

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: P921051

Luminaire Tested: DFN2DIP-TR4F0-070D120US935-FLLONL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P921051  
REPORT IS A COMBINATION OF REPORTS P902039 AND P898849  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-TR4F0-070D120US935-FLLONL  
Description: 4 foot, Triangle Define Geo, with Direct Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

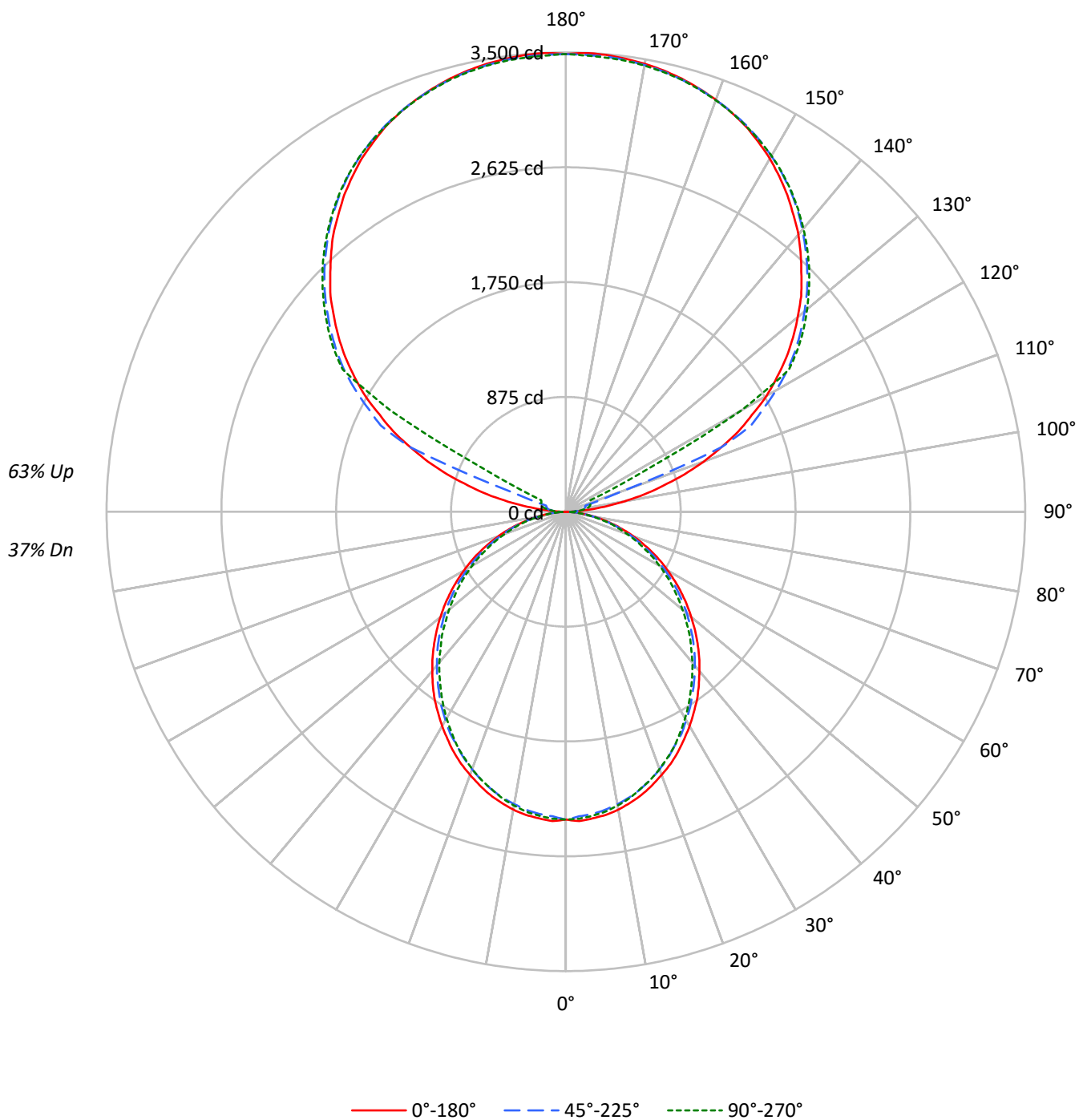
Lumens per Lamp: N/A  
Luminaire Lumens: 16195.4 lumens  
Efficiency: N/A  
Efficacy: 103.2 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 3.43' x L: 3.96' x H: 0.1')  
CIE Type: Semi-Indirect

