

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: P907328

Luminaire Tested: DFN2DIP-TR4F0-050D090US835-RLLFLL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P907328  
REPORT IS A COMBINATION OF REPORTS P900462 AND P897293  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-TR4F0-050D090US835-RLLFLL  
Description: 4 foot, Triangle Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

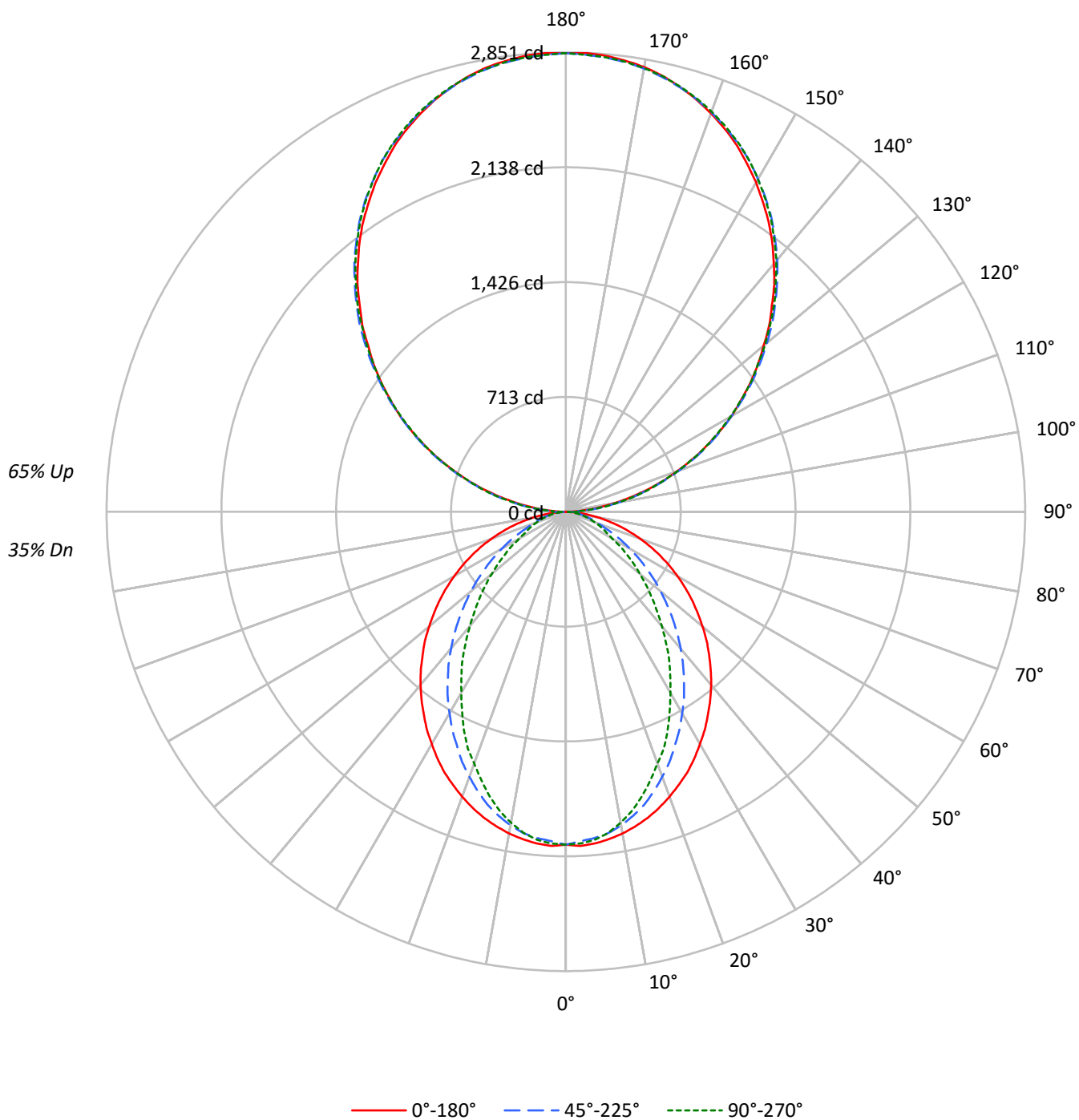
**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 12215.0 lumens  
Efficiency: N/A  
Efficacy: 111.5 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): 109.6  
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   | 104 | 104 | 104 | 104 | 94 | 94 | 94 | 94 | 75 | 75 | 75 | 58 | 58 | 58 | 42 | 42 | 42 |
| 1   | 95  | 91  | 87  | 84  | 85 | 82 | 79 | 76 | 66 | 64 | 62 | 51 | 50 | 49 | 38 | 37 | 36 |
| 2   | 86  | 79  | 74  | 69  | 78 | 72 | 67 | 63 | 58 | 55 | 52 | 45 | 43 | 41 | 34 | 32 | 31 |
| 3   | 79  | 70  | 63  | 58  | 71 | 64 | 58 | 53 | 52 | 47 | 44 | 40 | 38 | 35 | 30 | 28 | 27 |
| 4   | 72  | 62  | 55  | 49  | 65 | 57 | 50 | 45 | 46 | 41 | 38 | 36 | 33 | 30 | 27 | 25 | 23 |
| 5   | 67  | 55  | 48  | 42  | 60 | 51 | 44 | 39 | 41 | 36 | 33 | 33 | 29 | 26 | 25 | 22 | 21 |
| 6   | 61  | 50  | 42  | 37  | 55 | 45 | 39 | 34 | 37 | 32 | 29 | 30 | 26 | 23 | 22 | 20 | 18 |
| 7   | 57  | 45  | 37  | 32  | 51 | 41 | 34 | 30 | 34 | 29 | 25 | 27 | 23 | 21 | 21 | 18 | 16 |
| 8   | 53  | 41  | 33  | 28  | 48 | 37 | 31 | 26 | 31 | 26 | 22 | 25 | 21 | 19 | 19 | 16 | 15 |
| 9   | 49  | 37  | 30  | 25  | 44 | 34 | 28 | 23 | 28 | 23 | 20 | 23 | 19 | 17 | 17 | 15 | 13 |
| 10  | 46  | 34  | 27  | 23  | 41 | 31 | 25 | 21 | 26 | 21 | 18 | 21 | 18 | 15 | 16 | 14 | 12 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 1642 | 1642 | 1642 |
| 5°  | 1644 | 1616 | 1626 |
| 10° | 1628 | 1584 | 1573 |
| 15° | 1606 | 1532 | 1491 |
| 20° | 1576 | 1459 | 1391 |
| 25° | 1546 | 1378 | 1294 |
| 30° | 1505 | 1296 | 1171 |
| 35° | 1465 | 1206 | 1063 |
| 40° | 1424 | 1114 | 939  |
| 45° | 1377 | 1012 | 827  |
| 50° | 1328 | 908  | 717  |
| 55° | 1277 | 798  | 612  |
| 60° | 1218 | 682  | 503  |
| 65° | 1150 | 565  | 453  |
| 70° | 1068 | 456  | 410  |
