

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: P903003

Luminaire Tested: DFN2DIP-PN3F0-040D090US830-RLLONL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P903003  
REPORT IS A COMBINATION OF REPORTS P901118 AND P897955  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-PN3F0-040D090US830-RLLONL  
Description: 3 foot, Pentagon Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

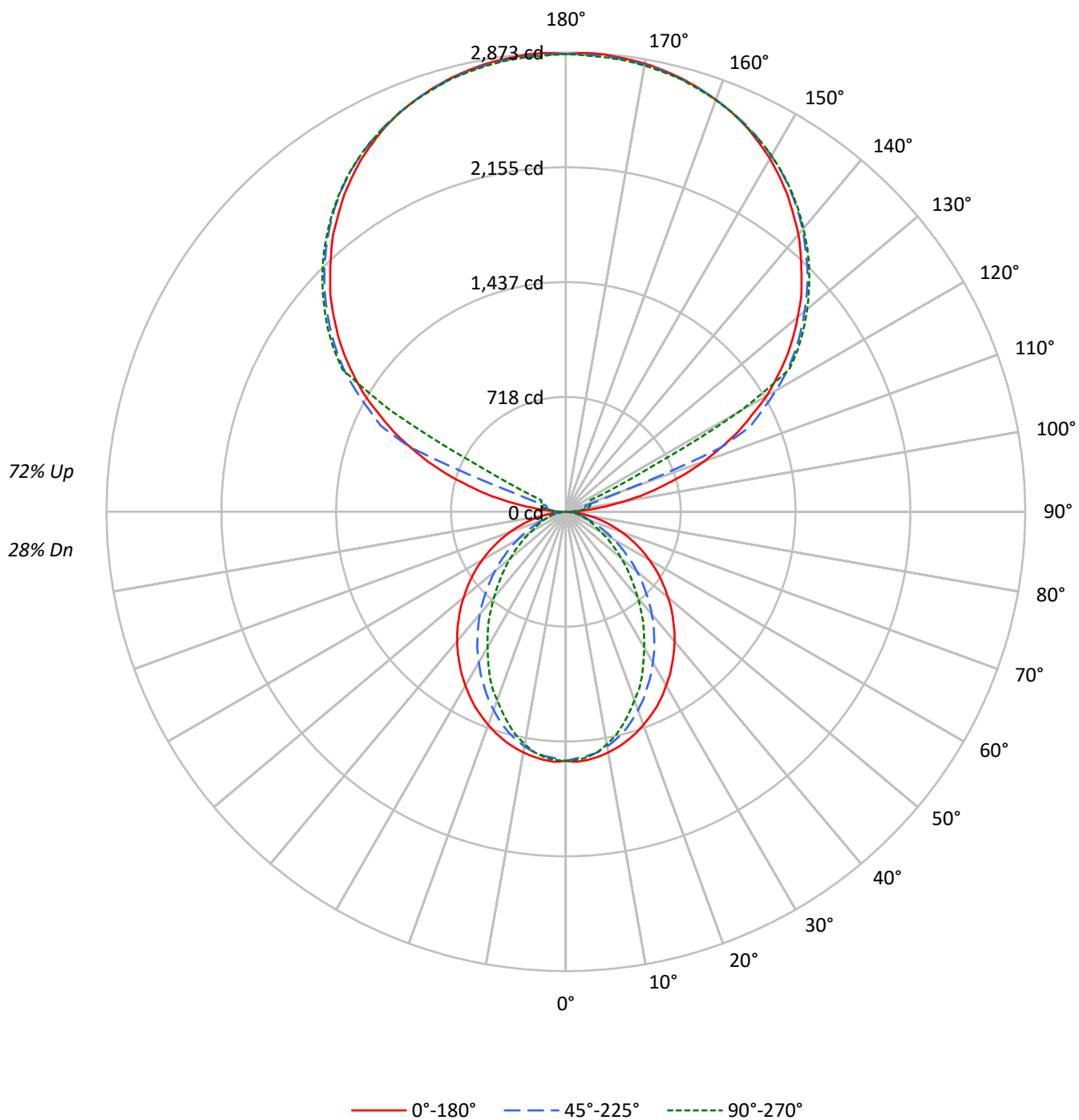
**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 11602.7 lumens  
Efficiency: N/A  
Efficacy: 109.6 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 0.99 / 1.16  
Luminous Opening: Rectangular w/ Sides (W: 2.96' x L: 3.11' x H: 0.1')  
CIE Type: Semi-Indirect  
  