Input Watts (W): 156.9  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9977  
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



TEST NUMBER: P921051

CATALOG NUMBER: DFN2DIP-TR4F0-070D120US935-FLONL

**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 | 76 | 76 | 76 | 59 | 59 | 59 | 44 | 44 | 44 |
| 1   | 95  | 91  | 87  | 83  | 86 | 82 | 79 | 76 | 67 | 64 | 62 | 52 | 51 | 49 | 39 | 38 | 37 |
| 2   | 86  | 79  | 73  | 68  | 78 | 72 | 67 | 62 | 58 | 55 | 52 | 46 | 43 | 41 | 34 | 33 | 31 |
| 3   | 79  | 69  | 62  | 57  | 71 | 63 | 57 | 52 | 51 | 47 | 43 | 40 | 37 | 35 | 30 | 28 | 27 |
| 4   | 72  | 61  | 54  | 48  | 65 | 56 | 49 | 44 | 46 | 41 | 37 | 36 | 33 | 30 | 27 | 25 | 23 |
| 5   | 66  | 55  | 47  | 41  | 60 | 50 | 43 | 38 | 41 | 36 | 32 | 32 | 29 | 26 | 24 | 22 | 20 |
| 6   | 61  | 49  | 41  | 35  | 55 | 45 | 38 | 33 | 37 | 31 | 28 | 29 | 25 | 23 | 22 | 20 | 18 |
| 7   | 56  | 44  | 36  | 31  | 51 | 40 | 33 | 29 | 33 | 28 | 24 | 26 | 23 | 20 | 20 | 18 | 16 |
| 8   | 52  | 40  | 32  | 27  | 47 | 37 | 30 | 25 | 30 | 25 | 21 | 24 | 20 | 18 | 19 | 16 | 14 |
| 9   | 48  | 36  | 29  | 24  | 44 | 33 | 27 | 22 | 28 | 23 | 19 | 22 | 19 | 16 | 17 | 15 | 13 |
| 10  | 45  | 33  | 26  | 22  | 41 | 31 | 24 | 20 | 25 | 21 | 17 | 20 | 17 | 14 | 16 | 13 | 11 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 1863 | 1863 | 1863 |
| 5°  | 1866 | 1837 | 1849 |
| 10° | 1851 | 1812 | 1824 |
| 15° | 1824 | 1782 | 1785 |
| 20° | 1787 | 1741 | 1745 |
| 25° | 1750 | 1691 | 1699 |
| 30° | 1705 | 1645 | 1640 |
| 35° | 1661 | 1591 | 1577 |
| 40° | 1608 | 1536 | 1518 |
| 45° | 1554 | 1481 | 1457 |
| 50° | 1496 | 1423 | 1387 |
| 55° | 1435 | 1356 | 1322 |
| 60° | 1366 | 1276 | 1248 |
| 65° | 1291 | 1194 | 1161 |
| 70° | 1195 | 1094 | 1067 |
| 75° | 1062 | 974  | 980  |
| 80° | 903  | 821  | 814  |
| 85° | 653  | 558  | 540  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 90°