| 75° | 965  | 401  | 373  |
| 80° | 815  | 337  | 323  |
| 85° | 569  | 225  | 243  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 90°

Vertical Angle: 90°

Luminance: 2218 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 193.7   | 1.6       |
| 10°-20°   | 531.7   | 4.4       |
| 20°-30°   | 746.5   | 6.1       |
| 30°-40°   | 813.7   | 6.7       |
| 40°-50°   | 747.9   | 6.1       |
| 50°-60°   | 587.3   | 4.8       |
| 60°-70°   | 382.3   | 3.1       |
| 70°-80°   | 196.8   | 1.6       |
| 80°-90°   | 58.3    | 0.5       |
| 90°-100°  | 176.1   | 1.4       |
| 100°-110° | 559.6   | 4.6       |
| 110°-120° | 957.7   | 7.8       |
| 120°-130° | 1259.5  | 10.3      |
| 130°-140° | 1413.8  | 11.6      |
| 140°-150° | 1386.4  | 11.3      |
| 150°-160° | 1163.0  | 9.5       |
| 160°-170° | 771.2   | 6.3       |
| 170°-180° | 269.6   | 2.2       |
| 0°-30°    | 1471.8  | 12.0      |
| 0°-40°    | 2285.5  | 18.7      |
| 0°-60°    | 3620.7  | 29.6      |
| 0°-90°    | 4258.1  | 34.9      |
| 90°-120°  | 1693.5  | 13.9      |
| 90°-150°  | 5753.1  | 47.1      |
| 90°-180°  | 7957.0  | 65.1      |
| 0°-180°   | 12215.0 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 2066 | 2066  | 2066 | 2066  | 2066 |      |
| 5°   | 2066 | 2057  | 2033 | 2050  | 2044 | 196  |
| 15°  | 1966 | 1945  | 1881 | 1846  | 1827 | 554  |
| 25°  | 1784 | 1724  | 1601 | 1524  | 1496 | 821  |
| 35°  | 1537 | 1442  | 1277 | 1160  | 1118 | 962  |
| 45°  | 1257 | 1131  | 935  | 802   | 757  | 971  |
| 55°  | 956  | 810   | 608  | 496   | 460  | 854  |
| 65°  | 645  | 494   | 325  | 262   | 256  | 640  |
| 75°  | 344  | 213   | 150  | 136   | 135  | 364  |
| 85°  | 80   | 41    | 36   | 36    | 36   | 92   |
| 90°  | 3    | 31    | 84   | 79    | 82   | 12   |
| 95°  | 125  | 149   | 154  | 154   | 149  | 139  |
| 105° | 517  | 523   | 529  | 533   | 533  | 545  |
| 115° | 961  | 975   | 970  | 968   | 961  | 951  |
| 125° | 1398 | 1419  | 1412 | 1405  | 1402 | 1249 |
| 135° | 1808 | 1835  | 1840 | 1837  | 1830 | 1398 |
| 145° | 2195 | 2212  | 2226 | 2228  | 2219 | 1372 |
| 155° | 2510 | 2517  | 2525 | 2537  | 2529 | 1155 |
| 165° | 2730 | 2728  | 2728 | 2745  | 2733 | 770  |
| 175° | 2841 | 2834  | 2829 | 2846  | 2832 | 270  |
