

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: P921413

Luminaire Tested: DFN2DIP-4P4F0-040D070US940-RLONL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P921413  
REPORT IS A COMBINATION OF REPORTS P900650 AND P897523  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-4P4F0-040D070US940-RLLONL  
Description: 4 foot, 90deg - 4way Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

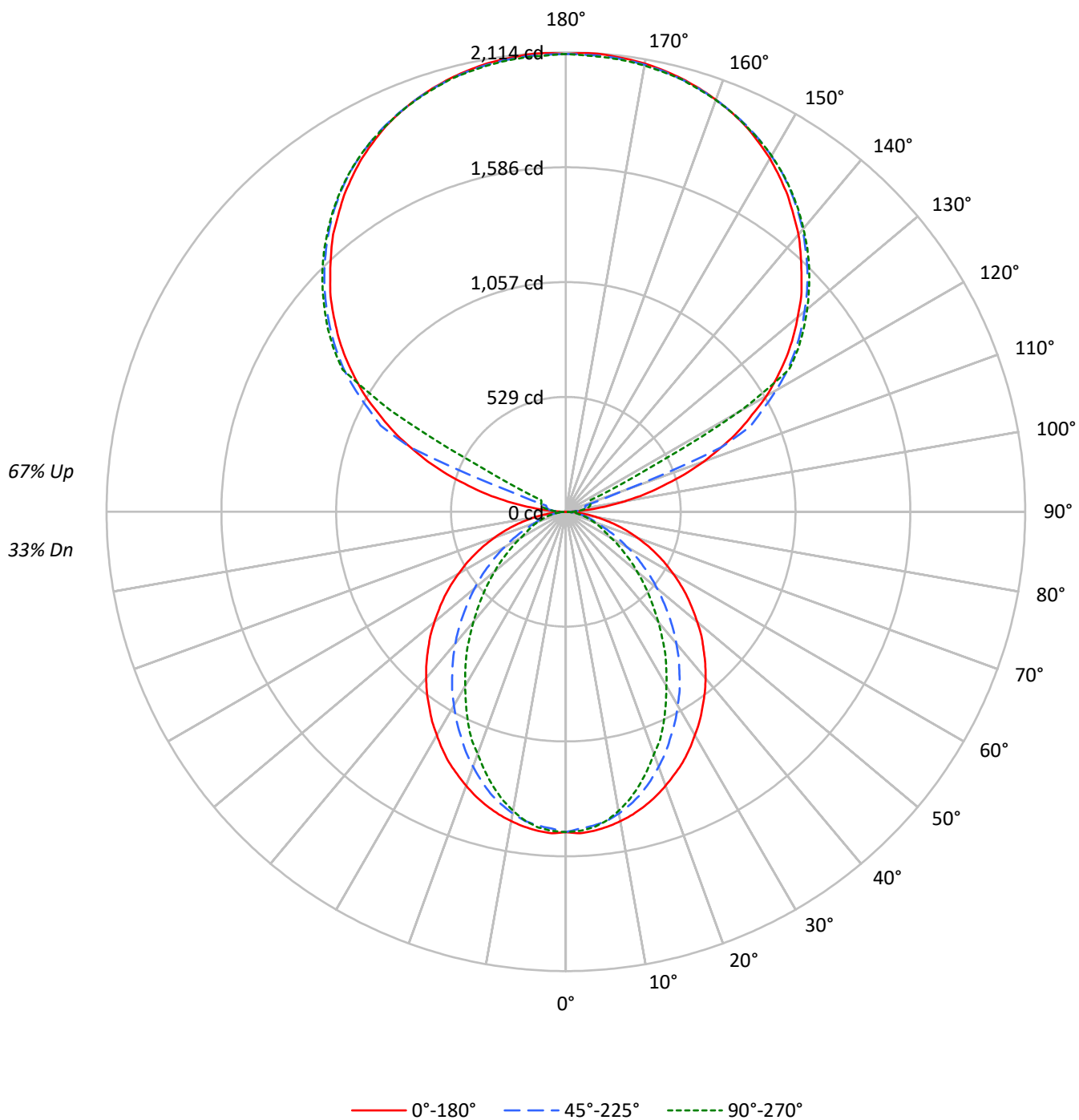
Lumens per Lamp: N/A  
Luminaire Lumens: 9211.4 lumens  
Efficiency: N/A  
Efficacy: 92.2 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 0.99 / 1.16  
Luminous Opening: Rectangular w/ Sides (W: 4.07' x L: 4.07' x H: 0.1')  
CIE Type: Semi-Indirect