Vertical Angle: 90°

Luminance: 1851 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 220.7   | 1.4       |
| 10°-20°   | 621.0   | 3.8       |
| 20°-30°   | 912.7   | 5.6       |
| 30°-40°   | 1060.0  | 6.5       |
| 40°-50°   | 1058.7  | 6.5       |
| 50°-60°   | 923.2   | 5.7       |
| 60°-70°   | 682.4   | 4.2       |
| 70°-80°   | 386.1   | 2.4       |
| 80°-90°   | 108.1   | 0.7       |
| 90°-100°  | 115.0   | 0.7       |
| 100°-110° | 428.6   | 2.6       |
| 110°-120° | 1136.8  | 7.0       |
| 120°-130° | 1885.4  | 11.6      |
| 130°-140° | 2002.8  | 12.4      |
| 140°-150° | 1861.3  | 11.5      |
| 150°-160° | 1496.5  | 9.2       |
| 160°-170° | 964.3   | 6.0       |
| 170°-180° | 331.9   | 2.0       |
| 0°-30°    | 1754.4  | 10.8      |
| 0°-40°    | 2814.4  | 17.4      |
| 0°-60°    | 4796.3  | 29.6      |
| 0°-90°    | 5972.9  | 36.9      |
| 90°-120°  | 1680.4  | 10.4      |
| 90°-150°  | 7429.9  | 45.9      |
| 90°-180°  | 10223.0 | 63.1      |
| 0°-180°   | 16195.4 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 2345 | 2345  | 2345 | 2345  | 2345 |      |
| 5°   | 2345 | 2336  | 2311 | 2329  | 2325 | 223  |
| 15°  | 2232 | 2219  | 2190 | 2199  | 2188 | 629  |
| 25°  | 2020 | 2002  | 1964 | 1969  | 1964 | 930  |
| 35°  | 1743 | 1721  | 1684 | 1671  | 1660 | 1089 |
| 45°  | 1418 | 1403  | 1369 | 1344  | 1335 | 1095 |
| 55°  | 1074 | 1060  | 1033 | 1006  | 994  | 960  |
| 65°  | 724  | 710   | 688  | 668   | 656  | 716  |
| 75°  | 379  | 374   | 363  | 350   | 354  | 404  |
| 85°  | 92   | 90    | 88   | 81    | 79   | 103  |
| 90°  | 2    | 30    | 50   | 63    | 68   | 15   |
| 95°  | 164  | 81    | 98   | 111   | 108  | 194  |
| 105° | 767  | 843   | 154  | 182   | 192  | 820  |
| 115° | 1451 | 1494  | 1557 | 389   | 207  | 1428 |
| 125° | 2051 | 2084  | 2132 | 2150  | 2157 | 1829 |
| 135° | 2538 | 2579  | 2601 | 2627  | 2622 | 1961 |
| 145° | 2945 | 2942  | 2985 | 3002  | 2990 | 1842 |
| 155° | 3242 | 3220  | 3250 | 3265  | 3245 | 1494 |
| 165° | 3416 | 3401  | 3409 | 3426  | 3409 | 965  |
| 175° | 3494 | 3477  | 3482 | 3500  | 3474 | 333  |
| 180° | 3487 | 3487  | 3487 | 3487  | 3487 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 2345.1 | 2345.1 | 2345.1 | 2345.1 | 2345.1 |
| 2.5°   | 2358.8 | 2347.5 | 2322.6 | 2345.1 | 2340.8 |
| 5°     | 2345.1 | 2336.3 | 2311.4 | 2329.3 | 2325.0 |
| 7.5°   | 2329.3 | 2315.9 | 2291.0 | 2309.3 | 2304.7 |
| 10°    | 2304.7 | 2288.9 | 2261.8 | 2279.8 | 2273.1 |
| 12.5°  | 2270.7 | 2257.4 | 2230.3 | 2241.5 | 2237.0 |
| 15°    | 2232.5 | 2219.0 | 2189.6 | 2198.7 | 2187.5 |
| 17.5°  | 2185.0 | 2171.7 | 2142.2 | 2153.5 | 2142.2 |
| 20°    | 2133.1 | 2119.8 | 2088.2 | 2094.9 | 2086.0 |
| 22.5°  | 2081.5 | 2061.1 | 2031.7 | 2031.7 | 2027.1 |
| 25°    | 2020.5 | 2002.5 | 1964.3 | 1968.6 | 1964.3 |
| 27.5°  | 1952.7 | 1937.0 | 1907.8 | 1901.1 | 1889.8 |
| 30°    | 1885.3 | 1867.1 | 1833.4 | 1826.7 | 1817.6 |
| 32.5°  | 1813.0 | 1799.7 | 1763.5 | 1749.9 | 1740.8 |
| 35°    | 1743.2 | 1720.7 | 1684.5 | 1670.9 | 1659.7 |
| 37.5°  | 1664.2 | 1643.9 | 1607.7 | 1592.0 | 1580.7 |
| 40°    | 1583.1 | 1564.9 | 1528.8 | 1508.7 | 1499.6 |
