

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: P906010

Luminaire Tested: DFN2DIP-PN4F0-070D110US835-RLLFLL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P906010  
REPORT IS A COMBINATION OF REPORTS P899742 AND P896497  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-PN4F0-070D110US835-RLLFLL  
Description: 4 foot, Pentagon Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

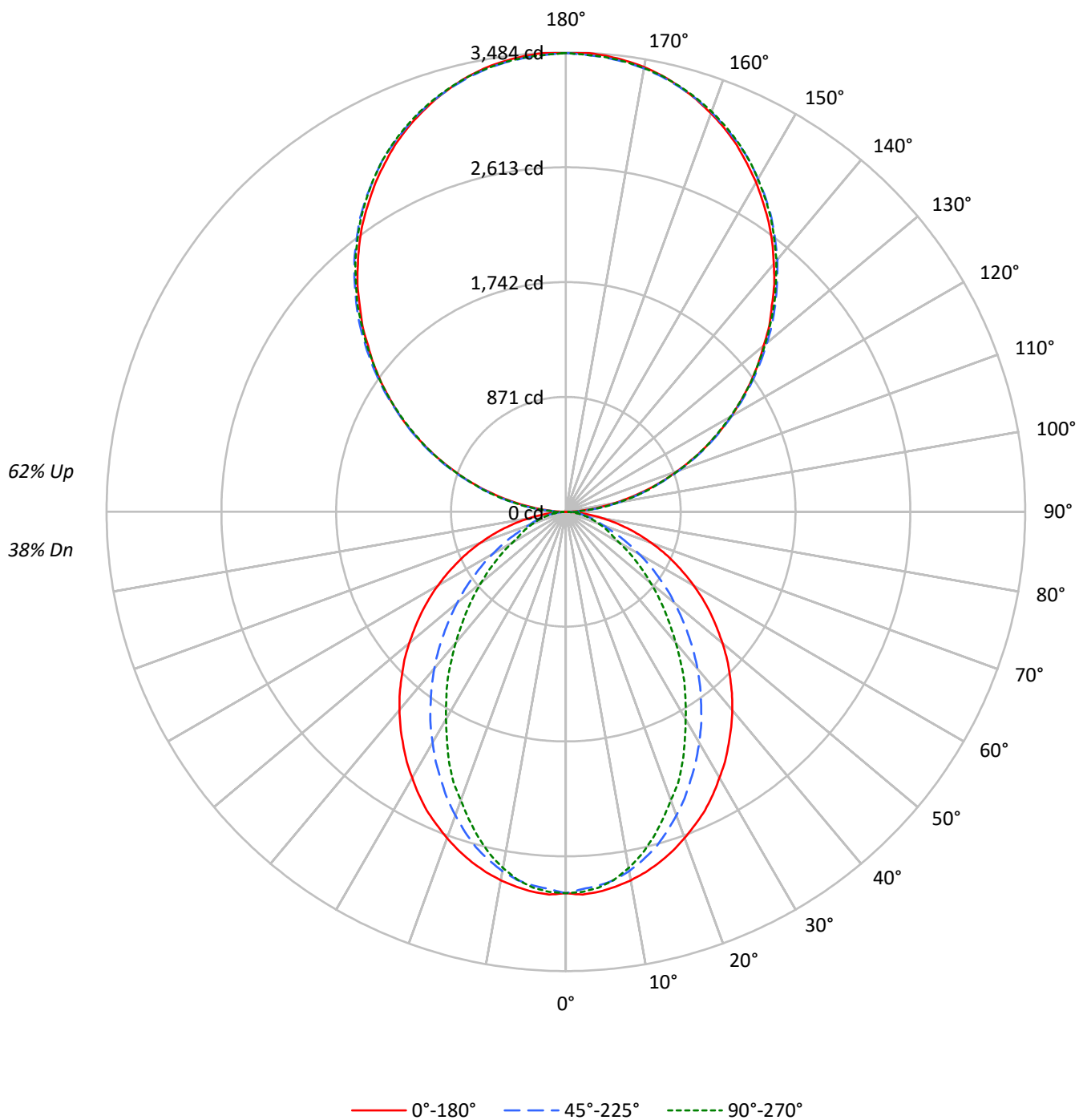
**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 15685.0 lumens  
Efficiency: N/A  
Efficacy: 99.1 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: Semi-Indirect  
  
