

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: P928220

Luminaire Tested: DFN2DIP-HX4F0-050D080US927-FLLONL

Issue Date: 12/12/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P928220  
REPORT IS A COMBINATION OF REPORTS P900893 AND P896187  
Test Lab: INNOVATION CENTER  
Issue Date: 12/12/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-HX4F0-050D080US927-FLLONL  
Description: 4 foot, Hexagon Define Geo, with Direct Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

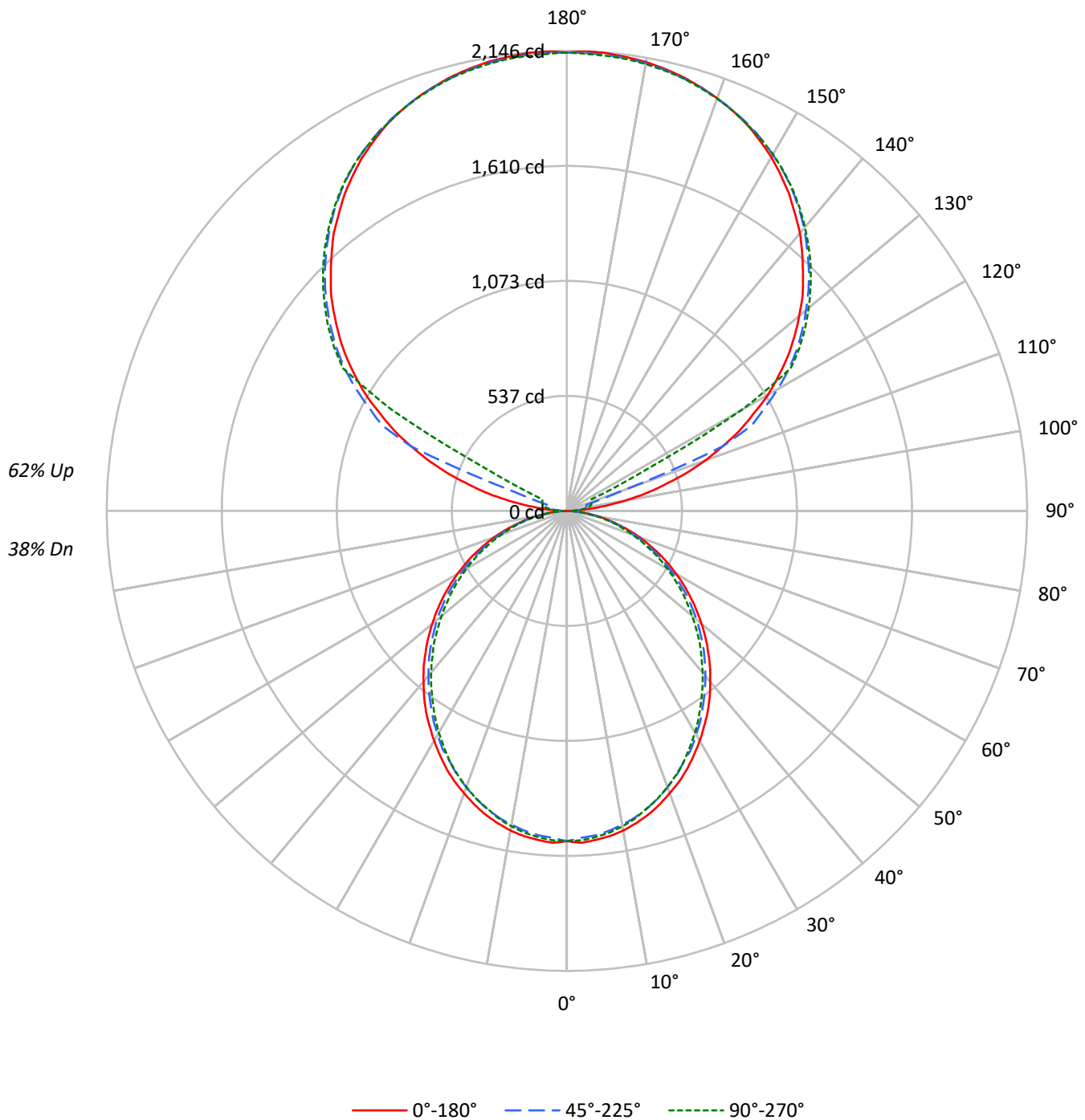
Lumens per Lamp: N/A  
Luminaire Lumens: 10193.1 lumens  
Efficiency: N/A  
Efficacy: 99.9 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 3.54' x L: 4.09' x H: 0.1')  
CIE Type: Semi-Indirect

