

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: P908203

Luminaire Tested: DFN2DIP-HX4F0-070D070US840-RLLFLL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P908203  
REPORT IS A COMBINATION OF REPORTS P899360 AND P896188  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-HX4F0-070D070US840-RLLFLL  
Description: 4 foot, Hexagon Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

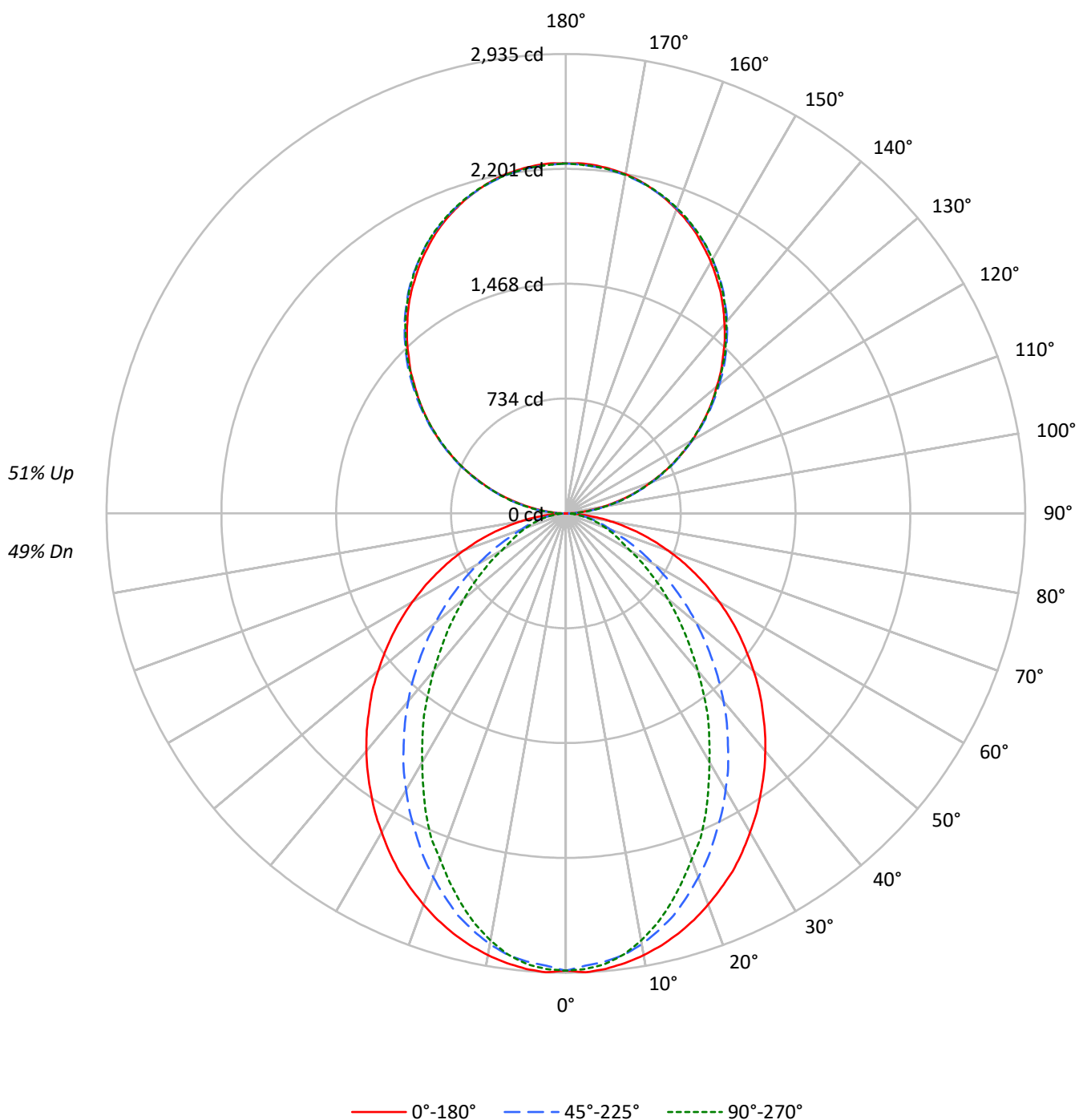
**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 12264.8 lumens  
Efficiency: N/A  
Efficacy: 115.9 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 0.99 / 1.16  
Luminous Opening: Rectangular w/ Sides (W: 3.54' x L: 4.09' x H: 0.1')  
CIE Type: General Diffuse  
  
