

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: P914869

Luminaire Tested: DFN2DIP-SQ4F0-060D110US927-FLLONL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P914869  
REPORT IS A COMBINATION OF REPORTS P901669 AND P898471  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-SQ4F0-060D110US927-FLLONL  
Description: 4 foot, Square Define Geo, with Direct Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

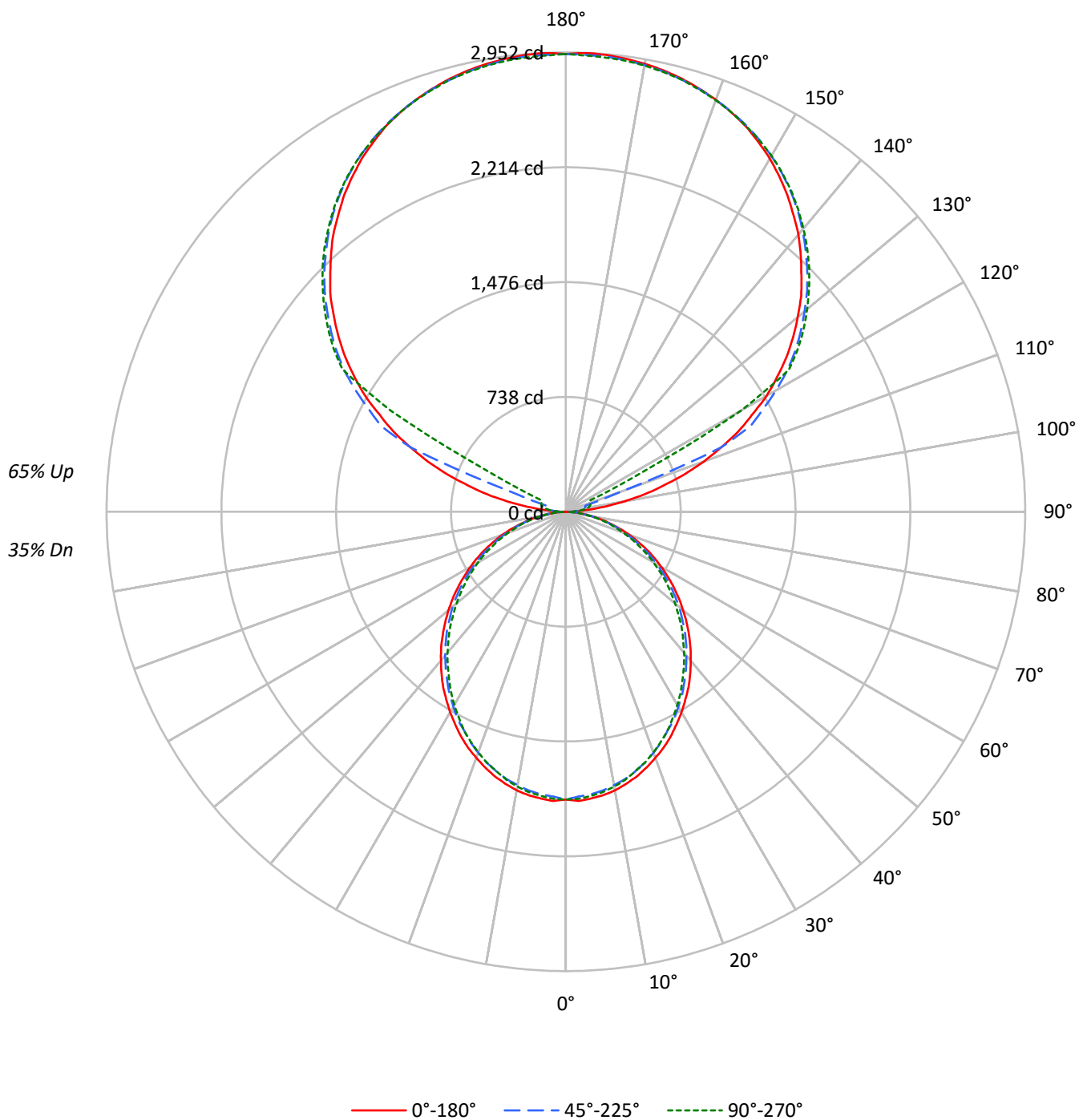
Lumens per Lamp: N/A  
Luminaire Lumens: 13332.4 lumens  
Efficiency: N/A  
Efficacy: 100.4 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 3.92' x L: 3.92' x H: 0.1')  
CIE Type: Semi-Indirect

Input Watts (W): 132.8  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.946  
Total Harmonic Distortion (THDi): 0.132  
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 | 43 | 43 | 43 |
| 1   | 95  | 90  | 86  | 83  | 85 | 82 | 79 | 76 | 66 | 64 | 62 | 51 | 50 | 48 | 38 | 37 | 36 |
| 2   | 86  | 79  | 73  | 68  | 78 | 71 | 66 | 62 | 58 | 54 | 51 | 45 | 43 | 40 | 33 | 32 | 30 |
| 3   | 78  | 69  | 62  | 56  | 71 | 63 | 57 | 52 | 51 | 46 | 43 | 40 | 37 | 34 | 29 | 27 | 26 |
| 4   | 72  | 61  | 53  | 48  | 65 | 56 | 49 | 44 | 45 | 40 | 36 | 35 | 32 | 29 | 26 | 24 | 22 |
| 5   | 66  | 54  | 46  | 41  | 59 | 50 | 43 | 38 | 40 | 35 | 31 | 32 | 28 | 25 | 24 | 21 | 19 |
| 6   | 60  | 49  | 41  | 35  | 54 | 44 | 37 | 32 | 36 | 31 | 27 | 29 | 25 | 22 | 21 | 19 | 17 |
| 7   | 56  | 44  | 36  | 31  | 50 | 40 | 33 | 28 | 33 | 28 | 24 | 26 | 22 | 19 | 20 | 17 | 15 |
| 8   | 52  | 40  | 32  | 27  | 47 | 36 | 30 | 25 | 30 | 25 | 21 | 24 | 20 | 17 | 18 | 15 | 13 |
| 9   | 48  | 36  | 29  | 24  | 43 | 33 | 27 | 22 | 27 | 22 | 19 | 22 | 18 | 15 | 17 | 14 | 12 |
| 10  | 45  | 33  | 26  | 21  | 41 | 30 | 24 | 20 | 25 | 20 | 17 | 20 | 16 | 14 | 15 | 13 | 11 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 1298 | 1298 | 1298 |
| 5°  | 1300 | 1280 | 1289 |
| 10° | 1289 | 1263 | 1272 |
| 15° | 1270 | 1242 | 1245 |
| 20° | 1245 | 1214 | 1217 |
| 25° | 1219 | 1179 | 1185 |
| 30° | 1187 | 1148 | 1145 |
| 35° | 1157 | 1110 | 1101 |
| 40° | 1120 | 1072 | 1061 |
| 45° | 1082 | 1034 | 1019 |
| 50° | 1042 | 994  | 970  |
| 55° | 999  | 948  | 926  |
| 60° | 951  | 893  | 875  |