| 180° | 2846 | 2846  | 2846 | 2846  | 2846 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 2066.5 | 2066.5 | 2066.5 | 2066.5 | 2066.5 |
| 2.5°   | 2075.8 | 2066.5 | 2045.9 | 2064.7 | 2060.9 |
| 5°     | 2066.5 | 2057.2 | 2032.8 | 2049.6 | 2044.1 |
| 7.5°   | 2049.6 | 2038.5 | 2012.3 | 2019.7 | 2010.3 |
| 10°    | 2027.2 | 2014.1 | 1976.8 | 1971.1 | 1959.9 |
| 12.5°  | 1999.2 | 1982.4 | 1931.8 | 1920.7 | 1900.0 |
| 15°    | 1965.5 | 1944.9 | 1881.4 | 1845.9 | 1827.2 |
| 17.5°  | 1926.2 | 1896.3 | 1817.7 | 1776.6 | 1746.6 |
| 20°    | 1881.4 | 1843.9 | 1750.4 | 1703.8 | 1662.5 |
| 22.5°  | 1832.8 | 1789.7 | 1681.2 | 1617.7 | 1589.7 |
| 25°    | 1784.1 | 1724.2 | 1600.8 | 1524.2 | 1496.0 |
| 27.5°  | 1726.2 | 1662.5 | 1526.0 | 1438.1 | 1395.1 |
| 30°    | 1664.5 | 1593.3 | 1443.7 | 1348.4 | 1297.8 |
| 32.5°  | 1604.6 | 1518.5 | 1365.3 | 1253.0 | 1206.2 |
| 35°    | 1537.3 | 1441.9 | 1277.4 | 1159.5 | 1118.3 |
| 37.5°  | 1471.8 | 1368.9 | 1195.1 | 1065.9 | 1019.3 |
| 40°    | 1402.6 | 1290.5 | 1108.9 | 976.2  | 927.6  |
| 42.5°  | 1331.6 | 1211.9 | 1023.0 | 884.5  | 837.9  |
| 45°    | 1256.8 | 1131.4 | 935.1  | 802.2  | 757.3  |
| 47.5°  | 1185.7 | 1053.0 | 851.0  | 718.1  | 677.0  |
| 50°    | 1107.2 | 974.4  | 768.7  | 639.5  | 600.4  |
| 52.5°  | 1030.4 | 890.1  | 690.1  | 566.7  | 531.2  |
| 55°    | 955.6  | 809.7  | 607.7  | 495.6  | 460.1  |
| 57.5°  | 879.0  | 729.4  | 534.9  | 430.2  | 400.2  |
| 60°    | 800.4  | 650.8  | 458.1  | 362.9  | 332.9  |
| 62.5°  | 723.8  | 574.2  | 392.7  | 303.0  | 288.1  |
| 65°    | 645.2  | 493.7  | 325.4  | 261.9  | 256.2  |
| 67.5°  | 570.4  | 418.9  | 261.9  | 230.0  | 224.4  |
| 70°    | 491.9  | 346.0  | 216.9  | 198.2  | 190.7  |
| 72.5°  | 417.1  | 278.6  | 181.4  | 166.5  | 162.7  |
| 75°    | 344.1  | 213.1  | 149.6  | 136.5  | 134.7  |
| 77.5°  | 271.2  | 151.4  | 117.9  | 110.3  | 106.5  |
| 80°    | 203.8  | 108.5  | 89.7   | 82.3   | 82.3   |
| 82.5°  | 142.1  | 73.0   | 61.7   | 57.9   | 57.9   |
| 85°    | 80.4   | 41.1   | 35.5   | 35.5   | 35.5   |
| 87.5°  | 30.0   | 14.9   | 14.9   | 13.1   | 13.1   |
| 90°    | 2.6    | 30.9   | 84.1   | 78.9   | 81.5   |
| 92.5°  | 53.2   | 72.1   | 74.7   | 77.2   | 77.2   |
