

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: P921153

Luminaire Tested: DFN2DIP-TR4F0-100D100US935-RLONL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P921153  
REPORT IS A COMBINATION OF REPORTS P902010 AND P898849  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-TR4F0-100D100US935-RLLONL  
Description: 4 foot, Triangle Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

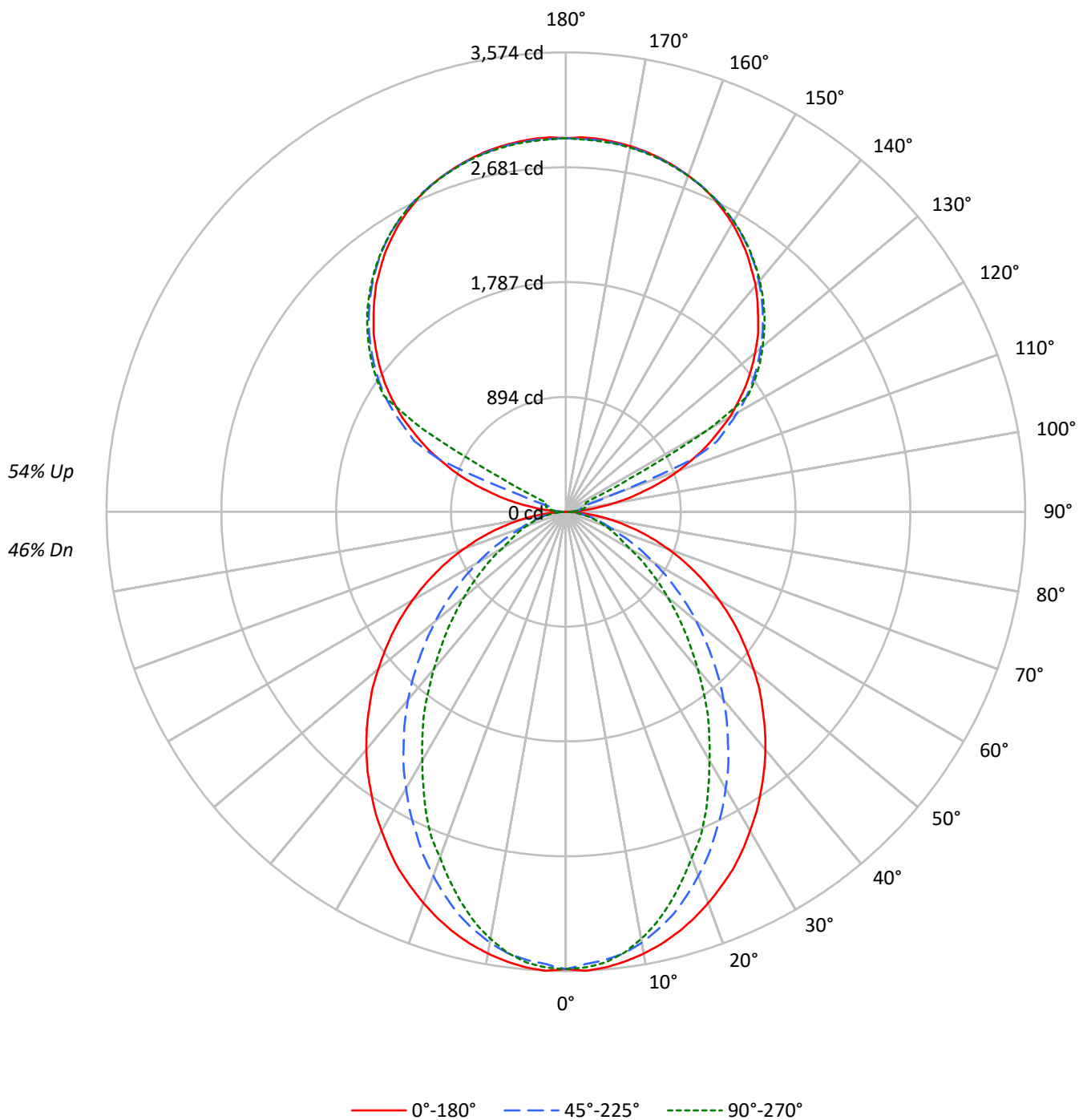
**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 15842.4 lumens  
Efficiency: N/A  
Efficacy: 89.3 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: General Diffuse  
  
Input Watts (W): 177.4  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9972  
Total Harmonic Distortion (THDi): 0.128  
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 |    |    |    |    | 0  |
| RW  | 70  | 50  | 30  | 10  | 70 | 50 | 30 | 10 | 50 | 30 | 10 | 50 | 30 | 10 | 50 | 30 | 10 | 50 | 30 | 10 |
| RCR |     |     |     |     |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 0   | 106 | 106 | 106 | 106 | 98 | 98 | 98 | 98 | 81 | 81 | 81 | 66 | 66 | 66 | 53 | 53 | 53 | 46 |    |    |
| 1   | 97  | 93  | 90  | 86  | 89 | 86 | 83 | 80 | 72 | 70 | 68 | 59 | 58 | 56 | 47 | 46 | 45 | 40 |    |    |
| 2   | 89  | 82  | 76  | 71  | 82 | 76 | 70 | 66 | 63 | 60 | 57 | 52 | 50 | 48 | 42 | 40 | 39 | 34 |    |    |
| 3   | 81  | 72  | 65  | 60  | 75 | 67 | 61 | 56 | 56 | 52 | 48 | 47 | 43 | 41 | 38 | 35 | 34 | 29 |    |    |
| 4   | 75  | 64  | 57  | 51  | 68 | 60 | 53 | 48 | 50 | 45 | 41 | 42 | 38 | 35 | 34 | 31 | 29 | 26 |    |    |
| 5   | 69  | 58  | 50  | 44  | 63 | 53 | 46 | 41 | 45 | 40 | 36 | 38 | 34 | 31 | 31 | 28 | 26 | 23 |    |    |
| 6   | 63  | 52  | 44  | 38  | 58 | 48 | 41 | 36 | 41 | 36 | 32 | 34 | 30 | 27 | 28 | 25 | 23 | 20 |    |    |
| 7   | 59  | 47  | 39  | 34  | 54 | 44 | 37 | 32 | 37 | 32 | 28 | 31 | 27 | 24 | 26 | 23 | 21 | 18 |    |    |
| 8   | 55  | 43  | 35  | 30  | 50 | 40 | 33 | 28 | 34 | 29 | 25 | 29 | 25 | 22 | 24 | 21 | 19 | 16 |    |    |
| 9   | 51  | 39  | 32  | 27  | 47 | 36 | 30 | 25 | 31 | 26 | 22 | 27 | 23 | 20 | 22 | 19 | 17 | 15 |    |    |
| 10  | 48  | 36  | 29  | 24  | 44 | 33 | 27 | 23 | 29 | 24 | 20 | 25 | 21 | 18 | 20 | 18 | 15 | 13 |    |    |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 2827 | 2827 | 2827 |