Input Watts (W): 158.3  
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: P906010

CATALOG NUMBER: DFN2DIP-PN4F0-070D110US835-RLFL

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

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 2112 | 2112 | 2112 |
| 5°  | 2115 | 2079 | 2092 |
| 10° | 2094 | 2038 | 2024 |
| 15° | 2065 | 1971 | 1919 |
| 20° | 2027 | 1878 | 1791 |
| 25° | 1988 | 1775 | 1666 |
| 30° | 1936 | 1668 | 1508 |
| 35° | 1884 | 1554 | 1370 |
| 40° | 1832 | 1435 | 1210 |
| 45° | 1771 | 1303 | 1066 |
| 50° | 1708 | 1171 | 925  |
| 55° | 1643 | 1029 | 790  |
| 60° | 1567 | 880  | 650  |
| 65° | 1480 | 729  | 586  |
| 70° | 1374 | 588  | 531  |
| 75° | 1241 | 519  | 484  |
| 80° | 1048 | 437  | 421  |
| 85° | 730  | 293  | 319  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 90°

Vertical Angle: 90°

Luminance: 2723 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 271.1   | 1.7       |
| 10°-20°   | 744.3   | 4.7       |
| 20°-30°   | 1045.0  | 6.7       |
| 30°-40°   | 1139.2  | 7.3       |
| 40°-50°   | 1047.0  | 6.7       |
| 50°-60°   | 822.3   | 5.2       |
| 60°-70°   | 535.2   | 3.4       |
| 70°-80°   | 275.5   | 1.8       |
| 80°-90°   | 80.2    | 0.5       |
| 90°-100°  | 215.3   | 1.4       |
| 100°-110° | 684.0   | 4.4       |
| 110°-120° | 1170.5  | 7.5       |
| 120°-130° | 1539.4  | 9.8       |
| 130°-140° | 1727.9  | 11.0      |
| 140°-150° | 1694.4  | 10.8      |
| 150°-160° | 1421.4  | 9.1       |
| 160°-170° | 942.6   | 6.0       |
| 170°-180° | 329.5   | 2.1       |
| 0°-30°    | 2060.5  | 13.1      |
| 0°-40°    | 3199.7  | 20.4      |
| 0°-60°    | 5068.9  | 32.3      |
| 0°-90°    | 5959.8  | 38.0      |
| 90°-120°  | 2069.8  | 13.2      |
| 90°-150°  | 7031.6  | 44.8      |
| 90°-180°  | 9725.0  | 62.0      |
| 0°-180°   | 15685.0 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 2893 | 2893  | 2893 | 2893  | 2893 |      |
| 5°   | 2893 | 2880  | 2846 | 2870  | 2862 | 274  |
| 15°  | 2752 | 2723  | 2634 | 2584  | 2558 | 775  |
| 25°  | 2498 | 2414  | 2241 | 2134  | 2094 | 1149 |
| 35°  | 2152 | 2019  | 1788 | 1623  | 1566 | 1347 |
| 45°  | 1760 | 1584  | 1309 | 1123  | 1060 | 1359 |
| 55°  | 1338 | 1134  | 851  | 694   | 644  | 1195 |
| 65°  | 903  | 691   | 456  | 367   | 359  | 896  |
| 75°  | 482  | 298   | 209  | 191   | 189  | 509  |
| 85°  | 112  | 58    | 50   | 50    | 50   | 129  |
