

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: P905048

Luminaire Tested: DFN2DIP-4P4F0-040D080US835-RLLFLL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P905048  
REPORT IS A COMBINATION OF REPORTS P899142 AND P895967  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-4P4F0-040D080US835-RLLFLL  
Description: 4 foot, 90deg - 4way Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

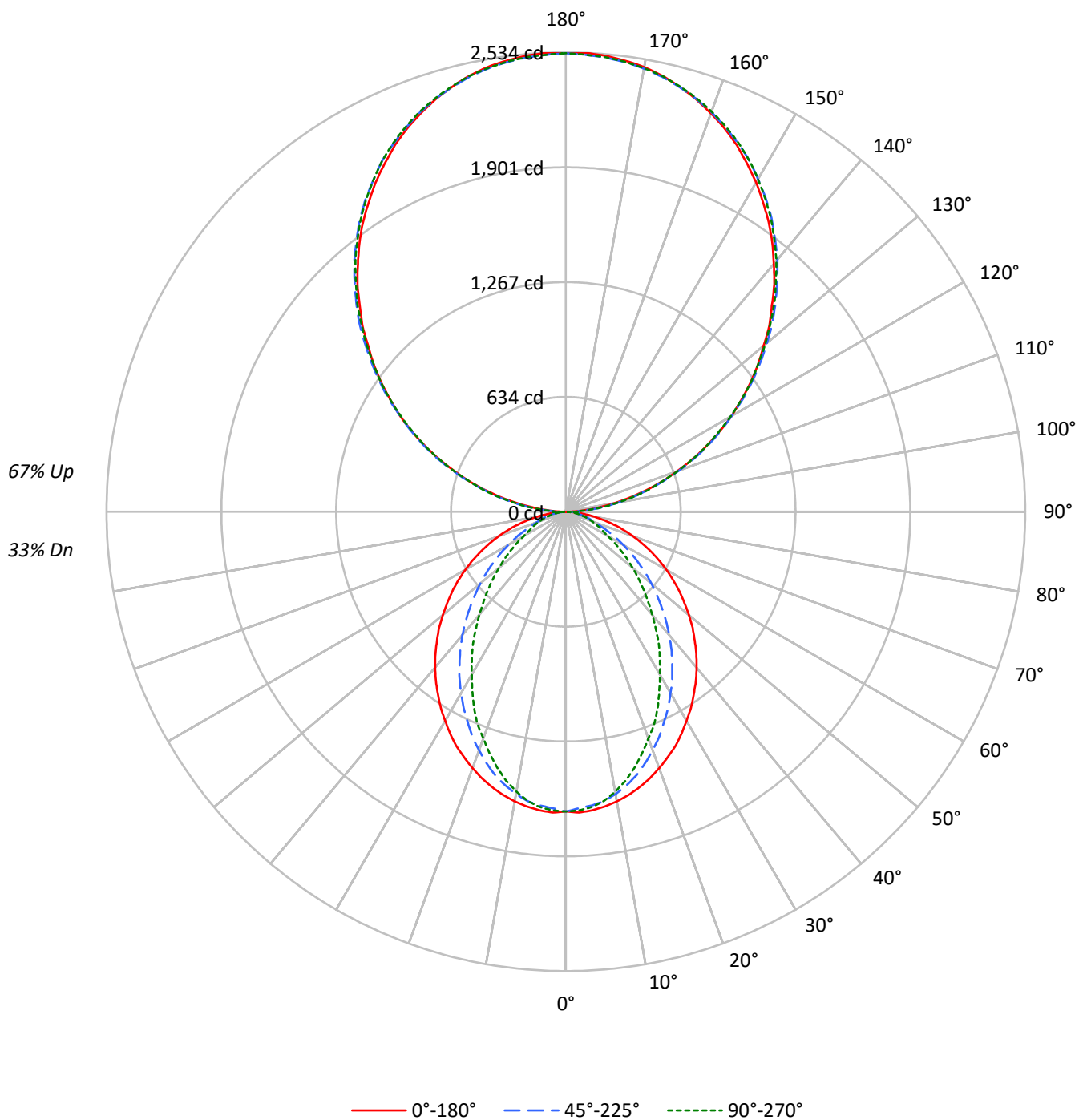
Lumens per Lamp: N/A  
Luminaire Lumens: 10480.0 lumens  
Efficiency: N/A  
Efficacy: 93.3 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 0.99 / 1.16  
Luminous Opening: Rectangular w/ Sides (W: 4.07' x L: 4.07' x H: 0.1')  
CIE Type: Semi-Indirect

Input Watts (W): 112.3  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9968  
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   | 103 | 103 | 103 | 103 | 93 | 93 | 93 | 93 | 74 | 74 | 74 | 56 | 56 | 56 | 40 | 40 | 40 |
| 1   | 94  | 90  | 86  | 83  | 85 | 81 | 78 | 75 | 65 | 63 | 61 | 50 | 48 | 47 | 36 | 35 | 34 |
| 2   | 86  | 79  | 73  | 68  | 77 | 71 | 67 | 62 | 57 | 54 | 51 | 44 | 42 | 40 | 32 | 31 | 29 |
| 3   | 79  | 70  | 63  | 57  | 71 | 63 | 57 | 52 | 51 | 46 | 43 | 39 | 36 | 34 | 29 | 27 | 25 |
| 4   | 72  | 62  | 54  | 49  | 65 | 56 | 50 | 45 | 45 | 41 | 37 | 35 | 32 | 29 | 26 | 24 | 22 |
| 5   | 66  | 55  | 47  | 42  | 59 | 50 | 43 | 38 | 40 | 36 | 32 | 32 | 28 | 26 | 23 | 21 | 19 |
| 6   | 61  | 49  | 42  | 36  | 55 | 45 | 38 | 33 | 36 | 32 | 28 | 29 | 25 | 23 | 21 | 19 | 17 |
| 7   | 56  | 45  | 37  | 32  | 51 | 41 | 34 | 29 | 33 | 28 | 25 | 26 | 23 | 20 | 19 | 17 | 15 |
| 8   | 52  | 40  | 33  | 28  | 47 | 37 | 30 | 26 | 30 | 25 | 22 | 24 | 20 | 18 | 18 | 16 | 14 |
| 9   | 49  | 37  | 30  | 25  | 44 | 34 | 27 | 23 | 28 | 23 | 20 | 22 | 19 | 16 | 17 | 14 | 13 |
| 10  | 45  | 34  | 27  | 22  | 41 | 31 | 25 | 21 | 25 | 21 | 18 | 20 | 17 | 15 | 15 | 13 | 11 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 1072 | 1072 | 1072 |
| 5°  | 1074 | 1056 | 1063 |
| 10° | 1064 | 1035 | 1028 |
| 15° | 1049 | 1002 | 975  |
| 20° | 1030 | 955  | 910  |
| 25° | 1010 | 902  | 847  |
| 30° | 984  | 848  | 767  |
| 35° | 958  | 790  | 697  |
| 40° | 931  | 730  | 616  |
| 45° | 900  | 663  | 543  |