| 95°    | 125.3  | 149.3  | 153.6  | 153.6  | 149.3  |
| 97.5°  | 208.5  | 230.8  | 240.3  | 240.3  | 240.3  |
| 100°   | 304.6  | 324.4  | 331.2  | 331.2  | 328.7  |
| 102.5° | 405.9  | 420.5  | 429.9  | 432.5  | 429.9  |
| 105°   | 516.6  | 523.4  | 528.6  | 532.9  | 532.9  |
| 107.5° | 626.4  | 636.7  | 636.7  | 638.4  | 626.4  |
| 110°   | 732.8  | 746.6  | 746.6  | 746.6  | 739.7  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 847.8  | 862.4  | 859.8  | 853.0  | 847.8  |
| 115°   | 961.1  | 974.8  | 970.5  | 968.0  | 961.1  |
| 117.5° | 1073.5 | 1092.4 | 1080.4 | 1073.5 | 1066.6 |
| 120°   | 1186.8 | 1205.6 | 1186.8 | 1186.8 | 1179.0 |
| 122.5° | 1289.7 | 1313.8 | 1301.8 | 1294.9 | 1289.7 |
| 125°   | 1397.9 | 1419.3 | 1412.5 | 1404.7 | 1402.2 |
| 127.5° | 1503.4 | 1530.0 | 1520.6 | 1510.3 | 1503.4 |
| 130°   | 1602.1 | 1633.0 | 1628.7 | 1623.5 | 1614.1 |
| 132.5° | 1712.8 | 1736.8 | 1738.5 | 1726.5 | 1719.7 |
| 135°   | 1808.0 | 1834.6 | 1839.8 | 1837.2 | 1830.4 |
| 137.5° | 1914.4 | 1935.9 | 1940.2 | 1938.5 | 1928.2 |
| 140°   | 2008.0 | 2029.4 | 2041.4 | 2041.4 | 2032.0 |
| 142.5° | 2104.1 | 2125.5 | 2132.4 | 2135.0 | 2125.5 |
| 145°   | 2195.1 | 2212.2 | 2225.9 | 2228.5 | 2219.1 |
| 147.5° | 2276.6 | 2298.0 | 2308.3 | 2312.6 | 2303.2 |
| 150°   | 2360.7 | 2375.3 | 2384.7 | 2392.4 | 2384.7 |
| 152.5° | 2435.3 | 2449.9 | 2461.9 | 2471.4 | 2461.9 |
| 155°   | 2510.0 | 2516.8 | 2524.6 | 2536.6 | 2528.9 |
| 157.5° | 2574.3 | 2579.5 | 2583.8 | 2600.9 | 2588.9 |
| 160°   | 2631.8 | 2637.0 | 2639.6 | 2654.1 | 2643.8 |
| 162.5° | 2685.0 | 2685.0 | 2687.6 | 2703.9 | 2691.9 |
| 165°   | 2730.5 | 2727.9 | 2727.9 | 2745.1 | 2733.1 |
| 167.5° | 2771.7 | 2764.0 | 2764.0 | 2781.1 | 2769.1 |
| 170°   | 2802.6 | 2795.7 | 2793.2 | 2810.3 | 2795.7 |
| 172.5° | 2824.0 | 2817.2 | 2814.6 | 2831.8 | 2817.2 |
| 175°   | 2841.2 | 2834.3 | 2829.2 | 2846.4 | 2831.8 |
| 177.5° | 2850.6 | 2843.8 | 2838.6 | 2853.2 | 2838.6 |
| 180°   | 2846.4 | 2846.4 | 2846.4 | 2846.4 | 2846.4 |

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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 | 7.26             | 7.98  | 8.34  | 9.06  | 10.53 | 3.23           | 3.95 | 4.31 | 5.03 | 6.50 |
