

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: P908734

Luminaire Tested: DFN2DIP-PN4F0-070D100US840-RLLFLL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P908734  
REPORT IS A COMBINATION OF REPORTS P899724 AND P896497  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-PN4F0-070D100US840-RLLFLL  
Description: 4 foot, Pentagon Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

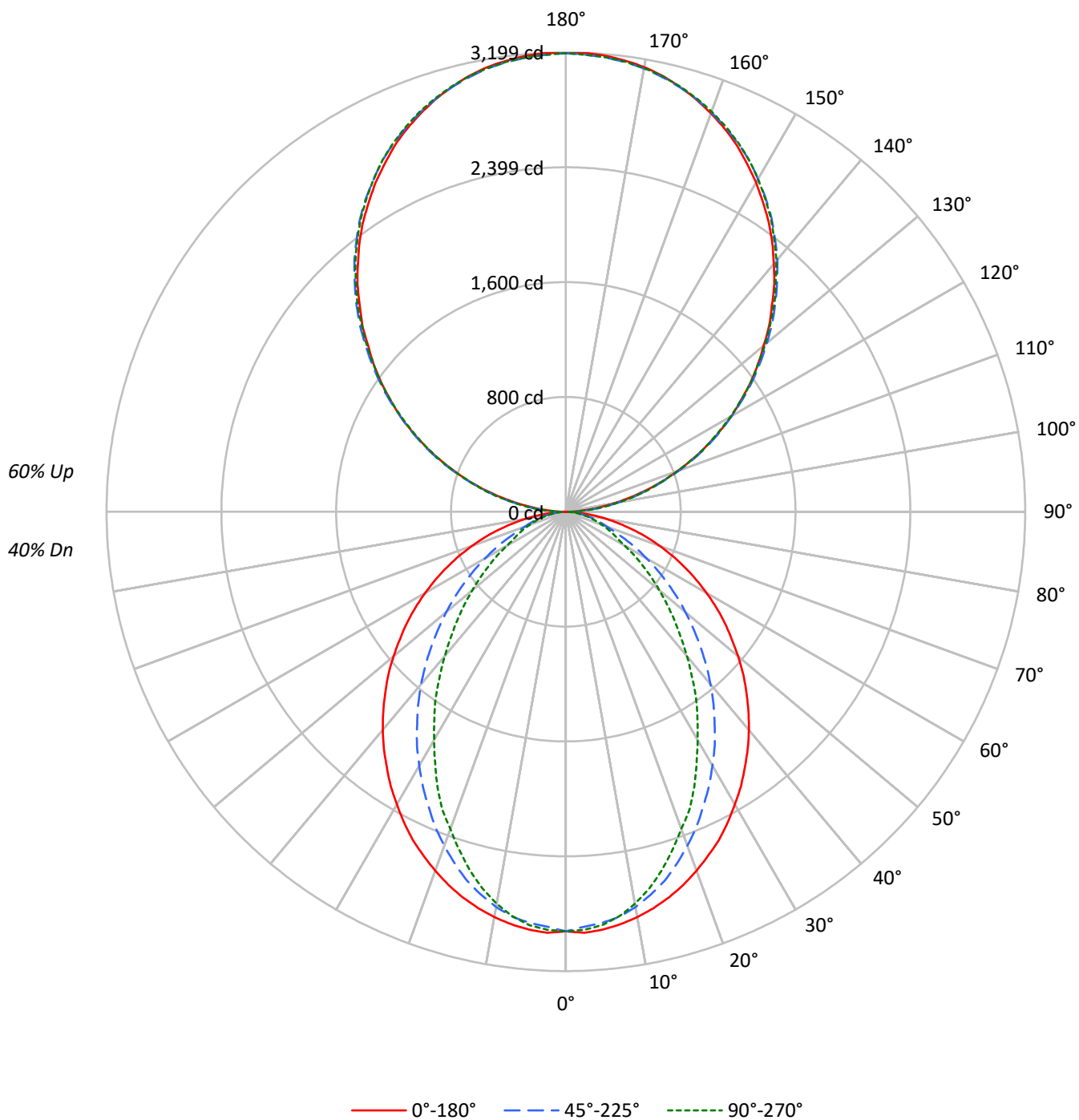
**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 14945.9 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: 3.74' x L: 3.94' x H: 0.1')  
CIE Type: General Diffuse  
  
