

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: P915511

Luminaire Tested: DFN2DIP-TR4F0-050D090US927-FLLONL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P915511  
REPORT IS A COMBINATION OF REPORTS P901981 AND P898849  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-TR4F0-050D090US927-FLLONL  
Description: 4 foot, Triangle Define Geo, with Direct Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

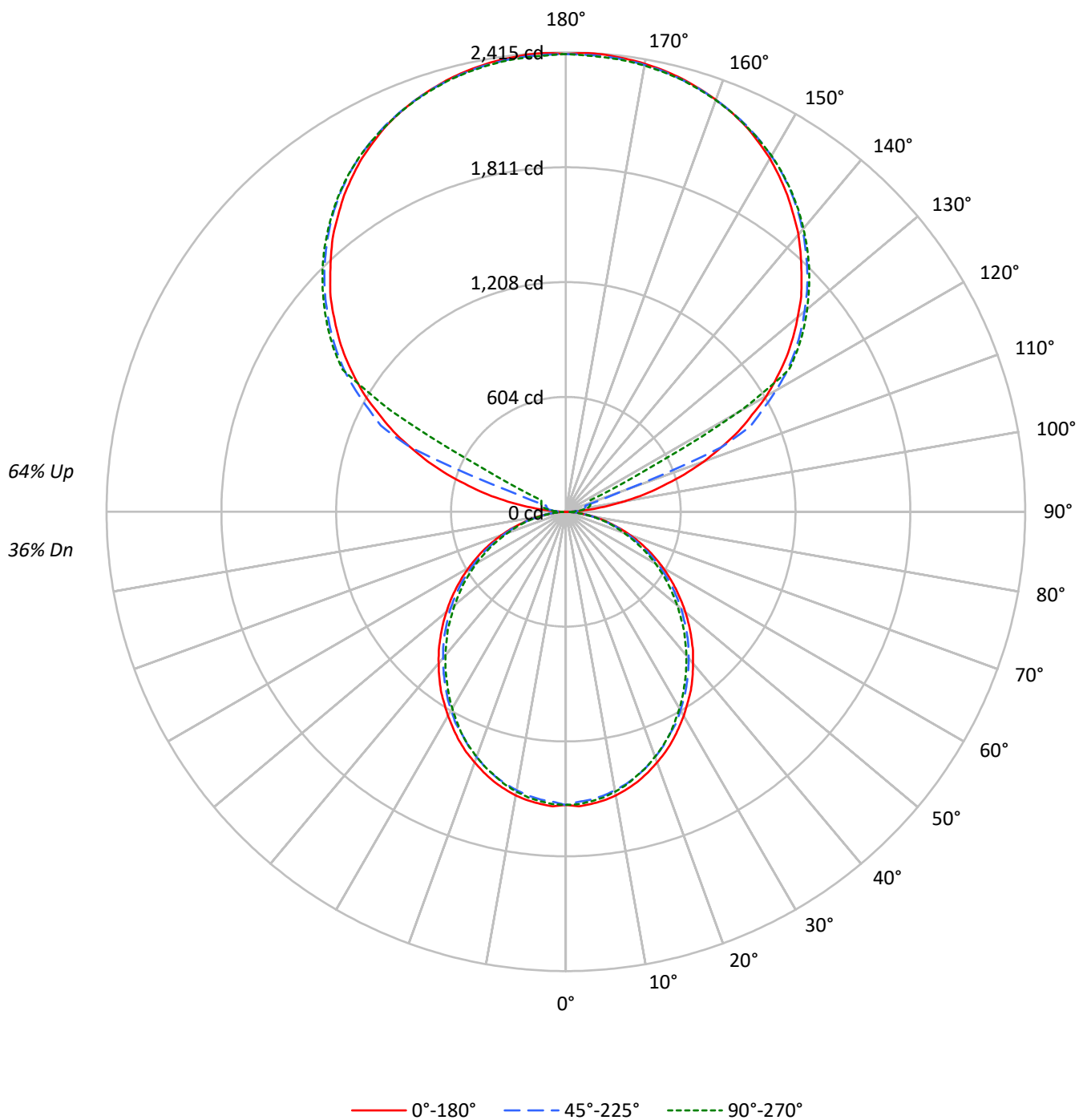
Lumens per Lamp: N/A  
Luminaire Lumens: 10979.6 lumens  
Efficiency: N/A  
Efficacy: 100.2 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 3.43' x L: 3.96' x H: 0.1')  
CIE Type: Semi-Indirect

