

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: P907649

Luminaire Tested: DFN2DIP-4P3F0-020D060US840-RLLONL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P907649  
REPORT IS A COMBINATION OF REPORTS P900590 AND P897473  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-4P3F0-020D060US840-RLLONL  
Description: 3 foot, 90deg - 4way Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

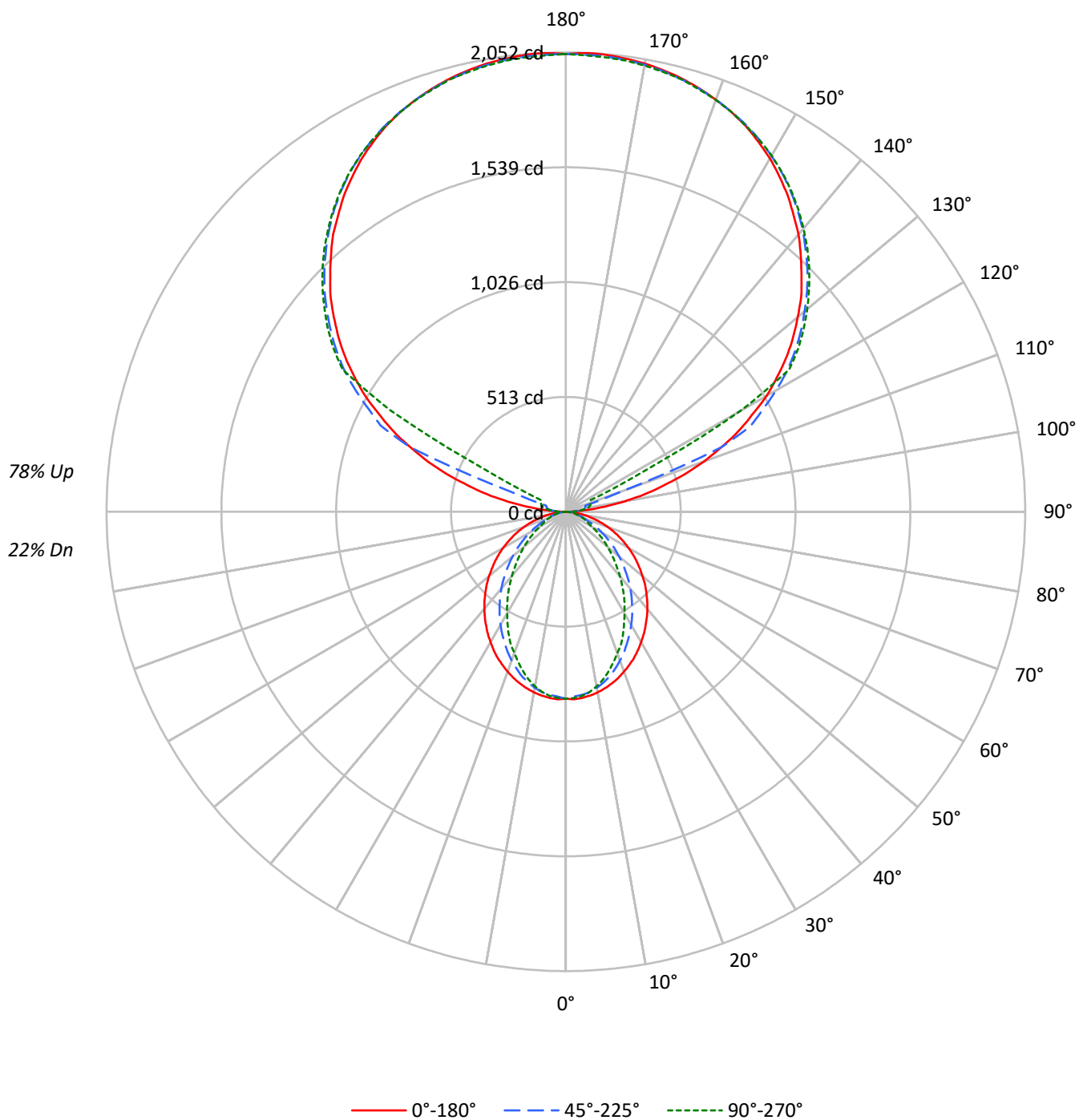
**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 7715.4 lumens  
Efficiency: N/A  
Efficacy: 122.9 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 0.99 / 1.16  
Luminous Opening: Rectangular w/ Sides (W: 3.07' x L: 3.07' x H: 0.1')  
CIE Type: Semi-Indirect  
  
