

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: P908322

Luminaire Tested: DFN2DIP-PN2F0-020D060US840-RLLFLL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P908322  
REPORT IS A COMBINATION OF REPORTS P899502 AND P896349  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-PN2F0-020D060US840-RLLFLL  
Description: 2 foot, Pentagon Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

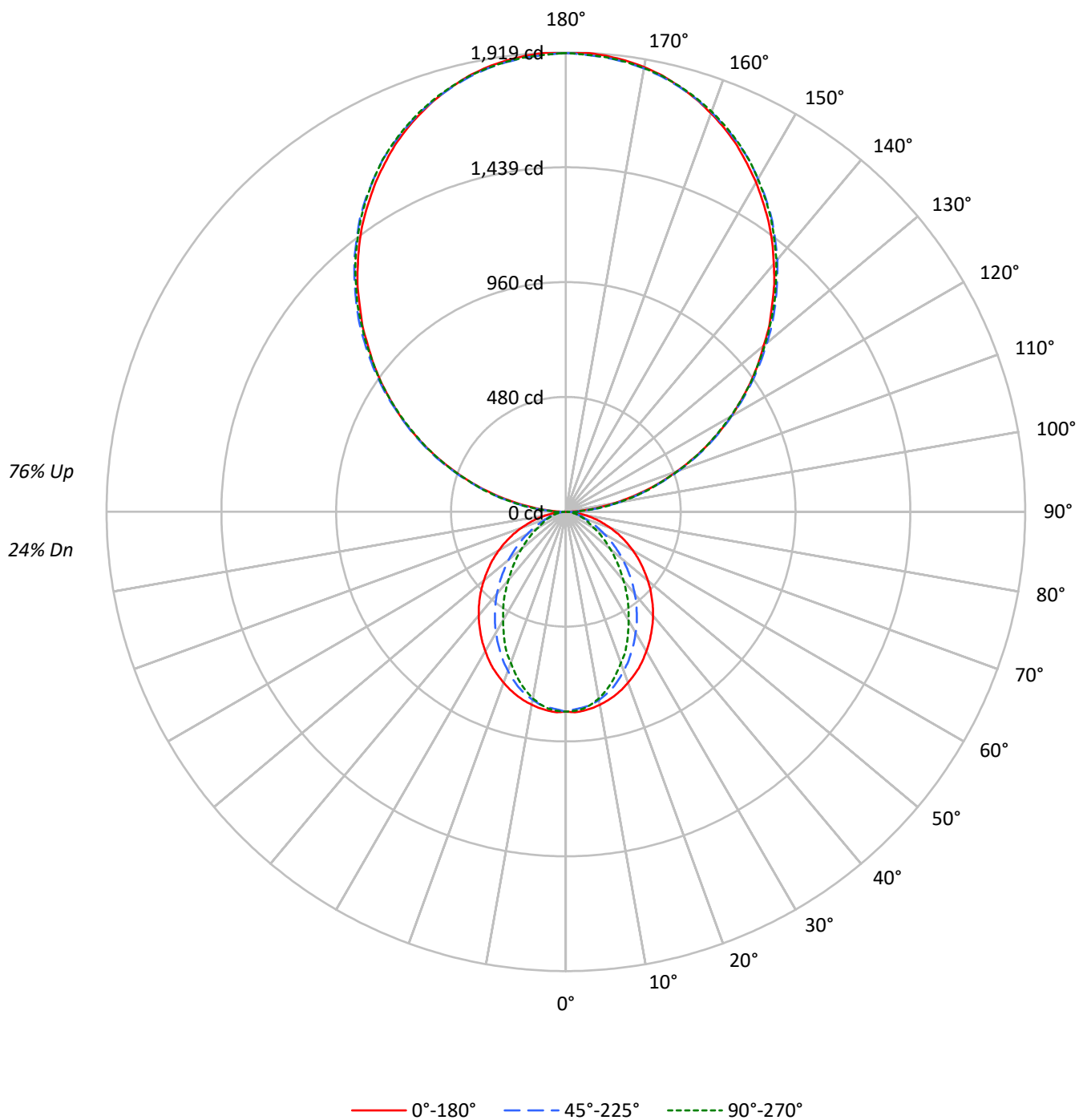
Lumens per Lamp: N/A  
Luminaire Lumens: 7079.2 lumens  
Efficiency: N/A  
Efficacy: 102.6 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 0.99 / 1.16  
Luminous Opening: Rectangular w/ Sides (W: 2.17' x L: 2.29' x H: 0.1')  
CIE Type: Semi-Indirect