| 5°  | 2832 | 2782 | 2800 |
| 10° | 2803 | 2727 | 2709 |
| 15° | 2765 | 2637 | 2568 |
| 20° | 2714 | 2513 | 2395 |
| 25° | 2662 | 2374 | 2228 |
| 30° | 2592 | 2231 | 2016 |
| 35° | 2523 | 2077 | 1830 |
| 40° | 2453 | 1918 | 1617 |
| 45° | 2371 | 1742 | 1424 |
| 50° | 2287 | 1564 | 1235 |
| 55° | 2200 | 1374 | 1053 |
| 60° | 2098 | 1175 | 867  |
| 65° | 1981 | 973  | 780  |
| 70° | 1840 | 784  | 706  |
| 75° | 1662 | 691  | 642  |
| 80° | 1404 | 580  | 557  |
| 85° | 979  | 387  | 418  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 2371 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 333.5   | 2.1       |
| 10°-20°   | 915.5   | 5.8       |
| 20°-30°   | 1285.4  | 8.1       |
| 30°-40°   | 1401.2  | 8.8       |
| 40°-50°   | 1287.8  | 8.1       |
| 50°-60°   | 1011.4  | 6.4       |
| 60°-70°   | 658.3   | 4.2       |
| 70°-80°   | 338.9   | 2.1       |
| 80°-90°   | 91.6    | 0.6       |
| 90°-100°  | 95.8    | 0.6       |
| 100°-110° | 357.2   | 2.3       |
| 110°-120° | 947.3   | 6.0       |
| 120°-130° | 1571.2  | 9.9       |
| 130°-140° | 1669.0  | 10.5      |
| 140°-150° | 1551.1  | 9.8       |
| 150°-160° | 1247.1  | 7.9       |
| 160°-170° | 803.6   | 5.1       |
| 170°-180° | 276.6   | 1.7       |
| 0°-30°    | 2534.4  | 16.0      |
| 0°-40°    | 3935.6  | 24.8      |
| 0°-60°    | 6234.8  | 39.4      |
| 0°-90°    | 7323.6  | 46.2      |
| 90°-120°  | 1400.3  | 8.8       |
| 90°-150°  | 6191.6  | 39.1      |
| 90°-180°  | 8519.0  | 53.8      |
| 0°-180°   | 15842.4 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 3558 | 3558  | 3558 | 3558  | 3558 |      |
| 5°   | 3558 | 3542  | 3500 | 3530  | 3520 | 337  |
| 15°  | 3385 | 3349  | 3240 | 3178  | 3146 | 954  |
| 25°  | 3072 | 2969  | 2757 | 2625  | 2576 | 1413 |
| 35°  | 2647 | 2483  | 2200 | 1997  | 1926 | 1657 |
| 45°  | 2164 | 1948  | 1610 | 1381  | 1304 | 1671 |
| 55°  | 1646 | 1394  | 1046 | 854   | 792  | 1470 |
| 65°  | 1111 | 850   | 560  | 451   | 441  | 1102 |
| 75°  | 592  | 367   | 258  | 235   | 232  | 627  |
| 85°  | 138  | 71    | 61   | 61    | 61   | 159  |
| 90°  | 2    | 25    | 42   | 53    | 57   | 15   |
| 95°  | 137  | 67    | 82   | 93    | 90   | 162  |
| 105° | 639  | 702   | 128  | 151   | 160  | 683  |
| 115° | 1209 | 1245  | 1297 | 324   | 172  | 1190 |
| 125° | 1709 | 1737  | 1777 | 1792  | 1798 | 1524 |
