

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: P926449

Luminaire Tested: DFN2DIP-TR4F0-060D060US950-RLLONL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P926449  
REPORT IS A COMBINATION OF REPORTS P901930 AND P898849  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-TR4F0-060D060US950-RLLONL  
Description: 4 foot, Triangle Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

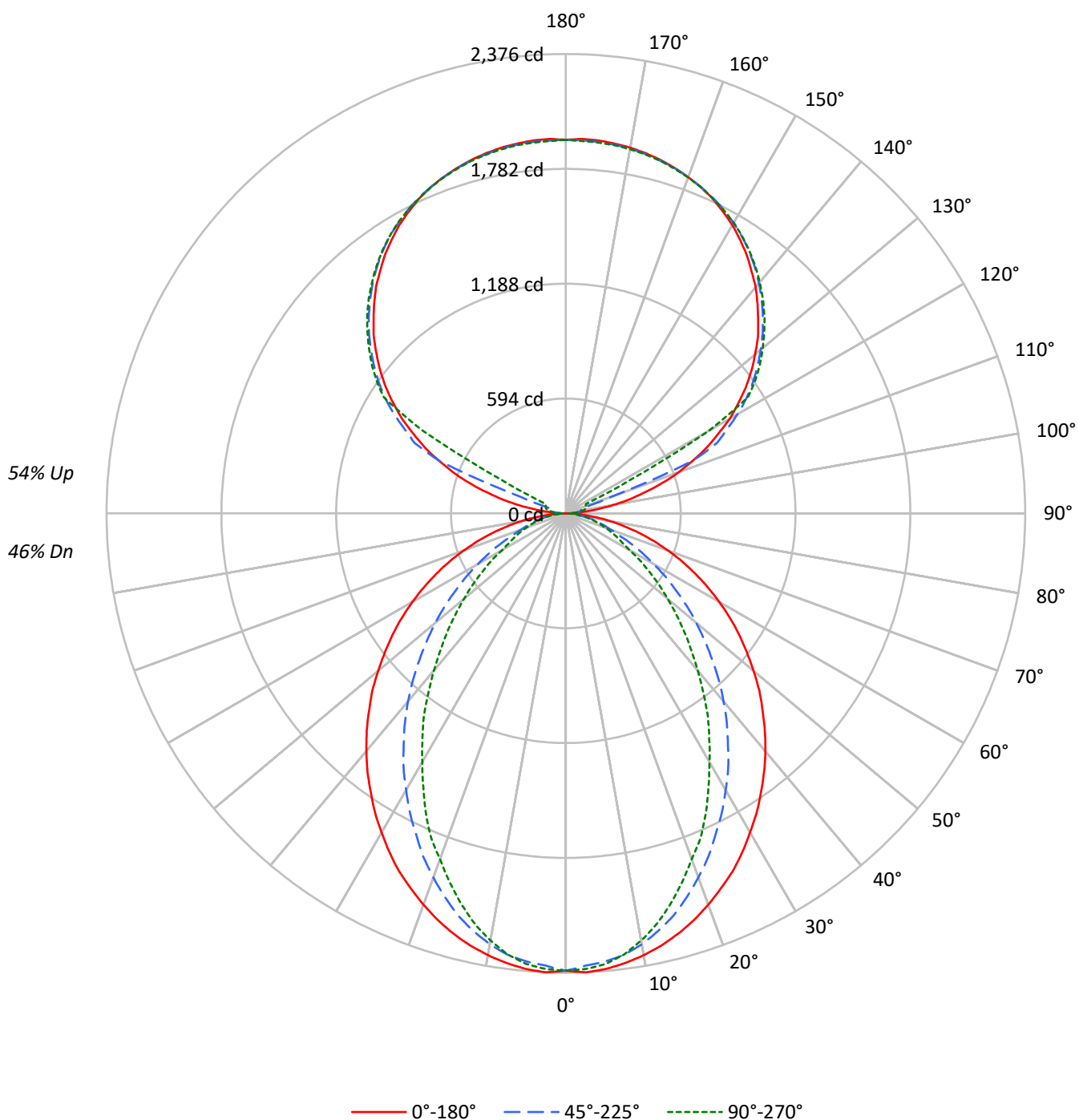
**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 10532.1 lumens  
Efficiency: N/A  
Efficacy: 107.4 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 0.99 / 1.16  
Luminous Opening: Rectangular w/ Sides (W: 3.43' x L: 3.96' x H: 0.1')  
CIE Type: General Diffuse  
  
Input Watts (W): 98.1  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9781  
Total Harmonic Distortion (THDi): 0.075  
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°  | 1879 | 1879 | 1879 |
| 5°  | 1882 | 1850 | 1861 |
| 10° | 1864 | 1813 | 1801 |
| 15° | 1838 | 1753 | 1707 |
| 20° | 1804 | 1671 | 1592 |
| 25° | 1770 | 1578 | 1481 |
| 30° | 1723 | 1483 | 1340 |
| 35° | 1677 | 1381 | 1217 |
| 40° | 1631 | 1275 | 1075 |
| 45° | 1577 | 1158 | 946  |
| 50° | 1521 | 1040 | 821  |
| 55° | 1462 | 913  | 700  |
| 60° | 1395 | 781  | 576  |
| 65° | 1317 | 647  | 519  |
| 70° | 1223 | 521  | 469  |
| 75° | 1105 | 459  | 427  |
| 80° | 933  | 386  | 370  |
| 85° | 651  | 257  | 277  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 1577 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 221.7   | 2.1       |
| 10°-20°   | 608.7   | 5.8       |
| 20°-30°   | 854.5   | 8.1       |
| 30°-40°   | 931.5   | 8.8       |
| 40°-50°   | 856.2   | 8.1       |
| 50°-60°   | 672.4   | 6.4       |
| 60°-70°   | 437.7   | 4.2       |
| 70°-80°   | 225.3   | 2.1       |
| 80°-90°   | 60.9    | 0.6       |
| 90°-100°  | 63.7    | 0.6       |
| 100°-110° | 237.5   | 2.3       |
| 110°-120° | 629.8   | 6.0       |
| 120°-130° | 1044.5  | 9.9       |
| 130°-140° | 1109.5  | 10.5      |
| 140°-150° | 1031.2  | 9.8       |
