

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: P912745

Luminaire Tested: DFN2DIP-TR4F0-040D080US850-RLLONL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P912745  
REPORT IS A COMBINATION OF REPORTS P901962 AND P898849  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-TR4F0-040D080US850-RLLONL  
Description: 4 foot, Triangle Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

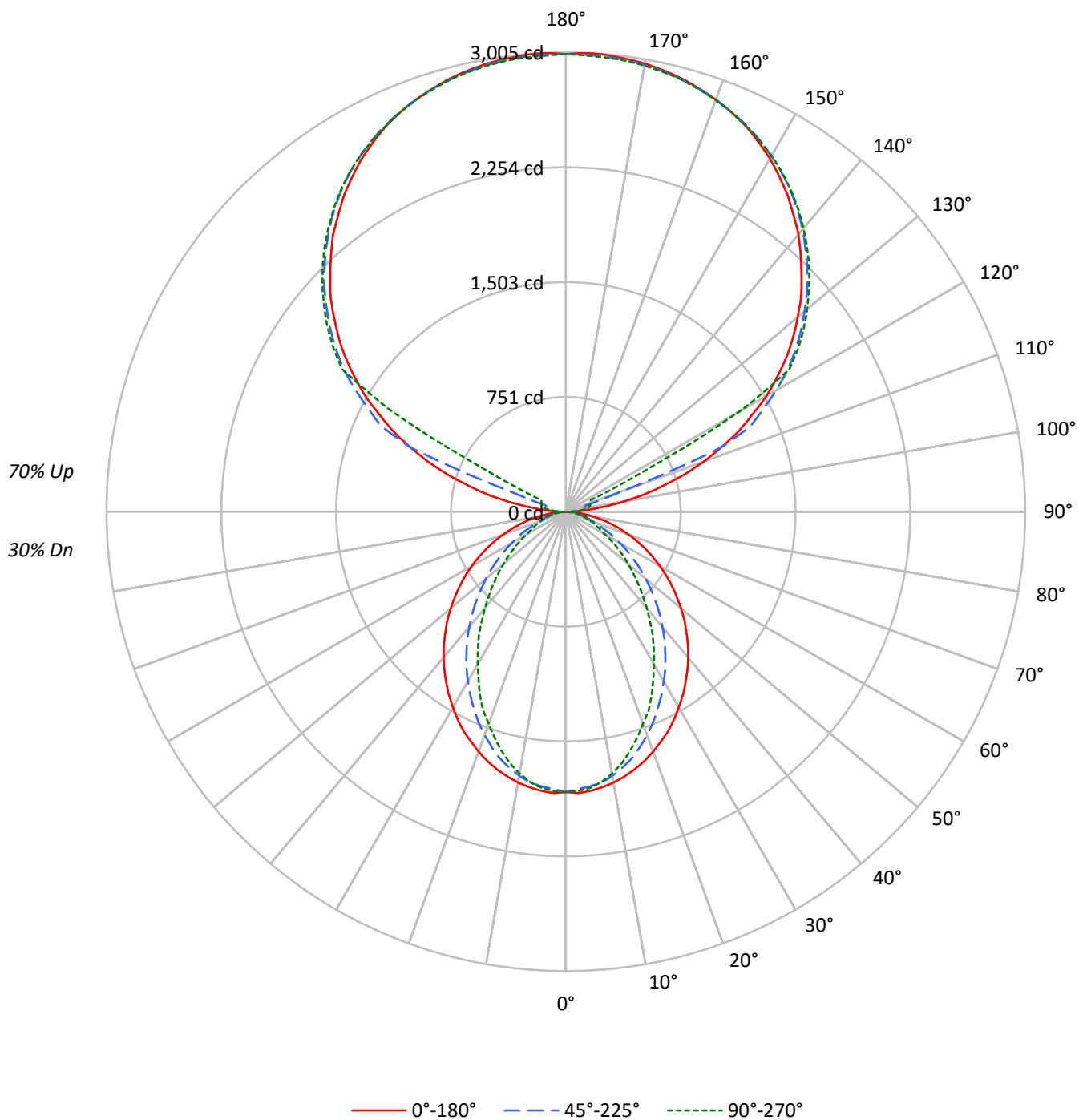
Lumens per Lamp: N/A  
Luminaire Lumens: 12553.9 lumens  
Efficiency: N/A  
Efficacy: 137.8 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 0.99 / 1.16  
Luminous Opening: Rectangular w/ Sides (W: 3.43' x L: 3.96' x H: 0.1')  
CIE Type: Semi-Indirect

Input Watts (W): 91.1  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9952  
Total Harmonic Distortion (THDi): 0.069  
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   | 102 | 102 | 102 | 102 | 92 | 92 | 92 | 92 | 72 | 72 | 72 | 54 | 54 | 54 | 38 | 38 | 38 |
| 1   | 94  | 90  | 86  | 83  | 84 | 81 | 77 | 75 | 64 | 62 | 60 | 48 | 47 | 46 | 34 | 33 | 32 |
| 2   | 85  | 78  | 73  | 68  | 76 | 71 | 66 | 62 | 56 | 53 | 50 | 43 | 40 | 39 | 30 | 29 | 28 |
| 3   | 78  | 69  | 62  | 57  | 70 | 62 | 57 | 52 | 50 | 46 | 42 | 38 | 35 | 33 | 27 | 25 | 24 |
| 4   | 71  | 61  | 54  | 48  | 64 | 55 | 49 | 44 | 44 | 40 | 36 | 34 | 31 | 28 | 24 | 22 | 21 |
| 5   | 66  | 55  | 47  | 41  | 59 | 49 | 43 | 38 | 40 | 35 | 31 | 30 | 27 | 25 | 22 | 20 | 18 |
| 6   | 60  | 49  | 41  | 36  | 54 | 44 | 38 | 33 | 36 | 31 | 27 | 28 | 24 | 22 | 20 | 18 | 16 |
| 7   | 56  | 44  | 37  | 31  | 50 | 40 | 34 | 29 | 32 | 28 | 24 | 25 | 22 | 19 | 18 | 16 | 15 |
| 8   | 52  | 40  | 33  | 28  | 46 | 36 | 30 | 25 | 29 | 25 | 21 | 23 | 20 | 17 | 17 | 15 | 13 |
| 9   | 48  | 37  | 29  | 25  | 43 | 33 | 27 | 23 | 27 | 22 | 19 | 21 | 18 | 15 | 16 | 13 | 12 |
| 10  | 45  | 33  | 27  | 22  | 40 | 30 | 24 | 20 | 25 | 20 | 17 | 20 | 16 | 14 | 14 | 12 | 11 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 1457 | 1457 | 1457 |
| 5°  | 1459 | 1433 | 1443 |
| 10° | 1444 | 1405 | 1396 |
| 15° | 1425 | 1359 | 1323 |
| 20° | 1398 | 1295 | 1234 |
| 25° | 1371 | 1223 | 1148 |
| 30° | 1335 | 1149 | 1039 |
| 35° | 1300 | 1070 | 943  |
| 40° | 1264 | 988  | 833  |
