

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: P904596

Luminaire Tested: DFN2DIP-TR4F0-050D080US830-RLLFLL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P904596  
REPORT IS A COMBINATION OF REPORTS P900444 AND P897293  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-TR4F0-050D080US830-RLLFLL  
Description: 4 foot, Triangle Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

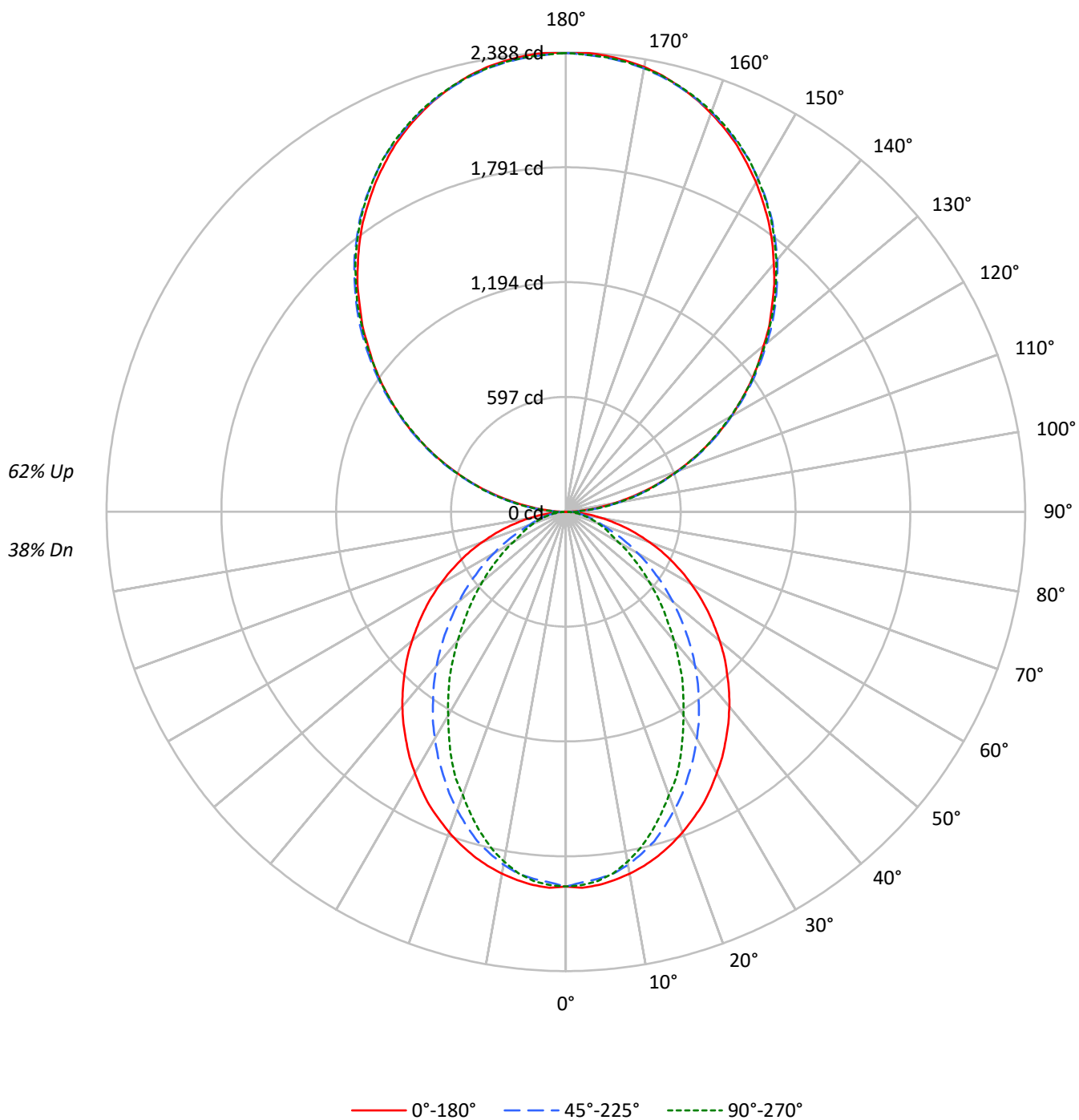
**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 10679.0 lumens  
Efficiency: N/A  
Efficacy: 105.6 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: Semi-Indirect  
  