| 135° | 2115 | 2149  | 2168 | 2189  | 2185 | 1634 |
| 145° | 2454 | 2452  | 2487 | 2502  | 2492 | 1535 |
| 155° | 2702 | 2683  | 2708 | 2721  | 2704 | 1245 |
| 165° | 2847 | 2834  | 2841 | 2855  | 2841 | 804  |
| 175° | 2912 | 2897  | 2902 | 2916  | 2895 | 277  |
| 180° | 2906 | 2906  | 2906 | 2906  | 2906 |      |

TEST NUMBER: P921153

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 3558.5 | 3558.5 | 3558.5 | 3558.5 | 3558.5 |
| 2.5°   | 3574.5 | 3558.5 | 3522.9 | 3555.4 | 3548.9 |
| 5°     | 3558.5 | 3542.4 | 3500.4 | 3529.5 | 3519.8 |
| 7.5°   | 3529.5 | 3510.3 | 3465.2 | 3477.8 | 3461.8 |
| 10°    | 3490.8 | 3468.3 | 3404.0 | 3394.1 | 3375.0 |
| 12.5°  | 3442.7 | 3413.6 | 3326.5 | 3307.4 | 3271.8 |
| 15°    | 3384.6 | 3349.0 | 3239.7 | 3178.5 | 3146.4 |
| 17.5°  | 3316.9 | 3265.3 | 3130.1 | 3059.3 | 3007.7 |
| 20°    | 3239.7 | 3175.1 | 3014.2 | 2933.9 | 2862.8 |
| 22.5°  | 3156.0 | 3081.9 | 2894.9 | 2785.7 | 2737.5 |
| 25°    | 3072.3 | 2969.2 | 2756.6 | 2624.7 | 2576.2 |
| 27.5°  | 2972.5 | 2862.8 | 2627.8 | 2476.4 | 2402.3 |
| 30°    | 2866.3 | 2743.6 | 2486.0 | 2322.0 | 2234.9 |
| 32.5°  | 2763.1 | 2614.8 | 2351.0 | 2157.7 | 2077.0 |
| 35°    | 2647.2 | 2482.9 | 2199.7 | 1996.7 | 1925.6 |
| 37.5°  | 2534.5 | 2357.2 | 2057.9 | 1835.5 | 1755.1 |
| 40°    | 2415.3 | 2222.2 | 1909.6 | 1681.0 | 1597.3 |
| 42.5°  | 2292.9 | 2086.9 | 1761.7 | 1523.2 | 1442.9 |
| 45°    | 2164.1 | 1948.2 | 1610.3 | 1381.4 | 1304.2 |
| 47.5°  | 2041.9 | 1813.3 | 1465.4 | 1236.5 | 1165.8 |
| 50°    | 1906.5 | 1677.9 | 1323.6 | 1101.2 | 1033.9 |
| 52.5°  | 1774.3 | 1532.7 | 1188.3 | 975.8  | 914.6  |
| 55°    | 1645.5 | 1394.4 | 1046.5 | 853.5  | 792.3  |
| 57.5°  | 1513.6 | 1255.9 | 921.2  | 740.7  | 689.1  |
| 60°    | 1378.3 | 1120.7 | 788.9  | 624.9  | 573.3  |
| 62.5°  | 1246.4 | 988.8  | 676.1  | 521.8  | 496.1  |
| 65°    | 1111.1 | 850.1  | 560.3  | 451.0  | 441.1  |
| 67.5°  | 982.3  | 721.3  | 451.0  | 396.0  | 386.4  |
| 70°    | 847.0  | 595.9  | 373.4  | 341.3  | 328.4  |
| 72.5°  | 718.2  | 479.7  | 312.3  | 286.6  | 280.2  |
| 75°    | 592.5  | 367.0  | 257.6  | 235.1  | 232.0  |
| 77.5°  | 467.1  | 260.7  | 202.9  | 189.9  | 183.5  |
| 80°    | 350.9  | 186.9  | 154.5  | 141.8  | 141.8  |
| 82.5°  | 244.6  | 125.7  | 106.2  | 99.8   | 99.8   |
| 85°    | 138.4  | 70.7   | 61.1   | 61.1   | 61.1   |