| 150°-160° | 829.1   | 7.9       |
| 160°-170° | 534.2   | 5.1       |
| 170°-180° | 183.9   | 1.7       |
| 0°-30°    | 1684.9  | 16.0      |
| 0°-40°    | 2616.4  | 24.8      |
| 0°-60°    | 4144.9  | 39.4      |
| 0°-90°    | 4868.8  | 46.2      |
| 90°-120°  | 930.9   | 8.8       |
| 90°-150°  | 4116.2  | 39.1      |
| 90°-180°  | 5663.0  | 53.8      |
| 0°-180°   | 10532.1 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 2366 | 2366  | 2366 | 2366  | 2366 |      |
| 5°   | 2366 | 2355  | 2327 | 2346  | 2340 | 224  |
| 15°  | 2250 | 2226  | 2154 | 2113  | 2092 | 634  |
| 25°  | 2042 | 1974  | 1833 | 1745  | 1713 | 939  |
| 35°  | 1760 | 1651  | 1462 | 1327  | 1280 | 1102 |
| 45°  | 1439 | 1295  | 1071 | 918   | 867  | 1111 |
| 55°  | 1094 | 927   | 696  | 567   | 527  | 978  |
| 65°  | 739  | 565   | 372  | 300   | 293  | 732  |
| 75°  | 394  | 244   | 171  | 156   | 154  | 417  |
| 85°  | 92   | 47    | 41   | 41    | 41   | 106  |
| 90°  | 1    | 17    | 28   | 35    | 38   | 10   |
| 95°  | 91   | 45    | 54   | 62    | 60   | 108  |
| 105° | 425  | 467   | 85   | 101   | 106  | 454  |
| 115° | 804  | 828   | 862  | 215   | 115  | 791  |
| 125° | 1136 | 1155  | 1181 | 1191  | 1195 | 1014 |
| 135° | 1406 | 1429  | 1441 | 1455  | 1452 | 1086 |
| 145° | 1631 | 1630  | 1654 | 1663  | 1656 | 1020 |
| 155° | 1796 | 1784  | 1800 | 1809  | 1798 | 828  |
| 165° | 1893 | 1884  | 1888 | 1898  | 1888 | 535  |
| 175° | 1936 | 1926  | 1929 | 1939  | 1925 | 184  |
| 180° | 1932 | 1932  | 1932 | 1932  | 1932 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 2365.7 | 2365.7 | 2365.7 | 2365.7 | 2365.7 |
| 2.5°   | 2376.4 | 2365.7 | 2342.1 | 2363.6 | 2359.3 |
| 5°     | 2365.7 | 2355.0 | 2327.1 | 2346.5 | 2340.1 |
| 7.5°   | 2346.5 | 2333.7 | 2303.7 | 2312.1 | 2301.4 |
| 10°    | 2320.7 | 2305.7 | 2263.1 | 2256.5 | 2243.7 |
| 12.5°  | 2288.7 | 2269.4 | 2211.5 | 2198.8 | 2175.1 |
| 15°    | 2250.1 | 2226.4 | 2153.8 | 2113.1 | 2091.7 |
| 17.5°  | 2205.2 | 2170.8 | 2080.9 | 2033.8 | 1999.6 |