Input Watts (W): 102  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9957  
Total Harmonic Distortion (THDi): 0.049  
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   | 104 | 104 | 104 | 104 | 95 | 95 | 95 | 95 | 77 | 77 | 77 | 61 | 61 | 61 | 46 | 46 | 46 |
| 1   | 95  | 91  | 87  | 84  | 86 | 83 | 80 | 77 | 67 | 65 | 63 | 53 | 52 | 50 | 40 | 39 | 38 |
| 2   | 87  | 79  | 73  | 68  | 78 | 72 | 67 | 63 | 59 | 55 | 52 | 47 | 44 | 42 | 35 | 34 | 32 |
| 3   | 79  | 70  | 63  | 57  | 71 | 64 | 57 | 52 | 52 | 48 | 44 | 41 | 38 | 36 | 31 | 29 | 28 |
| 4   | 72  | 62  | 54  | 48  | 65 | 56 | 50 | 44 | 46 | 41 | 37 | 37 | 33 | 30 | 28 | 26 | 24 |
| 5   | 66  | 55  | 47  | 41  | 60 | 50 | 43 | 38 | 41 | 36 | 32 | 33 | 29 | 26 | 25 | 23 | 21 |
| 6   | 61  | 49  | 41  | 36  | 55 | 45 | 38 | 33 | 37 | 32 | 28 | 30 | 26 | 23 | 23 | 20 | 18 |
| 7   | 56  | 44  | 36  | 31  | 51 | 41 | 34 | 29 | 34 | 28 | 25 | 27 | 23 | 20 | 21 | 18 | 16 |
| 8   | 52  | 40  | 33  | 27  | 47 | 37 | 30 | 25 | 31 | 25 | 22 | 25 | 21 | 18 | 19 | 16 | 14 |
| 9   | 49  | 37  | 29  | 24  | 44 | 34 | 27 | 23 | 28 | 23 | 19 | 23 | 19 | 16 | 18 | 15 | 13 |
| 10  | 45  | 33  | 26  | 22  | 41 | 31 | 25 | 20 | 26 | 21 | 17 | 21 | 17 | 15 | 16 | 14 | 12 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 1146 | 1146 | 1146 |
| 5°  | 1148 | 1130 | 1137 |
| 10° | 1138 | 1115 | 1122 |
| 15° | 1122 | 1097 | 1098 |
| 20° | 1099 | 1071 | 1073 |
| 25° | 1077 | 1041 | 1045 |
| 30° | 1049 | 1012 | 1009 |
| 35° | 1022 | 979  | 971  |
| 40° | 989  | 945  | 934  |
| 45° | 957  | 912  | 897  |
| 50° | 921  | 876  | 854  |
| 55° | 884  | 835  | 814  |
| 60° | 841  | 787  | 769  |
| 65° | 795  | 736  | 715  |
| 70° | 736  | 675  | 658  |
| 75° | 655  | 602  | 605  |
| 80° | 558  | 508  | 503  |
| 85° | 405  | 346  | 335  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 90°