| 42.5°  | 1504.2 | 1486.0 | 1450.1 | 1427.4 | 1413.9 |
| 45°    | 1418.5 | 1402.7 | 1368.7 | 1344.1 | 1335.0 |
| 47.5°  | 1335.0 | 1319.2 | 1283.1 | 1258.2 | 1244.8 |
| 50°    | 1247.0 | 1235.7 | 1204.1 | 1172.6 | 1161.3 |
| 52.5°  | 1161.3 | 1145.6 | 1116.4 | 1091.5 | 1075.6 |
| 55°    | 1073.5 | 1059.9 | 1032.9 | 1005.8 | 994.5  |
| 57.5°  | 985.5  | 974.2  | 944.8  | 917.7  | 908.7  |
| 60°    | 897.4  | 888.5  | 857.0  | 832.2  | 825.4  |
| 62.5°  | 811.7  | 796.0  | 773.5  | 751.0  | 741.9  |
| 65°    | 724.0  | 710.3  | 687.9  | 667.5  | 656.3  |
| 67.5°  | 633.8  | 622.3  | 602.2  | 586.4  | 577.3  |
| 70°    | 550.3  | 541.2  | 520.8  | 505.1  | 496.2  |
| 72.5°  | 464.6  | 455.6  | 444.3  | 428.5  | 421.8  |
| 75°    | 378.8  | 374.4  | 362.9  | 349.6  | 354.1  |
| 77.5°  | 302.2  | 293.1  | 288.5  | 281.8  | 275.2  |
| 80°    | 225.6  | 223.3  | 218.7  | 212.0  | 207.4  |
| 82.5°  | 153.3  | 153.3  | 151.2  | 142.2  | 142.2  |
| 85°    | 92.4   | 90.2   | 88.1   | 81.1   | 79.0   |
| 87.5°  | 40.6   | 36.2   | 31.6   | 24.9   | 22.5   |
| 90°    | 2.4    | 30.2   | 50.4   | 63.2   | 68.0   |
| 92.5°  | 63.2   | 53.0   | 60.5   | 65.6   | 68.0   |
| 95°    | 163.8  | 80.6   | 98.2   | 111.2  | 108.5  |
| 97.5°  | 295.2  | 88.4   | 128.5  | 136.3  | 138.7  |
| 100°   | 446.7  | 101.0  | 143.8  | 163.8  | 169.0  |
| 102.5° | 613.0  | 608.2  | 148.9  | 176.5  | 184.3  |
| 105°   | 767.0  | 842.8  | 154.0  | 181.6  | 191.7  |
| 107.5° | 946.2  | 1009.1 | 159.1  | 186.7  | 196.8  |
| 110°   | 1117.8 | 1170.6 | 441.6  | 189.3  | 199.2  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 1279.4 | 1324.6 | 1281.8 | 194.2  | 201.9  |
| 115°   | 1450.7 | 1493.6 | 1556.8 | 388.6  | 207.1  |
| 117.5° | 1599.6 | 1650.0 | 1693.2 | 1332.0 | 671.1  |
| 120°   | 1766.3 | 1804.0 | 1849.5 | 1879.8 | 1539.1 |
| 122.5° | 1907.4 | 1947.8 | 1998.5 | 2013.4 | 2016.1 |
| 125°   | 2051.2 | 2084.1 | 2132.1 | 2149.7 | 2157.2 |
| 127.5° | 2182.4 | 2217.8 | 2255.8 | 2281.0 | 2283.4 |
| 130°   | 2306.1 | 2346.6 | 2374.1 | 2402.0 | 2399.6 |
| 132.5° | 2432.2 | 2465.2 | 2492.8 | 2515.6 | 2513.2 |
| 135°   | 2538.3 | 2578.8 | 2601.2 | 2626.7 | 2621.7 |
| 137.5° | 2649.2 | 2679.4 | 2704.9 | 2730.1 | 2722.6 |
| 140°   | 2757.7 | 2778.0 | 2805.6 | 2828.4 | 2815.8 |
| 142.5° | 2848.7 | 2866.4 | 2899.1 | 2919.1 | 2906.6 |
| 145°   | 2944.6 | 2941.9 | 2984.7 | 3002.5 | 2989.8 |
| 147.5° | 3027.6 | 3020.1 | 3063.0 | 3075.6 | 3065.7 |
| 150°   | 3108.5 | 3090.8 | 3131.3 | 3146.3 | 3133.7 |
| 152.5° | 3176.5 | 3156.4 | 3194.2 | 3209.5 | 3191.8 |
| 155°   | 3242.1 | 3219.6 | 3249.9 | 3264.9 | 3244.8 |
| 157.5° | 3295.1 | 3275.1 | 3297.9 | 3315.5 | 3295.1 |
| 160°   | 3340.7 | 3325.4 | 3340.7 | 3355.7 | 3338.0 |
| 162.5° | 3380.9 | 3365.9 | 3378.5 | 3396.1 | 3373.4 |
| 165°   | 3416.2 | 3401.2 | 3408.7 | 3426.4 | 3408.7 |
| 167.5° | 3444.1 | 3428.8 | 3436.6 | 3454.2 | 3431.5 |
| 170°   | 3466.8 | 3451.6 | 3456.6 | 3474.3 | 3451.6 |
| 172.5° | 3481.8 | 3466.8 | 3472.0 | 3489.6 | 3466.8 |
| 175°   | 3494.4 | 3476.7 | 3481.8 | 3499.5 | 3474.3 |
| 177.5° | 3499.5 | 3481.8 | 3484.5 | 3502.2 | 3479.5 |
| 180°   | 3487.0 | 3487.0 | 3487.0 | 3487.0 | 3487.0 |