| 65° | 899  | 836  | 815  |
| 70° | 832  | 767  | 750  |
| 75° | 739  | 684  | 691  |
| 80° | 628  | 579  | 577  |
| 85° | 454  | 396  | 388  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 90°

Vertical Angle: 90°

Luminance: 1577 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 174.1   | 1.3       |
| 10°-20°   | 489.8   | 3.7       |
| 20°-30°   | 719.8   | 5.4       |
| 30°-40°   | 836.0   | 6.3       |
| 40°-50°   | 834.9   | 6.3       |
| 50°-60°   | 728.0   | 5.5       |
| 60°-70°   | 538.2   | 4.0       |
| 70°-80°   | 304.5   | 2.3       |
| 80°-90°   | 85.5    | 0.6       |
| 90°-100°  | 97.0    | 0.7       |
| 100°-110° | 361.5   | 2.7       |
| 110°-120° | 958.7   | 7.2       |
| 120°-130° | 1590.2  | 11.9      |
| 130°-140° | 1689.1  | 12.7      |
| 140°-150° | 1569.9  | 11.8      |
| 150°-160° | 1262.1  | 9.5       |
| 160°-170° | 813.3   | 6.1       |
| 170°-180° | 279.9   | 2.1       |
| 0°-30°    | 1383.6  | 10.4      |
| 0°-40°    | 2219.6  | 16.6      |
| 0°-60°    | 3782.5  | 28.4      |
| 0°-90°    | 4710.7  | 35.3      |
| 90°-120°  | 1417.2  | 10.6      |
| 90°-150°  | 6266.3  | 47.0      |
| 90°-180°  | 8622.0  | 64.7      |
| 0°-180°   | 13332.4 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 1849 | 1849  | 1849 | 1849  | 1849 |      |
| 5°   | 1849 | 1842  | 1823 | 1837  | 1834 | 176  |
| 15°  | 1760 | 1750  | 1727 | 1734  | 1725 | 496  |
| 25°  | 1593 | 1579  | 1549 | 1552  | 1549 | 733  |
| 35°  | 1375 | 1357  | 1328 | 1318  | 1309 | 858  |
| 45°  | 1119 | 1106  | 1079 | 1060  | 1053 | 863  |
| 55°  | 847  | 836   | 814  | 793   | 784  | 757  |
| 65°  | 571  | 560   | 542  | 526   | 518  | 564  |
| 75°  | 299  | 295   | 286  | 276   | 279  | 319  |
| 85°  | 73   | 71    | 69   | 64    | 62   | 81   |
| 90°  | 2    | 26    | 42   | 53    | 57   | 12   |
| 95°  | 138  | 68    | 83   | 94    | 92   | 164  |
| 105° | 647  | 711   | 130  | 153   | 162  | 691  |
| 115° | 1224 | 1260  | 1313 | 328   | 175  | 1205 |
| 125° | 1730 | 1758  | 1798 | 1813  | 1819 | 1543 |
| 135° | 2141 | 2175  | 2194 | 2215  | 2211 | 1654 |
| 145° | 2484 | 2481  | 2517 | 2532  | 2522 | 1553 |
| 155° | 2734 | 2715  | 2741 | 2754  | 2737 | 1260 |
| 165° | 2881 | 2869  | 2875 | 2890  | 2875 | 814  |