Input Watts (W): 141.6  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9789  
Total Harmonic Distortion (THDi): 0.074  
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: P908734

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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   | 105 | 105 | 105 | 105 | 95 | 95 | 95 | 95 | 78 | 78 | 78 | 62 | 62 | 62 | 47 | 47 | 47 |
| 1   | 96  | 92  | 88  | 85  | 87 | 84 | 81 | 78 | 69 | 67 | 65 | 55 | 54 | 52 | 42 | 41 | 41 |
| 2   | 88  | 81  | 75  | 70  | 80 | 74 | 69 | 65 | 61 | 57 | 54 | 49 | 46 | 44 | 38 | 36 | 35 |
| 3   | 80  | 71  | 64  | 59  | 73 | 65 | 59 | 54 | 54 | 50 | 46 | 43 | 40 | 38 | 34 | 32 | 30 |
| 4   | 74  | 63  | 56  | 50  | 67 | 58 | 51 | 46 | 48 | 43 | 39 | 39 | 35 | 33 | 30 | 28 | 26 |
| 5   | 68  | 56  | 49  | 43  | 61 | 52 | 45 | 40 | 43 | 38 | 34 | 35 | 31 | 29 | 28 | 25 | 23 |
| 6   | 62  | 51  | 43  | 37  | 57 | 47 | 40 | 35 | 39 | 34 | 30 | 32 | 28 | 25 | 25 | 23 | 20 |
| 7   | 58  | 46  | 38  | 33  | 53 | 42 | 35 | 31 | 35 | 30 | 27 | 29 | 25 | 22 | 23 | 20 | 18 |
| 8   | 54  | 42  | 34  | 29  | 49 | 38 | 32 | 27 | 32 | 27 | 24 | 27 | 23 | 20 | 21 | 19 | 17 |
| 9   | 50  | 38  | 31  | 26  | 45 | 35 | 29 | 24 | 30 | 25 | 21 | 25 | 21 | 18 | 20 | 17 | 15 |
| 10  | 47  | 35  | 28  | 23  | 43 | 32 | 26 | 22 | 27 | 22 | 19 | 23 | 19 | 16 | 18 | 16 | 14 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 2133 | 2133 | 2133 |
| 5°  | 2136 | 2099 | 2113 |
| 10° | 2115 | 2058 | 2044 |
| 15° | 2086 | 1990 | 1938 |
| 20° | 2047 | 1897 | 1808 |
| 25° | 2008 | 1792 | 1683 |
| 30° | 1955 | 1684 | 1523 |
| 35° | 1903 | 1569 | 1383 |
| 40° | 1850 | 1449 | 1222 |
| 45° | 1789 | 1316 | 1077 |
| 50° | 1725 | 1182 | 934  |
| 55° | 1659 | 1039 | 798  |
| 60° | 1583 | 889  | 657  |
| 65° | 1494 | 737  | 592  |
| 70° | 1387 | 594  | 536  |
| 75° | 1253 | 524  | 489  |
| 80° | 1059 | 441  | 425  |
| 85° | 737  | 296  | 322  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 90°