| 45° | 1222 | 897  | 733  |
| 50° | 1178 | 806  | 636  |
| 55° | 1133 | 708  | 543  |
| 60° | 1081 | 605  | 447  |
| 65° | 1021 | 501  | 402  |
| 70° | 948  | 404  | 364  |
| 75° | 856  | 356  | 331  |
| 80° | 723  | 299  | 287  |
| 85° | 504  | 199  | 215  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 90°

Vertical Angle: 90°

Luminance: 1589 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 171.8   | 1.4       |
| 10°-20°   | 471.7   | 3.8       |
| 20°-30°   | 662.3   | 5.3       |
| 30°-40°   | 721.9   | 5.8       |
| 40°-50°   | 663.5   | 5.3       |
| 50°-60°   | 521.1   | 4.2       |
| 60°-70°   | 339.2   | 2.7       |
| 70°-80°   | 174.6   | 1.4       |
| 80°-90°   | 49.8    | 0.4       |
| 90°-100°  | 98.7    | 0.8       |
| 100°-110° | 368.1   | 2.9       |
| 110°-120° | 976.2   | 7.8       |
| 120°-130° | 1619.0  | 12.9      |
| 130°-140° | 1719.8  | 13.7      |
| 140°-150° | 1598.3  | 12.7      |
| 150°-160° | 1285.0  | 10.2      |
| 160°-170° | 828.0   | 6.6       |
| 170°-180° | 285.0   | 2.3       |
| 0°-30°    | 1305.8  | 10.4      |
| 0°-40°    | 2027.7  | 16.2      |
| 0°-60°    | 3212.2  | 25.6      |
| 0°-90°    | 3775.8  | 30.1      |
| 90°-120°  | 1442.9  | 11.5      |
| 90°-150°  | 6380.0  | 50.8      |
| 90°-180°  | 8778.0  | 69.9      |
| 0°-180°   | 12553.9 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 1833 | 1833  | 1833 | 1833  | 1833 |      |
| 5°   | 1833 | 1825  | 1804 | 1818  | 1814 | 174  |
| 15°  | 1744 | 1726  | 1669 | 1638  | 1621 | 491  |
| 25°  | 1583 | 1530  | 1420 | 1352  | 1327 | 728  |
| 35°  | 1364 | 1279  | 1133 | 1029  | 992  | 854  |
| 45°  | 1115 | 1004  | 830  | 712   | 672  | 861  |
| 55°  | 848  | 718   | 539  | 440   | 408  | 758  |
| 65°  | 572  | 438   | 289  | 232   | 227  | 568  |
| 75°  | 305  | 189   | 133  | 121   | 120  | 323  |
| 85°  | 71   | 36    | 32   | 32    | 32   | 82   |
| 90°  | 2    | 26    | 43   | 54    | 58   | 12   |
| 95°  | 141  | 69    | 84   | 96    | 93   | 167  |
| 105° | 659  | 724   | 132  | 156   | 165  | 704  |
| 115° | 1246 | 1283  | 1337 | 334   | 178  | 1226 |
| 125° | 1761 | 1790  | 1831 | 1846  | 1852 | 1571 |
| 135° | 2180 | 2214  | 2234 | 2256  | 2251 | 1684 |
| 145° | 2528 | 2526  | 2563 | 2578  | 2567 | 1581 |