Input Watts (W): 101.1  
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



TEST NUMBER: P904596

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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   | 104 | 104 | 104 | 104 | 95 | 95 | 95 | 95 | 76 | 76 | 76 | 60 | 60 | 60 | 45 | 45 | 45 |
| 1   | 95  | 91  | 88  | 84  | 86 | 83 | 80 | 77 | 67 | 65 | 63 | 53 | 52 | 50 | 40 | 39 | 38 |
| 2   | 87  | 80  | 74  | 69  | 79 | 73 | 68 | 64 | 59 | 56 | 53 | 47 | 45 | 43 | 36 | 34 | 33 |
| 3   | 80  | 71  | 64  | 58  | 72 | 64 | 58 | 54 | 53 | 48 | 45 | 42 | 39 | 37 | 32 | 30 | 28 |
| 4   | 73  | 63  | 55  | 49  | 66 | 57 | 51 | 46 | 47 | 42 | 39 | 38 | 34 | 32 | 29 | 27 | 25 |
| 5   | 67  | 56  | 48  | 42  | 61 | 51 | 44 | 39 | 42 | 37 | 33 | 34 | 30 | 28 | 26 | 24 | 22 |
| 6   | 62  | 50  | 42  | 37  | 56 | 46 | 39 | 34 | 38 | 33 | 29 | 31 | 27 | 24 | 24 | 21 | 19 |
| 7   | 57  | 45  | 38  | 32  | 52 | 42 | 35 | 30 | 35 | 30 | 26 | 28 | 24 | 22 | 22 | 19 | 17 |
| 8   | 53  | 41  | 34  | 29  | 48 | 38 | 31 | 27 | 32 | 27 | 23 | 26 | 22 | 19 | 20 | 18 | 16 |
| 9   | 49  | 38  | 30  | 26  | 45 | 35 | 28 | 24 | 29 | 24 | 21 | 24 | 20 | 17 | 19 | 16 | 14 |
| 10  | 46  | 35  | 28  | 23  | 42 | 32 | 26 | 21 | 27 | 22 | 19 | 22 | 18 | 16 | 17 | 15 | 13 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 1547 | 1547 | 1547 |
| 5°  | 1550 | 1523 | 1533 |
| 10° | 1534 | 1493 | 1483 |
| 15° | 1513 | 1444 | 1405 |
| 20° | 1486 | 1375 | 1311 |
| 25° | 1457 | 1299 | 1219 |
| 30° | 1418 | 1221 | 1103 |
| 35° | 1381 | 1137 | 1002 |
| 40° | 1343 | 1050 | 885  |
| 45° | 1298 | 954  | 779  |
| 50° | 1252 | 856  | 676  |
| 55° | 1204 | 752  | 577  |
| 60° | 1148 | 643  | 475  |
| 65° | 1084 | 533  | 427  |
| 70° | 1007 | 429  | 386  |
| 75° | 910  | 378  | 352  |
| 80° | 769  | 317  | 305  |
| 85° | 536  | 212  | 229  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 90°

