

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: P908609

Luminaire Tested: DFN2DIP-PN4F0-040D060US840-FLLONL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P908609  
REPORT IS A COMBINATION OF REPORTS P901165 AND P898053  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-PN4F0-040D060US840-FLLONL  
Description: 4 foot, Pentagon Define Geo, with Direct Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

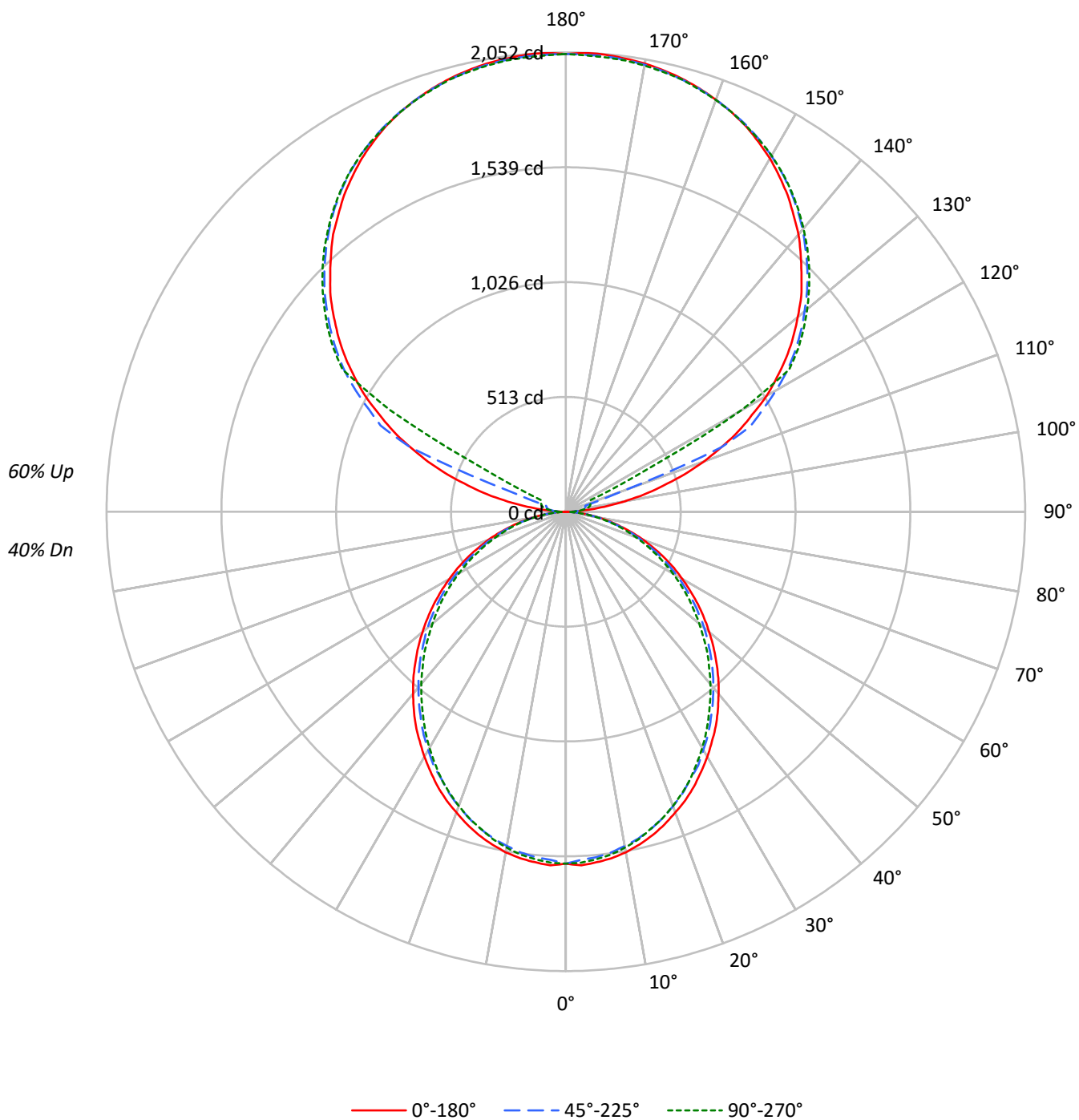
Lumens per Lamp: N/A  
Luminaire Lumens: 9997.6 lumens  
Efficiency: N/A  
Efficacy: 127.4 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 3.74' x L: 3.94' x H: 0.1')  
CIE Type: General Diffuse