| 155° | 2784 | 2765  | 2791 | 2804  | 2786 | 1283 |
| 165° | 2934 | 2921  | 2927 | 2942  | 2927 | 829  |
| 175° | 3001 | 2985  | 2990 | 3005  | 2983 | 286  |
| 180° | 2994 | 2994  | 2994 | 2994  | 2994 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 1833.4 | 1833.4 | 1833.4 | 1833.4 | 1833.4 |
| 2.5°   | 1841.7 | 1833.4 | 1815.1 | 1831.8 | 1828.4 |
| 5°     | 1833.4 | 1825.1 | 1803.5 | 1818.4 | 1813.5 |
| 7.5°   | 1818.4 | 1808.6 | 1785.4 | 1791.8 | 1783.6 |
| 10°    | 1798.6 | 1786.9 | 1753.8 | 1748.7 | 1738.9 |
| 12.5°  | 1773.7 | 1758.8 | 1713.8 | 1704.0 | 1685.7 |
| 15°    | 1743.8 | 1725.5 | 1669.2 | 1637.7 | 1621.1 |
| 17.5°  | 1709.0 | 1682.4 | 1612.6 | 1576.2 | 1549.6 |
| 20°    | 1669.2 | 1635.9 | 1552.9 | 1511.6 | 1475.0 |
| 22.5°  | 1626.0 | 1587.9 | 1491.5 | 1435.2 | 1410.4 |
| 25°    | 1582.9 | 1529.8 | 1420.2 | 1352.3 | 1327.3 |
| 27.5°  | 1531.5 | 1475.0 | 1353.9 | 1275.9 | 1237.6 |
| 30°    | 1476.7 | 1413.5 | 1280.8 | 1196.3 | 1151.5 |
| 32.5°  | 1423.6 | 1347.2 | 1211.2 | 1111.7 | 1070.1 |
| 35°    | 1364.0 | 1279.2 | 1133.3 | 1028.7 | 992.1  |
| 37.5°  | 1305.8 | 1214.5 | 1060.2 | 945.6  | 904.3  |
| 40°    | 1244.4 | 1144.9 | 983.9  | 866.1  | 823.0  |
| 42.5°  | 1181.3 | 1075.2 | 907.6  | 784.7  | 743.4  |
| 45°    | 1115.0 | 1003.8 | 829.6  | 711.8  | 671.9  |
| 47.5°  | 1052.0 | 934.2  | 755.0  | 637.1  | 600.6  |
| 50°    | 982.2  | 864.5  | 681.9  | 567.4  | 532.7  |
| 52.5°  | 914.1  | 789.7  | 612.3  | 502.7  | 471.2  |
| 55°    | 847.8  | 718.4  | 539.2  | 439.7  | 408.2  |
| 57.5°  | 779.8  | 647.1  | 474.5  | 381.6  | 355.1  |
| 60°    | 710.1  | 577.3  | 406.4  | 321.9  | 295.4  |
| 62.5°  | 642.2  | 509.5  | 348.3  | 268.8  | 255.6  |
| 65°    | 572.5  | 437.9  | 288.7  | 232.3  | 227.2  |
| 67.5°  | 506.1  | 371.6  | 232.3  | 204.1  | 199.1  |
| 70°    | 436.4  | 307.0  | 192.4  | 175.9  | 169.1  |
| 72.5°  | 370.1  | 247.2  | 160.9  | 147.7  | 144.4  |
| 75°    | 305.2  | 189.1  | 132.7  | 121.1  | 119.6  |
| 77.5°  | 240.7  | 134.3  | 104.6  | 97.9   | 94.5   |
| 80°    | 180.8  | 96.3   | 79.5   | 73.1   | 73.1   |
| 82.5°  | 126.1  | 64.8   | 54.8   | 51.3   | 51.3   |
| 85°    | 71.3   | 36.5   | 31.5   | 31.5   | 31.5   |
| 87.5°  | 26.6   | 13.2   | 13.2   | 11.6   | 11.6   |