Vertical Angle: 90°

Luminance: 2501 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 273.8   | 1.8       |
| 10°-20°   | 751.7   | 5.0       |
| 20°-30°   | 1055.3  | 7.1       |
| 30°-40°   | 1150.4  | 7.7       |
| 40°-50°   | 1057.3  | 7.1       |
| 50°-60°   | 830.4   | 5.6       |
| 60°-70°   | 540.5   | 3.6       |
| 70°-80°   | 278.2   | 1.9       |
| 80°-90°   | 80.1    | 0.5       |
| 90°-100°  | 197.6   | 1.3       |
| 100°-110° | 627.9   | 4.2       |
| 110°-120° | 1074.6  | 7.2       |
| 120°-130° | 1413.3  | 9.5       |
| 130°-140° | 1586.4  | 10.6      |
| 140°-150° | 1555.6  | 10.4      |
| 150°-160° | 1304.9  | 8.7       |
| 160°-170° | 865.4   | 5.8       |
| 170°-180° | 302.5   | 2.0       |
| 0°-30°    | 2080.9  | 13.9      |
| 0°-40°    | 3231.2  | 21.6      |
| 0°-60°    | 5118.9  | 34.2      |
| 0°-90°    | 6017.7  | 40.3      |
| 90°-120°  | 1900.2  | 12.7      |
| 90°-150°  | 6455.4  | 43.2      |
| 90°-180°  | 8928.0  | 59.7      |
| 0°-180°   | 14945.9 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 2922 | 2922  | 2922 | 2922  | 2922 |      |
| 5°   | 2922 | 2908  | 2874 | 2898  | 2890 | 277  |
| 15°  | 2779 | 2750  | 2660 | 2610  | 2583 | 783  |
| 25°  | 2522 | 2438  | 2263 | 2155  | 2115 | 1160 |
| 35°  | 2173 | 2038  | 1806 | 1639  | 1581 | 1360 |
| 45°  | 1777 | 1600  | 1322 | 1134  | 1071 | 1372 |
| 55°  | 1351 | 1145  | 859  | 701   | 651  | 1207 |
| 65°  | 912  | 698   | 460  | 370   | 362  | 904  |
| 75°  | 486  | 301   | 212  | 193   | 190  | 515  |
| 85°  | 114  | 58    | 50   | 50    | 50   | 130  |
| 90°  | 3    | 35    | 94   | 89    | 92   | 15   |
| 95°  | 141  | 168   | 172  | 172   | 168  | 156  |
| 105° | 580  | 587   | 593  | 598   | 598  | 612  |
| 115° | 1078 | 1094  | 1089 | 1086  | 1078 | 1067 |
| 125° | 1568 | 1593  | 1585 | 1576  | 1573 | 1402 |
| 135° | 2029 | 2059  | 2064 | 2062  | 2054 | 1568 |
| 145° | 2463 | 2482  | 2498 | 2500  | 2490 | 1539 |
| 155° | 2816 | 2824  | 2833 | 2846  | 2838 | 1296 |
| 165° | 3064 | 3061  | 3061 | 3080  | 3067 | 864  |
| 175° | 3188 | 3180  | 3175 | 3194  | 3177 | 303  |
| 180° | 3194 | 3194  | 3194 | 3194  | 3194 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 2921.6 | 2921.6 | 2921.6 | 2921.6 | 2921.6 |
| 2.5°   | 2934.8 | 2921.6 | 2892.5 | 2919.1 | 2913.8 |
| 5°     | 2921.6 | 2908.4 | 2874.0 | 2897.8 | 2889.9 |
| 7.5°   | 2897.8 | 2882.1 | 2845.1 | 2855.4 | 2842.3 |
| 10°    | 2866.1 | 2847.6 | 2794.8 | 2786.7 | 2771.0 |
| 12.5°  | 2826.5 | 2802.7 | 2731.2 | 2715.4 | 2686.2 |
| 15°    | 2778.8 | 2749.7 | 2659.9 | 2609.7 | 2583.3 |
| 17.5°  | 2723.3 | 2681.0 | 2569.9 | 2511.7 | 2469.4 |
| 20°    | 2659.9 | 2606.9 | 2474.8 | 2408.8 | 2350.5 |
| 22.5°  | 2591.2 | 2530.3 | 2376.8 | 2287.0 | 2247.6 |
| 25°    | 2522.4 | 2437.7 | 2263.2 | 2155.0 | 2115.2 |
| 27.5°  | 2440.5 | 2350.5 | 2157.5 | 2033.3 | 1972.4 |
| 30°    | 2353.3 | 2252.6 | 2041.0 | 1906.4 | 1834.9 |
| 32.5°  | 2268.6 | 2146.9 | 1930.3 | 1771.5 | 1705.3 |
| 35°    | 2173.4 | 2038.5 | 1806.0 | 1639.4 | 1581.0 |
| 37.5°  | 2080.9 | 1935.3 | 1689.6 | 1506.9 | 1441.1 |
| 40°    | 1983.0 | 1824.5 | 1567.8 | 1380.2 | 1311.4 |