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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 | 8.08             | 8.83  | 9.14  | 9.90  | 11.34 | 7.65           | 8.40  | 8.71  | 9.47  | 10.91 |
|                 | 3H   | 9.73             | 10.41 | 10.80 | 11.48 | 12.94 | 9.26           | 9.93  | 10.33 | 11.01 | 12.47 |
|                 | 4H   | 10.31            | 10.95 | 11.39 | 12.03 | 13.50 | 9.84           | 10.48 | 10.92 | 11.56 | 13.03 |
|                 | 6H   | 10.71            | 11.30 | 11.80 | 12.38 | 13.86 | 10.23          | 10.82 | 11.32 | 11.90 | 13.38 |
|                 | 8H   | 10.81            | 11.37 | 11.90 | 12.46 | 13.94 | 10.33          | 10.90 | 11.43 | 11.99 | 13.47 |
|                 | 12H  | 10.85            | 11.39 | 11.95 | 12.47 | 13.98 | 10.37          | 10.91 | 11.47 | 11.99 | 13.50 |
| 4H              | 2H   | 8.53             | 9.17  | 9.62  | 10.24 | 11.71 | 8.18           | 8.82  | 9.27  | 9.90  | 11.37 |
|                 | 3H   | 10.38            | 10.92 | 11.48 | 12.02 | 13.50 | 9.99           | 10.52 | 11.09 | 11.63 | 13.11 |
|                 | 4H   | 11.09            | 11.58 | 12.19 | 12.68 | 14.18 | 10.69          | 11.18 | 11.79 | 12.27 | 13.78 |
|                 | 6H   | 11.60            | 12.02 | 12.71 | 13.14 | 14.64 | 11.19          | 11.61 | 12.30 | 12.73 | 14.23 |
|                 | 8H   | 11.75            | 12.14 | 12.86 | 13.25 | 14.76 | 11.34          | 11.73 | 12.45 | 12.84 | 14.35 |
|                 | 12H  | 11.82            | 12.17 | 12.94 | 13.29 | 14.81 | 11.39          | 11.75 | 12.52 | 12.87 | 14.39 |
| 8H              | 4H   | 11.28            | 11.67 | 12.39 | 12.78 | 14.30 | 10.92          | 11.31 | 12.03 | 12.42 | 13.94 |
|                 | 6H   | 11.91            | 12.23 | 13.04 | 13.38 | 14.89 | 11.54          | 11.87 | 12.68 | 13.02 | 14.53 |
|                 | 8H   | 12.13            | 12.41 | 13.26 | 13.54 | 15.07 | 11.76          | 12.04 | 12.90 | 13.17 | 14.70 |
|                 | 12H  | 12.25            | 12.50 | 13.39 | 13.63 | 15.20 | 11.87          | 12.12 | 13.01 | 13.25 | 14.81 |
| 12H             | 4H   | 11.26            | 11.62 | 12.39 | 12.74 | 14.26 | 10.91          | 11.27 | 12.04 | 12.39 | 13.90 |
|                 | 6H   | 11.94            | 12.22 | 13.07 | 13.35 | 14.88 | 11.58          | 11.87 | 12.72 | 13.00 | 14.53 |
|                 | 8H   | 12.17            | 12.42 | 13.31 | 13.55 | 15.12 | 11.82          | 12.07 | 12.96 | 13.19 | 14.76 |

END OF REPORT