

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: P927706

Luminaire Tested: DFN2DIP-HX4F0-090D050US840-RLLONL

Issue Date: 12/12/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P927706  
REPORT IS A COMBINATION OF REPORTS P900848 AND P896187  
Test Lab: INNOVATION CENTER  
Issue Date: 12/12/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-HX4F0-090D050US840-RLLONL  
Description: 4 foot, Hexagon Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

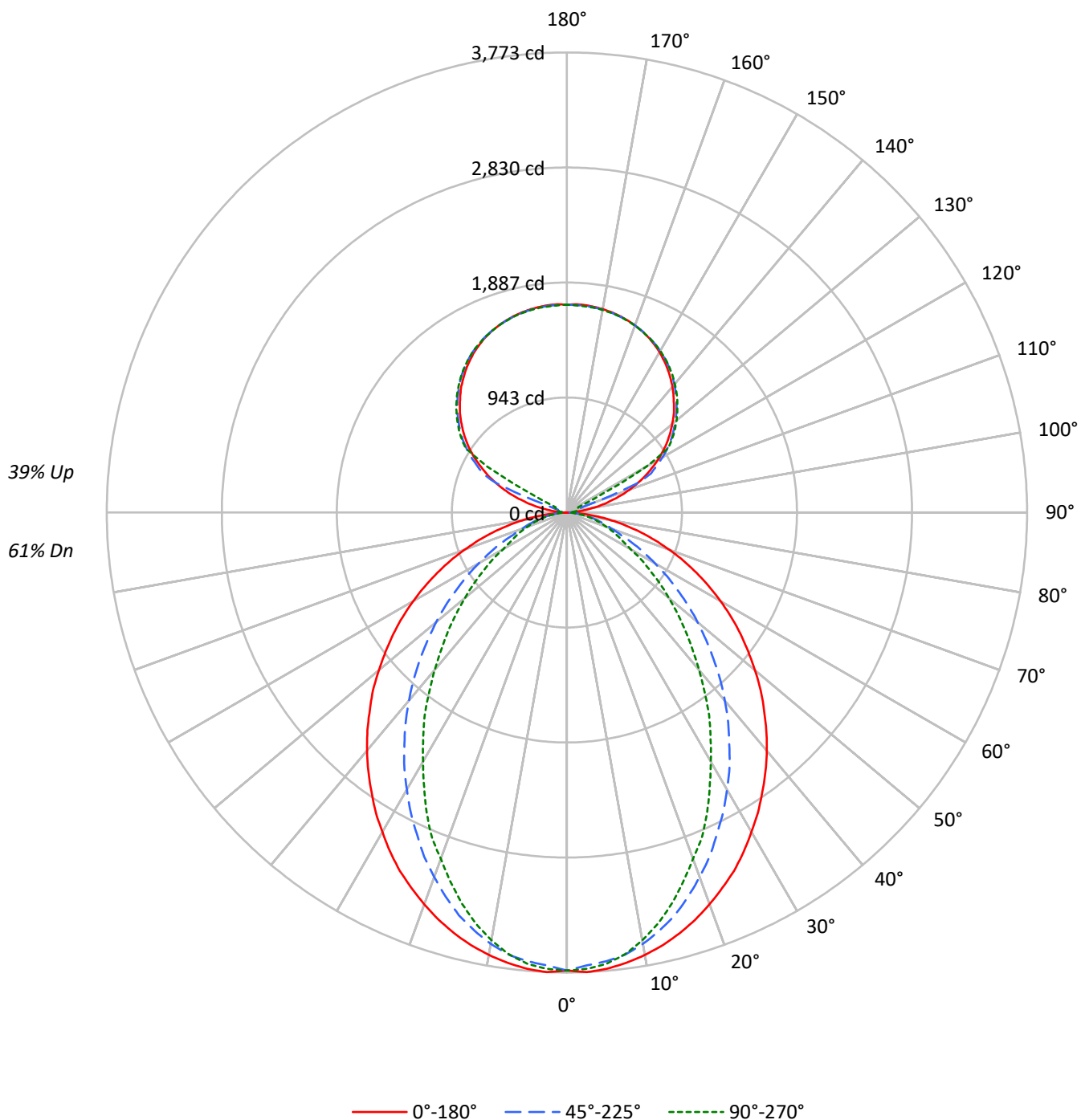
Lumens per Lamp: N/A  
Luminaire Lumens: 12723.5 lumens  
Efficiency: N/A  
Efficacy: 100.7 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 0.99 / 1.16  
Luminous Opening: Rectangular w/ Sides (W: 3.54' x L: 4.09' x H: 0.1')  
CIE Type: Semi-Direct

Input Watts (W): 126.3  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9821  
Total Harmonic Distortion (THDi): 0.08  
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   | 110 | 110 | 110 | 110 | 103 | 103 | 103 | 103 | 89 | 89 | 89 | 77 | 77 | 77 | 66 | 66 | 66 |
| 1   | 101 | 97  | 93  | 90  | 94  | 91  | 87  | 84  | 79 | 77 | 75 | 69 | 67 | 65 | 59 | 58 | 57 |
| 2   | 92  | 85  | 79  | 74  | 86  | 80  | 75  | 70  | 70 | 66 | 63 | 61 | 58 | 56 | 53 | 51 | 49 |
| 3   | 85  | 75  | 68  | 62  | 79  | 71  | 65  | 59  | 62 | 58 | 53 | 55 | 51 | 48 | 47 | 45 | 42 |
| 4   | 78  | 67  | 59  | 53  | 73  | 63  | 56  | 51  | 56 | 50 | 46 | 49 | 45 | 41 | 43 | 40 | 37 |
| 5   | 72  | 60  | 52  | 46  | 67  | 57  | 50  | 44  | 50 | 45 | 40 | 44 | 40 | 36 | 39 | 35 | 33 |
| 6   | 66  | 54  | 46  | 41  | 62  | 51  | 44  | 39  | 46 | 40 | 35 | 40 | 36 | 32 | 35 | 32 | 29 |
| 7   | 61  | 49  | 41  | 36  | 57  | 47  | 39  | 34  | 42 | 36 | 32 | 37 | 32 | 29 | 33 | 29 | 26 |
| 8   | 57  | 45  | 37  | 32  | 53  | 43  | 36  | 31  | 38 | 32 | 28 | 34 | 29 | 26 | 30 | 26 | 23 |
| 9   | 53  | 41  | 34  | 29  | 50  | 39  | 32  | 28  | 35 | 30 | 26 | 31 | 27 | 23 | 28 | 24 | 21 |
| 10  | 50  | 38  | 31  | 26  | 47  | 36  | 30  | 25  | 33 | 27 | 23 | 29 | 25 | 21 | 26 | 22 | 20 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 2793 | 2793 | 2793 |
| 5°  | 2798 | 2749 | 2766 |
| 10° | 2770 | 2695 | 2676 |
| 15° | 2732 | 2606 | 2537 |
| 20° | 2682 | 2484 | 2367 |
| 25° | 2631 | 2346 | 2202 |
| 30° | 2562 | 2206 | 1993 |