Input Watts (W): 62.8  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9951  
Total Harmonic Distortion (THDi): 0.07  
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 | 50 | 30 | 10 |
| RCR |     |     |     |     |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 0   | 101 | 101 | 101 | 101 | 89 | 89 | 89 | 89 | 68 | 68 | 68 | 49 | 49 | 49 | 31 | 31 | 31 |    |    | 22 |
| 1   | 92  | 88  | 84  | 81  | 81 | 78 | 75 | 72 | 60 | 58 | 56 | 43 | 42 | 41 | 27 | 27 | 26 |    |    | 19 |
| 2   | 84  | 77  | 71  | 66  | 74 | 68 | 64 | 60 | 52 | 49 | 47 | 38 | 36 | 34 | 24 | 23 | 22 |    |    | 16 |
| 3   | 76  | 68  | 61  | 55  | 68 | 60 | 55 | 50 | 46 | 43 | 39 | 34 | 31 | 29 | 22 | 20 | 19 |    |    | 14 |
| 4   | 70  | 60  | 52  | 47  | 62 | 53 | 47 | 42 | 41 | 37 | 34 | 30 | 27 | 25 | 20 | 18 | 17 |    |    | 12 |
| 5   | 64  | 53  | 46  | 40  | 57 | 48 | 41 | 36 | 37 | 32 | 29 | 27 | 24 | 22 | 18 | 16 | 15 |    |    | 11 |
| 6   | 59  | 48  | 40  | 35  | 52 | 43 | 36 | 31 | 33 | 29 | 25 | 24 | 21 | 19 | 16 | 14 | 13 |    |    | 10 |
| 7   | 54  | 43  | 35  | 30  | 48 | 38 | 32 | 27 | 30 | 25 | 22 | 22 | 19 | 17 | 15 | 13 | 12 |    |    | 9  |
| 8   | 50  | 39  | 32  | 27  | 45 | 35 | 29 | 24 | 27 | 23 | 20 | 20 | 17 | 15 | 14 | 12 | 10 |    |    | 8  |
| 9   | 47  | 35  | 28  | 23  | 42 | 32 | 26 | 21 | 25 | 20 | 17 | 19 | 16 | 13 | 12 | 11 | 9  |    |    | 7  |
| 10  | 44  | 32  | 25  | 21  | 39 | 29 | 23 | 19 | 23 | 19 | 16 | 17 | 14 | 12 | 12 | 10 | 9  |    |    | 6  |

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

|     | 0°  | 45° | 90° |
|-----|-----|-----|-----|
| 0°  | 951 | 951 | 951 |
| 5°  | 952 | 936 | 942 |
| 10° | 942 | 917 | 911 |
| 15° | 929 | 886 | 863 |
| 20° | 911 | 843 | 805 |
| 25° | 893 | 796 | 748 |
| 30° | 868 | 748 | 677 |
| 35° | 845 | 695 | 614 |
| 40° | 820 | 642 | 543 |
| 45° | 792 | 582 | 477 |
| 50° | 763 | 522 | 414 |
| 55° | 733 | 458 | 353 |
| 60° | 698 | 391 | 290 |
| 65° | 657 | 323 | 261 |
| 70° | 607 | 259 | 236 |
| 75° | 546 | 227 | 214 |
| 80° | 456 | 189 | 184 |
| 85° | 309 | 123 | 136 |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 90°