Vertical Angle: 90°

Luminance: 1098 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 145.0   | 1.4       |
| 10°-20°   | 408.0   | 4.0       |
| 20°-30°   | 599.7   | 5.9       |
| 30°-40°   | 696.5   | 6.8       |
| 40°-50°   | 695.6   | 6.8       |
| 50°-60°   | 606.6   | 6.0       |
| 60°-70°   | 448.4   | 4.4       |
| 70°-80°   | 253.7   | 2.5       |
| 80°-90°   | 70.7    | 0.7       |
| 90°-100°  | 70.5    | 0.7       |
| 100°-110° | 262.9   | 2.6       |
| 110°-120° | 697.1   | 6.8       |
| 120°-130° | 1156.2  | 11.3      |
| 130°-140° | 1228.2  | 12.0      |
| 140°-150° | 1141.5  | 11.2      |
| 150°-160° | 917.7   | 9.0       |
| 160°-170° | 591.3   | 5.8       |
| 170°-180° | 203.5   | 2.0       |
| 0°-30°    | 1152.7  | 11.3      |
| 0°-40°    | 1849.2  | 18.1      |
| 0°-60°    | 3151.4  | 30.9      |
| 0°-90°    | 3924.2  | 38.5      |
| 90°-120°  | 1030.5  | 10.1      |
| 90°-150°  | 4556.4  | 44.7      |
| 90°-180°  | 6269.0  | 61.5      |
| 0°-180°   | 10193.1 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 1541 | 1541  | 1541 | 1541  | 1541 |      |
| 5°   | 1541 | 1535  | 1519 | 1530  | 1528 | 146  |
| 15°  | 1467 | 1458  | 1439 | 1445  | 1437 | 413  |
| 25°  | 1328 | 1316  | 1291 | 1293  | 1291 | 611  |
| 35°  | 1145 | 1131  | 1107 | 1098  | 1090 | 715  |
| 45°  | 932  | 922   | 899  | 883   | 877  | 719  |
| 55°  | 705  | 696   | 679  | 661   | 654  | 631  |
| 65°  | 476  | 467   | 452  | 439   | 431  | 470  |
| 75°  | 249  | 246   | 238  | 230   | 233  | 266  |
| 85°  | 61   | 59    | 58   | 53    | 52   | 68   |
| 90°  | 2    | 18    | 31   | 39    | 42   | 9    |
| 95°  | 100  | 49    | 60   | 68    | 66   | 119  |
| 105° | 470  | 517   | 94   | 111   | 118  | 503  |
| 115° | 890  | 916   | 955  | 238   | 127  | 876  |
| 125° | 1258 | 1278  | 1307 | 1318  | 1323 | 1122 |
| 135° | 1557 | 1581  | 1595 | 1611  | 1608 | 1202 |
| 145° | 1806 | 1804  | 1830 | 1841  | 1834 | 1129 |
| 155° | 1988 | 1974  | 1993 | 2002  | 1990 | 916  |
| 165° | 2095 | 2086  | 2090 | 2101  | 2090 | 592  |
| 175° | 2143 | 2132  | 2135 | 2146  | 2131 | 204  |
| 180° | 2138 | 2138  | 2138 | 2138  | 2138 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 1540.8 | 1540.8 | 1540.8 | 1540.8 | 1540.8 |
| 2.5°   | 1549.8 | 1542.4 | 1526.1 | 1540.8 | 1538.1 |
| 5°     | 1540.8 | 1535.1 | 1518.7 | 1530.5 | 1527.7 |
| 7.5°   | 1530.5 | 1521.7 | 1505.4 | 1517.3 | 1514.3 |
| 10°    | 1514.3 | 1503.9 | 1486.2 | 1497.9 | 1493.6 |
| 12.5°  | 1492.0 | 1483.2 | 1465.4 | 1472.8 | 1469.8 |
| 15°    | 1466.8 | 1458.0 | 1438.7 | 1444.7 | 1437.2 |
| 17.5°  | 1435.7 | 1426.9 | 1407.5 | 1414.9 | 1407.5 |
| 20°    | 1401.6 | 1392.8 | 1372.1 | 1376.4 | 1370.6 |
| 22.5°  | 1367.6 | 1354.2 | 1334.9 | 1334.9 | 1331.9 |
| 25°    | 1327.6 | 1315.7 | 1290.6 | 1293.4 | 1290.6 |
| 27.5°  | 1283.0 | 1272.7 | 1253.5 | 1249.1 | 1241.7 |
| 30°    | 1238.7 | 1226.8 | 1204.6 | 1200.2 | 1194.3 |
| 32.5°  | 1191.2 | 1182.5 | 1158.7 | 1149.7 | 1143.8 |
| 35°    | 1145.3 | 1130.6 | 1106.8 | 1097.9 | 1090.5 |
| 37.5°  | 1093.4 | 1080.1 | 1056.4 | 1046.0 | 1038.6 |
| 40°    | 1040.2 | 1028.3 | 1004.5 | 991.3  | 985.3  |