Input Watts (W): 78.5  
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

TEST NUMBER: P908609

CATALOG NUMBER: DFN2DIP-PN4F0-040D060US840-FLLONL

### Luminous Intensity Polar Plot



TEST NUMBER: P908609

CATALOG NUMBER: DFN2DIP-PN4F0-040D060US840-FLLONL

**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   | 105 | 105 | 105 | 105 | 95 | 95 | 95 | 95 | 78 | 78 | 78 | 62 | 62 | 62 | 47 | 47 | 47 |
| 1   | 96  | 91  | 87  | 84  | 87 | 83 | 80 | 77 | 68 | 66 | 64 | 54 | 53 | 51 | 41 | 41 | 40 |
| 2   | 87  | 80  | 74  | 69  | 79 | 73 | 68 | 63 | 60 | 56 | 53 | 48 | 45 | 43 | 37 | 35 | 33 |
| 3   | 79  | 70  | 63  | 57  | 72 | 64 | 58 | 53 | 53 | 48 | 44 | 42 | 39 | 36 | 32 | 30 | 28 |
| 4   | 73  | 62  | 54  | 48  | 66 | 57 | 50 | 45 | 47 | 42 | 38 | 37 | 34 | 31 | 29 | 26 | 24 |
| 5   | 67  | 55  | 47  | 41  | 60 | 50 | 44 | 38 | 42 | 37 | 33 | 34 | 30 | 27 | 26 | 23 | 21 |
| 6   | 61  | 49  | 41  | 36  | 56 | 45 | 38 | 33 | 38 | 32 | 28 | 30 | 26 | 23 | 24 | 21 | 19 |
| 7   | 57  | 45  | 37  | 31  | 51 | 41 | 34 | 29 | 34 | 29 | 25 | 28 | 24 | 21 | 22 | 19 | 17 |
| 8   | 52  | 40  | 33  | 27  | 48 | 37 | 30 | 26 | 31 | 26 | 22 | 25 | 21 | 18 | 20 | 17 | 15 |
| 9   | 49  | 37  | 29  | 24  | 44 | 34 | 27 | 23 | 28 | 23 | 20 | 23 | 19 | 17 | 18 | 15 | 13 |
| 10  | 46  | 34  | 27  | 22  | 41 | 31 | 25 | 20 | 26 | 21 | 18 | 21 | 18 | 15 | 17 | 14 | 12 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 1147 | 1147 | 1147 |
| 5°  | 1149 | 1131 | 1139 |
| 10° | 1140 | 1116 | 1124 |
| 15° | 1123 | 1098 | 1100 |
| 20° | 1100 | 1073 | 1076 |
| 25° | 1078 | 1042 | 1047 |
| 30° | 1050 | 1014 | 1011 |
| 35° | 1023 | 981  | 973  |
| 40° | 990  | 947  | 937  |
| 45° | 957  | 913  | 900  |
| 50° | 921  | 878  | 857  |
| 55° | 884  | 837  | 817  |
| 60° | 841  | 788  | 772  |
| 65° | 795  | 738  | 719  |
| 70° | 736  | 677  | 661  |
| 75° | 654  | 603  | 609  |
| 80° | 556  | 509  | 508  |
| 85° | 402  | 348  | 339  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 90°

Vertical Angle: 90°

Luminance: 1091 cd/sqm

TEST NUMBER: P908609

CATALOG NUMBER: DFN2DIP-PN4F0-040D060US840-FLLONL

**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 147.9  | 1.5       |
| 10°-20°   | 416.2  | 4.2       |
| 20°-30°   | 611.7  | 6.1       |
| 30°-40°   | 710.5  | 7.1       |
| 40°-50°   | 709.6  | 7.1       |
| 50°-60°   | 618.7  | 6.2       |
| 60°-70°   | 457.4  | 4.6       |
| 70°-80°   | 258.8  | 2.6       |
| 80°-90°   | 71.9   | 0.7       |
| 90°-100°  | 67.4   | 0.7       |
| 100°-110° | 251.4  | 2.5       |
| 110°-120° | 666.7  | 6.7       |
| 120°-130° | 1105.7 | 11.1      |
| 130°-140° | 1174.5 | 11.7      |
| 140°-150° | 1091.6 | 10.9      |
| 150°-160° | 877.6  | 8.8       |
| 160°-170° | 565.5  | 5.7       |
| 170°-180° | 194.6  | 1.9       |
| 0°-30°    | 1175.9 | 11.8      |
| 0°-40°    | 1886.3 | 18.9      |
| 0°-60°    | 3214.6 | 32.2      |
| 0°-90°    | 4002.6 | 40.0      |
| 90°-120°  | 985.5  | 9.9       |
| 90°-150°  | 4357.2 | 43.6      |
| 90°-180°  | 5995.0 | 60.0      |
| 0°-180°   | 9997.6 | 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°  | 1    | 18    | 30   | 37    | 40   | 9    |
| 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 |      |

