

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: P908453

Luminaire Tested: DFN2DIP-PN3F0-040D080US840-FLLONL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P908453  
REPORT IS A COMBINATION OF REPORTS P901103 AND P897955  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-PN3F0-040D080US840-FLLONL  
Description: 3 foot, Pentagon Define Geo, with Direct Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

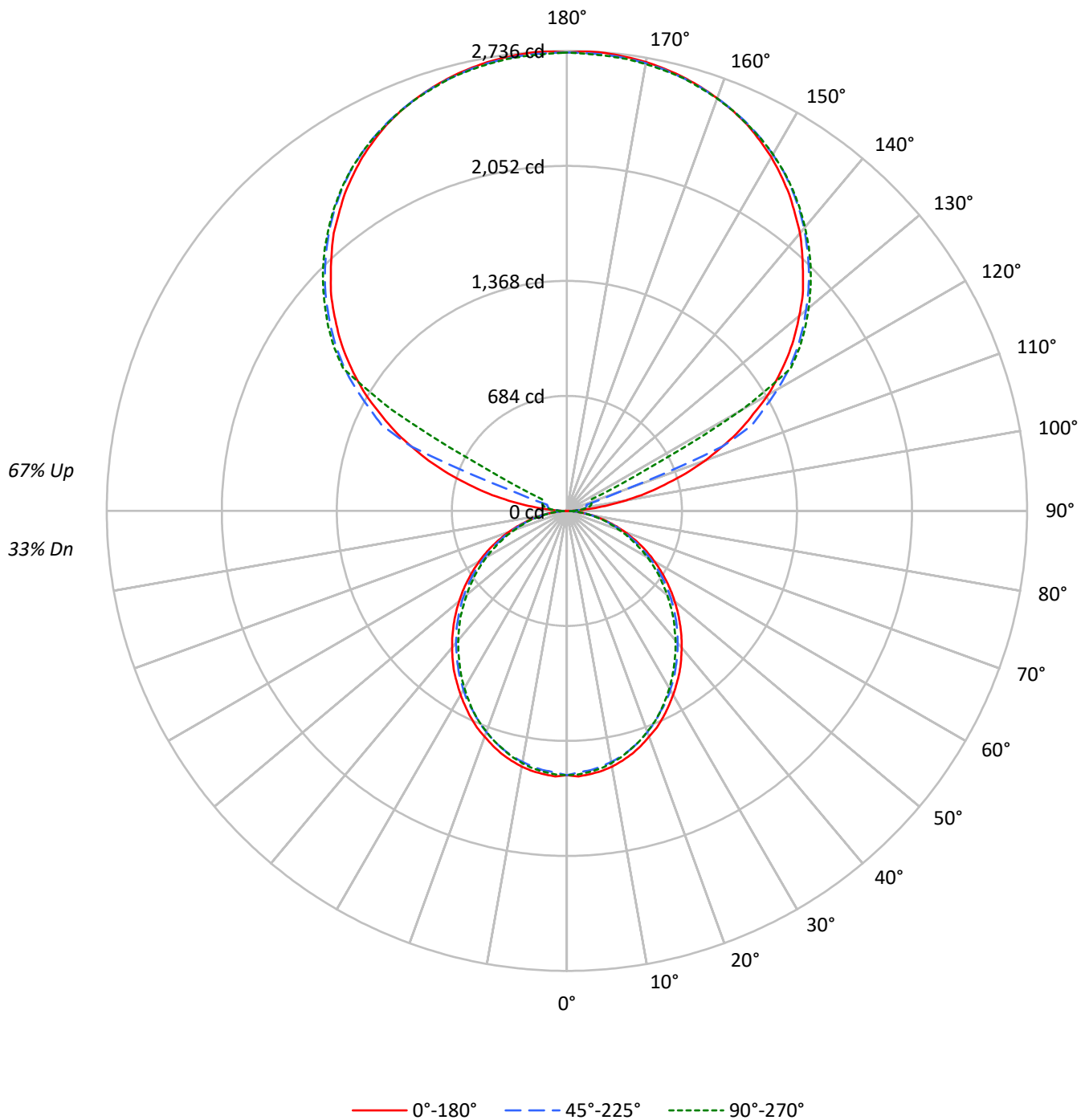
Lumens per Lamp: N/A  
Luminaire Lumens: 11997.2 lumens  
Efficiency: N/A  
Efficacy: 124.8 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 2.96' x L: 3.11' x H: 0.1')  
CIE Type: Semi-Indirect

Input Watts (W): 96.1  
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   | 103 | 103 | 103 | 103 | 93 | 93 | 93 | 93 | 74 | 74 | 74 | 57 | 57 | 57 | 41 | 41 | 41 |
| 1   | 94  | 90  | 86  | 83  | 85 | 81 | 78 | 75 | 65 | 63 | 61 | 50 | 48 | 47 | 36 | 35 | 34 |
| 2   | 86  | 78  | 72  | 67  | 77 | 71 | 66 | 62 | 57 | 53 | 50 | 44 | 41 | 39 | 32 | 30 | 29 |
| 3   | 78  | 69  | 62  | 56  | 70 | 62 | 56 | 51 | 50 | 46 | 42 | 39 | 36 | 33 | 28 | 26 | 25 |
| 4   | 71  | 61  | 53  | 47  | 64 | 55 | 49 | 43 | 44 | 40 | 36 | 34 | 31 | 28 | 25 | 23 | 21 |
| 5   | 65  | 54  | 46  | 40  | 59 | 49 | 42 | 37 | 40 | 35 | 31 | 31 | 27 | 25 | 23 | 20 | 18 |
| 6   | 60  | 48  | 41  | 35  | 54 | 44 | 37 | 32 | 36 | 31 | 27 | 28 | 24 | 21 | 20 | 18 | 16 |
| 7   | 56  | 44  | 36  | 30  | 50 | 40 | 33 | 28 | 32 | 27 | 23 | 25 | 22 | 19 | 19 | 16 | 14 |
| 8   | 51  | 39  | 32  | 27  | 46 | 36 | 29 | 25 | 29 | 24 | 21 | 23 | 19 | 17 | 17 | 15 | 13 |
| 9   | 48  | 36  | 29  | 24  | 43 | 33 | 26 | 22 | 27 | 22 | 19 | 21 | 18 | 15 | 16 | 13 | 12 |
| 10  | 45  | 33  | 26  | 21  | 40 | 30 | 24 | 20 | 25 | 20 | 17 | 19 | 16 | 14 | 15 | 12 | 11 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 1837 | 1837 | 1837 |
| 5°  | 1839 | 1810 | 1823 |
| 10° | 1823 | 1785 | 1798 |
| 15° | 1795 | 1754 | 1758 |
| 20° | 1758 | 1712 | 1718 |
| 25° | 1721 | 1662 | 1672 |
| 30° | 1674 | 1615 | 1613 |
| 35° | 1631 | 1560 | 1551 |
| 40° | 1577 | 1505 | 1491 |
| 45° | 1523 | 1449 | 1431 |
| 50° | 1464 | 1391 | 1361 |
| 55° | 1402 | 1323 | 1296 |
| 60° | 1332 | 1243 | 1222 |
| 65° | 1256 | 1159 | 1135 |