Input Watts (W): 105.9  
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

TEST NUMBER: P903003

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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   | 102 | 102 | 102 | 102 | 91 | 91 | 91 | 91 | 71 | 71 | 71 | 53 | 53 | 53 | 36 | 36 | 36 |
| 1   | 93  | 89  | 85  | 82  | 83 | 80 | 77 | 74 | 62 | 60 | 59 | 46 | 45 | 44 | 32 | 31 | 31 |
| 2   | 85  | 78  | 72  | 67  | 76 | 70 | 65 | 61 | 55 | 52 | 49 | 41 | 39 | 37 | 28 | 27 | 26 |
| 3   | 78  | 69  | 62  | 56  | 69 | 62 | 56 | 51 | 49 | 45 | 41 | 37 | 34 | 32 | 25 | 24 | 22 |
| 4   | 71  | 61  | 53  | 48  | 63 | 55 | 48 | 44 | 43 | 39 | 35 | 33 | 30 | 27 | 23 | 21 | 20 |
| 5   | 65  | 54  | 47  | 41  | 58 | 49 | 42 | 37 | 39 | 34 | 30 | 29 | 26 | 24 | 21 | 19 | 17 |
| 6   | 60  | 49  | 41  | 35  | 54 | 44 | 37 | 32 | 35 | 30 | 27 | 27 | 23 | 21 | 19 | 17 | 15 |
| 7   | 55  | 44  | 36  | 31  | 49 | 40 | 33 | 28 | 32 | 27 | 23 | 24 | 21 | 18 | 17 | 15 | 14 |
| 8   | 51  | 40  | 32  | 27  | 46 | 36 | 30 | 25 | 29 | 24 | 21 | 22 | 19 | 16 | 16 | 14 | 12 |
| 9   | 48  | 36  | 29  | 24  | 43 | 33 | 27 | 22 | 26 | 22 | 19 | 20 | 17 | 15 | 15 | 13 | 11 |
| 10  | 45  | 33  | 26  | 22  | 40 | 30 | 24 | 20 | 24 | 20 | 17 | 19 | 16 | 13 | 14 | 12 | 10 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 1822 | 1822 | 1822 |
| 5°  | 1823 | 1791 | 1803 |
| 10° | 1804 | 1755 | 1744 |
| 15° | 1778 | 1696 | 1652 |
| 20° | 1744 | 1614 | 1541 |
| 25° | 1710 | 1524 | 1432 |
| 30° | 1663 | 1431 | 1296 |
| 35° | 1618 | 1331 | 1175 |
| 40° | 1572 | 1228 | 1038 |
| 45° | 1518 | 1114 | 913  |
| 50° | 1462 | 999  | 791  |
| 55° | 1404 | 876  | 674  |
| 60° | 1337 | 747  | 555  |
| 65° | 1259 | 617  | 498  |
| 70° | 1165 | 495  | 449  |
| 75° | 1046 | 434  | 407  |
| 80° | 875  | 360  | 351  |
| 85° | 594  | 234  | 259  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 90°