| 87.5°  | 51.6   | 25.7   | 25.7   | 22.6   | 22.6   |
| 90°    | 2.0    | 25.2   | 41.9   | 52.7   | 56.7   |
| 92.5°  | 52.7   | 44.2   | 50.5   | 54.7   | 56.7   |
| 95°    | 136.6  | 67.2   | 81.9   | 92.6   | 90.4   |
| 97.5°  | 245.9  | 73.6   | 107.1  | 113.6  | 115.6  |
| 100°   | 372.3  | 84.1   | 119.9  | 136.6  | 140.9  |
| 102.5° | 510.8  | 506.9  | 124.1  | 147.1  | 153.5  |
| 105°   | 639.2  | 702.3  | 128.4  | 151.3  | 159.8  |
| 107.5° | 788.5  | 840.9  | 132.6  | 155.6  | 164.0  |
| 110°   | 931.5  | 975.5  | 368.0  | 157.8  | 166.0  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 1066.1 | 1103.8 | 1068.2 | 161.8  | 168.3  |
| 115°   | 1208.9 | 1244.7 | 1297.4 | 323.8  | 172.5  |
| 117.5° | 1333.0 | 1375.0 | 1410.9 | 1110.1 | 559.3  |
| 120°   | 1471.9 | 1503.3 | 1541.3 | 1566.5 | 1282.6 |
| 122.5° | 1589.5 | 1623.2 | 1665.3 | 1677.8 | 1680.1 |
| 125°   | 1709.3 | 1736.8 | 1776.8 | 1791.5 | 1797.7 |
| 127.5° | 1818.7 | 1848.1 | 1879.8 | 1900.8 | 1902.8 |
| 130°   | 1921.7 | 1955.5 | 1978.5 | 2001.6 | 1999.7 |
| 132.5° | 2026.9 | 2054.3 | 2077.3 | 2096.3 | 2094.3 |
| 135°   | 2115.3 | 2149.0 | 2167.7 | 2188.9 | 2184.7 |
| 137.5° | 2207.7 | 2232.9 | 2254.1 | 2275.1 | 2268.8 |
| 140°   | 2298.0 | 2315.1 | 2338.0 | 2357.0 | 2346.5 |
| 142.5° | 2373.9 | 2388.7 | 2415.9 | 2432.6 | 2422.2 |
| 145°   | 2453.8 | 2451.6 | 2487.3 | 2502.1 | 2491.6 |
| 147.5° | 2523.0 | 2516.8 | 2552.4 | 2562.9 | 2554.8 |
| 150°   | 2590.4 | 2575.7 | 2609.4 | 2621.9 | 2611.4 |
| 152.5° | 2647.1 | 2630.3 | 2661.9 | 2674.5 | 2659.8 |
| 155°   | 2701.8 | 2683.0 | 2708.3 | 2720.8 | 2704.0 |
| 157.5° | 2746.0 | 2729.3 | 2748.2 | 2762.9 | 2746.0 |
| 160°   | 2784.0 | 2771.2 | 2784.0 | 2796.4 | 2781.7 |
| 162.5° | 2817.4 | 2804.9 | 2815.4 | 2830.1 | 2811.2 |
| 165°   | 2846.8 | 2834.3 | 2840.6 | 2855.3 | 2840.6 |
| 167.5° | 2870.1 | 2857.3 | 2863.9 | 2878.6 | 2859.5 |
| 170°   | 2889.0 | 2876.3 | 2880.6 | 2895.3 | 2876.3 |
| 172.5° | 2901.5 | 2889.0 | 2893.3 | 2908.0 | 2889.0 |
| 175°   | 2912.0 | 2897.3 | 2901.5 | 2916.3 | 2895.3 |
| 177.5° | 2916.3 | 2901.5 | 2903.8 | 2918.5 | 2899.5 |
| 180°   | 2905.8 | 2905.8 | 2905.8 | 2905.8 | 2905.8 |

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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 | 10.39            | 11.19 | 11.38 | 12.19 | 13.52 | 6.36           | 7.16  | 7.36  | 8.17  | 9.49  |