Input Watts (W): 109.6  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.996  
Total Harmonic Distortion (THDi): 0.064  
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 | 94 | 94 | 94 | 94 | 75 | 75 | 75 | 59 | 59 | 59 | 43 | 43 | 43 |
| 1   | 95  | 90  | 87  | 83  | 85 | 82 | 79 | 76 | 66 | 64 | 62 | 51 | 50 | 49 | 38 | 37 | 36 |
| 2   | 86  | 79  | 73  | 68  | 78 | 72 | 66 | 62 | 58 | 54 | 51 | 45 | 43 | 41 | 33 | 32 | 31 |
| 3   | 79  | 69  | 62  | 56  | 71 | 63 | 57 | 52 | 51 | 47 | 43 | 40 | 37 | 34 | 30 | 28 | 26 |
| 4   | 72  | 61  | 54  | 48  | 65 | 56 | 49 | 44 | 45 | 40 | 37 | 36 | 32 | 29 | 26 | 24 | 22 |
| 5   | 66  | 54  | 47  | 41  | 59 | 50 | 43 | 38 | 40 | 35 | 31 | 32 | 28 | 25 | 24 | 21 | 19 |
| 6   | 61  | 49  | 41  | 35  | 55 | 44 | 38 | 33 | 36 | 31 | 27 | 29 | 25 | 22 | 22 | 19 | 17 |
| 7   | 56  | 44  | 36  | 31  | 50 | 40 | 33 | 28 | 33 | 28 | 24 | 26 | 22 | 20 | 20 | 17 | 15 |
| 8   | 52  | 40  | 32  | 27  | 47 | 36 | 30 | 25 | 30 | 25 | 21 | 24 | 20 | 17 | 18 | 16 | 14 |
| 9   | 48  | 36  | 29  | 24  | 44 | 33 | 27 | 22 | 27 | 22 | 19 | 22 | 18 | 16 | 17 | 14 | 12 |
| 10  | 45  | 33  | 26  | 21  | 41 | 30 | 24 | 20 | 25 | 20 | 17 | 20 | 17 | 14 | 15 | 13 | 11 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 1224 | 1224 | 1224 |
| 5°  | 1226 | 1207 | 1215 |
| 10° | 1216 | 1191 | 1199 |
| 15° | 1199 | 1171 | 1173 |
| 20° | 1174 | 1144 | 1147 |
| 25° | 1150 | 1112 | 1116 |
| 30° | 1120 | 1081 | 1078 |
| 35° | 1092 | 1045 | 1037 |
| 40° | 1057 | 1009 | 998  |
| 45° | 1021 | 973  | 958  |
| 50° | 983  | 935  | 912  |
| 55° | 943  | 891  | 869  |
| 60° | 898  | 839  | 820  |
| 65° | 848  | 785  | 763  |
| 70° | 785  | 719  | 701  |
| 75° | 698  | 640  | 644  |
| 80° | 593  | 540  | 535  |
| 85° | 429  | 366  | 355  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 90°