| 20°    | 2153.8 | 2110.8 | 2003.9 | 1950.5 | 1903.2 |
| 22.5°  | 2098.1 | 2048.8 | 1924.6 | 1851.9 | 1819.9 |
| 25°    | 2042.5 | 1973.9 | 1832.6 | 1745.0 | 1712.7 |
| 27.5°  | 1976.2 | 1903.2 | 1747.0 | 1646.3 | 1597.1 |
| 30°    | 1905.5 | 1824.0 | 1652.7 | 1543.7 | 1485.8 |
| 32.5°  | 1836.9 | 1738.4 | 1563.0 | 1434.4 | 1380.8 |
| 35°    | 1759.9 | 1650.7 | 1462.4 | 1327.4 | 1280.2 |
| 37.5°  | 1685.0 | 1567.0 | 1368.1 | 1220.3 | 1166.8 |
| 40°    | 1605.7 | 1477.4 | 1269.5 | 1117.5 | 1061.9 |
| 42.5°  | 1524.4 | 1387.4 | 1171.1 | 1012.6 | 959.2  |
| 45°    | 1438.7 | 1295.2 | 1070.6 | 918.3  | 867.0  |
| 47.5°  | 1357.4 | 1205.5 | 974.2  | 822.1  | 775.0  |
| 50°    | 1267.5 | 1115.5 | 880.0  | 732.1  | 687.4  |
| 52.5°  | 1179.5 | 1019.0 | 790.0  | 648.7  | 608.1  |
| 55°    | 1094.0 | 927.0  | 695.8  | 567.4  | 526.7  |
| 57.5°  | 1006.3 | 834.9  | 612.4  | 492.5  | 458.1  |
| 60°    | 916.3  | 745.1  | 524.5  | 415.5  | 381.1  |
| 62.5°  | 828.6  | 657.4  | 449.5  | 346.9  | 329.8  |
| 65°    | 738.7  | 565.1  | 372.5  | 299.8  | 293.3  |
| 67.5°  | 653.0  | 479.5  | 299.8  | 263.3  | 256.9  |
| 70°    | 563.1  | 396.1  | 248.2  | 227.0  | 218.3  |
| 72.5°  | 477.5  | 318.9  | 207.6  | 190.6  | 186.2  |
| 75°    | 393.9  | 243.9  | 171.2  | 156.3  | 154.3  |
| 77.5°  | 310.5  | 173.3  | 134.9  | 126.3  | 122.0  |
| 80°    | 233.3  | 124.2  | 102.7  | 94.3   | 94.3   |
| 82.5°  | 162.7  | 83.6   | 70.6   | 66.3   | 66.3   |
| 85°    | 92.0   | 47.0   | 40.6   | 40.6   | 40.6   |
| 87.5°  | 34.3   | 17.1   | 17.1   | 15.0   | 15.0   |
| 90°    | 1.3    | 16.8   | 27.9   | 35.0   | 37.7   |
| 92.5°  | 35.0   | 29.4   | 33.5   | 36.3   | 37.7   |
| 95°    | 90.8   | 44.6   | 54.5   | 61.6   | 60.1   |
| 97.5°  | 163.5  | 48.9   | 71.2   | 75.6   | 76.9   |
| 100°   | 247.5  | 55.9   | 79.7   | 90.8   | 93.6   |
| 102.5° | 339.6  | 337.0  | 82.5   | 97.8   | 102.1  |
| 105°   | 424.9  | 466.9  | 85.3   | 100.6  | 106.3  |
| 107.5° | 524.2  | 559.0  | 88.1   | 103.4  | 109.0  |