| 90°    | 2.1    | 26.0   | 43.3   | 54.2   | 58.4   |
| 92.5°  | 54.2   | 45.6   | 52.0   | 56.3   | 58.4   |
| 95°    | 140.7  | 69.2   | 84.4   | 95.5   | 93.2   |
| 97.5°  | 253.4  | 75.9   | 110.3  | 117.1  | 119.1  |
| 100°   | 383.6  | 86.7   | 123.5  | 140.7  | 145.1  |
| 102.5° | 526.4  | 522.2  | 127.9  | 151.5  | 158.3  |
| 105°   | 658.6  | 723.7  | 132.2  | 155.9  | 164.7  |
| 107.5° | 812.5  | 866.5  | 136.6  | 160.3  | 169.0  |
| 110°   | 960.0  | 1005.2 | 379.3  | 162.6  | 171.1  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 1098.6 | 1137.4 | 1100.7 | 166.7  | 173.4  |
| 115°   | 1245.7 | 1282.6 | 1336.8 | 333.7  | 177.8  |
| 117.5° | 1373.6 | 1416.9 | 1453.9 | 1143.8 | 576.3  |
| 120°   | 1516.7 | 1549.1 | 1588.2 | 1614.1 | 1321.6 |
| 122.5° | 1637.8 | 1672.6 | 1716.1 | 1728.9 | 1731.3 |
| 125°   | 1761.3 | 1789.6 | 1830.7 | 1845.9 | 1852.4 |
| 127.5° | 1874.0 | 1904.4 | 1937.1 | 1958.6 | 1960.7 |
| 130°   | 1980.2 | 2014.9 | 2038.7 | 2062.6 | 2060.5 |
| 132.5° | 2088.6 | 2116.9 | 2140.6 | 2160.1 | 2158.0 |
| 135°   | 2179.6 | 2214.3 | 2233.6 | 2255.6 | 2251.2 |
| 137.5° | 2274.9 | 2300.8 | 2322.7 | 2344.3 | 2337.9 |
| 140°   | 2367.9 | 2385.5 | 2409.2 | 2428.7 | 2417.8 |
| 142.5° | 2446.2 | 2461.3 | 2489.4 | 2506.7 | 2495.8 |
| 145°   | 2528.5 | 2526.2 | 2563.0 | 2578.2 | 2567.3 |
| 147.5° | 2599.8 | 2593.4 | 2630.1 | 2641.0 | 2632.4 |
| 150°   | 2669.3 | 2654.1 | 2688.8 | 2701.6 | 2690.9 |
| 152.5° | 2727.7 | 2710.4 | 2742.8 | 2756.0 | 2740.8 |
| 155°   | 2784.0 | 2764.7 | 2790.7 | 2803.6 | 2786.4 |
| 157.5° | 2829.5 | 2812.3 | 2831.8 | 2847.0 | 2829.5 |
| 160°   | 2868.7 | 2855.6 | 2868.7 | 2881.5 | 2866.3 |
| 162.5° | 2903.1 | 2890.3 | 2901.0 | 2916.2 | 2896.7 |
| 165°   | 2933.5 | 2920.7 | 2927.1 | 2942.2 | 2927.1 |
| 167.5° | 2957.4 | 2944.3 | 2950.9 | 2966.1 | 2946.6 |
| 170°   | 2977.0 | 2963.8 | 2968.2 | 2983.4 | 2963.8 |
| 172.5° | 2989.9 | 2977.0 | 2981.3 | 2996.5 | 2977.0 |
| 175°   | 3000.6 | 2985.4 | 2989.9 | 3004.9 | 2983.4 |
| 177.5° | 3004.9 | 2989.9 | 2992.1 | 3007.3 | 2987.8 |
| 180°   | 2994.2 | 2994.2 | 2994.2 | 2994.2 | 2994.2 |

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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 | 6.23             | 6.92 | 7.34  | 8.02  | 9.56  | 2.20           | 2.89 | 3.32 | 4.00 | 5.53 |