Vertical Angle: 90°

Luminance: 1859 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 182.5   | 1.7       |
| 10°-20°   | 501.1   | 4.7       |
| 20°-30°   | 703.6   | 6.6       |
| 30°-40°   | 766.9   | 7.2       |
| 40°-50°   | 704.9   | 6.6       |
| 50°-60°   | 553.6   | 5.2       |
| 60°-70°   | 360.3   | 3.4       |
| 70°-80°   | 185.5   | 1.7       |
| 80°-90°   | 54.1    | 0.5       |
| 90°-100°  | 147.6   | 1.4       |
| 100°-110° | 468.9   | 4.4       |
| 110°-120° | 802.4   | 7.5       |
| 120°-130° | 1055.3  | 9.9       |
| 130°-140° | 1184.5  | 11.1      |
| 140°-150° | 1161.5  | 10.9      |
| 150°-160° | 974.4   | 9.1       |
| 160°-170° | 646.2   | 6.1       |
| 170°-180° | 225.9   | 2.1       |
| 0°-30°    | 1387.2  | 13.0      |
| 0°-40°    | 2154.2  | 20.2      |
| 0°-60°    | 3412.7  | 32.0      |
| 0°-90°    | 4012.6  | 37.6      |
| 90°-120°  | 1418.8  | 13.3      |
| 90°-150°  | 4820.1  | 45.1      |
| 90°-180°  | 6666.0  | 62.4      |
| 0°-180°   | 10679.0 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 1948 | 1948  | 1948 | 1948  | 1948 |      |
| 5°   | 1948 | 1939  | 1916 | 1932  | 1927 | 185  |
| 15°  | 1853 | 1833  | 1773 | 1740  | 1722 | 522  |
| 25°  | 1682 | 1625  | 1509 | 1437  | 1410 | 773  |
| 35°  | 1449 | 1359  | 1204 | 1093  | 1054 | 907  |
| 45°  | 1185 | 1066  | 881  | 756   | 714  | 915  |
| 55°  | 901  | 763   | 573  | 467   | 434  | 805  |
| 65°  | 608  | 465   | 307  | 247   | 242  | 603  |
| 75°  | 324  | 201   | 141  | 129   | 127  | 343  |
| 85°  | 76   | 39    | 34   | 34    | 34   | 87   |
| 90°  | 2    | 26    | 70   | 66    | 68   | 11   |
| 95°  | 105  | 125   | 129  | 129   | 125  | 117  |
| 105° | 433  | 439   | 443  | 446   | 446  | 457  |
| 115° | 805  | 817   | 813  | 811   | 805  | 796  |
| 125° | 1171 | 1189  | 1183 | 1177  | 1175 | 1047 |
| 135° | 1515 | 1537  | 1541 | 1539  | 1534 | 1171 |
| 145° | 1839 | 1853  | 1865 | 1867  | 1859 | 1149 |
| 155° | 2103 | 2109  | 2115 | 2125  | 2119 | 968  |
| 165° | 2288 | 2286  | 2286 | 2300  | 2290 | 645  |
| 175° | 2380 | 2375  | 2370 | 2385  | 2372 | 226  |
| 180° | 2385 | 2385  | 2385 | 2385  | 2385 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 1947.8 | 1947.8 | 1947.8 | 1947.8 | 1947.8 |
| 2.5°   | 1956.5 | 1947.8 | 1928.3 | 1946.1 | 1942.5 |
| 5°     | 1947.8 | 1939.0 | 1916.0 | 1931.8 | 1926.7 |
| 7.5°   | 1931.8 | 1921.4 | 1896.7 | 1903.7 | 1894.8 |
| 10°    | 1910.7 | 1898.4 | 1863.2 | 1857.8 | 1847.3 |
| 12.5°  | 1884.3 | 1868.5 | 1820.8 | 1810.3 | 1790.8 |
| 15°    | 1852.6 | 1833.2 | 1773.3 | 1739.8 | 1722.2 |
| 17.5°  | 1815.5 | 1787.3 | 1713.3 | 1674.5 | 1646.2 |
| 20°    | 1773.3 | 1738.0 | 1649.8 | 1605.9 | 1567.0 |
| 22.5°  | 1727.5 | 1686.9 | 1584.6 | 1524.8 | 1498.4 |
| 25°    | 1681.6 | 1625.1 | 1508.8 | 1436.6 | 1410.0 |
| 27.5°  | 1627.0 | 1567.0 | 1438.3 | 1355.5 | 1314.9 |
| 30°    | 1568.9 | 1501.8 | 1360.7 | 1270.9 | 1223.2 |
| 32.5°  | 1512.4 | 1431.3 | 1286.9 | 1181.0 | 1136.9 |
| 35°    | 1449.0 | 1359.1 | 1204.0 | 1092.9 | 1054.0 |
| 37.5°  | 1387.2 | 1290.2 | 1126.4 | 1004.7 | 960.7  |
| 40°    | 1322.0 | 1216.4 | 1045.2 | 920.1  | 874.3  |