| 90°  | 3    | 38    | 103  | 96    | 100  | 15   |
| 95°  | 153  | 182   | 188  | 188   | 182  | 170  |
| 105° | 631  | 640   | 646  | 651   | 651  | 666  |
| 115° | 1175 | 1191  | 1186 | 1183  | 1175 | 1162 |
| 125° | 1708 | 1735  | 1726 | 1717  | 1714 | 1527 |
| 135° | 2210 | 2242  | 2249 | 2246  | 2237 | 1708 |
| 145° | 2683 | 2704  | 2721 | 2724  | 2712 | 1676 |
| 155° | 3068 | 3076  | 3086 | 3100  | 3091 | 1412 |
| 165° | 3337 | 3334  | 3334 | 3355  | 3340 | 941  |
| 175° | 3473 | 3464  | 3458 | 3479  | 3461 | 330  |
| 180° | 3479 | 3479  | 3479 | 3479  | 3479 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 2893.1 | 2893.1 | 2893.1 | 2893.1 | 2893.1 |
| 2.5°   | 2906.1 | 2893.1 | 2864.2 | 2890.6 | 2885.3 |
| 5°     | 2893.1 | 2880.0 | 2845.9 | 2869.5 | 2861.7 |
| 7.5°   | 2869.5 | 2853.9 | 2817.3 | 2827.5 | 2814.5 |
| 10°    | 2838.1 | 2819.8 | 2767.5 | 2759.5 | 2743.9 |
| 12.5°  | 2798.9 | 2775.3 | 2704.5 | 2688.9 | 2660.0 |
| 15°    | 2751.7 | 2722.8 | 2633.9 | 2584.2 | 2558.1 |
| 17.5°  | 2696.7 | 2654.8 | 2544.8 | 2487.2 | 2445.3 |
| 20°    | 2633.9 | 2581.4 | 2450.6 | 2385.3 | 2327.5 |
| 22.5°  | 2565.9 | 2505.6 | 2353.6 | 2264.7 | 2225.6 |
| 25°    | 2497.8 | 2413.9 | 2241.1 | 2133.9 | 2094.5 |
| 27.5°  | 2416.7 | 2327.5 | 2136.4 | 2013.4 | 1953.1 |
| 30°    | 2330.3 | 2230.6 | 2021.1 | 1887.8 | 1817.0 |
| 32.5°  | 2246.4 | 2125.9 | 1911.4 | 1754.2 | 1688.6 |
| 35°    | 2152.2 | 2018.6 | 1788.4 | 1623.4 | 1565.6 |
| 37.5°  | 2060.6 | 1916.4 | 1673.1 | 1492.2 | 1427.0 |
| 40°    | 1963.6 | 1806.7 | 1552.5 | 1366.7 | 1298.6 |
| 42.5°  | 1864.2 | 1696.7 | 1432.2 | 1238.3 | 1173.1 |
| 45°    | 1759.5 | 1583.9 | 1309.2 | 1123.1 | 1060.3 |
| 47.5°  | 1660.0 | 1474.2 | 1191.4 | 1005.3 | 947.8  |
| 50°    | 1550.0 | 1364.2 | 1076.1 | 895.3  | 840.6  |
| 52.5°  | 1442.5 | 1246.1 | 966.1  | 793.3  | 743.6  |
| 55°    | 1337.8 | 1133.6 | 850.8  | 693.9  | 644.2  |
| 57.5°  | 1230.6 | 1021.1 | 748.9  | 602.2  | 560.3  |
| 60°    | 1120.6 | 911.1  | 641.4  | 508.1  | 466.1  |
| 62.5°  | 1013.3 | 803.9  | 549.7  | 424.2  | 403.3  |
| 65°    | 903.3  | 691.1  | 455.6  | 366.7  | 358.6  |
| 67.5°  | 798.6  | 586.4  | 366.7  | 321.9  | 314.2  |
| 70°    | 688.6  | 484.4  | 303.6  | 277.5  | 266.9  |
| 72.5°  | 583.9  | 390.0  | 253.9  | 233.1  | 227.8  |
| 75°    | 481.7  | 298.3  | 209.4  | 191.1  | 188.6  |