Input Watts (W): 99.9  
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: P921413

CATALOG NUMBER: DFN2DIP-4P4F0-040D070US940-RLLONL

### Luminous Intensity Polar Plot



TEST NUMBER: P921413

CATALOG NUMBER: DFN2DIP-4P4F0-040D070US940-RLLONL

**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 | 56 | 56 | 56 | 40 | 40 | 40 |
| 1   | 94  | 90  | 87  | 83  | 85 | 81 | 78 | 76 | 65 | 63 | 61 | 50 | 49 | 48 | 36 | 35 | 35 |
| 2   | 86  | 79  | 73  | 68  | 77 | 72 | 67 | 62 | 57 | 54 | 51 | 44 | 42 | 40 | 32 | 31 | 30 |
| 3   | 79  | 70  | 63  | 57  | 71 | 63 | 57 | 53 | 51 | 47 | 43 | 39 | 37 | 34 | 29 | 27 | 26 |
| 4   | 72  | 62  | 54  | 49  | 65 | 56 | 50 | 45 | 45 | 41 | 37 | 35 | 32 | 30 | 26 | 24 | 22 |
| 5   | 66  | 55  | 47  | 42  | 59 | 50 | 43 | 38 | 41 | 36 | 32 | 32 | 28 | 26 | 24 | 21 | 20 |
| 6   | 61  | 49  | 42  | 36  | 55 | 45 | 38 | 33 | 37 | 32 | 28 | 29 | 25 | 23 | 21 | 19 | 17 |
| 7   | 56  | 45  | 37  | 32  | 51 | 41 | 34 | 29 | 33 | 28 | 25 | 26 | 23 | 20 | 20 | 17 | 16 |
| 8   | 52  | 41  | 33  | 28  | 47 | 37 | 31 | 26 | 30 | 25 | 22 | 24 | 21 | 18 | 18 | 16 | 14 |
| 9   | 49  | 37  | 30  | 25  | 44 | 34 | 27 | 23 | 28 | 23 | 20 | 22 | 19 | 16 | 17 | 14 | 13 |
| 10  | 45  | 34  | 27  | 22  | 41 | 31 | 25 | 21 | 26 | 21 | 18 | 20 | 17 | 15 | 16 | 13 | 12 |

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

|     | 0°  | 45° | 90° |
|-----|-----|-----|-----|
| 0°  | 956 | 956 | 956 |
| 5°  | 958 | 941 | 948 |
| 10° | 949 | 923 | 917 |
| 15° | 936 | 893 | 870 |
| 20° | 918 | 851 | 812 |
| 25° | 901 | 804 | 755 |
| 30° | 877 | 756 | 684 |
| 35° | 854 | 705 | 621 |
| 40° | 830 | 651 | 549 |
| 45° | 803 | 591 | 484 |
| 50° | 774 | 531 | 420 |
| 55° | 745 | 467 | 359 |
| 60° | 711 | 400 | 296 |
| 65° | 671 | 332 | 266 |
| 70° | 624 | 268 | 242 |
| 75° | 563 | 237 | 221 |
| 80° | 476 | 199 | 193 |
| 85° | 333 | 135 | 147 |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 90°