Input Watts (W): 105.8  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9972  
Total Harmonic Distortion (THDi): 0.128  
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   | 107 | 107 | 107 | 107 | 99 | 99 | 99 | 99 | 83 | 83 | 83 | 68 | 68 | 68 | 55 | 55 | 55 |
| 1   | 98  | 94  | 90  | 87  | 90 | 87 | 84 | 81 | 73 | 71 | 69 | 61 | 59 | 58 | 50 | 49 | 48 |
| 2   | 90  | 83  | 77  | 72  | 82 | 76 | 71 | 67 | 65 | 61 | 58 | 54 | 51 | 49 | 44 | 42 | 41 |
| 3   | 82  | 73  | 66  | 60  | 75 | 68 | 61 | 57 | 58 | 53 | 49 | 48 | 45 | 42 | 40 | 37 | 35 |
| 4   | 75  | 65  | 57  | 51  | 69 | 60 | 54 | 48 | 51 | 46 | 42 | 43 | 40 | 36 | 36 | 33 | 31 |
| 5   | 69  | 58  | 50  | 44  | 64 | 54 | 47 | 42 | 46 | 41 | 37 | 39 | 35 | 32 | 32 | 29 | 27 |
| 6   | 64  | 52  | 44  | 39  | 59 | 49 | 42 | 37 | 42 | 36 | 32 | 35 | 31 | 28 | 30 | 26 | 24 |
| 7   | 59  | 47  | 40  | 34  | 55 | 44 | 37 | 32 | 38 | 33 | 29 | 32 | 28 | 25 | 27 | 24 | 22 |
| 8   | 55  | 43  | 36  | 30  | 51 | 40 | 33 | 29 | 35 | 29 | 26 | 30 | 26 | 23 | 25 | 22 | 20 |
| 9   | 51  | 39  | 32  | 27  | 47 | 37 | 30 | 26 | 32 | 27 | 23 | 27 | 23 | 20 | 23 | 20 | 18 |
| 10  | 48  | 36  | 29  | 24  | 44 | 34 | 28 | 23 | 30 | 24 | 21 | 25 | 21 | 19 | 22 | 18 | 16 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 2172 | 2172 | 2172 |
| 5°  | 2176 | 2138 | 2152 |
| 10° | 2155 | 2096 | 2082 |
| 15° | 2125 | 2027 | 1974 |
| 20° | 2086 | 1932 | 1841 |
| 25° | 2046 | 1825 | 1713 |
| 30° | 1992 | 1715 | 1550 |
| 35° | 1940 | 1598 | 1407 |
| 40° | 1886 | 1476 | 1243 |
| 45° | 1824 | 1340 | 1095 |
| 50° | 1759 | 1204 | 950  |
| 55° | 1692 | 1058 | 811  |
| 60° | 1615 | 905  | 667  |
| 65° | 1525 | 750  | 601  |
| 70° | 1417 | 605  | 544  |
| 75° | 1281 | 533  | 495  |
| 80° | 1083 | 448  | 430  |
| 85° | 757  | 300  | 324  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 1824 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 273.8   | 2.2       |
| 10°-20°   | 751.7   | 6.1       |
| 20°-30°   | 1055.3  | 8.6       |
| 30°-40°   | 1150.4  | 9.4       |
| 40°-50°   | 1057.3  | 8.6       |
| 50°-60°   | 830.4   | 6.8       |
| 60°-70°   | 540.5   | 4.4       |
| 70°-80°   | 278.2   | 2.3       |
| 80°-90°   | 77.4    | 0.6       |
| 90°-100°  | 138.3   | 1.1       |
| 100°-110° | 439.6   | 3.6       |
| 110°-120° | 752.2   | 6.1       |
| 120°-130° | 989.3   | 8.1       |
| 130°-140° | 1110.5  | 9.1       |
| 140°-150° | 1088.9  | 8.9       |
| 150°-160° | 913.5   | 7.4       |
| 160°-170° | 605.8   | 4.9       |
| 170°-180° | 211.7   | 1.7       |
| 0°-30°    | 2080.9  | 17.0      |
| 0°-40°    | 3231.2  | 26.3      |
| 0°-60°    | 5118.9  | 41.7      |
| 0°-90°    | 6015.0  | 49.0      |
| 90°-120°  | 1330.1  | 10.8      |
| 90°-150°  | 4518.8  | 36.8      |
| 90°-180°  | 6250.0  | 51.0      |
| 0°-180°   | 12264.8 | 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°  | 2    | 24    | 66   | 62    | 64   | 12   |
| 95°  | 98   | 117   | 121  | 121   | 117  | 109  |
| 105° | 406  | 411   | 415  | 419   | 419  | 428  |
| 115° | 755  | 766   | 762  | 760   | 755  | 747  |
| 125° | 1098 | 1115  | 1109 | 1103  | 1101 | 981  |
| 135° | 1420 | 1441  | 1445 | 1443  | 1438 | 1098 |
| 145° | 1724 | 1738  | 1748 | 1750  | 1743 | 1077 |
| 155° | 1972 | 1977  | 1983 | 1992  | 1986 | 907  |
| 165° | 2145 | 2143  | 2143 | 2156  | 2147 | 605  |
| 175° | 2232 | 2226  | 2222 | 2236  | 2224 | 212  |
| 180° | 2236 | 2236  | 2236 | 2236  | 2236 |      |