| 35° | 2494 | 2054 | 1809 |
| 40° | 2425 | 1897 | 1599 |
| 45° | 2345 | 1723 | 1408 |
| 50° | 2262 | 1548 | 1221 |
| 55° | 2176 | 1360 | 1042 |
| 60° | 2076 | 1163 | 858  |
| 65° | 1961 | 964  | 772  |
| 70° | 1821 | 777  | 699  |
| 75° | 1646 | 686  | 636  |
| 80° | 1393 | 576  | 553  |
| 85° | 973  | 386  | 416  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 2345 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 352.0   | 2.8       |
| 10°-20°   | 966.4   | 7.6       |
| 20°-30°   | 1356.8  | 10.7      |
| 30°-40°   | 1479.0  | 11.6      |
| 40°-50°   | 1359.4  | 10.7      |
| 50°-60°   | 1067.6  | 8.4       |
| 60°-70°   | 694.9   | 5.5       |
| 70°-80°   | 357.7   | 2.8       |
| 80°-90°   | 94.3    | 0.7       |
| 90°-100°  | 56.2    | 0.4       |
| 100°-110° | 209.5   | 1.6       |
| 110°-120° | 555.5   | 4.4       |
| 120°-130° | 921.4   | 7.2       |
| 130°-140° | 978.7   | 7.7       |
| 140°-150° | 909.6   | 7.1       |
| 150°-160° | 731.3   | 5.7       |
| 160°-170° | 471.2   | 3.7       |
| 170°-180° | 162.2   | 1.3       |
| 0°-30°    | 2675.2  | 21.0      |
| 0°-40°    | 4154.2  | 32.6      |
| 0°-60°    | 6581.1  | 51.7      |
| 0°-90°    | 7728.0  | 60.7      |
| 90°-120°  | 821.2   | 6.5       |
| 90°-150°  | 3630.8  | 28.5      |
| 90°-180°  | 4996.0  | 39.3      |
| 0°-180°   | 12723.5 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 3756 | 3756  | 3756 | 3756  | 3756 |      |
| 5°   | 3756 | 3739  | 3695 | 3726  | 3715 | 356  |
| 15°  | 3573 | 3535  | 3420 | 3355  | 3321 | 1007 |
| 25°  | 3243 | 3134  | 2910 | 2770  | 2719 | 1491 |
| 35°  | 2794 | 2621  | 2322 | 2108  | 2033 | 1749 |
| 45°  | 2284 | 2056  | 1700 | 1458  | 1377 | 1764 |
| 55°  | 1737 | 1472  | 1105 | 901   | 836  | 1552 |
| 65°  | 1173 | 897   | 591  | 476   | 466  | 1163 |
| 75°  | 625  | 387   | 272  | 248   | 245  | 661  |
| 85°  | 146  | 75    | 64   | 64    | 64   | 168  |
| 90°  | 1    | 15    | 25   | 31    | 33   | 12   |
| 95°  | 80   | 39    | 48   | 54    | 53   | 95   |
| 105° | 375  | 412   | 75   | 89    | 94   | 401  |
| 115° | 709  | 730   | 761  | 190   | 101  | 698  |
| 125° | 1002 | 1018  | 1042 | 1050  | 1054 | 894  |
| 135° | 1240 | 1260  | 1271 | 1284  | 1281 | 958  |
| 145° | 1439 | 1438  | 1459 | 1467  | 1461 | 900  |
