2 | 1683.4 | 1620.2 |
| 32.5°  | 2003.1 | 1895.7 | 1704.4 | 1564.2 | 1505.7 |
| 35°    | 1919.1 | 1800.0 | 1594.7 | 1447.6 | 1396.1 |
| 37.5°  | 1837.5 | 1708.9 | 1491.9 | 1330.6 | 1272.5 |
| 40°    | 1751.0 | 1611.1 | 1384.4 | 1218.7 | 1158.0 |
| 42.5°  | 1662.3 | 1513.0 | 1277.1 | 1104.2 | 1046.1 |
| 45°    | 1569.0 | 1412.4 | 1167.4 | 1001.5 | 945.5  |
| 47.5°  | 1480.2 | 1314.6 | 1062.4 | 896.4  | 845.2  |
| 50°    | 1382.2 | 1216.5 | 959.6  | 798.3  | 749.6  |
| 52.5°  | 1286.3 | 1111.2 | 861.5  | 707.4  | 663.1  |
| 55°    | 1192.9 | 1010.8 | 758.7  | 618.8  | 574.4  |
| 57.5°  | 1097.3 | 910.5  | 667.8  | 537.0  | 499.6  |
| 60°    | 999.3  | 812.4  | 571.9  | 453.1  | 415.6  |
| 62.5°  | 903.6  | 716.8  | 490.2  | 378.3  | 359.6  |
| 65°    | 805.5  | 616.3  | 406.3  | 327.0  | 319.8  |
| 67.5°  | 712.1  | 522.9  | 327.0  | 287.0  | 280.2  |
| 70°    | 614.0  | 431.9  | 270.7  | 247.4  | 238.0  |
| 72.5°  | 520.7  | 347.8  | 226.4  | 207.9  | 203.1  |
| 75°    | 429.5  | 266.0  | 186.7  | 170.4  | 168.2  |
| 77.5°  | 338.6  | 189.0  | 147.1  | 137.7  | 133.0  |
| 80°    | 254.4  | 135.5  | 112.0  | 102.8  | 102.8  |
| 82.5°  | 177.4  | 91.1   | 77.0   | 72.3   | 72.3   |
| 85°    | 100.3  | 51.3   | 44.3   | 44.3   | 44.3   |
| 87.5°  | 37.4   | 18.5   | 18.5   | 16.3   | 16.3   |
| 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  |

TEST NUMBER: P923075

CATALOG NUMBER: DFN2DIP-SQ4F0-070D070US940-RLLONL

**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 |

TEST NUMBER: P923075

CATALOG NUMBER: DFN2DIP-SQ4F0-070D070US940-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 | 8.86             | 9.66  | 9.85  | 10.66 | 11.99 | 4.82           | 5.62 | 5.81 | 6.62 | 7.95  |
|                 | 3H   | 10.54            | 11.25 | 11.54 | 12.26 | 13.61 | 6.01           | 6.72 | 7.01 | 7.73 | 9.08  |
|                 | 4H   | 11.15            | 11.82 | 12.17 | 12.84 | 14.20 | 6.46           | 7.13 | 7.47 | 8.15 | 9.50  |
|                 | 6H   | 11.57            | 12.19 | 12.60 | 13.21 | 14.58 | 6.78           | 7.40 | 7.80 | 8.42 | 9.78  |
|                 | 8H   | 11.70            | 12.29 | 12.73 | 13.33 | 14.69 | 6.87           | 7.46 | 7.90 | 8.49 | 9.86  |
|                 | 12H  | 11.76            | 12.33 | 12.80 | 13.35 | 14.74 | 6.91           | 7.47 | 7.95 | 8.50 | 9.89  |
| 4H              | 2H   | 8.87             | 9.55  | 9.90  | 10.56 | 11.92 | 5.41           | 6.09 | 6.44 | 7.10 | 8.46  |
|                 | 3H   | 10.70            | 11.27 | 11.74 | 12.31 | 13.68 | 6.76           | 7.32 | 7.79 | 8.37 | 9.74  |
|                 | 4H   | 11.40            | 11.91 | 12.44 | 12.95 | 14.34 | 7.31           | 7.82 | 8.35 | 8.86 | 10.25 |
|                 | 6H   | 11.92            | 12.36 | 12.97 | 13.42 | 14.80 | 7.73           | 8.17 | 8.78 | 9.23 | 10.62 |
|                 | 8H   | 12.09            | 12.51 | 13.14 | 13.56 | 14.96 | 7.86           | 8.27 | 8.91 | 9.32 | 10.72 |
|                 | 12H  | 12.19            | 12.56 | 13.26 | 13.63 | 15.03 | 7.92           | 8.29 | 8.99 | 9.36 | 10.77 |
| 8H              | 4H   | 11.36            | 11.78 | 12.41 | 12.83 | 14.23 | 7.59           | 8.00 | 8.64 | 9.05 | 10.45 |
|                 | 6H   | 11.93            | 12.27 | 13.01 | 13.37 | 14.77 | 8.11           | 8.45 | 9.18 | 9.54 | 10.94 |
|                 | 8H   | 12.15            | 12.45 | 13.23 | 13.53 | 14.95 | 8.30           | 8.60 | 9.38 | 9.68 | 11.09 |
|                 | 12H  | 12.29            | 12.56 | 13.38 | 13.63 | 15.09 | 8.42           | 8.68 | 9.50 | 9.75 | 11.21 |
| 12H             | 4H   | 11.31            | 11.69 | 12.38 | 12.75 | 14.16 | 7.59           | 7.97 | 8.66 | 9.03 | 10.44 |
|                 | 6H   | 11.91            | 12.21 | 12.99 | 13.29 | 14.70 | 8.16           | 8.46 | 9.24 | 9.53 | 10.95 |
|                 | 8H   | 12.13            | 12.39 | 13.22 | 13.47 | 14.93 | 8.37           | 8.63 | 9.45 | 9.70 | 11.16 |

END OF REPORT