| 42.5°  | 1882.6 | 1713.4 | 1446.3 | 1250.5 | 1184.7 |
| 45°    | 1776.9 | 1599.5 | 1322.1 | 1134.2 | 1070.8 |
| 47.5°  | 1676.4 | 1488.7 | 1203.2 | 1015.2 | 957.2  |
| 50°    | 1565.3 | 1377.7 | 1086.7 | 904.1  | 848.9  |
| 52.5°  | 1456.7 | 1258.4 | 975.6  | 801.1  | 750.9  |
| 55°    | 1351.0 | 1144.8 | 859.2  | 700.7  | 650.6  |
| 57.5°  | 1242.7 | 1031.2 | 756.3  | 608.1  | 565.8  |
| 60°    | 1131.7 | 920.1  | 647.7  | 513.1  | 470.7  |
| 62.5°  | 1023.3 | 811.8  | 555.1  | 428.4  | 407.3  |
| 65°    | 912.2  | 697.9  | 460.1  | 370.3  | 362.1  |
| 67.5°  | 806.5  | 592.2  | 370.3  | 325.1  | 317.3  |
| 70°    | 695.4  | 489.2  | 306.6  | 280.2  | 269.5  |
| 72.5°  | 589.7  | 393.8  | 256.4  | 235.4  | 230.0  |
| 75°    | 486.5  | 301.2  | 211.5  | 193.0  | 190.5  |
| 77.5°  | 383.4  | 214.0  | 166.6  | 155.9  | 150.7  |
| 80°    | 288.1  | 153.4  | 126.8  | 116.4  | 116.4  |
| 82.5°  | 200.9  | 103.2  | 87.3   | 81.9   | 81.9   |
| 85°    | 113.6  | 58.1   | 50.2   | 50.2   | 50.2   |
| 87.5°  | 42.3   | 21.0   | 21.0   | 18.5   | 18.5   |
| 90°    | 2.9    | 34.6   | 94.3   | 88.6   | 91.5   |
| 92.5°  | 59.7   | 80.9   | 83.8   | 86.6   | 86.6   |
| 95°    | 140.6  | 167.5  | 172.4  | 172.4  | 167.5  |
| 97.5°  | 234.0  | 259.0  | 269.6  | 269.6  | 269.6  |
| 100°   | 341.8  | 364.0  | 371.6  | 371.6  | 368.8  |
| 102.5° | 455.4  | 471.8  | 482.4  | 485.2  | 482.4  |
| 105°   | 579.7  | 587.3  | 593.1  | 597.9  | 597.9  |
| 107.5° | 702.9  | 714.5  | 714.5  | 716.4  | 702.9  |
| 110°   | 822.3  | 837.7  | 837.7  | 837.7  | 830.0  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 951.3  | 967.7  | 964.8  | 957.0  | 951.3  |
| 115°   | 1078.4 | 1093.8 | 1089.0 | 1086.1 | 1078.4 |
| 117.5° | 1204.6 | 1225.8 | 1212.2 | 1204.6 | 1196.8 |
| 120°   | 1331.6 | 1352.8 | 1331.6 | 1331.6 | 1323.0 |
| 122.5° | 1447.1 | 1474.1 | 1460.7 | 1453.0 | 1447.1 |
| 125°   | 1568.5 | 1592.6 | 1584.9 | 1576.2 | 1573.4 |
| 127.5° | 1687.0 | 1716.8 | 1706.2 | 1694.7 | 1687.0 |
| 130°   | 1797.7 | 1832.3 | 1827.6 | 1821.7 | 1811.2 |
| 132.5° | 1921.9 | 1948.8 | 1950.8 | 1937.3 | 1929.6 |
| 135°   | 2028.7 | 2058.6 | 2064.4 | 2061.5 | 2053.8 |
| 137.5° | 2148.2 | 2172.2 | 2177.1 | 2175.1 | 2163.5 |
| 140°   | 2253.1 | 2277.1 | 2290.7 | 2290.7 | 2280.1 |
| 142.5° | 2361.0 | 2385.0 | 2392.7 | 2395.6 | 2385.0 |
| 145°   | 2463.0 | 2482.2 | 2497.7 | 2500.5 | 2489.9 |
| 147.5° | 2554.5 | 2578.6 | 2590.1 | 2595.0 | 2584.3 |
| 150°   | 2648.9 | 2665.2 | 2675.8 | 2684.4 | 2675.8 |
| 152.5° | 2732.6 | 2749.0 | 2762.5 | 2773.1 | 2762.5 |
| 155°   | 2816.4 | 2824.1 | 2832.8 | 2846.2 | 2837.5 |
| 157.5° | 2888.6 | 2894.4 | 2899.2 | 2918.4 | 2905.0 |
| 160°   | 2953.1 | 2958.9 | 2961.7 | 2978.1 | 2966.6 |
| 162.5° | 3012.8 | 3012.8 | 3015.7 | 3033.9 | 3020.5 |
| 165°   | 3063.8 | 3060.9 | 3060.9 | 3080.2 | 3066.8 |
| 167.5° | 3110.1 | 3101.4 | 3101.4 | 3120.7 | 3107.2 |
| 170°   | 3144.7 | 3137.0 | 3134.1 | 3153.4 | 3137.0 |
| 172.5° | 3168.8 | 3161.1 | 3158.2 | 3177.4 | 3161.1 |
| 175°   | 3188.0 | 3180.4 | 3174.6 | 3193.8 | 3177.4 |
| 177.5° | 3198.6 | 3191.0 | 3185.1 | 3201.5 | 3185.1 |
| 180°   | 3193.8 | 3193.8 | 3193.8 | 3193.8 | 3193.8 |