| 70° | 1158 | 1058 | 1040 |
| 75° | 1024 | 936  | 952  |
| 80° | 861  | 780  | 786  |
| 85° | 607  | 516  | 512  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 90°

Vertical Angle: 90°

Luminance: 1840 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 147.9   | 1.2       |
| 10°-20°   | 416.2   | 3.5       |
| 20°-30°   | 611.7   | 5.1       |
| 30°-40°   | 710.5   | 5.9       |
| 40°-50°   | 709.6   | 5.9       |
| 50°-60°   | 618.7   | 5.2       |
| 60°-70°   | 457.4   | 3.8       |
| 70°-80°   | 258.8   | 2.2       |
| 80°-90°   | 73.1    | 0.6       |
| 90°-100°  | 89.9    | 0.7       |
| 100°-110° | 335.1   | 2.8       |
| 110°-120° | 888.9   | 7.4       |
| 120°-130° | 1474.3  | 12.3      |
| 130°-140° | 1566.0  | 13.1      |
| 140°-150° | 1455.4  | 12.1      |
| 150°-160° | 1170.1  | 9.8       |
| 160°-170° | 754.0   | 6.3       |
| 170°-180° | 259.5   | 2.2       |
| 0°-30°    | 1175.9  | 9.8       |
| 0°-40°    | 1886.3  | 15.7      |
| 0°-60°    | 3214.6  | 26.8      |
| 0°-90°    | 4003.8  | 33.4      |
| 90°-120°  | 1314.0  | 11.0      |
| 90°-150°  | 5809.7  | 48.4      |
| 90°-180°  | 7993.0  | 66.6      |
| 0°-180°   | 11997.2 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 1572 | 1572  | 1572 | 1572  | 1572 |      |
| 5°   | 1572 | 1566  | 1549 | 1561  | 1558 | 149  |
| 15°  | 1496 | 1487  | 1468 | 1474  | 1466 | 421  |
| 25°  | 1354 | 1342  | 1316 | 1319  | 1316 | 623  |
| 35°  | 1168 | 1153  | 1129 | 1120  | 1112 | 730  |
| 45°  | 951  | 940   | 917  | 901   | 895  | 734  |
| 55°  | 720  | 710   | 692  | 674   | 667  | 643  |
| 65°  | 485  | 476   | 461  | 447   | 440  | 480  |
| 75°  | 254  | 251   | 243  | 234   | 237  | 271  |
| 85°  | 62   | 60    | 59   | 54    | 53   | 69   |
| 90°  | 2    | 24    | 39   | 49    | 53   | 11   |
| 95°  | 128  | 63    | 77   | 87    | 85   | 152  |
| 105° | 600  | 659   | 120  | 142   | 150  | 641  |
| 115° | 1134 | 1168  | 1217 | 304   | 162  | 1117 |
| 125° | 1604 | 1630  | 1667 | 1681  | 1687 | 1430 |
| 135° | 1985 | 2016  | 2034 | 2054  | 2050 | 1533 |
| 145° | 2302 | 2300  | 2334 | 2348  | 2338 | 1440 |
| 155° | 2535 | 2518  | 2541 | 2553  | 2537 | 1168 |
| 165° | 2671 | 2660  | 2665 | 2679  | 2665 | 755  |