|                 | 3H   | 8.93             | 9.57  | 10.02 | 10.66 | 12.15 | 4.41           | 5.06 | 5.50 | 6.14 | 7.64 |
|                 | 4H   | 9.53             | 10.14 | 10.63 | 11.23 | 12.73 | 4.86           | 5.47 | 5.96 | 6.56 | 8.06 |
|                 | 6H   | 9.95             | 10.51 | 11.06 | 11.60 | 13.11 | 5.17           | 5.74 | 6.28 | 6.83 | 8.34 |
|                 | 8H   | 10.07            | 10.60 | 11.18 | 11.71 | 13.21 | 5.26           | 5.80 | 6.38 | 6.90 | 8.41 |
|                 | 12H  | 10.13            | 10.63 | 11.24 | 11.73 | 13.26 | 5.30           | 5.81 | 6.42 | 6.91 | 8.44 |
| 4H              | 2H   | 7.26             | 7.87  | 8.37  | 8.96  | 10.46 | 3.81           | 4.42 | 4.92 | 5.51 | 7.01 |
|                 | 3H   | 9.08             | 9.59  | 10.20 | 10.70 | 12.21 | 5.15           | 5.66 | 6.27 | 6.78 | 8.29 |
|                 | 4H   | 9.77             | 10.23 | 10.89 | 11.34 | 12.87 | 5.70           | 6.16 | 6.82 | 7.27 | 8.80 |
|                 | 6H   | 10.28            | 10.68 | 11.40 | 11.81 | 13.33 | 6.11           | 6.51 | 7.24 | 7.64 | 9.16 |
|                 | 8H   | 10.45            | 10.82 | 11.58 | 11.94 | 13.48 | 6.24           | 6.61 | 7.36 | 7.73 | 9.27 |
|                 | 12H  | 10.54            | 10.88 | 11.68 | 12.01 | 13.55 | 6.30           | 6.64 | 7.44 | 7.77 | 9.31 |
| 8H              | 4H   | 9.73             | 10.10 | 10.85 | 11.22 | 12.76 | 5.97           | 6.34 | 7.10 | 7.46 | 9.00 |
|                 | 6H   | 10.29            | 10.60 | 11.44 | 11.76 | 13.30 | 6.48           | 6.79 | 7.63 | 7.95 | 9.49 |
|                 | 8H   | 10.51            | 10.78 | 11.66 | 11.92 | 13.47 | 6.68           | 6.94 | 7.83 | 8.09 | 9.64 |
|                 | 12H  | 10.64            | 10.88 | 11.80 | 12.02 | 13.61 | 6.79           | 7.03 | 7.95 | 8.17 | 9.76 |
| 12H             | 4H   | 9.68             | 10.01 | 10.82 | 11.15 | 12.69 | 5.97           | 6.31 | 7.11 | 7.44 | 8.98 |
|                 | 6H   | 10.27            | 10.53 | 11.42 | 11.68 | 13.23 | 6.53           | 6.80 | 7.69 | 7.94 | 9.50 |
|                 | 8H   | 10.48            | 10.72 | 11.64 | 11.86 | 13.45 | 6.74           | 6.98 | 7.90 | 8.11 | 9.71 |

END OF REPORT