| 77.5°  | 379.7  | 211.9  | 165.0  | 154.4  | 149.2  |
| 80°    | 285.3  | 151.9  | 125.6  | 115.3  | 115.3  |
| 82.5°  | 198.9  | 102.2  | 86.4   | 81.1   | 81.1   |
| 85°    | 112.5  | 57.5   | 49.7   | 49.7   | 49.7   |
| 87.5°  | 41.9   | 20.8   | 20.8   | 18.3   | 18.3   |
| 90°    | 3.1    | 37.8   | 102.8  | 96.5   | 99.6   |
| 92.5°  | 65.0   | 88.1   | 91.2   | 94.4   | 94.4   |
| 95°    | 153.1  | 182.5  | 187.7  | 187.7  | 182.5  |
| 97.5°  | 254.9  | 282.1  | 293.7  | 293.7  | 293.7  |
| 100°   | 372.3  | 396.4  | 404.8  | 404.8  | 401.7  |
| 102.5° | 496.1  | 513.9  | 525.5  | 528.6  | 525.5  |
| 105°   | 631.4  | 639.8  | 646.1  | 651.3  | 651.3  |
| 107.5° | 765.6  | 778.2  | 778.2  | 780.3  | 765.6  |
| 110°   | 895.7  | 912.5  | 912.5  | 912.5  | 904.1  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 1036.2 | 1054.0 | 1050.9 | 1042.5 | 1036.2 |
| 115°   | 1174.7 | 1191.4 | 1186.2 | 1183.1 | 1174.7 |
| 117.5° | 1312.1 | 1335.1 | 1320.4 | 1312.1 | 1303.7 |
| 120°   | 1450.5 | 1473.6 | 1450.5 | 1450.5 | 1441.1 |
| 122.5° | 1576.4 | 1605.7 | 1591.0 | 1582.6 | 1576.4 |
| 125°   | 1708.5 | 1734.7 | 1726.3 | 1716.9 | 1713.7 |
| 127.5° | 1837.5 | 1870.0 | 1858.5 | 1845.9 | 1837.5 |
| 130°   | 1958.1 | 1995.9 | 1990.6 | 1984.3 | 1972.8 |
| 132.5° | 2093.4 | 2122.8 | 2124.9 | 2110.2 | 2101.8 |
| 135°   | 2209.8 | 2242.3 | 2248.6 | 2245.5 | 2237.1 |
| 137.5° | 2339.9 | 2366.1 | 2371.3 | 2369.2 | 2356.7 |
| 140°   | 2454.2 | 2480.4 | 2495.1 | 2495.1 | 2483.6 |
| 142.5° | 2571.7 | 2597.9 | 2606.3 | 2609.4 | 2597.9 |
| 145°   | 2682.8 | 2703.8 | 2720.6 | 2723.7 | 2712.2 |
| 147.5° | 2782.5 | 2808.7 | 2821.3 | 2826.5 | 2815.0 |
| 150°   | 2885.3 | 2903.1 | 2914.6 | 2924.1 | 2914.6 |
| 152.5° | 2976.5 | 2994.3 | 3009.0 | 3020.6 | 3009.0 |
| 155°   | 3067.8 | 3076.1 | 3085.6 | 3100.3 | 3090.8 |
| 157.5° | 3146.4 | 3152.7 | 3157.9 | 3178.9 | 3164.2 |
| 160°   | 3216.7 | 3223.0 | 3226.1 | 3244.0 | 3231.4 |
| 162.5° | 3281.7 | 3281.7 | 3284.9 | 3304.8 | 3290.1 |
| 165°   | 3337.3 | 3334.1 | 3334.1 | 3355.1 | 3340.4 |
| 167.5° | 3387.6 | 3378.2 | 3378.2 | 3399.2 | 3384.5 |
| 170°   | 3425.4 | 3417.0 | 3413.9 | 3434.8 | 3417.0 |
| 172.5° | 3451.6 | 3443.2 | 3440.1 | 3461.1 | 3443.2 |
| 175°   | 3472.6 | 3464.2 | 3457.9 | 3478.9 | 3461.1 |
| 177.5° | 3484.1 | 3475.7 | 3469.4 | 3487.3 | 3469.4 |
| 180°   | 3478.9 | 3478.9 | 3478.9 | 3478.9 | 3478.9 |