|                 | 3H   | 7.89             | 8.51 | 9.02  | 9.63  | 11.17 | 3.38           | 4.00 | 4.50 | 5.11 | 6.66 |
|                 | 4H   | 8.50             | 9.08 | 9.63  | 10.20 | 11.75 | 3.82           | 4.41 | 4.96 | 5.53 | 7.08 |
|                 | 6H   | 8.91             | 9.45 | 10.05 | 10.57 | 12.13 | 4.14           | 4.68 | 5.28 | 5.80 | 7.36 |
|                 | 8H   | 9.03             | 9.54 | 10.18 | 10.68 | 12.24 | 4.23           | 4.74 | 5.37 | 5.87 | 7.43 |
|                 | 12H  | 9.09             | 9.58 | 10.24 | 10.70 | 12.28 | 4.26           | 4.75 | 5.41 | 5.88 | 7.46 |
| 4H              | 2H   | 6.23             | 6.81 | 7.37  | 7.93  | 9.48  | 2.78           | 3.36 | 3.92 | 4.48 | 6.03 |
|                 | 3H   | 8.04             | 8.53 | 9.19  | 9.67  | 11.24 | 4.12           | 4.60 | 5.26 | 5.75 | 7.31 |
|                 | 4H   | 8.73             | 9.18 | 9.88  | 10.31 | 11.90 | 4.66           | 5.11 | 5.81 | 6.24 | 7.83 |
|                 | 6H   | 9.24             | 9.62 | 10.39 | 10.78 | 12.35 | 5.07           | 5.46 | 6.23 | 6.61 | 8.19 |
|                 | 8H   | 9.41             | 9.77 | 10.57 | 10.91 | 12.51 | 5.20           | 5.56 | 6.35 | 6.70 | 8.30 |
|                 | 12H  | 9.50             | 9.82 | 10.67 | 10.98 | 12.58 | 5.26           | 5.58 | 6.43 | 6.74 | 8.34 |
| 8H              | 4H   | 8.69             | 9.05 | 9.84  | 10.19 | 11.78 | 4.93           | 5.29 | 6.08 | 6.43 | 8.03 |
|                 | 6H   | 9.25             | 9.54 | 10.42 | 10.73 | 12.32 | 5.44           | 5.74 | 6.62 | 6.93 | 8.52 |
|                 | 8H   | 9.47             | 9.72 | 10.65 | 10.89 | 12.50 | 5.64           | 5.89 | 6.82 | 7.06 | 8.67 |
|                 | 12H  | 9.60             | 9.82 | 10.78 | 10.99 | 12.63 | 5.75           | 5.97 | 6.93 | 7.14 | 8.78 |
| 12H             | 4H   | 8.63             | 8.96 | 9.80  | 10.12 | 11.71 | 4.93           | 5.25 | 6.10 | 6.41 | 8.01 |
|                 | 6H   | 9.22             | 9.48 | 10.40 | 10.65 | 12.26 | 5.49           | 5.75 | 6.67 | 6.92 | 8.53 |
|                 | 8H   | 9.44             | 9.66 | 10.62 | 10.83 | 12.47 | 5.70           | 5.92 | 6.88 | 7.09 | 8.73 |

END OF REPORT