| 42.5°  | 1255.1 | 1142.3 | 964.2  | 833.7  | 789.8  |
| 45°    | 1184.6 | 1066.4 | 881.4  | 756.1  | 713.8  |
| 47.5°  | 1117.6 | 992.5  | 802.1  | 676.8  | 638.1  |
| 50°    | 1043.6 | 918.4  | 724.5  | 602.8  | 565.9  |
| 52.5°  | 971.2  | 839.0  | 650.4  | 534.1  | 500.7  |
| 55°    | 900.7  | 763.2  | 572.8  | 467.1  | 433.7  |
| 57.5°  | 828.5  | 687.5  | 504.2  | 405.5  | 377.2  |
| 60°    | 754.4  | 613.4  | 431.8  | 342.0  | 313.8  |
| 62.5°  | 682.2  | 541.2  | 370.1  | 285.6  | 271.5  |
| 65°    | 608.1  | 465.3  | 306.7  | 246.9  | 241.5  |
| 67.5°  | 537.6  | 394.8  | 246.9  | 216.8  | 211.5  |
| 70°    | 463.6  | 326.1  | 204.4  | 186.8  | 179.7  |
| 72.5°  | 393.1  | 262.6  | 171.0  | 156.9  | 153.4  |
| 75°    | 324.3  | 200.9  | 141.0  | 128.7  | 127.0  |
| 77.5°  | 255.6  | 142.7  | 111.1  | 104.0  | 100.4  |
| 80°    | 192.1  | 102.3  | 84.5   | 77.6   | 77.6   |
| 82.5°  | 133.9  | 68.8   | 58.2   | 54.6   | 54.6   |
| 85°    | 75.8   | 38.7   | 33.5   | 33.5   | 33.5   |
| 87.5°  | 28.3   | 14.0   | 14.0   | 12.3   | 12.3   |
| 90°    | 2.2    | 25.9   | 70.5   | 66.2   | 68.3   |
| 92.5°  | 44.6   | 60.4   | 62.6   | 64.7   | 64.7   |
| 95°    | 105.0  | 125.1  | 128.7  | 128.7  | 125.1  |
| 97.5°  | 174.7  | 193.4  | 201.3  | 201.3  | 201.3  |
| 100°   | 255.2  | 271.7  | 277.5  | 277.5  | 275.3  |
| 102.5° | 340.1  | 352.3  | 360.1  | 362.3  | 360.1  |
| 105°   | 432.8  | 438.6  | 442.9  | 446.5  | 446.5  |
| 107.5° | 524.8  | 533.5  | 533.5  | 534.9  | 524.8  |
| 110°   | 614.0  | 625.5  | 625.5  | 625.5  | 619.7  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 710.3  | 722.6  | 720.4  | 714.6  | 710.3  |
| 115°   | 805.2  | 816.7  | 813.1  | 811.0  | 805.2  |
| 117.5° | 899.4  | 915.2  | 905.1  | 899.4  | 893.6  |
| 120°   | 994.3  | 1010.1 | 994.3  | 994.3  | 987.8  |
| 122.5° | 1080.5 | 1100.7 | 1090.6 | 1084.9 | 1080.5 |
| 125°   | 1171.1 | 1189.1 | 1183.4 | 1176.9 | 1174.8 |
| 127.5° | 1259.6 | 1281.9 | 1273.9 | 1265.4 | 1259.6 |
| 130°   | 1342.3 | 1368.1 | 1364.5 | 1360.3 | 1352.4 |
| 132.5° | 1435.0 | 1455.1 | 1456.6 | 1446.5 | 1440.8 |
| 135°   | 1514.8 | 1537.1 | 1541.4 | 1539.3 | 1533.5 |
| 137.5° | 1603.9 | 1621.9 | 1625.5 | 1624.1 | 1615.4 |
| 140°   | 1682.3 | 1700.3 | 1710.3 | 1710.3 | 1702.4 |
| 142.5° | 1762.8 | 1780.8 | 1786.6 | 1788.8 | 1780.8 |
| 145°   | 1839.1 | 1853.4 | 1864.9 | 1867.1 | 1859.2 |
| 147.5° | 1907.3 | 1925.3 | 1933.9 | 1937.6 | 1929.7 |
| 150°   | 1977.8 | 1990.0 | 1997.9 | 2004.4 | 1997.9 |
| 152.5° | 2040.3 | 2052.6 | 2062.7 | 2070.6 | 2062.7 |
| 155°   | 2102.9 | 2108.7 | 2115.2 | 2125.2 | 2118.7 |
| 157.5° | 2156.8 | 2161.2 | 2164.7 | 2179.1 | 2169.1 |
| 160°   | 2205.0 | 2209.3 | 2211.5 | 2223.6 | 2215.1 |
| 162.5° | 2249.6 | 2249.6 | 2251.7 | 2265.4 | 2255.3 |
| 165°   | 2287.6 | 2285.5 | 2285.5 | 2299.9 | 2289.8 |
| 167.5° | 2322.1 | 2315.7 | 2315.7 | 2330.1 | 2320.0 |
| 170°   | 2348.1 | 2342.3 | 2340.1 | 2354.6 | 2342.3 |
| 172.5° | 2366.1 | 2360.3 | 2358.1 | 2372.5 | 2360.3 |
| 175°   | 2380.4 | 2374.6 | 2370.3 | 2384.7 | 2372.5 |
| 177.5° | 2388.3 | 2382.6 | 2378.2 | 2390.5 | 2378.2 |
| 180°   | 2384.7 | 2384.7 | 2384.7 | 2384.7 | 2384.7 |