| 155° | 1584 | 1573  | 1588 | 1596  | 1586 | 730  |
| 165° | 1669 | 1662  | 1666 | 1674  | 1666 | 472  |
| 175° | 1708 | 1699  | 1702 | 1710  | 1698 | 163  |
| 180° | 1704 | 1704  | 1704 | 1704  | 1704 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 3756.2 | 3756.2 | 3756.2 | 3756.2 | 3756.2 |
| 2.5°   | 3773.1 | 3756.2 | 3718.6 | 3752.9 | 3746.1 |
| 5°     | 3756.2 | 3739.2 | 3694.9 | 3725.5 | 3715.4 |
| 7.5°   | 3725.5 | 3705.3 | 3657.7 | 3671.0 | 3654.1 |
| 10°    | 3684.8 | 3660.9 | 3593.2 | 3582.7 | 3562.5 |
| 12.5°  | 3633.9 | 3603.3 | 3511.3 | 3491.1 | 3453.5 |
| 15°    | 3572.6 | 3535.1 | 3419.7 | 3355.1 | 3321.2 |
| 17.5°  | 3501.2 | 3446.8 | 3303.9 | 3229.2 | 3174.8 |
| 20°    | 3419.7 | 3351.5 | 3181.6 | 3096.9 | 3021.8 |
| 22.5°  | 3331.3 | 3253.1 | 3055.8 | 2940.3 | 2889.5 |
| 25°    | 3243.0 | 3134.0 | 2909.7 | 2770.5 | 2719.3 |
| 27.5°  | 3137.7 | 3021.8 | 2773.7 | 2614.0 | 2535.7 |
| 30°    | 3025.5 | 2896.0 | 2624.1 | 2451.0 | 2359.0 |
| 32.5°  | 2916.5 | 2760.0 | 2481.6 | 2277.5 | 2192.4 |
| 35°    | 2794.3 | 2620.8 | 2321.8 | 2107.7 | 2032.6 |
| 37.5°  | 2675.3 | 2488.1 | 2172.2 | 1937.4 | 1852.7 |
| 40°    | 2549.4 | 2345.7 | 2015.7 | 1774.4 | 1686.1 |
| 42.5°  | 2420.3 | 2202.9 | 1859.4 | 1607.8 | 1523.0 |
| 45°    | 2284.4 | 2056.5 | 1699.7 | 1458.1 | 1376.6 |
| 47.5°  | 2155.2 | 1914.0 | 1546.8 | 1305.2 | 1230.5 |
| 50°    | 2012.4 | 1771.1 | 1397.2 | 1162.4 | 1091.3 |
| 52.5°  | 1872.9 | 1617.9 | 1254.4 | 1030.0 | 965.5  |
| 55°    | 1736.9 | 1471.8 | 1104.6 | 900.9  | 836.3  |
| 57.5°  | 1597.7 | 1325.8 | 972.3  | 781.9  | 727.5  |
| 60°    | 1454.8 | 1182.9 | 832.8  | 659.6  | 605.2  |
| 62.5°  | 1315.7 | 1043.7 | 713.7  | 550.7  | 523.7  |
| 65°    | 1172.8 | 897.3  | 591.4  | 476.0  | 465.6  |
| 67.5°  | 1036.9 | 761.3  | 476.0  | 418.0  | 407.9  |
| 70°    | 894.1  | 629.0  | 394.2  | 360.3  | 346.6  |
| 72.5°  | 758.1  | 506.3  | 329.6  | 302.5  | 295.8  |
| 75°    | 625.4  | 387.4  | 271.9  | 248.1  | 244.9  |
| 77.5°  | 493.0  | 275.2  | 214.2  | 200.5  | 193.7  |
| 80°    | 370.4  | 197.3  | 163.0  | 149.7  | 149.7  |
| 82.5°  | 258.2  | 132.7  | 112.2  | 105.3  | 105.3  |
| 85°    | 146.0  | 74.6   | 64.5   | 64.5   | 64.5   |
| 87.5°  | 54.4   | 27.1   | 27.1   | 23.8   | 23.8   |
| 90°    | 1.2    | 14.7   | 24.6   | 30.9   | 33.2   |