| 50° | 868  | 596  | 471  |
| 55° | 835  | 524  | 402  |
| 60° | 797  | 449  | 332  |
| 65° | 753  | 372  | 299  |
| 70° | 699  | 300  | 271  |
| 75° | 632  | 266  | 248  |
| 80° | 535  | 224  | 216  |
| 85° | 374  | 151  | 165  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 90°

Vertical Angle: 90°

Luminance: 1916 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 154.9   | 1.5       |
| 10°-20°   | 425.3   | 4.1       |
| 20°-30°   | 597.2   | 5.7       |
| 30°-40°   | 650.9   | 6.2       |
| 40°-50°   | 598.3   | 5.7       |
| 50°-60°   | 469.9   | 4.5       |
| 60°-70°   | 305.8   | 2.9       |
| 70°-80°   | 157.4   | 1.5       |
| 80°-90°   | 47.4    | 0.5       |
| 90°-100°  | 156.6   | 1.5       |
| 100°-110° | 497.5   | 4.7       |
| 110°-120° | 851.3   | 8.1       |
| 120°-130° | 1119.6  | 10.7      |
| 130°-140° | 1256.7  | 12.0      |
| 140°-150° | 1232.3  | 11.8      |
| 150°-160° | 1033.7  | 9.9       |
| 160°-170° | 685.6   | 6.5       |
| 170°-180° | 239.6   | 2.3       |
| 0°-30°    | 1177.4  | 11.2      |
| 0°-40°    | 1828.4  | 17.4      |
| 0°-60°    | 2896.5  | 27.6      |
| 0°-90°    | 3407.2  | 32.5      |
| 90°-120°  | 1505.3  | 14.4      |
| 90°-150°  | 5113.9  | 48.8      |
| 90°-180°  | 7073.0  | 67.5      |
| 0°-180°   | 10480.0 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 1653 | 1653  | 1653 | 1653  | 1653 |      |
| 5°   | 1653 | 1646  | 1626 | 1640  | 1635 | 157  |
| 15°  | 1572 | 1556  | 1505 | 1477  | 1462 | 443  |
| 25°  | 1427 | 1379  | 1281 | 1219  | 1197 | 656  |
| 35°  | 1230 | 1154  | 1022 | 928   | 895  | 770  |
| 45°  | 1005 | 905   | 748  | 642   | 606  | 776  |
| 55°  | 764  | 648   | 486  | 396   | 368  | 683  |
| 65°  | 516  | 395   | 260  | 210   | 205  | 512  |
| 75°  | 275  | 170   | 120  | 109   | 108  | 291  |
| 85°  | 64   | 33    | 28   | 28    | 28   | 74   |
| 90°  | 2    | 28    | 75   | 70    | 72   | 10   |
| 95°  | 111  | 133   | 136  | 136   | 133  | 124  |
| 105° | 459  | 465   | 470  | 474   | 474  | 485  |
| 115° | 854  | 866   | 863  | 860   | 854  | 845  |
| 125° | 1242 | 1262  | 1256 | 1249  | 1246 | 1110 |
| 135° | 1607 | 1631  | 1635 | 1633  | 1627 | 1242 |
| 145° | 1951 | 1966  | 1979 | 1981  | 1972 | 1219 |
| 155° | 2231 | 2237  | 2244 | 2255  | 2248 | 1027 |