Vertical Angle: 90°

Luminance: 1930 cd/sqm

TEST NUMBER: P903003

CATALOG NUMBER: DFN2DIP-PN3F0-040D090US830-RLLONL

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 146.0   | 1.3       |
| 10°-20°   | 400.9   | 3.5       |
| 20°-30°   | 562.8   | 4.9       |
| 30°-40°   | 613.5   | 5.3       |
| 40°-50°   | 563.9   | 4.9       |
| 50°-60°   | 442.9   | 3.8       |
| 60°-70°   | 288.3   | 2.5       |
| 70°-80°   | 148.4   | 1.3       |
| 80°-90°   | 42.9    | 0.4       |
| 90°-100°  | 94.4    | 0.8       |
| 100°-110° | 351.9   | 3.0       |
| 110°-120° | 933.3   | 8.0       |
| 120°-130° | 1548.0  | 13.3      |
| 130°-140° | 1644.3  | 14.2      |
| 140°-150° | 1528.2  | 13.2      |
| 150°-160° | 1228.6  | 10.6      |
| 160°-170° | 791.7   | 6.8       |
| 170°-180° | 272.5   | 2.3       |
| 0°-30°    | 1109.8  | 9.6       |
| 0°-40°    | 1723.3  | 14.9      |
| 0°-60°    | 2730.1  | 23.5      |
| 0°-90°    | 3209.7  | 27.7      |
| 90°-120°  | 1379.6  | 11.9      |
| 90°-150°  | 6100.2  | 52.6      |
| 90°-180°  | 8393.0  | 72.3      |
| 0°-180°   | 11602.7 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 1558 | 1558  | 1558 | 1558  | 1558 |      |
| 5°   | 1558 | 1551  | 1533 | 1546  | 1541 | 148  |
| 15°  | 1482 | 1466  | 1419 | 1392  | 1378 | 418  |
| 25°  | 1345 | 1300  | 1207 | 1149  | 1128 | 619  |
| 35°  | 1159 | 1087  | 963  | 874   | 843  | 726  |
| 45°  | 948  | 853   | 705  | 605   | 571  | 732  |
| 55°  | 721  | 611   | 458  | 374   | 347  | 644  |
| 65°  | 486  | 372   | 245  | 198   | 193  | 482  |
| 75°  | 259  | 161   | 113  | 103   | 102  | 274  |
| 85°  | 61   | 31    | 27   | 27    | 27   | 70   |
| 90°  | 2    | 25    | 41   | 52    | 56   | 11   |
| 95°  | 135  | 66    | 81   | 91    | 89   | 159  |
| 105° | 630  | 692   | 126  | 149   | 157  | 673  |
| 115° | 1191 | 1226  | 1278 | 319   | 170  | 1173 |
| 125° | 1684 | 1711  | 1750 | 1765  | 1771 | 1502 |
| 135° | 2084 | 2117  | 2136 | 2157  | 2152 | 1610 |
| 145° | 2418 | 2415  | 2451 | 2465  | 2455 | 1512 |
| 155° | 2662 | 2644  | 2668 | 2681  | 2664 | 1227 |
| 165° | 2805 | 2792  | 2799 | 2813  | 2799 | 792  |
| 175° | 2869 | 2854  | 2859 | 2873  | 2852 | 273  |
| 180° | 2863 | 2863  | 2863 | 2863  | 2863 |      |