Input Watts (W): 69  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.099  
Total Harmonic Distortion (THDi): 0.979  
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: P908322

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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   | 101 | 101 | 101 | 101 | 90 | 90 | 90 | 90 | 69 | 69 | 69 | 50 | 50 | 50 | 33 | 33 | 33 |
| 1   | 92  | 88  | 85  | 81  | 82 | 79 | 76 | 73 | 61 | 59 | 57 | 44 | 43 | 42 | 29 | 28 | 28 |
| 2   | 84  | 77  | 71  | 67  | 75 | 69 | 64 | 60 | 53 | 50 | 47 | 39 | 37 | 35 | 26 | 25 | 24 |
| 3   | 77  | 68  | 61  | 56  | 68 | 61 | 55 | 50 | 47 | 43 | 40 | 35 | 32 | 30 | 23 | 22 | 20 |
| 4   | 70  | 60  | 53  | 47  | 62 | 54 | 48 | 43 | 42 | 38 | 34 | 31 | 28 | 26 | 21 | 19 | 18 |
| 5   | 64  | 54  | 46  | 40  | 57 | 48 | 42 | 37 | 38 | 33 | 29 | 28 | 25 | 22 | 19 | 17 | 16 |
| 6   | 59  | 48  | 40  | 35  | 53 | 43 | 37 | 32 | 34 | 29 | 26 | 25 | 22 | 20 | 17 | 15 | 14 |
| 7   | 55  | 43  | 36  | 30  | 49 | 39 | 32 | 28 | 31 | 26 | 23 | 23 | 20 | 17 | 16 | 14 | 12 |
| 8   | 51  | 39  | 32  | 27  | 45 | 35 | 29 | 24 | 28 | 23 | 20 | 21 | 18 | 16 | 14 | 12 | 11 |
| 9   | 47  | 36  | 29  | 24  | 42 | 32 | 26 | 22 | 25 | 21 | 18 | 19 | 16 | 14 | 13 | 11 | 10 |
| 10  | 44  | 33  | 26  | 21  | 39 | 29 | 23 | 19 | 23 | 19 | 16 | 18 | 15 | 13 | 12 | 10 | 9  |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 1808 | 1808 | 1808 |
| 5°  | 1808 | 1775 | 1788 |
| 10° | 1787 | 1737 | 1727 |
| 15° | 1760 | 1675 | 1635 |
| 20° | 1724 | 1593 | 1522 |
| 25° | 1688 | 1501 | 1414 |
| 30° | 1640 | 1407 | 1277 |
| 35° | 1593 | 1306 | 1157 |
| 40° | 1545 | 1203 | 1020 |
| 45° | 1490 | 1088 | 896  |
| 50° | 1432 | 973  | 775  |
| 55° | 1372 | 850  | 658  |
| 60° | 1302 | 722  | 540  |
| 65° | 1221 | 593  | 483  |
| 70° | 1123 | 472  | 433  |
| 75° | 1000 | 409  | 389  |
| 80° | 822  | 333  | 328  |
| 85° | 537  | 206  | 233  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 90°