| 110°   | 619.3  | 648.5  | 244.7  | 104.9  | 110.4  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 708.7  | 733.8  | 710.1  | 107.5  | 111.9  |
| 115°   | 803.7  | 827.5  | 862.5  | 215.3  | 114.7  |
| 117.5° | 886.2  | 914.1  | 938.0  | 738.0  | 371.8  |
| 120°   | 978.5  | 999.4  | 1024.7 | 1041.4 | 852.7  |
| 122.5° | 1056.7 | 1079.1 | 1107.1 | 1115.4 | 1116.9 |
| 125°   | 1136.4 | 1154.6 | 1181.1 | 1191.0 | 1195.1 |
| 127.5° | 1209.1 | 1228.7 | 1249.7 | 1263.7 | 1265.0 |
| 130°   | 1277.6 | 1300.0 | 1315.3 | 1330.7 | 1329.4 |
| 132.5° | 1347.5 | 1365.7 | 1381.0 | 1393.6 | 1392.3 |
| 135°   | 1406.3 | 1428.7 | 1441.1 | 1455.2 | 1452.4 |
| 137.5° | 1467.6 | 1484.4 | 1498.5 | 1512.5 | 1508.4 |
| 140°   | 1527.7 | 1539.1 | 1554.4 | 1566.9 | 1560.0 |
| 142.5° | 1578.2 | 1588.0 | 1606.2 | 1617.2 | 1610.3 |
| 145°   | 1631.3 | 1629.8 | 1653.6 | 1663.4 | 1656.4 |
| 147.5° | 1677.3 | 1673.1 | 1696.9 | 1703.8 | 1698.4 |
| 150°   | 1722.2 | 1712.3 | 1734.8 | 1743.1 | 1736.1 |
| 152.5° | 1759.8 | 1748.7 | 1769.6 | 1778.1 | 1768.2 |
| 155°   | 1796.2 | 1783.7 | 1800.5 | 1808.8 | 1797.6 |
| 157.5° | 1825.6 | 1814.4 | 1827.0 | 1836.8 | 1825.6 |
| 160°   | 1850.8 | 1842.3 | 1850.8 | 1859.1 | 1849.3 |
| 162.5° | 1873.0 | 1864.7 | 1871.7 | 1881.5 | 1868.9 |
| 165°   | 1892.6 | 1884.3 | 1888.4 | 1898.3 | 1888.4 |
| 167.5° | 1908.0 | 1899.6 | 1903.9 | 1913.7 | 1901.0 |
| 170°   | 1920.7 | 1912.2 | 1915.1 | 1924.8 | 1912.2 |
| 172.5° | 1929.0 | 1920.7 | 1923.5 | 1933.3 | 1920.7 |
| 175°   | 1936.0 | 1926.1 | 1929.0 | 1938.7 | 1924.8 |
| 177.5° | 1938.7 | 1929.0 | 1930.4 | 1940.2 | 1927.7 |
| 180°   | 1931.8 | 1931.8 | 1931.8 | 1931.8 | 1931.8 |

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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 | 8.97             | 9.77  | 9.97  | 10.77 | 12.10 | 4.94           | 5.75 | 5.94 | 6.75 | 8.07  |
|                 | 3H   | 10.65            | 11.36 | 11.65 | 12.37 | 13.72 | 6.13           | 6.85 | 7.14 | 7.86 | 9.21  |
|                 | 4H   | 11.25            | 11.93 | 12.27 | 12.94 | 14.30 | 6.58           | 7.26 | 7.60 | 8.27 | 9.63  |