TEST NUMBER: P903003

CATALOG NUMBER: DFN2DIP-PN3F0-040D090US830-RLLONL

**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 1558.2 | 1558.2 | 1558.2 | 1558.2 | 1558.2 |
| 2.5°   | 1565.3 | 1558.2 | 1542.7 | 1556.9 | 1554.0 |
| 5°     | 1558.2 | 1551.1 | 1532.8 | 1545.5 | 1541.3 |
| 7.5°   | 1545.5 | 1537.1 | 1517.4 | 1522.9 | 1515.9 |
| 10°    | 1528.6 | 1518.7 | 1490.5 | 1486.2 | 1477.9 |
| 12.5°  | 1507.5 | 1494.8 | 1456.6 | 1448.2 | 1432.7 |
| 15°    | 1482.1 | 1466.5 | 1418.6 | 1391.9 | 1377.8 |
| 17.5°  | 1452.5 | 1429.8 | 1370.6 | 1339.6 | 1317.0 |
| 20°    | 1418.6 | 1390.3 | 1319.8 | 1284.7 | 1253.6 |
| 22.5°  | 1382.0 | 1349.5 | 1267.6 | 1219.7 | 1198.7 |
| 25°    | 1345.3 | 1300.1 | 1207.0 | 1149.3 | 1128.0 |
| 27.5°  | 1301.7 | 1253.6 | 1150.7 | 1084.4 | 1051.9 |
| 30°    | 1255.1 | 1201.4 | 1088.5 | 1016.7 | 978.6  |
| 32.5°  | 1209.9 | 1145.0 | 1029.4 | 944.8  | 909.5  |
| 35°    | 1159.2 | 1087.2 | 963.2  | 874.3  | 843.2  |
| 37.5°  | 1109.8 | 1032.2 | 901.1  | 803.7  | 768.5  |
| 40°    | 1057.6 | 973.1  | 836.2  | 736.1  | 699.5  |
| 42.5°  | 1004.0 | 913.8  | 771.4  | 666.9  | 631.8  |
| 45°    | 947.6  | 853.1  | 705.1  | 604.9  | 571.1  |
| 47.5°  | 894.1  | 794.0  | 641.7  | 541.5  | 510.5  |
| 50°    | 834.8  | 734.7  | 579.6  | 482.2  | 452.7  |
| 52.5°  | 776.9  | 671.2  | 520.4  | 427.3  | 400.5  |
| 55°    | 720.6  | 610.6  | 458.3  | 373.7  | 346.9  |
| 57.5°  | 662.8  | 550.0  | 403.3  | 324.3  | 301.8  |
| 60°    | 603.5  | 490.7  | 345.4  | 273.6  | 251.1  |
| 62.5°  | 545.8  | 433.0  | 296.1  | 228.5  | 217.3  |
| 65°    | 486.5  | 372.2  | 245.3  | 197.5  | 193.1  |
| 67.5°  | 430.2  | 315.8  | 197.5  | 173.4  | 169.2  |
| 70°    | 370.9  | 260.9  | 163.5  | 149.5  | 143.7  |
| 72.5°  | 314.5  | 210.1  | 136.8  | 125.5  | 122.7  |
| 75°    | 259.4  | 160.7  | 112.8  | 102.9  | 101.6  |
| 77.5°  | 204.5  | 114.1  | 88.9   | 83.2   | 80.3   |
| 80°    | 153.6  | 81.8   | 67.6   | 62.1   | 62.1   |
| 82.5°  | 107.2  | 55.0   | 46.6   | 43.6   | 43.6   |
| 85°    | 60.6   | 31.0   | 26.8   | 26.8   | 26.8   |
| 87.5°  | 22.6   | 11.2   | 11.2   | 9.9    | 9.9    |
| 90°    | 2.0    | 24.9   | 41.3   | 51.9   | 55.8   |
| 92.5°  | 51.9   | 43.5   | 49.7   | 53.9   | 55.8   |
| 95°    | 134.6  | 66.2   | 80.7   | 91.2   | 89.1   |
| 97.5°  | 242.3  | 72.6   | 105.6  | 111.9  | 113.9  |
| 100°   | 366.7  | 82.9   | 118.1  | 134.6  | 138.7  |
| 102.5° | 503.3  | 499.4  | 122.2  | 144.9  | 151.3  |
| 105°   | 629.7  | 692.0  | 126.4  | 149.1  | 157.4  |
| 107.5° | 776.8  | 828.5  | 130.6  | 153.3  | 161.6  |
| 110°   | 917.8  | 961.1  | 362.6  | 155.4  | 163.6  |

TEST NUMBER: P903003

CATALOG NUMBER: DFN2DIP-PN3F0-040D090US830-RLLONL

**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 1050.4 | 1087.5 | 1052.3 | 159.4  | 165.8  |
| 115°   | 1191.1 | 1226.2 | 1278.2 | 319.1  | 169.9  |
| 117.5° | 1313.3 | 1354.7 | 1390.1 | 1093.7 | 551.0  |
| 120°   | 1450.1 | 1481.1 | 1518.5 | 1543.3 | 1263.7 |
| 122.5° | 1566.0 | 1599.2 | 1640.8 | 1653.0 | 1655.3 |
| 125°   | 1684.0 | 1711.1 | 1750.5 | 1765.0 | 1771.1 |
| 127.5° | 1791.8 | 1820.8 | 1852.1 | 1872.7 | 1874.7 |
| 130°   | 1893.4 | 1926.7 | 1949.3 | 1972.1 | 1970.2 |
| 132.5° | 1997.0 | 2024.0 | 2046.6 | 2065.4 | 2063.4 |
| 135°   | 2084.1 | 2117.2 | 2135.7 | 2156.6 | 2152.5 |
| 137.5° | 2175.1 | 2199.9 | 2220.8 | 2241.5 | 2235.3 |
| 140°   | 2264.1 | 2280.9 | 2303.5 | 2322.1 | 2311.9 |
| 142.5° | 2338.9 | 2353.4 | 2380.2 | 2396.7 | 2386.4 |
| 145°   | 2417.6 | 2415.4 | 2450.6 | 2465.1 | 2454.8 |
| 147.5° | 2485.8 | 2479.6 | 2514.8 | 2525.2 | 2517.0 |
| 150°   | 2552.2 | 2537.7 | 2570.9 | 2583.1 | 2572.9 |
| 152.5° | 2608.0 | 2591.5 | 2622.5 | 2635.1 | 2620.6 |
| 155°   | 2661.9 | 2643.5 | 2668.2 | 2680.6 | 2664.1 |
| 157.5° | 2705.5 | 2689.0 | 2707.6 | 2722.2 | 2705.5 |
| 160°   | 2742.8 | 2730.3 | 2742.8 | 2755.1 | 2740.6 |
| 162.5° | 2775.8 | 2763.4 | 2773.8 | 2788.3 | 2769.7 |
| 165°   | 2804.8 | 2792.5 | 2798.7 | 2813.2 | 2798.7 |
| 167.5° | 2827.7 | 2815.2 | 2821.5 | 2836.0 | 2817.4 |
| 170°   | 2846.4 | 2833.8 | 2838.0 | 2852.5 | 2833.8 |
| 172.5° | 2858.7 | 2846.4 | 2850.5 | 2865.0 | 2846.4 |
| 175°   | 2869.0 | 2854.5 | 2858.7 | 2873.2 | 2852.5 |
| 177.5° | 2873.2 | 2858.7 | 2860.9 | 2875.4 | 2856.8 |
| 180°   | 2862.9 | 2862.9 | 2862.9 | 2862.9 | 2862.9 |