| 165° | 2427 | 2425  | 2425 | 2440  | 2429 | 685  |
| 175° | 2526 | 2519  | 2515 | 2530  | 2517 | 240  |
| 180° | 2530 | 2530  | 2530 | 2530  | 2530 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 1653.2 | 1653.2 | 1653.2 | 1653.2 | 1653.2 |
| 2.5°   | 1660.7 | 1653.2 | 1636.7 | 1651.8 | 1648.7 |
| 5°     | 1653.2 | 1645.7 | 1626.2 | 1639.7 | 1635.3 |
| 7.5°   | 1639.7 | 1630.8 | 1609.9 | 1615.7 | 1608.3 |
| 10°    | 1621.8 | 1611.3 | 1581.4 | 1576.8 | 1568.0 |
| 12.5°  | 1599.4 | 1585.9 | 1545.4 | 1536.5 | 1520.0 |
| 15°    | 1572.4 | 1555.9 | 1505.1 | 1476.7 | 1461.8 |
| 17.5°  | 1541.0 | 1517.0 | 1454.1 | 1421.3 | 1397.3 |
| 20°    | 1505.1 | 1475.1 | 1400.3 | 1363.0 | 1330.0 |
| 22.5°  | 1466.2 | 1431.8 | 1344.9 | 1294.1 | 1271.8 |
| 25°    | 1427.3 | 1379.4 | 1280.6 | 1219.4 | 1196.8 |
| 27.5°  | 1381.0 | 1330.0 | 1220.8 | 1150.5 | 1116.0 |
| 30°    | 1331.6 | 1274.6 | 1154.9 | 1078.7 | 1038.3 |
| 32.5°  | 1283.7 | 1214.8 | 1092.2 | 1002.4 | 964.9  |
| 35°    | 1229.9 | 1153.5 | 1021.9 | 927.6  | 894.6  |
| 37.5°  | 1177.5 | 1095.1 | 956.0  | 852.7  | 815.4  |
| 40°    | 1122.1 | 1032.4 | 887.2  | 781.0  | 742.1  |
| 42.5°  | 1065.2 | 969.5  | 818.4  | 707.6  | 670.3  |
| 45°    | 1005.4 | 905.1  | 748.1  | 641.8  | 605.9  |
| 47.5°  | 948.6  | 842.4  | 680.8  | 574.5  | 541.6  |
| 50°    | 885.7  | 779.5  | 614.9  | 511.6  | 480.3  |
| 52.5°  | 824.3  | 712.1  | 552.1  | 453.3  | 424.9  |
| 55°    | 764.5  | 647.8  | 486.2  | 396.5  | 368.1  |
| 57.5°  | 703.2  | 583.5  | 427.9  | 344.1  | 320.2  |
| 60°    | 640.3  | 520.6  | 366.5  | 290.3  | 266.4  |
| 62.5°  | 579.1  | 459.4  | 314.1  | 242.4  | 230.5  |
| 65°    | 516.2  | 394.9  | 260.3  | 209.5  | 204.9  |
| 67.5°  | 456.4  | 335.1  | 209.5  | 184.0  | 179.5  |
| 70°    | 393.5  | 276.8  | 173.5  | 158.6  | 152.5  |
| 72.5°  | 333.7  | 222.9  | 145.1  | 133.2  | 130.2  |
| 75°    | 275.2  | 170.5  | 119.7  | 109.2  | 107.8  |
| 77.5°  | 217.0  | 121.1  | 94.3   | 88.3   | 85.2   |
| 80°    | 163.0  | 86.8   | 71.7   | 65.9   | 65.9   |
| 82.5°  | 113.7  | 58.4   | 49.4   | 46.3   | 46.3   |
| 85°    | 64.3   | 32.9   | 28.4   | 28.4   | 28.4   |
| 87.5°  | 24.0   | 11.9   | 11.9   | 10.5   | 10.5   |