Vertical Angle: 90°

Luminance: 1086 cd/sqm

TEST NUMBER: P921413

CATALOG NUMBER: DFN2DIP-4P4F0-040D070US940-RLLONL

**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 138.2  | 1.5       |
| 10°-20°   | 379.3  | 4.1       |
| 20°-30°   | 532.5  | 5.8       |
| 30°-40°   | 580.5  | 6.3       |
| 40°-50°   | 533.5  | 5.8       |
| 50°-60°   | 419.0  | 4.5       |
| 60°-70°   | 272.7  | 3.0       |
| 70°-80°   | 140.4  | 1.5       |
| 80°-90°   | 39.5   | 0.4       |
| 90°-100°  | 69.5   | 0.8       |
| 100°-110° | 259.0  | 2.8       |
| 110°-120° | 686.8  | 7.5       |
| 120°-130° | 1139.1 | 12.4      |
| 130°-140° | 1209.9 | 13.1      |
| 140°-150° | 1124.5 | 12.2      |
| 150°-160° | 904.1  | 9.8       |
| 160°-170° | 582.6  | 6.3       |
| 170°-180° | 200.5  | 2.2       |
| 0°-30°    | 1049.9 | 11.4      |
| 0°-40°    | 1630.4 | 17.7      |
| 0°-60°    | 2582.9 | 28.0      |
| 0°-90°    | 3035.5 | 33.0      |
| 90°-120°  | 1015.2 | 11.0      |
| 90°-150°  | 4488.7 | 48.7      |
| 90°-180°  | 6176.0 | 67.0      |
| 0°-180°   | 9211.4 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 1474 | 1474  | 1474 | 1474  | 1474 |      |
| 5°   | 1474 | 1468  | 1450 | 1462  | 1458 | 140  |
| 15°  | 1402 | 1387  | 1342 | 1317  | 1304 | 395  |
| 25°  | 1273 | 1230  | 1142 | 1087  | 1067 | 585  |
| 35°  | 1097 | 1029  | 911  | 827   | 798  | 686  |
| 45°  | 896  | 807   | 667  | 572   | 540  | 692  |
| 55°  | 682  | 578   | 434  | 354   | 328  | 609  |
| 65°  | 460  | 352   | 232  | 187   | 183  | 456  |
| 75°  | 245  | 152   | 107  | 97    | 96   | 260  |
| 85°  | 57   | 29    | 25   | 25    | 25   | 66   |
| 90°  | 1    | 18    | 30   | 38    | 41   | 9    |
| 95°  | 99   | 49    | 59   | 67    | 66   | 117  |
| 105° | 463  | 509   | 93   | 110   | 116  | 495  |
| 115° | 876  | 902   | 940  | 235   | 125  | 863  |
| 125° | 1239 | 1259  | 1288 | 1299  | 1303 | 1105 |
| 135° | 1534 | 1558  | 1572 | 1587  | 1584 | 1185 |
| 145° | 1779 | 1777  | 1803 | 1814  | 1806 | 1113 |
| 155° | 1959 | 1945  | 1963 | 1972  | 1960 | 903  |
| 165° | 2064 | 2055  | 2059 | 2070  | 2059 | 583  |
| 175° | 2111 | 2100  | 2104 | 2114  | 2099 | 201  |
| 180° | 2107 | 2107  | 2107 | 2107  | 2107 |      |