TEST NUMBER: P903003

CATALOG NUMBER: DFN2DIP-PN3F0-040D090US830-RLONL

**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 | 6.63             | 7.30  | 7.76  | 8.42  | 9.99  | 2.59           | 3.27 | 3.73 | 4.39 | 5.95 |
|                 | 3H   | 8.29             | 8.89  | 9.43  | 10.02 | 11.60 | 3.76           | 4.37 | 4.90 | 5.50 | 7.07 |
|                 | 4H   | 8.89             | 9.46  | 10.03 | 10.59 | 12.17 | 4.20           | 4.78 | 5.35 | 5.91 | 7.49 |
|                 | 6H   | 9.29             | 9.82  | 10.45 | 10.95 | 12.55 | 4.51           | 5.04 | 5.67 | 6.17 | 7.76 |
|                 | 8H   | 9.41             | 9.91  | 10.57 | 11.06 | 12.65 | 4.59           | 5.10 | 5.75 | 6.24 | 7.83 |
|                 | 12H  | 9.47             | 9.94  | 10.63 | 11.08 | 12.69 | 4.63           | 5.11 | 5.79 | 6.25 | 7.85 |
| 4H              | 2H   | 6.63             | 7.20  | 7.78  | 8.33  | 9.91  | 3.17           | 3.74 | 4.32 | 4.87 | 6.45 |
|                 | 3H   | 8.43             | 8.91  | 9.60  | 10.07 | 11.66 | 4.50           | 4.97 | 5.66 | 6.13 | 7.72 |
|                 | 4H   | 9.11             | 9.55  | 10.28 | 10.70 | 12.31 | 5.03           | 5.47 | 6.20 | 6.62 | 8.23 |
|                 | 6H   | 9.62             | 9.99  | 10.79 | 11.16 | 12.76 | 5.44           | 5.81 | 6.61 | 6.98 | 8.58 |
|                 | 8H   | 9.78             | 10.13 | 10.95 | 11.29 | 12.91 | 5.56           | 5.91 | 6.73 | 7.07 | 8.69 |
|                 | 12H  | 9.87             | 10.19 | 11.05 | 11.36 | 12.98 | 5.61           | 5.93 | 6.80 | 7.10 | 8.72 |
| 8H              | 4H   | 9.07             | 9.42  | 10.24 | 10.58 | 12.20 | 5.30           | 5.65 | 6.47 | 6.81 | 8.43 |
|                 | 6H   | 9.62             | 9.91  | 10.81 | 11.11 | 12.73 | 5.80           | 6.09 | 6.99 | 7.29 | 8.91 |
|                 | 8H   | 9.84             | 10.09 | 11.03 | 11.27 | 12.90 | 5.99           | 6.24 | 7.18 | 7.42 | 9.05 |
|                 | 12H  | 9.96             | 10.18 | 11.16 | 11.36 | 13.03 | 6.09           | 6.32 | 7.29 | 7.49 | 9.16 |
| 12H             | 4H   | 9.01             | 9.33  | 10.20 | 10.50 | 12.12 | 5.29           | 5.61 | 6.48 | 6.78 | 8.40 |
|                 | 6H   | 9.60             | 9.85  | 10.79 | 11.03 | 12.66 | 5.85           | 6.10 | 7.04 | 7.28 | 8.92 |
|                 | 8H   | 9.81             | 10.03 | 11.00 | 11.20 | 12.87 | 6.05           | 6.27 | 7.24 | 7.44 | 9.11 |

END OF REPORT