| 90°    | 2.3    | 27.5   | 74.8   | 70.2   | 72.5   |
| 92.5°  | 47.3   | 64.1   | 66.4   | 68.6   | 68.6   |
| 95°    | 111.4  | 132.7  | 136.5  | 136.5  | 132.7  |
| 97.5°  | 185.4  | 205.2  | 213.6  | 213.6  | 213.6  |
| 100°   | 270.8  | 288.3  | 294.4  | 294.4  | 292.1  |
| 102.5° | 360.8  | 373.8  | 382.1  | 384.4  | 382.1  |
| 105°   | 459.2  | 465.3  | 469.9  | 473.7  | 473.7  |
| 107.5° | 556.8  | 566.0  | 566.0  | 567.5  | 556.8  |
| 110°   | 651.4  | 663.6  | 663.6  | 663.6  | 657.5  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 753.6  | 766.6  | 764.3  | 758.2  | 753.6  |
| 115°   | 854.3  | 866.5  | 862.7  | 860.4  | 854.3  |
| 117.5° | 954.2  | 971.0  | 960.3  | 954.2  | 948.1  |
| 120°   | 1054.9 | 1071.7 | 1054.9 | 1054.9 | 1048.0 |
| 122.5° | 1146.4 | 1167.8 | 1157.1 | 1151.0 | 1146.4 |
| 125°   | 1242.5 | 1261.6 | 1255.5 | 1248.6 | 1246.4 |
| 127.5° | 1336.4 | 1360.0 | 1351.6 | 1342.5 | 1336.4 |
| 130°   | 1424.1 | 1451.5 | 1447.7 | 1443.2 | 1434.8 |
| 132.5° | 1522.5 | 1543.8 | 1545.4 | 1534.7 | 1528.6 |
| 135°   | 1607.1 | 1630.8 | 1635.4 | 1633.1 | 1627.0 |
| 137.5° | 1701.7 | 1720.8 | 1724.6 | 1723.1 | 1713.9 |
| 140°   | 1784.9 | 1803.9 | 1814.6 | 1814.6 | 1806.2 |
| 142.5° | 1870.3 | 1889.4 | 1895.5 | 1897.8 | 1889.4 |
| 145°   | 1951.2 | 1966.4 | 1978.6 | 1980.9 | 1972.5 |
| 147.5° | 2023.6 | 2042.7 | 2051.8 | 2055.7 | 2047.3 |
| 150°   | 2098.4 | 2111.3 | 2119.7 | 2126.6 | 2119.7 |
| 152.5° | 2164.7 | 2177.7 | 2188.4 | 2196.8 | 2188.4 |
| 155°   | 2231.1 | 2237.2 | 2244.1 | 2254.7 | 2247.9 |
| 157.5° | 2288.3 | 2292.9 | 2296.7 | 2311.9 | 2301.3 |
| 160°   | 2339.4 | 2344.0 | 2346.3 | 2359.2 | 2350.1 |
| 162.5° | 2386.7 | 2386.7 | 2389.0 | 2403.5 | 2392.8 |
| 165°   | 2427.1 | 2424.8 | 2424.8 | 2440.1 | 2429.4 |
| 167.5° | 2463.7 | 2456.9 | 2456.9 | 2472.1 | 2461.4 |
| 170°   | 2491.2 | 2485.1 | 2482.8 | 2498.1 | 2485.1 |
| 172.5° | 2510.3 | 2504.2 | 2501.9 | 2517.1 | 2504.2 |
| 175°   | 2525.5 | 2519.4 | 2514.8 | 2530.1 | 2517.1 |
| 177.5° | 2533.9 | 2527.8 | 2523.2 | 2536.2 | 2523.2 |
| 180°   | 2530.1 | 2530.1 | 2530.1 | 2530.1 | 2530.1 |

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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 | 5.51             | 6.21 | 6.61  | 7.31  | 8.81  | 1.47           | 2.17 | 2.57 | 3.27 | 4.77 |