TEST NUMBER: P921413

CATALOG NUMBER: DFN2DIP-4P4F0-040D070US940-RLLONL

**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 1474.2 | 1474.2 | 1474.2 | 1474.2 | 1474.2 |
| 2.5°   | 1480.9 | 1474.2 | 1459.5 | 1472.9 | 1470.2 |
| 5°     | 1474.2 | 1467.5 | 1450.1 | 1462.1 | 1458.2 |
| 7.5°   | 1462.1 | 1454.2 | 1435.6 | 1440.7 | 1434.1 |
| 10°    | 1446.2 | 1436.8 | 1410.2 | 1406.0 | 1398.2 |
| 12.5°  | 1426.2 | 1414.2 | 1378.0 | 1370.1 | 1355.4 |
| 15°    | 1402.1 | 1387.4 | 1342.1 | 1316.8 | 1303.5 |
| 17.5°  | 1374.1 | 1352.7 | 1296.6 | 1267.4 | 1246.0 |
| 20°    | 1342.1 | 1315.4 | 1248.7 | 1215.4 | 1186.0 |
| 22.5°  | 1307.4 | 1276.8 | 1199.3 | 1154.0 | 1134.1 |
| 25°    | 1272.7 | 1230.0 | 1141.9 | 1087.4 | 1067.2 |
| 27.5°  | 1231.5 | 1186.0 | 1088.6 | 1025.9 | 995.1  |
| 30°    | 1187.4 | 1136.6 | 1029.8 | 961.9  | 925.9  |
| 32.5°  | 1144.7 | 1083.2 | 973.9  | 893.9  | 860.4  |
| 35°    | 1096.7 | 1028.6 | 911.2  | 827.2  | 797.7  |
| 37.5°  | 1050.0 | 976.5  | 852.5  | 760.4  | 727.1  |
| 40°    | 1000.6 | 920.6  | 791.1  | 696.4  | 661.7  |
| 42.5°  | 949.8  | 864.5  | 729.8  | 631.0  | 597.7  |
| 45°    | 896.5  | 807.1  | 667.1  | 572.3  | 540.3  |
| 47.5°  | 845.9  | 751.2  | 607.1  | 512.3  | 483.0  |
| 50°    | 789.8  | 695.1  | 548.3  | 456.2  | 428.3  |
| 52.5°  | 735.0  | 635.0  | 492.3  | 404.2  | 378.9  |
| 55°    | 681.7  | 577.6  | 433.5  | 353.6  | 328.2  |
| 57.5°  | 627.1  | 520.3  | 381.6  | 306.8  | 285.5  |
| 60°    | 571.0  | 464.2  | 326.8  | 258.9  | 237.6  |
| 62.5°  | 516.4  | 409.7  | 280.1  | 216.2  | 205.5  |
| 65°    | 460.3  | 352.1  | 232.1  | 186.8  | 182.7  |
| 67.5°  | 407.0  | 298.8  | 186.8  | 164.1  | 160.1  |
| 70°    | 350.9  | 246.8  | 154.7  | 141.4  | 136.0  |
| 72.5°  | 297.6  | 198.8  | 129.4  | 118.8  | 116.1  |
| 75°    | 245.4  | 152.0  | 106.7  | 97.4   | 96.1   |
| 77.5°  | 193.5  | 108.0  | 84.1   | 78.7   | 76.0   |
| 80°    | 145.3  | 77.4   | 63.9   | 58.8   | 58.8   |
| 82.5°  | 101.4  | 52.1   | 44.1   | 41.3   | 41.3   |
| 85°    | 57.3   | 29.3   | 25.3   | 25.3   | 25.3   |
| 87.5°  | 21.4   | 10.6   | 10.6   | 9.4    | 9.4    |
| 90°    | 1.4    | 18.3   | 30.4   | 38.2   | 41.1   |
| 92.5°  | 38.2   | 32.0   | 36.6   | 39.7   | 41.1   |
| 95°    | 99.0   | 48.7   | 59.4   | 67.1   | 65.5   |
| 97.5°  | 178.3  | 53.4   | 77.7   | 82.4   | 83.8   |
| 100°   | 269.9  | 61.0   | 86.9   | 99.0   | 102.1  |
| 102.5° | 370.3  | 367.5  | 90.0   | 106.6  | 111.3  |
| 105°   | 463.4  | 509.2  | 93.0   | 109.7  | 115.8  |
| 107.5° | 571.6  | 609.7  | 96.1   | 112.8  | 119.0  |
| 110°   | 675.4  | 707.2  | 266.8  | 114.4  | 120.4  |

TEST NUMBER: P921413

CATALOG NUMBER: DFN2DIP-4P4F0-040D070US940-RLLONL

**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 772.9  | 800.2  | 774.4  | 117.3  | 122.0  |
| 115°   | 876.5  | 902.3  | 940.5  | 234.8  | 125.1  |
| 117.5° | 966.4  | 996.8  | 1022.9 | 804.8  | 405.5  |
| 120°   | 1067.0 | 1089.8 | 1117.4 | 1135.7 | 929.9  |
| 122.5° | 1152.3 | 1176.7 | 1207.4 | 1216.4 | 1218.0 |
| 125°   | 1239.2 | 1259.1 | 1288.1 | 1298.8 | 1303.2 |
| 127.5° | 1318.5 | 1339.8 | 1362.8 | 1378.0 | 1379.5 |
| 130°   | 1393.2 | 1417.6 | 1434.3 | 1451.2 | 1449.7 |
| 132.5° | 1469.4 | 1489.3 | 1506.0 | 1519.7 | 1518.3 |
| 135°   | 1533.5 | 1557.9 | 1571.6 | 1586.9 | 1583.9 |
| 137.5° | 1600.4 | 1618.8 | 1634.1 | 1649.4 | 1644.8 |
| 140°   | 1666.0 | 1678.3 | 1695.0 | 1708.7 | 1701.1 |
| 142.5° | 1721.0 | 1731.7 | 1751.4 | 1763.5 | 1756.0 |
| 145°   | 1779.0 | 1777.4 | 1803.2 | 1813.9 | 1806.3 |
| 147.5° | 1829.1 | 1824.6 | 1850.5 | 1858.1 | 1852.1 |
| 150°   | 1877.9 | 1867.3 | 1891.8 | 1900.8 | 1893.2 |
| 152.5° | 1919.0 | 1906.9 | 1929.8 | 1938.9 | 1928.3 |
| 155°   | 1958.7 | 1945.1 | 1963.4 | 1972.5 | 1960.3 |
| 157.5° | 1990.7 | 1978.6 | 1992.3 | 2003.0 | 1990.7 |
| 160°   | 2018.3 | 2009.0 | 2018.3 | 2027.3 | 2016.6 |
| 162.5° | 2042.6 | 2033.5 | 2041.0 | 2051.7 | 2038.0 |
| 165°   | 2063.9 | 2054.9 | 2059.3 | 2070.0 | 2059.3 |
| 167.5° | 2080.7 | 2071.4 | 2076.2 | 2086.9 | 2073.1 |
| 170°   | 2094.4 | 2085.3 | 2088.3 | 2099.0 | 2085.3 |
| 172.5° | 2103.5 | 2094.4 | 2097.6 | 2108.2 | 2094.4 |
| 175°   | 2111.1 | 2100.4 | 2103.5 | 2114.2 | 2099.0 |
| 177.5° | 2114.2 | 2103.5 | 2105.1 | 2115.9 | 2102.0 |
| 180°   | 2106.6 | 2106.6 | 2106.6 | 2106.6 | 2106.6 |