Vertical Angle: 90°

Luminance: 1276 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 145.1   | 1.3       |
| 10°-20°   | 408.1   | 3.7       |
| 20°-30°   | 599.8   | 5.5       |
| 30°-40°   | 696.6   | 6.3       |
| 40°-50°   | 695.8   | 6.3       |
| 50°-60°   | 606.7   | 5.5       |
| 60°-70°   | 448.5   | 4.1       |
| 70°-80°   | 253.7   | 2.3       |
| 80°-90°   | 71.2    | 0.6       |
| 90°-100°  | 79.3    | 0.7       |
| 100°-110° | 295.8   | 2.7       |
| 110°-120° | 784.4   | 7.1       |
| 120°-130° | 1301.0  | 11.8      |
| 130°-140° | 1382.0  | 12.6      |
| 140°-150° | 1284.4  | 11.7      |
| 150°-160° | 1032.6  | 9.4       |
| 160°-170° | 665.4   | 6.1       |
| 170°-180° | 229.0   | 2.1       |
| 0°-30°    | 1153.0  | 10.5      |
| 0°-40°    | 1849.6  | 16.8      |
| 0°-60°    | 3152.1  | 28.7      |
| 0°-90°    | 3925.5  | 35.8      |
| 90°-120°  | 1159.5  | 10.6      |
| 90°-150°  | 5127.0  | 46.7      |
| 90°-180°  | 7054.0  | 64.2      |
| 0°-180°   | 10979.6 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 1541 | 1541  | 1541 | 1541  | 1541 |      |
| 5°   | 1541 | 1535  | 1519 | 1531  | 1528 | 146  |
| 15°  | 1467 | 1458  | 1439 | 1445  | 1438 | 413  |
| 25°  | 1328 | 1316  | 1291 | 1294  | 1291 | 611  |
| 35°  | 1146 | 1131  | 1107 | 1098  | 1091 | 715  |
| 45°  | 932  | 922   | 900  | 883   | 877  | 719  |
| 55°  | 706  | 697   | 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    | 21    | 35   | 44    | 47   | 10   |
| 95°  | 113  | 56    | 68   | 77    | 75   | 134  |
| 105° | 529  | 582   | 106  | 125   | 132  | 566  |
| 115° | 1001 | 1031  | 1074 | 268   | 143  | 986  |
| 125° | 1415 | 1438  | 1471 | 1483  | 1489 | 1262 |
| 135° | 1752 | 1780  | 1795 | 1813  | 1809 | 1353 |
| 145° | 2032 | 2030  | 2060 | 2072  | 2063 | 1271 |
| 155° | 2237 | 2222  | 2243 | 2253  | 2239 | 1031 |
| 165° | 2357 | 2347  | 2352 | 2364  | 2352 | 666  |
| 175° | 2411 | 2399  | 2403 | 2415  | 2398 | 229  |
| 180° | 2406 | 2406  | 2406 | 2406  | 2406 |      |

TEST NUMBER: P915511

CATALOG NUMBER: DFN2DIP-TR4F0-050D090US927-FLLONL

**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 1541.2 | 1541.2 | 1541.2 | 1541.2 | 1541.2 |
| 2.5°   | 1550.1 | 1542.8 | 1526.5 | 1541.2 | 1538.4 |
| 5°     | 1541.2 | 1535.4 | 1519.0 | 1530.8 | 1528.0 |
| 7.5°   | 1530.8 | 1522.0 | 1505.7 | 1517.7 | 1514.7 |
| 10°    | 1514.7 | 1504.3 | 1486.5 | 1498.3 | 1493.9 |
| 12.5°  | 1492.3 | 1483.5 | 1465.8 | 1473.1 | 1470.1 |
| 15°    | 1467.1 | 1458.3 | 1439.0 | 1445.0 | 1437.6 |
| 17.5°  | 1436.0 | 1427.2 | 1407.9 | 1415.2 | 1407.9 |
| 20°    | 1401.9 | 1393.1 | 1372.4 | 1376.7 | 1370.9 |
| 22.5°  | 1367.9 | 1354.6 | 1335.2 | 1335.2 | 1332.2 |
| 25°    | 1327.9 | 1316.1 | 1290.9 | 1293.7 | 1290.9 |
| 27.5°  | 1283.3 | 1273.0 | 1253.8 | 1249.3 | 1242.0 |
| 30°    | 1239.0 | 1227.1 | 1204.9 | 1200.5 | 1194.5 |
| 32.5°  | 1191.5 | 1182.7 | 1159.0 | 1150.0 | 1144.1 |
| 35°    | 1145.6 | 1130.8 | 1107.1 | 1098.1 | 1090.8 |
| 37.5°  | 1093.7 | 1080.4 | 1056.6 | 1046.2 | 1038.9 |
| 40°    | 1040.5 | 1028.5 | 1004.7 | 991.5  | 985.6  |
| 42.5°  | 988.6  | 976.6  | 953.0  | 938.0  | 929.2  |
| 45°    | 932.2  | 921.9  | 899.5  | 883.4  | 877.3  |
| 47.5°  | 877.3  | 867.0  | 843.3  | 826.9  | 818.1  |
| 50°    | 819.5  | 812.1  | 791.4  | 770.6  | 763.2  |
| 52.5°  | 763.2  | 752.8  | 733.6  | 717.3  | 706.9  |
| 55°    | 705.5  | 696.6  | 678.7  | 661.0  | 653.6  |
| 57.5°  | 647.6  | 640.2  | 620.9  | 603.2  | 597.1  |
| 60°    | 589.8  | 584.0  | 563.2  | 546.8  | 542.5  |
| 62.5°  | 533.5  | 523.2  | 508.3  | 493.5  | 487.6  |
| 65°    | 475.8  | 466.8  | 452.0  | 438.7  | 431.3  |
| 67.5°  | 416.5  | 409.0  | 395.8  | 385.4  | 379.4  |
| 70°    | 361.6  | 355.7  | 342.3  | 331.9  | 326.1  |
| 72.5°  | 305.4  | 299.4  | 292.0  | 281.6  | 277.2  |
| 75°    | 248.9  | 246.1  | 238.5  | 229.7  | 232.7  |
| 77.5°  | 198.6  | 192.6  | 189.6  | 185.2  | 180.9  |
| 80°    | 148.3  | 146.7  | 143.7  | 139.3  | 136.3  |
| 82.5°  | 100.8  | 100.8  | 99.3   | 93.4   | 93.4   |
| 85°    | 60.7   | 59.3   | 57.8   | 53.3   | 51.9   |
| 87.5°  | 26.7   | 23.8   | 20.8   | 16.3   | 14.8   |
| 90°    | 1.7    | 20.9   | 34.7   | 43.6   | 46.9   |
| 92.5°  | 43.6   | 36.6   | 41.7   | 45.3   | 46.9   |
| 95°    | 113.1  | 55.6   | 67.8   | 76.7   | 74.9   |
| 97.5°  | 203.7  | 61.0   | 88.7   | 94.0   | 95.7   |
| 100°   | 308.2  | 69.7   | 99.3   | 113.1  | 116.6  |
| 102.5° | 423.0  | 419.7  | 102.7  | 121.8  | 127.1  |
| 105°   | 529.3  | 581.6  | 106.2  | 125.3  | 132.3  |
| 107.5° | 652.9  | 696.3  | 109.8  | 128.8  | 135.9  |
| 110°   | 771.3  | 807.8  | 304.8  | 130.6  | 137.5  |