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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 | 8.80             | 9.56  | 9.84  | 10.60 | 12.01 | 4.77           | 5.52 | 5.81 | 6.57 | 7.97  |
|                 | 3H   | 10.48            | 11.15 | 11.53 | 12.21 | 13.63 | 5.95           | 6.63 | 7.00 | 7.68 | 9.10  |
|                 | 4H   | 11.08            | 11.72 | 12.15 | 12.78 | 14.21 | 6.40           | 7.04 | 7.46 | 8.09 | 9.53  |
|                 | 6H   | 11.50            | 12.09 | 12.58 | 13.15 | 14.60 | 6.71           | 7.30 | 7.79 | 8.36 | 9.81  |
|                 | 8H   | 11.63            | 12.19 | 12.71 | 13.26 | 14.70 | 6.80           | 7.36 | 7.88 | 8.44 | 9.88  |
|                 | 12H  | 11.69            | 12.22 | 12.77 | 13.29 | 14.75 | 6.85           | 7.38 | 7.93 | 8.45 | 9.91  |
| 4H              | 2H   | 8.81             | 9.45  | 9.88  | 10.51 | 11.94 | 5.35           | 5.99 | 6.42 | 7.05 | 8.48  |
|                 | 3H   | 10.64            | 11.17 | 11.71 | 12.25 | 13.70 | 6.70           | 7.23 | 7.78 | 8.31 | 9.76  |
|                 | 4H   | 11.33            | 11.82 | 12.41 | 12.89 | 14.36 | 7.24           | 7.73 | 8.33 | 8.81 | 10.27 |
|                 | 6H   | 11.84            | 12.26 | 12.93 | 13.36 | 14.82 | 7.66           | 8.08 | 8.75 | 9.18 | 10.64 |
|                 | 8H   | 12.02            | 12.41 | 13.11 | 13.50 | 14.97 | 7.79           | 8.18 | 8.88 | 9.27 | 10.74 |
|                 | 12H  | 12.11            | 12.46 | 13.22 | 13.57 | 15.05 | 7.85           | 8.20 | 8.96 | 9.31 | 10.79 |
| 8H              | 4H   | 11.29            | 11.68 | 12.38 | 12.77 | 14.25 | 7.52           | 7.91 | 8.61 | 9.00 | 10.48 |
|                 | 6H   | 11.86            | 12.18 | 12.97 | 13.31 | 14.78 | 8.04           | 8.36 | 9.15 | 9.49 | 10.96 |
|                 | 8H   | 12.07            | 12.36 | 13.19 | 13.47 | 14.96 | 8.23           | 8.51 | 9.35 | 9.62 | 11.12 |
|                 | 12H  | 12.21            | 12.46 | 13.34 | 13.57 | 15.10 | 8.35           | 8.59 | 9.47 | 9.70 | 11.23 |
| 12H             | 4H   | 11.24            | 11.59 | 12.35 | 12.69 | 14.17 | 7.52           | 7.88 | 8.63 | 8.98 | 10.46 |
|                 | 6H   | 11.83            | 12.11 | 12.95 | 13.23 | 14.72 | 8.09           | 8.37 | 9.21 | 9.48 | 10.98 |
|                 | 8H   | 12.05            | 12.30 | 13.17 | 13.41 | 14.94 | 8.30           | 8.54 | 9.42 | 9.65 | 11.18 |

END OF REPORT