TEST NUMBER: P921413

CATALOG NUMBER: DFN2DIP-4P4F0-040D070US940-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 | 5.17             | 5.88 | 6.27 | 6.97 | 8.47  | 1.13           | 1.84 | 2.23 | 2.93 | 4.43 |
|                 | 3H   | 6.84             | 7.48 | 7.95 | 8.58 | 10.09 | 2.31           | 2.94 | 3.42 | 4.04 | 5.56 |
|                 | 4H   | 7.45             | 8.05 | 8.57 | 9.15 | 10.67 | 2.76           | 3.36 | 3.87 | 4.46 | 5.98 |
|                 | 6H   | 7.87             | 8.42 | 8.99 | 9.53 | 11.06 | 3.07           | 3.63 | 4.20 | 4.73 | 6.26 |
|                 | 8H   | 8.00             | 8.52 | 9.12 | 9.64 | 11.16 | 3.16           | 3.69 | 4.29 | 4.80 | 6.33 |
|                 | 12H  | 8.06             | 8.55 | 9.19 | 9.67 | 11.21 | 3.20           | 3.70 | 4.33 | 4.81 | 6.36 |
| 4H              | 2H   | 5.17             | 5.77 | 6.30 | 6.87 | 8.39  | 1.71           | 2.31 | 2.84 | 3.41 | 4.93 |
|                 | 3H   | 7.00             | 7.50 | 8.13 | 8.62 | 10.16 | 3.05           | 3.55 | 4.18 | 4.68 | 6.21 |
|                 | 4H   | 7.69             | 8.15 | 8.82 | 9.26 | 10.82 | 3.60           | 4.06 | 4.73 | 5.17 | 6.73 |
|                 | 6H   | 8.20             | 8.60 | 9.34 | 9.73 | 11.28 | 4.01           | 4.41 | 5.15 | 5.55 | 7.09 |
|                 | 8H   | 8.38             | 8.75 | 9.52 | 9.88 | 11.44 | 4.14           | 4.51 | 5.28 | 5.64 | 7.20 |
|                 | 12H  | 8.47             | 8.80 | 9.63 | 9.95 | 11.51 | 4.20           | 4.53 | 5.36 | 5.68 | 7.24 |
| 8H              | 4H   | 7.65             | 8.01 | 8.79 | 9.14 | 10.71 | 3.87           | 4.24 | 5.01 | 5.37 | 6.93 |
|                 | 6H   | 8.22             | 8.52 | 9.37 | 9.69 | 11.25 | 4.39           | 4.69 | 5.55 | 5.87 | 7.42 |
|                 | 8H   | 8.44             | 8.70 | 9.60 | 9.85 | 11.43 | 4.58           | 4.85 | 5.75 | 6.00 | 7.58 |
|                 | 12H  | 8.57             | 8.81 | 9.74 | 9.95 | 11.57 | 4.70           | 4.93 | 5.87 | 6.08 | 7.69 |
| 12H             | 4H   | 7.59             | 7.93 | 8.75 | 9.07 | 10.63 | 3.87           | 4.21 | 5.03 | 5.35 | 6.91 |
|                 | 6H   | 8.19             | 8.45 | 9.35 | 9.61 | 11.18 | 4.44           | 4.71 | 5.61 | 5.86 | 7.44 |
|                 | 8H   | 8.41             | 8.64 | 9.58 | 9.79 | 11.40 | 4.65           | 4.88 | 5.82 | 6.03 | 7.64 |

END OF REPORT