| 175° | 2947 | 2932  | 2936 | 2952  | 2930 | 280  |
| 180° | 2941 | 2941  | 2941 | 2941  | 2941 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 1849.4 | 1849.4 | 1849.4 | 1849.4 | 1849.4 |
| 2.5°   | 1860.2 | 1851.3 | 1831.7 | 1849.4 | 1846.0 |
| 5°     | 1849.4 | 1842.5 | 1822.8 | 1837.0 | 1833.6 |
| 7.5°   | 1837.0 | 1826.5 | 1806.8 | 1821.1 | 1817.6 |
| 10°    | 1817.6 | 1805.1 | 1783.8 | 1797.9 | 1792.6 |
| 12.5°  | 1790.8 | 1780.2 | 1758.9 | 1767.8 | 1764.2 |
| 15°    | 1760.5 | 1750.0 | 1726.8 | 1734.0 | 1725.1 |
| 17.5°  | 1723.2 | 1712.7 | 1689.5 | 1698.3 | 1689.5 |
| 20°    | 1682.3 | 1671.7 | 1646.8 | 1652.1 | 1645.1 |
| 22.5°  | 1641.6 | 1625.5 | 1602.3 | 1602.3 | 1598.7 |
| 25°    | 1593.4 | 1579.3 | 1549.0 | 1552.4 | 1549.0 |
| 27.5°  | 1540.0 | 1527.6 | 1504.5 | 1499.3 | 1490.4 |
| 30°    | 1486.8 | 1472.4 | 1445.9 | 1440.6 | 1433.4 |
| 32.5°  | 1429.8 | 1419.3 | 1390.8 | 1380.0 | 1372.8 |
| 35°    | 1374.8 | 1357.0 | 1328.5 | 1317.7 | 1308.8 |
| 37.5°  | 1312.5 | 1296.4 | 1268.0 | 1255.4 | 1246.6 |
| 40°    | 1248.5 | 1234.1 | 1205.7 | 1189.9 | 1182.6 |
| 42.5°  | 1186.2 | 1171.9 | 1143.6 | 1125.7 | 1115.1 |
| 45°    | 1118.7 | 1106.2 | 1079.4 | 1060.0 | 1052.8 |
| 47.5°  | 1052.8 | 1040.4 | 1011.9 | 992.3  | 981.7  |
| 50°    | 983.4  | 974.5  | 949.7  | 924.7  | 915.8  |
| 52.5°  | 915.8  | 903.4  | 880.4  | 860.8  | 848.3  |
| 55°    | 846.6  | 835.8  | 814.5  | 793.2  | 784.3  |
| 57.5°  | 777.2  | 768.3  | 745.1  | 723.8  | 716.6  |
| 60°    | 707.7  | 700.8  | 675.9  | 656.2  | 650.9  |
| 62.5°  | 640.2  | 627.7  | 610.0  | 592.2  | 585.1  |
| 65°    | 570.9  | 560.2  | 542.5  | 526.4  | 517.5  |
| 67.5°  | 499.8  | 490.8  | 474.9  | 462.5  | 455.3  |
| 70°    | 434.0  | 426.8  | 410.7  | 398.3  | 391.3  |
| 72.5°  | 366.4  | 359.3  | 350.4  | 337.9  | 332.6  |
| 75°    | 298.7  | 295.3  | 286.2  | 275.7  | 279.2  |
| 77.5°  | 238.3  | 231.2  | 227.5  | 222.3  | 217.0  |
| 80°    | 177.9  | 176.0  | 172.5  | 167.2  | 163.6  |
| 82.5°  | 121.0  | 121.0  | 119.2  | 112.1  | 112.1  |
| 85°    | 72.8   | 71.1   | 69.4   | 63.9   | 62.3   |
| 87.5°  | 32.1   | 28.5   | 24.9   | 19.6   | 17.7   |
| 90°    | 2.1    | 25.5   | 42.5   | 53.3   | 57.4   |
| 92.5°  | 53.3   | 44.8   | 51.0   | 55.4   | 57.4   |