Vertical Angle: 90°

Luminance: 1397 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 78.2   | 1.0       |
| 10°-20°   | 214.8  | 2.8       |
| 20°-30°   | 301.5  | 3.9       |
| 30°-40°   | 328.7  | 4.3       |
| 40°-50°   | 302.1  | 3.9       |
| 50°-60°   | 237.3  | 3.1       |
| 60°-70°   | 154.4  | 2.0       |
| 70°-80°   | 79.5   | 1.0       |
| 80°-90°   | 23.9   | 0.3       |
| 90°-100°  | 67.4   | 0.9       |
| 100°-110° | 251.4  | 3.3       |
| 110°-120° | 666.7  | 8.6       |
| 120°-130° | 1105.7 | 14.3      |
| 130°-140° | 1174.5 | 15.2      |
| 140°-150° | 1091.6 | 14.1      |
| 150°-160° | 877.6  | 11.4      |
| 160°-170° | 565.5  | 7.3       |
| 170°-180° | 194.6  | 2.5       |
| 0°-30°    | 594.5  | 7.7       |
| 0°-40°    | 923.2  | 12.0      |
| 0°-60°    | 1462.6 | 19.0      |
| 0°-90°    | 1720.4 | 22.3      |
| 90°-120°  | 985.5  | 12.8      |
| 90°-150°  | 4357.2 | 56.5      |
| 90°-180°  | 5995.0 | 77.7      |
| 0°-180°   | 7715.4 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 835  | 835   | 835  | 835   | 835  |      |
| 5°   | 835  | 831   | 821  | 828   | 826  | 79   |
| 15°  | 794  | 786   | 760  | 746   | 738  | 224  |
| 25°  | 721  | 696   | 647  | 616   | 604  | 331  |
| 35°  | 621  | 582   | 516  | 468   | 452  | 389  |
| 45°  | 508  | 457   | 378  | 324   | 306  | 392  |
| 55°  | 386  | 327   | 246  | 200   | 186  | 345  |
| 65°  | 261  | 199   | 132  | 106   | 104  | 258  |
| 75°  | 139  | 86    | 60   | 55    | 54   | 147  |
| 85°  | 32   | 17    | 14   | 14    | 14   | 37   |
| 90°  | 1    | 18    | 30   | 37    | 40   | 7    |
| 95°  | 96   | 47    | 58   | 65    | 64   | 114  |
| 105° | 450  | 494   | 90   | 106   | 112  | 481  |
| 115° | 851  | 876   | 913  | 228   | 121  | 838  |
| 125° | 1203 | 1222  | 1250 | 1261  | 1265 | 1073 |
| 135° | 1489 | 1512  | 1526 | 1540  | 1537 | 1150 |
| 145° | 1727 | 1725  | 1750 | 1761  | 1753 | 1080 |
| 155° | 1901 | 1888  | 1906 | 1915  | 1903 | 876  |
| 165° | 2004 | 1995  | 1999 | 2009  | 1999 | 566  |
| 175° | 2049 | 2039  | 2042 | 2052  | 2038 | 195  |
| 180° | 2045 | 2045  | 2045 | 2045  | 2045 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°    | 22.5° | 45°   | 67.5° | 90°   |
|--------|-------|-------|-------|-------|-------|
| 0°     | 834.8 | 834.8 | 834.8 | 834.8 | 834.8 |
| 2.5°   | 838.5 | 834.8 | 826.4 | 834.0 | 832.5 |
| 5°     | 834.8 | 831.0 | 821.1 | 828.0 | 825.7 |
| 7.5°   | 828.0 | 823.4 | 812.8 | 815.9 | 812.0 |
| 10°    | 818.9 | 813.5 | 798.5 | 796.2 | 791.7 |
| 12.5°  | 807.6 | 800.7 | 780.3 | 775.9 | 767.5 |
| 15°    | 794.0 | 785.6 | 759.9 | 745.6 | 738.1 |
| 17.5°  | 778.1 | 766.0 | 734.3 | 717.6 | 705.6 |
| 20°    | 759.9 | 744.8 | 707.1 | 688.2 | 671.6 |
| 22.5°  | 740.3 | 723.0 | 679.1 | 653.5 | 642.2 |
| 25°    | 720.7 | 696.5 | 646.6 | 615.7 | 604.3 |
| 27.5°  | 697.3 | 671.6 | 616.4 | 580.9 | 563.5 |
| 30°    | 672.4 | 643.6 | 583.2 | 544.7 | 524.2 |
| 32.5°  | 648.1 | 613.4 | 551.5 | 506.1 | 487.3 |
| 35°    | 621.0 | 582.5 | 516.0 | 468.4 | 451.7 |
| 37.5°  | 594.5 | 552.9 | 482.7 | 430.6 | 411.7 |