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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°    | 2.0    | 24.2   | 66.0   | 62.0   | 64.0   |
| 92.5°  | 41.8   | 56.7   | 58.7   | 60.7   | 60.7   |
| 95°    | 98.4   | 117.2  | 120.7  | 120.7  | 117.2  |
| 97.5°  | 163.8  | 181.3  | 188.7  | 188.7  | 188.7  |
| 100°   | 239.2  | 254.8  | 260.1  | 260.1  | 258.1  |
| 102.5° | 318.8  | 330.2  | 337.7  | 339.7  | 337.7  |
| 105°   | 405.8  | 411.1  | 415.2  | 418.6  | 418.6  |
| 107.5° | 492.0  | 500.1  | 500.1  | 501.5  | 492.0  |
| 110°   | 575.6  | 586.4  | 586.4  | 586.4  | 581.0  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 665.9  | 677.4  | 675.4  | 669.9  | 665.9  |
| 115°   | 754.9  | 765.7  | 762.3  | 760.3  | 754.9  |
| 117.5° | 843.1  | 858.0  | 848.6  | 843.1  | 837.8  |
| 120°   | 932.1  | 947.0  | 932.1  | 932.1  | 926.0  |
| 122.5° | 1013.0 | 1031.9 | 1022.5 | 1017.0 | 1013.0 |
| 125°   | 1097.9 | 1114.8 | 1109.4 | 1103.4 | 1101.4 |
| 127.5° | 1180.8 | 1201.7 | 1194.4 | 1186.3 | 1180.8 |
| 130°   | 1258.4 | 1282.6 | 1279.3 | 1275.3 | 1267.8 |
| 132.5° | 1345.3 | 1364.2 | 1365.5 | 1356.1 | 1350.7 |
| 135°   | 1420.2 | 1441.0 | 1445.1 | 1443.0 | 1437.6 |
| 137.5° | 1503.7 | 1520.6 | 1523.9 | 1522.6 | 1514.5 |
| 140°   | 1577.2 | 1594.1 | 1603.5 | 1603.5 | 1596.1 |
| 142.5° | 1652.6 | 1669.5 | 1674.9 | 1676.9 | 1669.5 |
| 145°   | 1724.1 | 1737.6 | 1748.4 | 1750.4 | 1743.0 |
| 147.5° | 1788.2 | 1805.0 | 1813.1 | 1816.4 | 1809.1 |
| 150°   | 1854.2 | 1865.6 | 1873.1 | 1879.2 | 1873.1 |
| 152.5° | 1912.8 | 1924.3 | 1933.7 | 1941.2 | 1933.7 |
| 155°   | 1971.5 | 1976.8 | 1983.0 | 1992.4 | 1986.3 |
| 157.5° | 2022.1 | 2026.1 | 2029.4 | 2043.0 | 2033.5 |
| 160°   | 2067.2 | 2071.2 | 2073.3 | 2084.7 | 2076.6 |
| 162.5° | 2109.0 | 2109.0 | 2111.0 | 2123.7 | 2114.4 |
| 165°   | 2144.7 | 2142.6 | 2142.6 | 2156.2 | 2146.7 |
| 167.5° | 2177.1 | 2171.0 | 2171.0 | 2184.4 | 2175.0 |
| 170°   | 2201.3 | 2196.0 | 2193.9 | 2207.4 | 2196.0 |
| 172.5° | 2218.2 | 2212.7 | 2210.7 | 2224.2 | 2212.7 |
| 175°   | 2231.6 | 2226.2 | 2222.2 | 2235.6 | 2224.2 |
| 177.5° | 2239.1 | 2233.6 | 2229.6 | 2241.1 | 2229.6 |
| 180°   | 2235.6 | 2235.6 | 2235.6 | 2235.6 | 2235.6 |