| 95°    | 138.2  | 68.0   | 82.9   | 93.7   | 91.5   |
| 97.5°  | 248.9  | 74.5   | 108.4  | 114.9  | 117.0  |
| 100°   | 376.8  | 85.2   | 121.3  | 138.2  | 142.5  |
| 102.5° | 517.0  | 512.9  | 125.6  | 148.9  | 155.4  |
| 105°   | 646.9  | 710.8  | 129.9  | 153.1  | 161.8  |
| 107.5° | 798.0  | 851.0  | 134.2  | 157.4  | 166.0  |
| 110°   | 942.8  | 987.3  | 372.5  | 159.7  | 168.0  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 1079.0 | 1117.1 | 1081.0 | 163.7  | 170.3  |
| 115°   | 1223.5 | 1259.6 | 1313.0 | 327.7  | 174.6  |
| 117.5° | 1349.2 | 1391.6 | 1428.0 | 1123.5 | 566.0  |
| 120°   | 1489.6 | 1521.5 | 1559.9 | 1585.4 | 1298.1 |
| 122.5° | 1608.7 | 1642.7 | 1685.4 | 1698.1 | 1700.4 |
| 125°   | 1730.0 | 1757.8 | 1798.2 | 1813.1 | 1819.4 |
| 127.5° | 1840.6 | 1870.4 | 1902.5 | 1923.7 | 1925.8 |
| 130°   | 1945.0 | 1979.1 | 2002.3 | 2025.8 | 2023.9 |
| 132.5° | 2051.4 | 2079.2 | 2102.4 | 2121.6 | 2119.6 |
| 135°   | 2140.9 | 2174.9 | 2193.9 | 2215.4 | 2211.1 |
| 137.5° | 2234.3 | 2259.9 | 2281.3 | 2302.6 | 2296.2 |
| 140°   | 2325.8 | 2343.0 | 2366.2 | 2385.4 | 2374.8 |
| 142.5° | 2402.6 | 2417.5 | 2445.1 | 2462.0 | 2451.4 |
| 145°   | 2483.5 | 2481.2 | 2517.3 | 2532.3 | 2521.7 |
| 147.5° | 2553.5 | 2547.2 | 2583.3 | 2593.9 | 2585.6 |
| 150°   | 2621.7 | 2606.8 | 2640.9 | 2653.6 | 2643.0 |
| 152.5° | 2679.1 | 2662.1 | 2694.0 | 2706.9 | 2692.0 |
| 155°   | 2734.5 | 2715.4 | 2740.9 | 2753.6 | 2736.7 |
| 157.5° | 2779.1 | 2762.2 | 2781.4 | 2796.3 | 2779.1 |
| 160°   | 2817.6 | 2804.6 | 2817.6 | 2830.1 | 2815.3 |
| 162.5° | 2851.4 | 2838.8 | 2849.4 | 2864.3 | 2845.1 |
| 165°   | 2881.2 | 2868.6 | 2874.9 | 2889.8 | 2874.9 |
| 167.5° | 2904.7 | 2891.9 | 2898.4 | 2913.3 | 2894.2 |
| 170°   | 2923.9 | 2911.0 | 2915.3 | 2930.3 | 2911.0 |
| 172.5° | 2936.5 | 2923.9 | 2928.2 | 2943.1 | 2923.9 |
| 175°   | 2947.2 | 2932.3 | 2936.5 | 2951.5 | 2930.3 |
| 177.5° | 2951.5 | 2936.5 | 2938.8 | 2953.7 | 2934.6 |
| 180°   | 2940.9 | 2940.9 | 2940.9 | 2940.9 | 2940.9 |

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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 | 6.66             | 7.40  | 7.73  | 8.47  | 9.94  | 6.21           | 6.96  | 7.29  | 8.03  | 9.50  |