|                 | 3H   | 7.18             | 7.81 | 8.29  | 8.91  | 10.43 | 2.65           | 3.28 | 3.76 | 4.38 | 5.90 |
|                 | 4H   | 7.79             | 8.39 | 8.91  | 9.49  | 11.01 | 3.09           | 3.69 | 4.21 | 4.80 | 6.32 |
|                 | 6H   | 8.21             | 8.76 | 9.33  | 9.86  | 11.40 | 3.41           | 3.96 | 4.54 | 5.07 | 6.60 |
|                 | 8H   | 8.33             | 8.86 | 9.46  | 9.98  | 11.51 | 3.50           | 4.02 | 4.63 | 5.14 | 6.67 |
|                 | 12H  | 8.39             | 8.89 | 9.53  | 10.00 | 11.56 | 3.54           | 4.04 | 4.67 | 5.15 | 6.70 |
| 4H              | 2H   | 5.51             | 6.11 | 6.64  | 7.21  | 8.74  | 2.05           | 2.65 | 3.18 | 3.75 | 5.28 |
|                 | 3H   | 7.33             | 7.83 | 8.47  | 8.96  | 10.50 | 3.39           | 3.89 | 4.52 | 5.02 | 6.56 |
|                 | 4H   | 8.03             | 8.48 | 9.16  | 9.60  | 11.16 | 3.94           | 4.39 | 5.07 | 5.51 | 7.07 |
|                 | 6H   | 8.54             | 8.93 | 9.68  | 10.07 | 11.62 | 4.35           | 4.74 | 5.49 | 5.88 | 7.43 |
|                 | 8H   | 8.72             | 9.08 | 9.86  | 10.21 | 11.78 | 4.48           | 4.84 | 5.62 | 5.98 | 7.54 |
|                 | 12H  | 8.81             | 9.14 | 9.97  | 10.28 | 11.86 | 4.54           | 4.87 | 5.70 | 6.01 | 7.59 |
| 8H              | 4H   | 7.99             | 8.35 | 9.13  | 9.48  | 11.05 | 4.21           | 4.58 | 5.35 | 5.71 | 7.28 |
|                 | 6H   | 8.55             | 8.85 | 9.71  | 10.03 | 11.59 | 4.73           | 5.03 | 5.89 | 6.20 | 7.77 |
|                 | 8H   | 8.77             | 9.04 | 9.94  | 10.19 | 11.77 | 4.92           | 5.18 | 6.09 | 6.34 | 7.92 |
|                 | 12H  | 8.91             | 9.14 | 10.08 | 10.29 | 11.91 | 5.04           | 5.27 | 6.20 | 6.42 | 8.03 |
| 12H             | 4H   | 7.93             | 8.26 | 9.09  | 9.41  | 10.98 | 4.21           | 4.54 | 5.37 | 5.69 | 7.26 |
|                 | 6H   | 8.53             | 8.79 | 9.69  | 9.95  | 11.53 | 4.78           | 5.04 | 5.94 | 6.20 | 7.78 |
|                 | 8H   | 8.75             | 8.98 | 9.92  | 10.13 | 11.75 | 4.99           | 5.22 | 6.15 | 6.37 | 7.98 |

END OF REPORT