| 40°    | 566.5 | 521.3 | 448.0 | 394.4 | 374.7 |
| 42.5°  | 537.9 | 489.6 | 413.2 | 357.3 | 338.5 |
| 45°    | 507.7 | 457.0 | 377.8 | 324.1 | 305.9 |
| 47.5°  | 479.0 | 425.4 | 343.8 | 290.0 | 273.5 |
| 50°    | 447.3 | 393.6 | 310.5 | 258.3 | 242.6 |
| 52.5°  | 416.2 | 359.5 | 278.7 | 228.9 | 214.6 |
| 55°    | 386.0 | 327.1 | 245.5 | 200.3 | 185.8 |
| 57.5°  | 355.1 | 294.6 | 216.1 | 173.8 | 161.7 |
| 60°    | 323.4 | 262.9 | 185.1 | 146.6 | 134.5 |
| 62.5°  | 292.4 | 232.0 | 158.6 | 122.4 | 116.3 |
| 65°    | 260.6 | 199.4 | 131.5 | 105.8 | 103.5 |
| 67.5°  | 230.5 | 169.2 | 105.8 | 92.9  | 90.7  |
| 70°    | 198.6 | 139.8 | 87.6  | 80.1  | 77.1  |
| 72.5°  | 168.4 | 112.5 | 73.2  | 67.3  | 65.7  |
| 75°    | 139.0 | 86.0  | 60.4  | 55.1  | 54.4  |
| 77.5°  | 109.6 | 61.2  | 47.6  | 44.5  | 43.0  |
| 80°    | 82.3  | 43.8  | 36.3  | 33.2  | 33.2  |
| 82.5°  | 57.4  | 29.5  | 24.9  | 23.4  | 23.4  |
| 85°    | 32.4  | 16.6  | 14.3  | 14.3  | 14.3  |
| 87.5°  | 12.1  | 6.1   | 6.1   | 5.3   | 5.3   |
| 90°    | 1.4   | 17.8  | 29.5  | 37.1  | 39.9  |
| 92.5°  | 37.1  | 31.1  | 35.4  | 38.5  | 39.9  |
| 95°    | 96.1  | 47.3  | 57.7  | 65.2  | 63.6  |
| 97.5°  | 173.1 | 51.8  | 75.3  | 80.0  | 81.4  |
| 100°   | 262.0 | 59.2  | 84.3  | 96.1  | 99.1  |
| 102.5° | 359.5 | 356.7 | 87.4  | 103.5 | 108.1 |
| 105°   | 449.8 | 494.2 | 90.3  | 106.4 | 112.5 |
| 107.5° | 554.9 | 591.8 | 93.3  | 109.5 | 115.4 |
| 110°   | 655.6 | 686.5 | 259.0 | 111.1 | 116.8 |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 750.2  | 776.8  | 751.6  | 113.8  | 118.5  |
| 115°   | 850.8  | 876.0  | 913.0  | 227.9  | 121.4  |
| 117.5° | 938.1  | 967.7  | 992.9  | 781.2  | 393.5  |
| 120°   | 1035.8 | 1057.9 | 1084.7 | 1102.4 | 902.6  |
| 122.5° | 1118.5 | 1142.3 | 1171.9 | 1180.7 | 1182.4 |
| 125°   | 1203.0 | 1222.2 | 1250.3 | 1260.7 | 1265.1 |
| 127.5° | 1279.9 | 1300.6 | 1322.9 | 1337.7 | 1339.1 |
| 130°   | 1352.4 | 1376.1 | 1392.3 | 1408.7 | 1407.2 |
| 132.5° | 1426.4 | 1445.7 | 1461.9 | 1475.2 | 1473.8 |
| 135°   | 1488.6 | 1512.4 | 1525.5 | 1540.4 | 1537.4 |
| 137.5° | 1553.6 | 1571.4 | 1586.3 | 1601.0 | 1596.7 |
| 140°   | 1617.2 | 1629.2 | 1645.4 | 1658.7 | 1651.3 |
| 142.5° | 1670.6 | 1681.0 | 1700.2 | 1711.9 | 1704.6 |
| 145°   | 1726.9 | 1725.3 | 1750.4 | 1760.8 | 1753.4 |
| 147.5° | 1775.5 | 1771.1 | 1796.2 | 1803.6 | 1797.9 |
| 150°   | 1823.0 | 1812.6 | 1836.3 | 1845.1 | 1837.8 |
| 152.5° | 1862.9 | 1851.1 | 1873.2 | 1882.2 | 1871.8 |
| 155°   | 1901.4 | 1888.1 | 1905.9 | 1914.7 | 1902.9 |
| 157.5° | 1932.5 | 1920.7 | 1934.0 | 1944.4 | 1932.5 |
| 160°   | 1959.1 | 1950.2 | 1959.1 | 1967.9 | 1957.6 |
| 162.5° | 1982.7 | 1973.9 | 1981.3 | 1991.7 | 1978.3 |
| 165°   | 2003.5 | 1994.7 | 1999.0 | 2009.4 | 1999.0 |
| 167.5° | 2019.7 | 2010.8 | 2015.4 | 2025.8 | 2012.4 |
| 170°   | 2033.2 | 2024.2 | 2027.2 | 2037.5 | 2024.2 |
| 172.5° | 2041.9 | 2033.2 | 2036.1 | 2046.5 | 2033.2 |
| 175°   | 2049.3 | 2038.9 | 2041.9 | 2052.2 | 2037.5 |
| 177.5° | 2052.2 | 2041.9 | 2043.5 | 2053.9 | 2040.5 |
| 180°   | 2044.9 | 2044.9 | 2044.9 | 2044.9 | 2044.9 |