TEST NUMBER: P908609

CATALOG NUMBER: DFN2DIP-PN4F0-040D060US840-FLLONL

**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°    | 1.4    | 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  |

TEST NUMBER: P908609

CATALOG NUMBER: DFN2DIP-PN4F0-040D060US840-FLLONL

**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 |

TEST NUMBER: P908609

CATALOG NUMBER: DFN2DIP-PN4F0-040D060US840-FLLONL

**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 | 6.76             | 7.54  | 7.80  | 8.58  | 9.99  | 6.32           | 7.10  | 7.36  | 8.14  | 9.55  |
|                 | 3H   | 8.42             | 9.11  | 9.46  | 10.17 | 11.59 | 7.93           | 8.63  | 8.98  | 9.68  | 11.11 |
|                 | 4H   | 9.00             | 9.66  | 10.06 | 10.72 | 12.15 | 8.51           | 9.18  | 9.57  | 10.23 | 11.66 |
|                 | 6H   | 9.40             | 10.01 | 10.47 | 11.07 | 12.51 | 8.91           | 9.52  | 9.98  | 10.58 | 12.02 |
|                 | 8H   | 9.50             | 10.08 | 10.58 | 11.16 | 12.60 | 9.01           | 9.59  | 10.08 | 10.67 | 12.10 |
|                 | 12H  | 9.55             | 10.10 | 10.63 | 11.17 | 12.63 | 9.05           | 9.60  | 10.13 | 10.67 | 12.13 |
| 4H              | 2H   | 7.21             | 7.87  | 8.28  | 8.93  | 10.36 | 6.86           | 7.52  | 7.93  | 8.58  | 10.01 |
|                 | 3H   | 9.07             | 9.62  | 10.15 | 10.71 | 12.15 | 8.67           | 9.22  | 9.74  | 10.30 | 11.75 |
|                 | 4H   | 9.79             | 10.29 | 10.87 | 11.37 | 12.83 | 9.37           | 9.87  | 10.45 | 10.95 | 12.41 |
|                 | 6H   | 10.30            | 10.73 | 11.39 | 11.83 | 13.29 | 9.87           | 10.31 | 10.96 | 11.41 | 12.87 |
|                 | 8H   | 10.45            | 10.85 | 11.54 | 11.94 | 13.42 | 10.02          | 10.42 | 11.11 | 11.51 | 12.99 |
|                 | 12H  | 10.52            | 10.89 | 11.62 | 11.99 | 13.47 | 10.08          | 10.45 | 11.18 | 11.55 | 13.03 |
| 8H              | 4H   | 9.98             | 10.38 | 11.06 | 11.47 | 12.95 | 9.60           | 10.01 | 10.69 | 11.10 | 12.58 |
|                 | 6H   | 10.61            | 10.94 | 11.72 | 12.07 | 13.55 | 10.23          | 10.57 | 11.34 | 11.70 | 13.17 |
|                 | 8H   | 10.83            | 11.12 | 11.95 | 12.24 | 13.73 | 10.44          | 10.74 | 11.56 | 11.85 | 13.34 |
|                 | 12H  | 10.96            | 11.22 | 12.08 | 12.33 | 13.86 | 10.56          | 10.81 | 11.68 | 11.92 | 13.45 |
| 12H             | 4H   | 9.96             | 10.32 | 11.06 | 11.43 | 12.91 | 9.59           | 9.96  | 10.70 | 11.06 | 12.55 |
|                 | 6H   | 10.64            | 10.93 | 11.75 | 12.04 | 13.54 | 10.27          | 10.57 | 11.39 | 11.68 | 13.17 |
|                 | 8H   | 10.88            | 11.13 | 12.00 | 12.24 | 13.78 | 10.50          | 10.76 | 11.63 | 11.87 | 13.40 |

END OF REPORT