TEST NUMBER: P915511

CATALOG NUMBER: DFN2DIP-TR4F0-050D090US927-FLLONL

**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 882.8  | 914.0  | 884.5  | 134.0  | 139.3  |
| 115°   | 1001.1 | 1030.6 | 1074.3 | 268.2  | 142.8  |
| 117.5° | 1103.8 | 1138.6 | 1168.3 | 919.2  | 463.1  |
| 120°   | 1218.8 | 1244.8 | 1276.3 | 1297.1 | 1062.1 |
| 122.5° | 1316.2 | 1344.1 | 1379.0 | 1389.3 | 1391.2 |
| 125°   | 1415.4 | 1438.1 | 1471.2 | 1483.4 | 1488.6 |
| 127.5° | 1505.9 | 1530.3 | 1556.6 | 1574.0 | 1575.6 |
| 130°   | 1591.3 | 1619.3 | 1638.3 | 1657.5 | 1655.9 |
| 132.5° | 1678.4 | 1701.1 | 1720.1 | 1735.9 | 1734.2 |
| 135°   | 1751.6 | 1779.5 | 1795.0 | 1812.6 | 1809.1 |
| 137.5° | 1828.1 | 1849.0 | 1866.5 | 1883.9 | 1878.7 |
| 140°   | 1902.9 | 1917.0 | 1936.0 | 1951.7 | 1943.1 |
| 142.5° | 1965.8 | 1978.0 | 2000.5 | 2014.4 | 2005.7 |
| 145°   | 2031.9 | 2030.0 | 2059.7 | 2071.9 | 2063.2 |
| 147.5° | 2089.2 | 2084.1 | 2113.6 | 2122.3 | 2115.4 |
| 150°   | 2145.1 | 2132.9 | 2160.8 | 2171.1 | 2162.4 |
| 152.5° | 2192.0 | 2178.1 | 2204.2 | 2214.7 | 2202.5 |
| 155°   | 2237.3 | 2221.8 | 2242.6 | 2253.0 | 2239.1 |
| 157.5° | 2273.9 | 2260.0 | 2275.7 | 2287.9 | 2273.9 |
| 160°   | 2305.2 | 2294.7 | 2305.2 | 2315.6 | 2303.4 |
| 162.5° | 2333.0 | 2322.6 | 2331.3 | 2343.5 | 2327.8 |
| 165°   | 2357.4 | 2347.0 | 2352.2 | 2364.4 | 2352.2 |
| 167.5° | 2376.6 | 2366.1 | 2371.4 | 2383.6 | 2367.9 |
| 170°   | 2392.3 | 2381.8 | 2385.3 | 2397.5 | 2381.8 |
| 172.5° | 2402.7 | 2392.3 | 2395.8 | 2408.0 | 2392.3 |
| 175°   | 2411.3 | 2399.1 | 2402.7 | 2414.8 | 2397.5 |
| 177.5° | 2414.8 | 2402.7 | 2404.5 | 2416.7 | 2401.0 |
| 180°   | 2406.2 | 2406.2 | 2406.2 | 2406.2 | 2406.2 |