Vertical Angle: 90°

Luminance: 2581 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 78.2   | 1.1       |
| 10°-20°   | 214.8  | 3.0       |
| 20°-30°   | 301.5  | 4.3       |
| 30°-40°   | 328.7  | 4.6       |
| 40°-50°   | 302.1  | 4.3       |
| 50°-60°   | 237.3  | 3.4       |
| 60°-70°   | 154.4  | 2.2       |
| 70°-80°   | 79.5   | 1.1       |
| 80°-90°   | 25.7   | 0.4       |
| 90°-100°  | 118.6  | 1.7       |
| 100°-110° | 376.8  | 5.3       |
| 110°-120° | 644.8  | 9.1       |
| 120°-130° | 848.0  | 12.0      |
| 130°-140° | 951.8  | 13.4      |
| 140°-150° | 933.4  | 13.2      |
| 150°-160° | 783.0  | 11.1      |
| 160°-170° | 519.2  | 7.3       |
| 170°-180° | 181.5  | 2.6       |
| 0°-30°    | 594.5  | 8.4       |
| 0°-40°    | 923.2  | 13.0      |
| 0°-60°    | 1462.6 | 20.7      |
| 0°-90°    | 1722.2 | 24.3      |
| 90°-120°  | 1140.1 | 16.1      |
| 90°-150°  | 3873.3 | 54.7      |
| 90°-180°  | 5357.0 | 75.7      |
| 0°-180°   | 7079.2 | 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°  | 2    | 21    | 57   | 53    | 55   | 7    |
| 95°  | 84   | 100   | 103  | 103   | 100  | 94   |
| 105° | 348  | 352   | 356  | 359   | 359  | 367  |
| 115° | 647  | 656   | 653  | 652   | 647  | 640  |
| 125° | 941  | 956   | 951  | 946   | 944  | 841  |
| 135° | 1217 | 1235  | 1239 | 1237  | 1232 | 941  |
| 145° | 1478 | 1489  | 1499 | 1500  | 1494 | 923  |
| 155° | 1690 | 1694  | 1700 | 1708  | 1702 | 778  |
| 165° | 1838 | 1836  | 1836 | 1848  | 1840 | 519  |
| 175° | 1913 | 1908  | 1905 | 1916  | 1906 | 182  |
| 180° | 1916 | 1916  | 1916 | 1916  | 1916 |      |

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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°    | 1.7   | 20.8  | 56.7  | 53.1  | 54.8  |
| 92.5°  | 35.9  | 48.6  | 50.3  | 52.0  | 52.0  |
| 95°    | 84.3  | 100.5 | 103.4 | 103.4 | 100.5 |
| 97.5°  | 140.4 | 155.4 | 161.8 | 161.8 | 161.8 |
| 100°   | 205.1 | 218.3 | 223.0 | 223.0 | 221.3 |
| 102.5° | 273.3 | 283.1 | 289.4 | 291.1 | 289.4 |
| 105°   | 347.8 | 352.4 | 355.9 | 358.8 | 358.8 |
| 107.5° | 421.7 | 428.7 | 428.7 | 429.8 | 421.7 |
| 110°   | 493.4 | 502.6 | 502.6 | 502.6 | 498.0 |



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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 570.8  | 580.6  | 578.9  | 574.2  | 570.8  |
| 115°   | 647.0  | 656.3  | 653.4  | 651.7  | 647.0  |
| 117.5° | 722.8  | 735.5  | 727.3  | 722.8  | 718.1  |
| 120°   | 799.0  | 811.7  | 799.0  | 799.0  | 793.8  |
| 122.5° | 868.3  | 884.4  | 876.4  | 871.8  | 868.3  |
| 125°   | 941.1  | 955.5  | 950.9  | 945.7  | 944.0  |
| 127.5° | 1012.2 | 1030.1 | 1023.7 | 1016.8 | 1012.2 |
| 130°   | 1078.6 | 1099.4 | 1096.5 | 1093.1 | 1086.7 |
| 132.5° | 1153.2 | 1169.3 | 1170.4 | 1162.4 | 1157.7 |
| 135°   | 1217.3 | 1235.2 | 1238.6 | 1236.9 | 1232.2 |
| 137.5° | 1288.9 | 1303.3 | 1306.3 | 1305.0 | 1298.2 |
| 140°   | 1351.9 | 1366.3 | 1374.4 | 1374.4 | 1368.1 |
| 142.5° | 1416.5 | 1431.0 | 1435.6 | 1437.3 | 1431.0 |
| 145°   | 1477.8 | 1489.3 | 1498.6 | 1500.4 | 1494.0 |
| 147.5° | 1532.7 | 1547.1 | 1554.1 | 1556.9 | 1550.5 |
| 150°   | 1589.3 | 1599.1 | 1605.5 | 1610.6 | 1605.5 |
| 152.5° | 1639.5 | 1649.4 | 1657.5 | 1663.9 | 1657.5 |
| 155°   | 1689.8 | 1694.5 | 1699.6 | 1707.8 | 1702.5 |
| 157.5° | 1733.1 | 1736.7 | 1739.5 | 1751.1 | 1743.0 |
| 160°   | 1771.9 | 1775.3 | 1777.1 | 1786.9 | 1780.0 |
| 162.5° | 1807.7 | 1807.7 | 1809.4 | 1820.4 | 1812.3 |
| 165°   | 1838.3 | 1836.5 | 1836.5 | 1848.2 | 1840.1 |
| 167.5° | 1866.0 | 1860.9 | 1860.9 | 1872.4 | 1864.3 |
| 170°   | 1886.8 | 1882.2 | 1880.5 | 1892.0 | 1882.2 |
| 172.5° | 1901.3 | 1896.6 | 1894.9 | 1906.4 | 1896.6 |
| 175°   | 1912.8 | 1908.2 | 1904.7 | 1916.3 | 1906.4 |
| 177.5° | 1919.1 | 1914.6 | 1911.1 | 1920.9 | 1911.1 |
| 180°   | 1916.3 | 1916.3 | 1916.3 | 1916.3 | 1916.3 |