| 42.5°  | 988.3  | 976.4  | 952.8  | 937.8  | 929.0  |
| 45°    | 932.0  | 921.7  | 899.3  | 883.2  | 877.1  |
| 47.5°  | 877.1  | 866.8  | 843.1  | 826.7  | 817.9  |
| 50°    | 819.3  | 812.0  | 791.2  | 770.5  | 763.0  |
| 52.5°  | 763.0  | 752.6  | 733.5  | 717.2  | 706.8  |
| 55°    | 705.4  | 696.4  | 678.6  | 660.8  | 653.5  |
| 57.5°  | 647.5  | 640.1  | 620.8  | 603.0  | 597.0  |
| 60°    | 589.6  | 583.9  | 563.1  | 546.7  | 542.4  |
| 62.5°  | 533.4  | 523.0  | 508.2  | 493.4  | 487.5  |
| 65°    | 475.7  | 466.7  | 451.9  | 438.6  | 431.2  |
| 67.5°  | 416.4  | 408.9  | 395.7  | 385.3  | 379.3  |
| 70°    | 361.5  | 355.6  | 342.2  | 331.8  | 326.1  |
| 72.5°  | 305.3  | 299.3  | 291.9  | 281.6  | 277.1  |
| 75°    | 248.8  | 246.0  | 238.5  | 229.7  | 232.7  |
| 77.5°  | 198.6  | 192.5  | 189.6  | 185.2  | 180.8  |
| 80°    | 148.3  | 146.7  | 143.7  | 139.3  | 136.3  |
| 82.5°  | 100.7  | 100.7  | 99.3   | 93.4   | 93.4   |
| 85°    | 60.7   | 59.2   | 57.8   | 53.3   | 51.9   |
| 87.5°  | 26.7   | 23.8   | 20.8   | 16.3   | 14.8   |
| 90°    | 1.5    | 18.5   | 30.9   | 38.7   | 41.7   |
| 92.5°  | 38.7   | 32.6   | 37.1   | 40.2   | 41.7   |
| 95°    | 100.5  | 49.4   | 60.3   | 68.2   | 66.5   |
| 97.5°  | 181.0  | 54.2   | 78.8   | 83.6   | 85.1   |
| 100°   | 274.0  | 61.9   | 88.2   | 100.5  | 103.6  |
| 102.5° | 376.0  | 373.0  | 91.3   | 108.2  | 113.0  |
| 105°   | 470.4  | 516.9  | 94.4   | 111.4  | 117.6  |
| 107.5° | 580.2  | 618.8  | 97.6   | 114.4  | 120.7  |
| 110°   | 685.6  | 717.9  | 270.9  | 116.1  | 122.2  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 784.6  | 812.3  | 786.1  | 119.0  | 123.9  |
| 115°   | 889.7  | 915.9  | 954.7  | 238.3  | 127.0  |
| 117.5° | 981.0  | 1011.9 | 1038.3 | 816.9  | 411.6  |
| 120°   | 1083.1 | 1106.3 | 1134.2 | 1152.8 | 943.8  |
| 122.5° | 1169.6 | 1194.5 | 1225.5 | 1234.7 | 1236.4 |
| 125°   | 1257.9 | 1278.1 | 1307.4 | 1318.3 | 1322.9 |
| 127.5° | 1338.3 | 1360.0 | 1383.4 | 1398.8 | 1400.3 |
| 130°   | 1414.2 | 1439.0 | 1455.9 | 1473.0 | 1471.5 |
| 132.5° | 1491.6 | 1511.8 | 1528.7 | 1542.7 | 1541.2 |
| 135°   | 1556.6 | 1581.4 | 1595.2 | 1610.8 | 1607.7 |
| 137.5° | 1624.6 | 1643.2 | 1658.8 | 1674.2 | 1669.6 |
| 140°   | 1691.1 | 1703.6 | 1720.5 | 1734.5 | 1726.7 |
| 142.5° | 1747.0 | 1757.8 | 1777.8 | 1790.2 | 1782.4 |
| 145°   | 1805.8 | 1804.1 | 1830.4 | 1841.2 | 1833.5 |
| 147.5° | 1856.7 | 1852.1 | 1878.3 | 1886.1 | 1880.0 |
| 150°   | 1906.3 | 1895.4 | 1920.2 | 1929.4 | 1921.7 |
| 152.5° | 1948.0 | 1935.6 | 1958.8 | 1968.2 | 1957.3 |
| 155°   | 1988.2 | 1974.5 | 1993.0 | 2002.2 | 1989.9 |
| 157.5° | 2020.7 | 2008.4 | 2022.4 | 2033.2 | 2020.7 |
| 160°   | 2048.7 | 2039.3 | 2048.7 | 2057.9 | 2047.0 |
| 162.5° | 2073.3 | 2064.1 | 2071.8 | 2082.6 | 2068.7 |
| 165°   | 2095.0 | 2085.8 | 2090.4 | 2101.2 | 2090.4 |
| 167.5° | 2112.0 | 2102.7 | 2107.4 | 2118.3 | 2104.3 |
| 170°   | 2126.0 | 2116.6 | 2119.8 | 2130.6 | 2116.6 |
| 172.5° | 2135.2 | 2126.0 | 2129.1 | 2140.0 | 2126.0 |
| 175°   | 2142.9 | 2132.1 | 2135.2 | 2146.0 | 2130.6 |
| 177.5° | 2146.0 | 2135.2 | 2136.8 | 2147.7 | 2133.7 |
| 180°   | 2138.3 | 2138.3 | 2138.3 | 2138.3 | 2138.3 |