|                 | 3H   | 12.06            | 12.78 | 13.07 | 13.79 | 15.14 | 7.55           | 8.27  | 8.56  | 9.28  | 10.62 |
|                 | 4H   | 12.67            | 13.35 | 13.69 | 14.36 | 15.72 | 8.00           | 8.68  | 9.02  | 9.69  | 11.05 |
|                 | 6H   | 13.09            | 13.71 | 14.12 | 14.73 | 16.10 | 8.32           | 8.94  | 9.35  | 9.96  | 11.33 |
|                 | 8H   | 13.22            | 13.81 | 14.25 | 14.84 | 16.21 | 8.41           | 9.00  | 9.44  | 10.04 | 11.40 |
|                 | 12H  | 13.28            | 13.84 | 14.32 | 14.87 | 16.26 | 8.45           | 9.02  | 9.49  | 10.05 | 11.43 |
| 4H              | 2H   | 10.40            | 11.08 | 11.43 | 12.10 | 13.45 | 6.95           | 7.63  | 7.98  | 8.65  | 10.00 |
|                 | 3H   | 12.23            | 12.79 | 13.26 | 13.84 | 15.20 | 8.30           | 8.87  | 9.34  | 9.91  | 11.28 |
|                 | 4H   | 12.92            | 13.44 | 13.96 | 14.47 | 15.86 | 8.85           | 9.36  | 9.89  | 10.40 | 11.79 |
|                 | 6H   | 13.43            | 13.88 | 14.49 | 14.93 | 16.32 | 9.27           | 9.71  | 10.32 | 10.77 | 12.16 |
|                 | 8H   | 13.61            | 14.02 | 14.66 | 15.07 | 16.47 | 9.40           | 9.81  | 10.45 | 10.86 | 12.26 |
|                 | 12H  | 13.70            | 14.07 | 14.77 | 15.14 | 16.55 | 9.46           | 9.83  | 10.53 | 10.90 | 12.31 |
| 8H              | 4H   | 12.89            | 13.30 | 13.94 | 14.35 | 15.75 | 9.13           | 9.54  | 10.18 | 10.59 | 11.99 |
|                 | 6H   | 13.45            | 13.79 | 14.53 | 14.89 | 16.28 | 9.65           | 9.99  | 10.72 | 11.08 | 12.48 |
|                 | 8H   | 13.67            | 13.97 | 14.75 | 15.04 | 16.46 | 9.84           | 10.14 | 10.92 | 11.21 | 12.63 |
|                 | 12H  | 13.81            | 14.07 | 14.89 | 15.14 | 16.60 | 9.96           | 10.22 | 11.04 | 11.29 | 12.75 |
| 12H             | 4H   | 12.84            | 13.21 | 13.91 | 14.28 | 15.68 | 9.13           | 9.50  | 10.20 | 10.57 | 11.98 |
|                 | 6H   | 13.43            | 13.73 | 14.51 | 14.80 | 16.22 | 9.70           | 9.99  | 10.78 | 11.07 | 12.49 |
|                 | 8H   | 13.65            | 13.91 | 14.73 | 14.98 | 16.44 | 9.91           | 10.17 | 10.99 | 11.24 | 12.70 |

END OF REPORT