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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 | 6.00             | 6.66 | 7.16  | 7.80  | 9.40  | 1.97           | 2.63 | 3.13 | 3.77 | 5.37 |
|                 | 3H   | 7.65             | 8.23 | 8.81  | 9.38  | 10.99 | 3.13           | 3.72 | 4.29 | 4.87 | 6.48 |
|                 | 4H   | 8.23             | 8.79 | 9.40  | 9.94  | 11.56 | 3.56           | 4.12 | 4.73 | 5.27 | 6.88 |
|                 | 6H   | 8.63             | 9.14 | 9.81  | 10.29 | 11.92 | 3.86           | 4.37 | 5.03 | 5.52 | 7.15 |
|                 | 8H   | 8.74             | 9.23 | 9.92  | 10.39 | 12.01 | 3.93           | 4.42 | 5.11 | 5.59 | 7.21 |
|                 | 12H  | 8.79             | 9.25 | 9.97  | 10.41 | 12.05 | 3.96           | 4.43 | 5.15 | 5.58 | 7.23 |
| 4H              | 2H   | 5.99             | 6.55 | 7.17  | 7.70  | 9.32  | 2.54           | 3.09 | 3.71 | 4.24 | 5.86 |
|                 | 3H   | 7.78             | 8.25 | 8.97  | 9.42  | 11.05 | 3.85           | 4.31 | 5.03 | 5.49 | 7.12 |
|                 | 4H   | 8.45             | 8.88 | 9.64  | 10.04 | 11.69 | 4.38           | 4.80 | 5.56 | 5.96 | 7.61 |
|                 | 6H   | 8.94             | 9.31 | 10.13 | 10.49 | 12.13 | 4.77           | 5.13 | 5.95 | 6.31 | 7.95 |
|                 | 8H   | 9.10             | 9.44 | 10.29 | 10.62 | 12.27 | 4.88           | 5.22 | 6.07 | 6.40 | 8.05 |
|                 | 12H  | 9.18             | 9.49 | 10.38 | 10.67 | 12.33 | 4.93           | 5.24 | 6.13 | 6.42 | 8.08 |
| 8H              | 4H   | 8.40             | 8.75 | 9.59  | 9.92  | 11.57 | 4.63           | 4.97 | 5.82 | 6.15 | 7.80 |
|                 | 6H   | 8.94             | 9.22 | 10.15 | 10.44 | 12.09 | 5.12           | 5.40 | 6.32 | 6.62 | 8.27 |
|                 | 8H   | 9.14             | 9.39 | 10.36 | 10.58 | 12.25 | 5.29           | 5.54 | 6.51 | 6.73 | 8.40 |
|                 | 12H  | 9.26             | 9.48 | 10.47 | 10.67 | 12.37 | 5.39           | 5.61 | 6.61 | 6.80 | 8.50 |
| 12H             | 4H   | 8.35             | 8.66 | 9.55  | 9.84  | 11.50 | 4.62           | 4.93 | 5.83 | 6.12 | 7.78 |
|                 | 6H   | 8.92             | 9.16 | 10.13 | 10.35 | 12.03 | 5.16           | 5.41 | 6.37 | 6.60 | 8.27 |
|                 | 8H   | 9.11             | 9.33 | 10.33 | 10.52 | 12.22 | 5.35           | 5.56 | 6.56 | 6.76 | 8.46 |

END OF REPORT