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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 | 6.49             | 7.23  | 7.56  | 8.30  | 9.77  | 6.06           | 6.80  | 7.13  | 7.87  | 9.34  |
|                 | 3H   | 8.14             | 8.81  | 9.22  | 9.89  | 11.37 | 7.67           | 8.33  | 8.75  | 9.42  | 10.89 |
|                 | 4H   | 8.72             | 9.35  | 9.81  | 10.44 | 11.92 | 8.25           | 8.88  | 9.34  | 9.96  | 11.45 |
|                 | 6H   | 9.11             | 9.70  | 10.21 | 10.78 | 12.28 | 8.64           | 9.22  | 9.74  | 10.31 | 11.81 |
|                 | 8H   | 9.22             | 9.77  | 10.32 | 10.87 | 12.36 | 8.74           | 9.30  | 9.84  | 10.40 | 11.89 |
|                 | 12H  | 9.26             | 9.79  | 10.37 | 10.88 | 12.40 | 8.78           | 9.31  | 9.89  | 10.40 | 11.92 |
| 4H              | 2H   | 6.93             | 7.57  | 8.03  | 8.65  | 10.14 | 6.59           | 7.22  | 7.69  | 8.31  | 9.79  |
|                 | 3H   | 8.79             | 9.32  | 9.89  | 10.43 | 11.93 | 8.40           | 8.93  | 9.50  | 10.04 | 11.53 |
|                 | 4H   | 9.50             | 9.99  | 10.61 | 11.08 | 12.60 | 9.09           | 9.58  | 10.20 | 10.68 | 12.20 |
|                 | 6H   | 10.01            | 10.42 | 11.12 | 11.55 | 13.06 | 9.60           | 10.02 | 10.72 | 11.14 | 12.65 |
|                 | 8H   | 10.15            | 10.54 | 11.27 | 11.66 | 13.19 | 9.74           | 10.13 | 10.86 | 11.25 | 12.77 |
|                 | 12H  | 10.22            | 10.57 | 11.36 | 11.70 | 13.23 | 9.80           | 10.15 | 10.93 | 11.28 | 12.81 |
| 8H              | 4H   | 9.69             | 10.08 | 10.80 | 11.19 | 12.72 | 9.33           | 9.72  | 10.44 | 10.83 | 12.36 |
|                 | 6H   | 10.31            | 10.63 | 11.45 | 11.79 | 13.32 | 9.95           | 10.27 | 11.09 | 11.43 | 12.95 |
|                 | 8H   | 10.53            | 10.81 | 11.68 | 11.95 | 13.49 | 10.16          | 10.45 | 11.31 | 11.58 | 13.13 |
|                 | 12H  | 10.66            | 10.91 | 11.81 | 12.04 | 13.62 | 10.27          | 10.52 | 11.42 | 11.66 | 13.24 |
| 12H             | 4H   | 9.67             | 10.02 | 10.80 | 11.15 | 12.68 | 9.31           | 9.67  | 10.45 | 10.79 | 12.33 |
|                 | 6H   | 10.34            | 10.62 | 11.49 | 11.76 | 13.30 | 9.99           | 10.27 | 11.13 | 11.41 | 12.95 |
|                 | 8H   | 10.58            | 10.83 | 11.73 | 11.96 | 13.54 | 10.22          | 10.47 | 11.37 | 11.60 | 13.18 |

END OF REPORT