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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 | 6.58             | 7.35  | 7.63  | 8.40  | 9.83  | 6.15           | 6.91  | 7.20  | 7.97  | 9.39  |
|                 | 3H   | 8.23             | 8.92  | 9.29  | 9.98  | 11.43 | 7.76           | 8.45  | 8.82  | 9.51  | 10.96 |
|                 | 4H   | 8.82             | 9.47  | 9.89  | 10.53 | 11.98 | 8.34           | 8.99  | 9.41  | 10.06 | 11.51 |
|                 | 6H   | 9.21             | 9.81  | 10.29 | 10.88 | 12.34 | 8.74           | 9.34  | 9.82  | 10.40 | 11.87 |
|                 | 8H   | 9.31             | 9.89  | 10.40 | 10.97 | 12.43 | 8.84           | 9.41  | 9.92  | 10.50 | 11.95 |
|                 | 12H  | 9.36             | 9.90  | 10.45 | 10.98 | 12.46 | 8.88           | 9.42  | 9.97  | 10.50 | 11.98 |
| 4H              | 2H   | 7.03             | 7.68  | 8.11  | 8.75  | 10.20 | 6.68           | 7.34  | 7.76  | 8.40  | 9.85  |
|                 | 3H   | 8.89             | 9.43  | 9.97  | 10.52 | 11.99 | 8.49           | 9.04  | 9.58  | 10.13 | 11.60 |
|                 | 4H   | 9.60             | 10.10 | 10.69 | 11.18 | 12.67 | 9.19           | 9.69  | 10.28 | 10.77 | 12.26 |
|                 | 6H   | 10.11            | 10.54 | 11.21 | 11.64 | 13.12 | 9.70           | 10.13 | 10.80 | 11.23 | 12.71 |
|                 | 8H   | 10.26            | 10.66 | 11.36 | 11.76 | 13.25 | 9.85           | 10.25 | 10.94 | 11.34 | 12.84 |
|                 | 12H  | 10.33            | 10.69 | 11.44 | 11.80 | 13.30 | 9.90           | 10.27 | 11.02 | 11.38 | 12.88 |
| 8H              | 4H   | 9.79             | 10.19 | 10.89 | 11.29 | 12.78 | 9.43           | 9.83  | 10.53 | 10.93 | 12.42 |
|                 | 6H   | 10.42            | 10.75 | 11.54 | 11.89 | 13.38 | 10.05          | 10.38 | 11.18 | 11.52 | 13.02 |
|                 | 8H   | 10.64            | 10.93 | 11.77 | 12.05 | 13.56 | 10.27          | 10.56 | 11.40 | 11.68 | 13.19 |
|                 | 12H  | 10.77            | 11.02 | 11.90 | 12.14 | 13.69 | 10.38          | 10.64 | 11.51 | 11.75 | 13.30 |
| 12H             | 4H   | 9.77             | 10.13 | 10.89 | 11.24 | 12.74 | 9.42           | 9.78  | 10.53 | 10.89 | 12.39 |
|                 | 6H   | 10.45            | 10.74 | 11.57 | 11.86 | 13.37 | 10.09          | 10.38 | 11.22 | 11.51 | 13.02 |
|                 | 8H   | 10.68            | 10.94 | 11.82 | 12.06 | 13.61 | 10.33          | 10.58 | 11.46 | 11.70 | 13.25 |

END OF REPORT