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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 | 3.51             | 4.16 | 4.68 | 5.31 | 6.93 | 0.00           | 0.12 | 0.64 | 1.27 | 2.89 |
|                 | 3H   | 5.17             | 5.75 | 6.35 | 6.91 | 8.54 | 0.65           | 1.22 | 1.82 | 2.38 | 4.02 |
|                 | 4H   | 5.77             | 6.32 | 6.95 | 7.48 | 9.12 | 1.08           | 1.63 | 2.26 | 2.79 | 4.43 |
|                 | 6H   | 6.18             | 6.68 | 7.37 | 7.84 | 9.49 | 1.39           | 1.89 | 2.58 | 3.05 | 4.70 |
|                 | 8H   | 6.30             | 6.78 | 7.49 | 7.95 | 9.59 | 1.47           | 1.95 | 2.66 | 3.12 | 4.76 |
|                 | 12H  | 6.35             | 6.81 | 7.55 | 7.97 | 9.64 | 1.50           | 1.96 | 2.70 | 3.13 | 4.79 |
| 4H              | 2H   | 3.51             | 4.06 | 4.70 | 5.21 | 6.85 | 0.05           | 0.60 | 1.24 | 1.75 | 3.39 |
|                 | 3H   | 5.32             | 5.77 | 6.51 | 6.95 | 8.61 | 1.37           | 1.83 | 2.57 | 3.01 | 4.66 |
|                 | 4H   | 6.00             | 6.42 | 7.19 | 7.59 | 9.26 | 1.91           | 2.33 | 3.10 | 3.50 | 5.17 |
|                 | 6H   | 6.50             | 6.86 | 7.70 | 8.05 | 9.71 | 2.31           | 2.67 | 3.51 | 3.86 | 5.52 |
|                 | 8H   | 6.67             | 7.00 | 7.86 | 8.19 | 9.86 | 2.43           | 2.77 | 3.63 | 3.95 | 5.62 |
|                 | 12H  | 6.75             | 7.05 | 7.96 | 8.25 | 9.93 | 2.48           | 2.79 | 3.70 | 3.98 | 5.66 |
| 8H              | 4H   | 5.95             | 6.28 | 7.15 | 7.47 | 9.14 | 2.17           | 2.51 | 3.37 | 3.69 | 5.37 |
|                 | 6H   | 6.50             | 6.78 | 7.72 | 8.01 | 9.68 | 2.67           | 2.95 | 3.89 | 4.18 | 5.85 |
|                 | 8H   | 6.72             | 6.96 | 7.94 | 8.16 | 9.85 | 2.86           | 3.10 | 4.08 | 4.30 | 5.99 |
|                 | 12H  | 6.84             | 7.05 | 8.07 | 8.25 | 9.98 | 2.96           | 3.17 | 4.19 | 4.38 | 6.10 |
| 12H             | 4H   | 5.89             | 6.20 | 7.10 | 7.39 | 9.07 | 2.17           | 2.47 | 3.38 | 3.67 | 5.35 |
|                 | 6H   | 6.48             | 6.72 | 7.70 | 7.92 | 9.61 | 2.72           | 2.96 | 3.94 | 4.16 | 5.86 |
|                 | 8H   | 6.69             | 6.90 | 7.91 | 8.10 | 9.82 | 2.92           | 3.13 | 4.14 | 4.33 | 6.05 |

END OF REPORT