|                 | 6H   | 11.67            | 12.30 | 12.70 | 13.31 | 14.68 | 6.90           | 7.53 | 7.93 | 8.54 | 9.91  |
|                 | 8H   | 11.80            | 12.39 | 12.83 | 13.43 | 14.79 | 6.99           | 7.59 | 8.03 | 8.62 | 9.98  |
|                 | 12H  | 11.86            | 12.42 | 12.90 | 13.45 | 14.84 | 7.04           | 7.60 | 8.07 | 8.63 | 10.01 |
| 4H              | 2H   | 8.99             | 9.66  | 10.01 | 10.68 | 12.03 | 5.54           | 6.21 | 6.56 | 7.23 | 8.58  |
|                 | 3H   | 10.81            | 11.37 | 11.84 | 12.42 | 13.79 | 6.88           | 7.45 | 7.92 | 8.49 | 9.86  |
|                 | 4H   | 11.50            | 12.02 | 12.54 | 13.05 | 14.44 | 7.43           | 7.95 | 8.47 | 8.98 | 10.37 |
|                 | 6H   | 12.02            | 12.46 | 13.07 | 13.52 | 14.90 | 7.85           | 8.29 | 8.90 | 9.35 | 10.74 |
|                 | 8H   | 12.19            | 12.60 | 13.24 | 13.65 | 15.06 | 7.98           | 8.39 | 9.03 | 9.44 | 10.85 |
|                 | 12H  | 12.28            | 12.66 | 13.35 | 13.72 | 15.13 | 8.04           | 8.42 | 9.11 | 9.48 | 10.89 |
| 8H              | 4H   | 11.47            | 11.88 | 12.52 | 12.93 | 14.33 | 7.71           | 8.12 | 8.76 | 9.17 | 10.58 |
|                 | 6H   | 12.03            | 12.37 | 13.11 | 13.47 | 14.87 | 8.23           | 8.57 | 9.30 | 9.66 | 11.06 |
|                 | 8H   | 12.25            | 12.55 | 13.33 | 13.63 | 15.04 | 8.42           | 8.72 | 9.50 | 9.80 | 11.22 |
|                 | 12H  | 12.39            | 12.65 | 13.47 | 13.72 | 15.18 | 8.54           | 8.80 | 9.62 | 9.87 | 11.33 |
| 12H             | 4H   | 11.42            | 11.79 | 12.49 | 12.86 | 14.26 | 7.71           | 8.09 | 8.78 | 9.15 | 10.56 |
|                 | 6H   | 12.01            | 12.31 | 13.09 | 13.38 | 14.80 | 8.28           | 8.58 | 9.36 | 9.65 | 11.07 |
|                 | 8H   | 12.23            | 12.49 | 13.31 | 13.56 | 15.02 | 8.49           | 8.75 | 9.57 | 9.82 | 11.28 |

END OF REPORT