| 175° | 2732 | 2719  | 2723 | 2736  | 2717 | 260  |
| 180° | 2726 | 2726  | 2726 | 2726  | 2726 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 1571.8 | 1571.8 | 1571.8 | 1571.8 | 1571.8 |
| 2.5°   | 1580.9 | 1573.4 | 1556.7 | 1571.8 | 1568.9 |
| 5°     | 1571.8 | 1565.8 | 1549.1 | 1561.2 | 1558.3 |
| 7.5°   | 1561.2 | 1552.2 | 1535.5 | 1547.7 | 1544.7 |
| 10°    | 1544.7 | 1534.1 | 1516.0 | 1528.0 | 1523.5 |
| 12.5°  | 1521.9 | 1512.9 | 1494.8 | 1502.4 | 1499.2 |
| 15°    | 1496.2 | 1487.2 | 1467.5 | 1473.6 | 1466.1 |
| 17.5°  | 1464.5 | 1455.5 | 1435.8 | 1443.3 | 1435.8 |
| 20°    | 1429.7 | 1420.7 | 1399.6 | 1404.0 | 1398.2 |
| 22.5°  | 1395.0 | 1381.4 | 1361.7 | 1361.7 | 1358.7 |
| 25°    | 1354.1 | 1342.1 | 1316.5 | 1319.4 | 1316.5 |
| 27.5°  | 1308.8 | 1298.2 | 1278.7 | 1274.1 | 1266.7 |
| 30°    | 1263.5 | 1251.4 | 1228.8 | 1224.3 | 1218.2 |
| 32.5°  | 1215.2 | 1206.2 | 1181.9 | 1172.9 | 1166.7 |
| 35°    | 1168.3 | 1153.3 | 1129.0 | 1119.9 | 1112.4 |
| 37.5°  | 1115.4 | 1101.8 | 1077.5 | 1067.0 | 1059.4 |
| 40°    | 1061.1 | 1048.8 | 1024.6 | 1011.2 | 1005.1 |
| 42.5°  | 1008.1 | 995.9  | 971.9  | 956.6  | 947.7  |
| 45°    | 950.7  | 940.2  | 917.4  | 900.9  | 894.7  |
| 47.5°  | 894.7  | 884.1  | 860.0  | 843.3  | 834.4  |
| 50°    | 835.8  | 828.2  | 807.1  | 785.9  | 778.3  |
| 52.5°  | 778.3  | 767.8  | 748.2  | 731.5  | 720.9  |
| 55°    | 719.5  | 710.3  | 692.3  | 674.1  | 666.6  |
| 57.5°  | 660.5  | 653.0  | 633.2  | 615.1  | 609.0  |
| 60°    | 601.5  | 595.5  | 574.4  | 557.7  | 553.2  |
| 62.5°  | 544.1  | 533.5  | 518.5  | 503.3  | 497.3  |
| 65°    | 485.2  | 476.1  | 461.0  | 447.4  | 439.9  |
| 67.5°  | 424.7  | 417.1  | 403.6  | 393.0  | 387.0  |
| 70°    | 368.8  | 362.7  | 349.1  | 338.5  | 332.5  |
| 72.5°  | 311.4  | 305.3  | 297.8  | 287.2  | 282.7  |
| 75°    | 253.9  | 251.0  | 243.3  | 234.3  | 237.3  |
| 77.5°  | 202.5  | 196.4  | 193.4  | 188.8  | 184.4  |
| 80°    | 151.2  | 149.6  | 146.5  | 142.1  | 139.1  |
| 82.5°  | 102.8  | 102.8  | 101.4  | 95.2   | 95.2   |
| 85°    | 61.9   | 60.5   | 59.0   | 54.3   | 52.9   |
| 87.5°  | 27.3   | 24.2   | 21.2   | 16.7   | 15.0   |
| 90°    | 1.9    | 23.6   | 39.4   | 49.4   | 53.2   |
| 92.5°  | 49.4   | 41.5   | 47.4   | 51.3   | 53.2   |