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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 | 8.51             | 9.26  | 9.57  | 10.31 | 11.75 | 4.48           | 5.22 | 5.54 | 6.28 | 7.71  |
|                 | 3H   | 10.19            | 10.85 | 11.26 | 11.92 | 13.37 | 5.66           | 6.32 | 6.73 | 7.39 | 8.85  |
|                 | 4H   | 10.79            | 11.42 | 11.87 | 12.49 | 13.95 | 6.11           | 6.74 | 7.19 | 7.81 | 9.27  |
|                 | 6H   | 11.21            | 11.79 | 12.30 | 12.86 | 14.34 | 6.43           | 7.00 | 7.51 | 8.08 | 9.55  |
|                 | 8H   | 11.34            | 11.89 | 12.43 | 12.98 | 14.44 | 6.51           | 7.06 | 7.61 | 8.15 | 9.62  |
|                 | 12H  | 11.40            | 11.92 | 12.50 | 13.00 | 14.49 | 6.55           | 7.08 | 7.65 | 8.16 | 9.65  |
| 4H              | 2H   | 8.52             | 9.15  | 9.61  | 10.22 | 11.68 | 5.06           | 5.69 | 6.15 | 6.76 | 8.22  |
|                 | 3H   | 10.35            | 10.87 | 11.44 | 11.96 | 13.44 | 6.41           | 6.93 | 7.50 | 8.03 | 9.50  |
|                 | 4H   | 11.04            | 11.52 | 12.13 | 12.60 | 14.10 | 6.95           | 7.43 | 8.05 | 8.52 | 10.01 |
|                 | 6H   | 11.55            | 11.96 | 12.66 | 13.07 | 14.56 | 7.37           | 7.78 | 8.47 | 8.89 | 10.38 |
|                 | 8H   | 11.72            | 12.11 | 12.83 | 13.21 | 14.71 | 7.50           | 7.88 | 8.60 | 8.98 | 10.48 |
|                 | 12H  | 11.82            | 12.16 | 12.94 | 13.28 | 14.79 | 7.56           | 7.90 | 8.68 | 9.02 | 10.53 |
| 8H              | 4H   | 11.00            | 11.38 | 12.10 | 12.48 | 13.99 | 7.23           | 7.61 | 8.33 | 8.71 | 10.22 |
|                 | 6H   | 11.56            | 11.88 | 12.69 | 13.02 | 14.52 | 7.74           | 8.06 | 8.87 | 9.21 | 10.70 |
|                 | 8H   | 11.78            | 12.06 | 12.92 | 13.18 | 14.70 | 7.94           | 8.21 | 9.07 | 9.34 | 10.86 |
|                 | 12H  | 11.92            | 12.16 | 13.06 | 13.28 | 14.84 | 8.05           | 8.30 | 9.19 | 9.42 | 10.97 |
| 12H             | 4H   | 10.95            | 11.29 | 12.07 | 12.41 | 13.91 | 7.23           | 7.58 | 8.35 | 8.69 | 10.20 |
|                 | 6H   | 11.54            | 11.82 | 12.67 | 12.94 | 14.46 | 7.79           | 8.07 | 8.93 | 9.20 | 10.72 |
|                 | 8H   | 11.76            | 12.00 | 12.89 | 13.12 | 14.68 | 8.00           | 8.25 | 9.14 | 9.37 | 10.92 |

END OF REPORT