| 92.5°  | 30.9   | 26.0   | 29.6   | 32.1   | 33.2   |
| 95°    | 80.1   | 39.4   | 48.1   | 54.3   | 53.0   |
| 97.5°  | 144.2  | 43.2   | 62.8   | 66.6   | 67.8   |
| 100°   | 218.3  | 49.4   | 70.3   | 80.1   | 82.6   |
| 102.5° | 299.6  | 297.2  | 72.8   | 86.2   | 90.1   |
| 105°   | 374.8  | 411.9  | 75.2   | 88.8   | 93.7   |
| 107.5° | 462.4  | 493.1  | 77.8   | 91.2   | 96.2   |
| 110°   | 546.3  | 572.1  | 215.8  | 92.5   | 97.3   |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 625.2  | 647.3  | 626.4  | 94.9   | 98.7   |
| 115°   | 709.0  | 729.9  | 760.8  | 189.9  | 101.2  |
| 117.5° | 781.7  | 806.3  | 827.4  | 650.9  | 328.0  |
| 120°   | 863.1  | 881.6  | 903.8  | 918.6  | 752.1  |
| 122.5° | 932.0  | 951.8  | 976.6  | 983.9  | 985.3  |
| 125°   | 1002.3 | 1018.5 | 1041.9 | 1050.5 | 1054.2 |
| 127.5° | 1066.4 | 1083.7 | 1102.4 | 1114.6 | 1115.8 |
| 130°   | 1126.9 | 1146.7 | 1160.2 | 1173.8 | 1172.7 |
| 132.5° | 1188.6 | 1204.7 | 1218.1 | 1229.3 | 1228.1 |
| 135°   | 1240.4 | 1260.2 | 1271.1 | 1283.7 | 1281.1 |
| 137.5° | 1294.6 | 1309.4 | 1321.8 | 1334.1 | 1330.5 |
| 140°   | 1347.6 | 1357.6 | 1371.0 | 1382.1 | 1376.1 |
| 142.5° | 1392.1 | 1400.8 | 1416.7 | 1426.5 | 1420.4 |
| 145°   | 1439.0 | 1437.7 | 1458.6 | 1467.2 | 1461.1 |
| 147.5° | 1479.6 | 1475.8 | 1496.8 | 1503.0 | 1498.1 |
| 150°   | 1519.0 | 1510.5 | 1530.1 | 1537.5 | 1531.4 |
| 152.5° | 1552.3 | 1542.5 | 1560.9 | 1568.4 | 1559.7 |
| 155°   | 1584.4 | 1573.4 | 1588.1 | 1595.5 | 1585.7 |
| 157.5° | 1610.2 | 1600.4 | 1611.5 | 1620.2 | 1610.2 |
| 160°   | 1632.5 | 1625.1 | 1632.5 | 1639.8 | 1631.2 |
| 162.5° | 1652.1 | 1644.9 | 1650.9 | 1659.6 | 1648.5 |
| 165°   | 1669.4 | 1662.1 | 1665.8 | 1674.3 | 1665.8 |
| 167.5° | 1683.0 | 1675.6 | 1679.4 | 1688.0 | 1676.9 |
| 170°   | 1694.1 | 1686.7 | 1689.2 | 1697.8 | 1686.7 |
| 172.5° | 1701.5 | 1694.1 | 1696.7 | 1705.2 | 1694.1 |
| 175°   | 1707.7 | 1699.0 | 1701.5 | 1710.1 | 1697.8 |
| 177.5° | 1710.1 | 1701.5 | 1702.8 | 1711.4 | 1700.3 |
| 180°   | 1703.9 | 1703.9 | 1703.9 | 1703.9 | 1703.9 |

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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 | 11.66            | 12.59 | 12.53 | 13.47 | 14.59 | 7.64           | 8.56  | 8.50  | 9.45  | 10.56 |