| 95°    | 128.2  | 63.0   | 76.9   | 86.9   | 84.8   |
| 97.5°  | 230.8  | 69.1   | 100.5  | 106.6  | 108.5  |
| 100°   | 349.3  | 79.0   | 112.5  | 128.2  | 132.1  |
| 102.5° | 479.4  | 475.5  | 116.4  | 137.9  | 144.1  |
| 105°   | 599.8  | 659.0  | 120.4  | 142.0  | 150.0  |
| 107.5° | 739.8  | 789.0  | 124.4  | 145.9  | 153.9  |
| 110°   | 874.1  | 915.3  | 345.4  | 148.0  | 155.8  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 1000.4 | 1035.7 | 1002.3 | 151.8  | 157.9  |
| 115°   | 1134.4 | 1167.9 | 1217.3 | 303.9  | 161.9  |
| 117.5° | 1250.8 | 1290.2 | 1323.9 | 1041.6 | 524.8  |
| 120°   | 1381.1 | 1410.6 | 1446.2 | 1469.9 | 1203.5 |
| 122.5° | 1491.4 | 1523.1 | 1562.7 | 1574.4 | 1576.5 |
| 125°   | 1603.9 | 1629.6 | 1667.1 | 1680.9 | 1686.8 |
| 127.5° | 1706.5 | 1734.1 | 1763.9 | 1783.5 | 1785.4 |
| 130°   | 1803.2 | 1834.8 | 1856.4 | 1878.2 | 1876.3 |
| 132.5° | 1901.9 | 1927.6 | 1949.2 | 1967.0 | 1965.1 |
| 135°   | 1984.8 | 2016.4 | 2034.0 | 2054.0 | 2049.9 |
| 137.5° | 2071.5 | 2095.2 | 2115.1 | 2134.8 | 2128.9 |
| 140°   | 2156.3 | 2172.2 | 2193.8 | 2211.6 | 2201.7 |
| 142.5° | 2227.6 | 2241.3 | 2266.8 | 2282.6 | 2272.7 |
| 145°   | 2302.5 | 2300.4 | 2333.9 | 2347.7 | 2337.8 |
| 147.5° | 2367.4 | 2361.6 | 2395.0 | 2404.9 | 2397.1 |
| 150°   | 2430.6 | 2416.8 | 2448.4 | 2460.1 | 2450.3 |
| 152.5° | 2483.9 | 2468.1 | 2497.6 | 2509.6 | 2495.8 |
| 155°   | 2535.2 | 2517.6 | 2541.2 | 2552.9 | 2537.3 |
| 157.5° | 2576.6 | 2560.9 | 2578.7 | 2592.5 | 2576.6 |
| 160°   | 2612.2 | 2600.3 | 2612.2 | 2623.9 | 2610.1 |
| 162.5° | 2643.6 | 2631.9 | 2641.7 | 2655.5 | 2637.8 |
| 165°   | 2671.3 | 2659.6 | 2665.4 | 2679.2 | 2665.4 |
| 167.5° | 2693.0 | 2681.1 | 2687.2 | 2701.0 | 2683.2 |
| 170°   | 2710.9 | 2698.9 | 2702.9 | 2716.7 | 2698.9 |
| 172.5° | 2722.6 | 2710.9 | 2714.8 | 2728.7 | 2710.9 |
| 175°   | 2732.4 | 2718.6 | 2722.6 | 2736.3 | 2716.7 |
| 177.5° | 2736.3 | 2722.6 | 2724.6 | 2738.5 | 2720.7 |
| 180°   | 2726.5 | 2726.5 | 2726.5 | 2726.5 | 2726.5 |

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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 | 7.57             | 8.30  | 8.66  | 9.39  | 10.88 | 7.13           | 7.86  | 8.22  | 8.95  | 10.44 |