TEST NUMBER: P904596

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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 | 7.37             | 8.11  | 8.44  | 9.17  | 10.61 | 3.35           | 4.09 | 4.41 | 5.15 | 6.59 |
|                 | 3H   | 9.04             | 9.70  | 10.12 | 10.77 | 12.23 | 4.53           | 5.19 | 5.60 | 6.26 | 7.72 |
|                 | 4H   | 9.65             | 10.27 | 10.73 | 11.34 | 12.81 | 4.98           | 5.60 | 6.06 | 6.67 | 8.14 |
|                 | 6H   | 10.06            | 10.64 | 11.16 | 11.71 | 13.19 | 5.29           | 5.87 | 6.39 | 6.94 | 8.42 |
|                 | 8H   | 10.19            | 10.73 | 11.28 | 11.83 | 13.30 | 5.38           | 5.93 | 6.48 | 7.02 | 8.49 |
|                 | 12H  | 10.25            | 10.77 | 11.35 | 11.85 | 13.35 | 5.42           | 5.94 | 6.52 | 7.03 | 8.52 |
| 4H              | 2H   | 7.38             | 8.01  | 8.47  | 9.08  | 10.54 | 3.93           | 4.56 | 5.02 | 5.63 | 7.09 |
|                 | 3H   | 9.20             | 9.72  | 10.30 | 10.82 | 12.30 | 5.27           | 5.79 | 6.37 | 6.89 | 8.37 |
|                 | 4H   | 9.89             | 10.37 | 10.99 | 11.46 | 12.95 | 5.82           | 6.30 | 6.92 | 7.39 | 8.88 |
|                 | 6H   | 10.40            | 10.81 | 11.51 | 11.92 | 13.41 | 6.23           | 6.64 | 7.34 | 7.75 | 9.25 |
|                 | 8H   | 10.57            | 10.95 | 11.68 | 12.06 | 13.57 | 6.36           | 6.74 | 7.47 | 7.85 | 9.36 |
|                 | 12H  | 10.66            | 11.01 | 11.79 | 12.13 | 13.64 | 6.42           | 6.77 | 7.55 | 7.89 | 9.40 |
| 8H              | 4H   | 9.85             | 10.23 | 10.96 | 11.34 | 12.84 | 6.09           | 6.47 | 7.20 | 7.58 | 9.09 |
|                 | 6H   | 10.41            | 10.73 | 11.54 | 11.87 | 13.38 | 6.61           | 6.92 | 7.74 | 8.07 | 9.57 |
|                 | 8H   | 10.63            | 10.90 | 11.77 | 12.03 | 13.56 | 6.80           | 7.07 | 7.94 | 8.20 | 9.73 |
|                 | 12H  | 10.76            | 11.01 | 11.90 | 12.13 | 13.69 | 6.91           | 7.16 | 8.05 | 8.28 | 9.84 |
| 12H             | 4H   | 9.80             | 10.14 | 10.92 | 11.26 | 12.77 | 6.09           | 6.44 | 7.22 | 7.55 | 9.07 |
|                 | 6H   | 10.39            | 10.66 | 11.52 | 11.79 | 13.32 | 6.66           | 6.93 | 7.79 | 8.06 | 9.58 |
|                 | 8H   | 10.60            | 10.85 | 11.74 | 11.97 | 13.53 | 6.86           | 7.11 | 8.00 | 8.23 | 9.79 |

END OF REPORT