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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 | 9.75             | 10.57 | 10.72 | 11.56 | 12.84 | 5.72           | 6.55 | 6.70  | 7.53  | 8.82  |
|                 | 3H   | 11.43            | 12.16 | 12.41 | 13.16 | 14.47 | 6.91           | 7.65 | 7.90  | 8.64  | 9.95  |
|                 | 4H   | 12.04            | 12.73 | 13.03 | 13.73 | 15.05 | 7.37           | 8.06 | 8.36  | 9.05  | 10.37 |
|                 | 6H   | 12.46            | 13.10 | 13.47 | 14.10 | 15.43 | 7.69           | 8.33 | 8.69  | 9.33  | 10.66 |
|                 | 8H   | 12.59            | 13.20 | 13.60 | 14.21 | 15.54 | 7.78           | 8.39 | 8.79  | 9.40  | 10.73 |
|                 | 12H  | 12.65            | 13.23 | 13.67 | 14.24 | 15.59 | 7.82           | 8.40 | 8.84  | 9.41  | 10.76 |
| 4H              | 2H   | 9.77             | 10.46 | 10.77 | 11.46 | 12.78 | 6.32           | 7.01 | 7.32  | 8.01  | 9.33  |
|                 | 3H   | 11.60            | 12.18 | 12.61 | 13.20 | 14.53 | 7.67           | 8.25 | 8.68  | 9.27  | 10.60 |
|                 | 4H   | 12.29            | 12.82 | 13.31 | 13.84 | 15.19 | 8.22           | 8.75 | 9.24  | 9.76  | 11.12 |
|                 | 6H   | 12.81            | 13.26 | 13.84 | 14.30 | 15.65 | 8.64           | 9.09 | 9.67  | 10.13 | 11.49 |
|                 | 8H   | 12.98            | 13.41 | 14.01 | 14.44 | 15.80 | 8.77           | 9.19 | 9.80  | 10.23 | 11.59 |
|                 | 12H  | 13.08            | 13.46 | 14.13 | 14.51 | 15.88 | 8.84           | 9.22 | 9.88  | 10.27 | 11.64 |
| 8H              | 4H   | 12.26            | 12.68 | 13.29 | 13.71 | 15.08 | 8.50           | 8.92 | 9.53  | 9.96  | 11.32 |
|                 | 6H   | 12.83            | 13.18 | 13.88 | 14.25 | 15.61 | 9.02           | 9.37 | 10.07 | 10.44 | 11.81 |
|                 | 8H   | 13.04            | 13.35 | 14.11 | 14.41 | 15.79 | 9.21           | 9.52 | 10.27 | 10.58 | 11.96 |
|                 | 12H  | 13.18            | 13.45 | 14.25 | 14.51 | 15.93 | 9.33           | 9.60 | 10.40 | 10.66 | 12.08 |
| 12H             | 4H   | 12.21            | 12.59 | 13.26 | 13.64 | 15.01 | 8.50           | 8.89 | 9.55  | 9.93  | 11.30 |
|                 | 6H   | 12.80            | 13.11 | 13.86 | 14.17 | 15.55 | 9.07           | 9.38 | 10.13 | 10.44 | 11.82 |
|                 | 8H   | 13.02            | 13.29 | 14.09 | 14.35 | 15.77 | 9.28           | 9.55 | 10.35 | 10.61 | 12.03 |

END OF REPORT