|                 | 3H   | 9.22             | 9.87  | 10.31 | 10.97 | 12.47 | 8.74           | 9.39  | 9.83  | 10.48 | 11.99 |
|                 | 4H   | 9.80             | 10.42 | 10.90 | 11.51 | 13.03 | 9.31           | 9.93  | 10.42 | 11.03 | 12.54 |
|                 | 6H   | 10.18            | 10.75 | 11.30 | 11.85 | 13.38 | 9.69           | 10.26 | 10.81 | 11.36 | 12.89 |
|                 | 8H   | 10.28            | 10.83 | 11.40 | 11.94 | 13.46 | 9.79           | 10.34 | 10.91 | 11.45 | 12.97 |
|                 | 12H  | 10.32            | 10.84 | 11.45 | 11.95 | 13.49 | 9.83           | 10.34 | 10.95 | 11.45 | 12.99 |
| 4H              | 2H   | 8.02             | 8.64  | 9.13  | 9.73  | 11.25 | 7.66           | 8.28  | 8.78  | 9.38  | 10.89 |
|                 | 3H   | 9.86             | 10.38 | 10.98 | 11.50 | 13.03 | 9.46           | 9.98  | 10.58 | 11.10 | 12.63 |
|                 | 4H   | 10.57            | 11.04 | 11.69 | 12.15 | 13.70 | 10.15          | 10.63 | 11.27 | 11.74 | 13.28 |
|                 | 6H   | 11.07            | 11.48 | 12.20 | 12.61 | 14.15 | 10.64          | 11.05 | 11.78 | 12.19 | 13.73 |
|                 | 8H   | 11.21            | 11.59 | 12.34 | 12.72 | 14.27 | 10.78          | 11.16 | 11.92 | 12.29 | 13.85 |
|                 | 12H  | 11.28            | 11.62 | 12.42 | 12.76 | 14.32 | 10.84          | 11.18 | 11.99 | 12.32 | 13.88 |
| 8H              | 4H   | 10.75            | 11.13 | 11.88 | 12.26 | 13.81 | 10.38          | 10.76 | 11.51 | 11.89 | 13.44 |
|                 | 6H   | 11.37            | 11.68 | 12.52 | 12.85 | 14.40 | 10.99          | 11.30 | 12.14 | 12.47 | 14.03 |
|                 | 8H   | 11.58            | 11.86 | 12.74 | 13.00 | 14.58 | 11.20          | 11.47 | 12.36 | 12.62 | 14.19 |
|                 | 12H  | 11.70            | 11.94 | 12.86 | 13.09 | 14.70 | 11.30          | 11.54 | 12.46 | 12.69 | 14.30 |
| 12H             | 4H   | 10.73            | 11.07 | 11.87 | 12.21 | 13.77 | 10.36          | 10.71 | 11.51 | 11.85 | 13.41 |
|                 | 6H   | 11.39            | 11.67 | 12.55 | 12.82 | 14.39 | 11.03          | 11.30 | 12.19 | 12.45 | 14.02 |
|                 | 8H   | 11.62            | 11.87 | 12.79 | 13.01 | 14.62 | 11.25          | 11.49 | 12.41 | 12.64 | 14.25 |

END OF REPORT