|                 | 3H   | 8.31             | 8.98  | 9.40  | 10.06 | 11.55 | 7.82           | 8.49  | 8.91  | 9.57  | 11.06 |
|                 | 4H   | 8.90             | 9.53  | 9.99  | 10.61 | 12.10 | 8.40           | 9.04  | 9.50  | 10.12 | 11.61 |
|                 | 6H   | 9.29             | 9.88  | 10.40 | 10.96 | 12.47 | 8.79           | 9.38  | 9.90  | 10.46 | 11.97 |
|                 | 8H   | 9.40             | 9.95  | 10.50 | 11.06 | 12.55 | 8.90           | 9.45  | 10.00 | 10.55 | 12.05 |
|                 | 12H  | 9.44             | 9.97  | 10.56 | 11.07 | 12.59 | 8.93           | 9.46  | 10.05 | 10.56 | 12.08 |
| 4H              | 2H   | 7.10             | 7.74  | 8.20  | 8.82  | 10.31 | 6.75           | 7.38  | 7.85  | 8.47  | 9.96  |
|                 | 3H   | 8.96             | 9.49  | 10.07 | 10.60 | 12.11 | 8.56           | 9.08  | 9.66  | 10.20 | 11.70 |
|                 | 4H   | 9.68             | 10.16 | 10.79 | 11.26 | 12.79 | 9.25           | 9.74  | 10.36 | 10.84 | 12.36 |
|                 | 6H   | 10.19            | 10.60 | 11.31 | 11.73 | 13.25 | 9.76           | 10.17 | 10.88 | 11.30 | 12.81 |
|                 | 8H   | 10.34            | 10.73 | 11.46 | 11.84 | 13.38 | 9.90           | 10.29 | 11.02 | 11.41 | 12.94 |
|                 | 12H  | 10.41            | 10.76 | 11.54 | 11.89 | 13.43 | 9.96           | 10.31 | 11.09 | 11.44 | 12.98 |
| 8H              | 4H   | 9.86             | 10.25 | 10.98 | 11.37 | 12.90 | 9.49           | 9.88  | 10.61 | 10.99 | 12.52 |
|                 | 6H   | 10.50            | 10.82 | 11.64 | 11.97 | 13.50 | 10.11          | 10.43 | 11.25 | 11.59 | 13.12 |
|                 | 8H   | 10.72            | 11.00 | 11.86 | 12.14 | 13.69 | 10.33          | 10.61 | 11.47 | 11.74 | 13.29 |
|                 | 12H  | 10.85            | 11.09 | 12.00 | 12.23 | 13.81 | 10.44          | 10.68 | 11.59 | 11.82 | 13.40 |
| 12H             | 4H   | 9.84             | 10.20 | 10.98 | 11.32 | 12.86 | 9.48           | 9.83  | 10.61 | 10.96 | 12.49 |
|                 | 6H   | 10.52            | 10.80 | 11.67 | 11.94 | 13.49 | 10.15          | 10.43 | 11.30 | 11.57 | 13.12 |
|                 | 8H   | 10.76            | 11.01 | 11.91 | 12.15 | 13.73 | 10.38          | 10.63 | 11.53 | 11.77 | 13.35 |

END OF REPORT