|                 | 3H   | 13.35            | 14.18 | 14.23 | 15.07 | 16.21 | 8.83           | 9.66  | 9.71  | 10.56 | 11.69 |
|                 | 4H   | 13.96            | 14.75 | 14.86 | 15.64 | 16.79 | 9.29           | 10.07 | 10.19 | 10.97 | 12.12 |
|                 | 6H   | 14.39            | 15.11 | 15.30 | 16.02 | 17.18 | 9.62           | 10.34 | 10.53 | 11.24 | 12.40 |
|                 | 8H   | 14.52            | 15.20 | 15.43 | 16.13 | 17.29 | 9.71           | 10.40 | 10.63 | 11.32 | 12.48 |
|                 | 12H  | 14.59            | 15.24 | 15.50 | 16.15 | 17.34 | 9.76           | 10.41 | 10.68 | 11.33 | 12.51 |
| 4H              | 2H   | 11.69            | 12.48 | 12.59 | 13.37 | 14.52 | 8.24           | 9.03  | 9.14  | 9.92  | 11.07 |
|                 | 3H   | 13.53            | 14.18 | 14.44 | 15.11 | 16.28 | 9.61           | 10.25 | 10.52 | 11.18 | 12.35 |
|                 | 4H   | 14.23            | 14.82 | 15.15 | 15.75 | 16.94 | 10.16          | 10.75 | 11.08 | 11.68 | 12.86 |
|                 | 6H   | 14.75            | 15.26 | 15.69 | 16.21 | 17.40 | 10.59          | 11.09 | 11.52 | 12.04 | 13.23 |
|                 | 8H   | 14.93            | 15.40 | 15.87 | 16.35 | 17.55 | 10.72          | 11.19 | 11.65 | 12.14 | 13.34 |
|                 | 12H  | 15.03            | 15.46 | 15.99 | 16.42 | 17.63 | 10.79          | 11.22 | 11.74 | 12.18 | 13.38 |
| 8H              | 4H   | 14.21            | 14.68 | 15.14 | 15.62 | 16.83 | 10.45          | 10.92 | 11.38 | 11.86 | 13.07 |
|                 | 6H   | 14.78            | 15.17 | 15.74 | 16.15 | 17.36 | 10.97          | 11.36 | 11.93 | 12.35 | 13.55 |
|                 | 8H   | 14.99            | 15.34 | 15.97 | 16.32 | 17.54 | 11.16          | 11.51 | 12.14 | 12.49 | 13.71 |
|                 | 12H  | 15.14            | 15.44 | 16.11 | 16.41 | 17.68 | 11.29          | 11.59 | 12.26 | 12.56 | 13.83 |
| 12H             | 4H   | 14.16            | 14.59 | 15.12 | 15.55 | 16.76 | 10.46          | 10.88 | 11.41 | 11.84 | 13.05 |
|                 | 6H   | 14.75            | 15.10 | 15.72 | 16.07 | 17.29 | 11.02          | 11.37 | 11.99 | 12.34 | 13.56 |
|                 | 8H   | 14.98            | 15.28 | 15.95 | 16.25 | 17.52 | 11.24          | 11.54 | 12.21 | 12.51 | 13.78 |

END OF REPORT