

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: P922911

Luminaire Tested: DFN2DIP-SQ3F0-090D090US940-RLLONL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P922911  
REPORT IS A COMBINATION OF REPORTS P901482 AND P898289  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-SQ3F0-090D090US940-RLLONL  
Description: 3 foot, Square Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

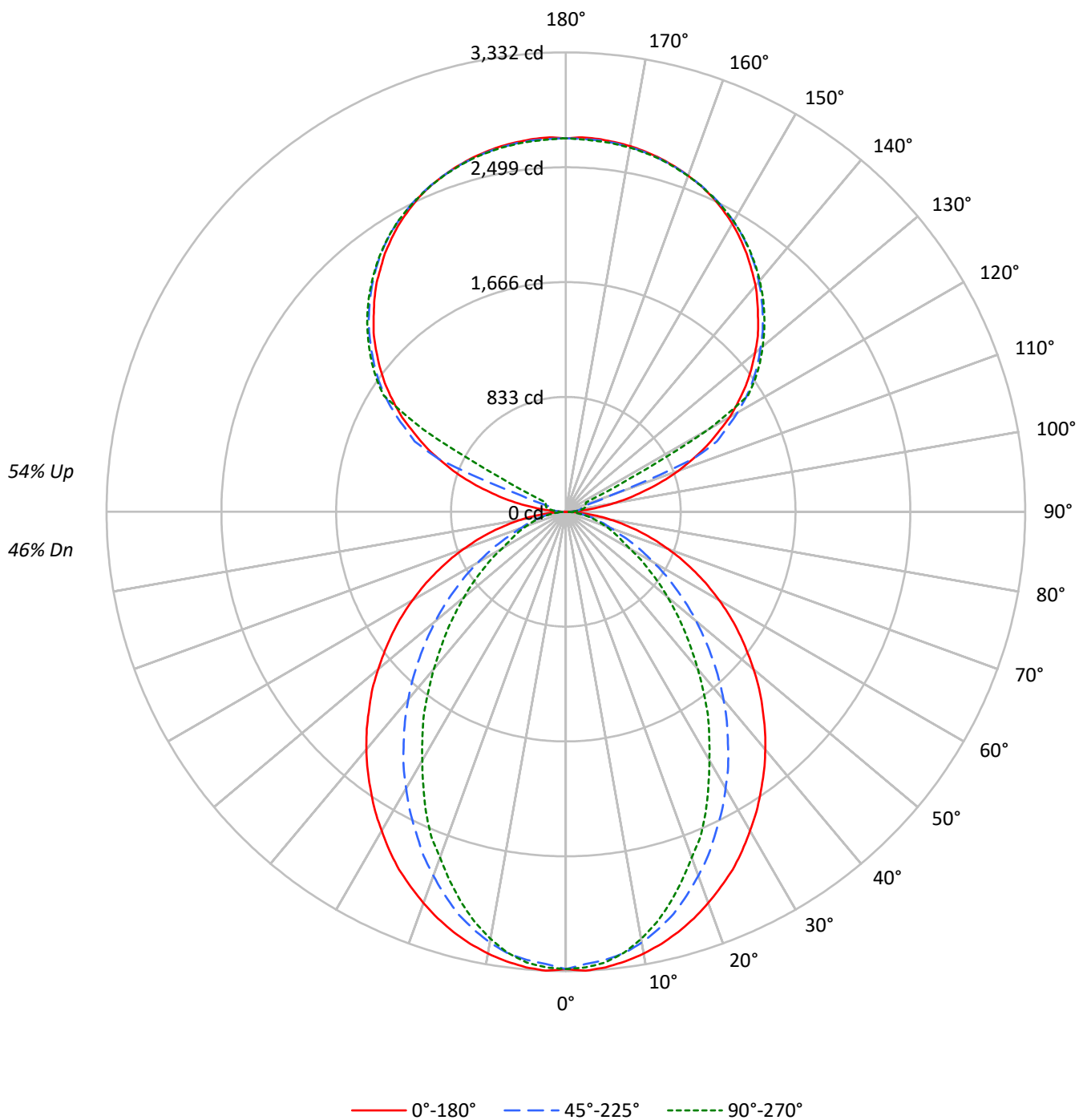
Lumens per Lamp: N/A  
Luminaire Lumens: 14766.7 lumens  
Efficiency: N/A  
Efficacy: 94.5 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 0.99 / 1.16  
Luminous Opening: Rectangular w/ Sides (W: 3.06' x L: 3.06' x H: 0.1')  
CIE Type: General Diffuse

Input Watts (W): 156.3  
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 |    |    |    |    | 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°  | 3801 | 3801 | 3801 |
| 5°  | 3804 | 3738 | 3763 |
| 10° | 3764 | 3662 | 3639 |
| 15° | 3710 | 3538 | 3449 |
| 20° | 3639 | 3369 | 3215 |
| 25° | 3566 | 3180 | 2990 |
| 30° | 3469 | 2986 | 2705 |
| 35° | 3374 | 2778 | 2455 |
| 40° | 3278 | 2563 | 2168 |
| 45° | 3165 | 2325 | 1908 |
| 50° | 3049 | 2085 | 1654 |
| 55° | 2927 | 1828 | 1410 |
| 60° | 2787 | 1561 | 1159 |
| 65° | 2624 | 1289 | 1042 |
| 70° | 2427 | 1035 | 941  |
| 75° | 2179 | 907  | 853  |
| 80° | 1821 | 753  | 736  |
| 85° | 1234 | 491  | 546  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 3165 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 310.9   | 2.1       |
| 10°-20°   | 853.4   | 5.8       |
| 20°-30°   | 1198.1  | 8.1       |
| 30°-40°   | 1306.0  | 8.8       |
| 40°-50°   | 1200.4  | 8.1       |
| 50°-60°   | 942.7   | 6.4       |
| 60°-70°   | 613.6   | 4.2       |
| 70°-80°   | 315.9   | 2.1       |
| 80°-90°   | 85.4    | 0.6       |
| 90°-100°  | 89.3    | 0.6       |
| 100°-110° | 332.9   | 2.3       |
| 110°-120° | 883.0   | 6.0       |
| 120°-130° | 1464.5  | 9.9       |
| 130°-140° | 1555.6  | 10.5      |
| 140°-150° | 1445.8  | 9.8       |
| 150°-160° | 1162.4  | 7.9       |
| 160°-170° | 749.0   | 5.1       |
| 170°-180° | 257.8   | 1.7       |
| 0°-30°    | 2362.4  | 16.0      |
| 0°-40°    | 3668.4  | 24.8      |
| 0°-60°    | 5811.5  | 39.4      |
| 0°-90°    | 6826.4  | 46.2      |
| 90°-120°  | 1305.2  | 8.8       |
| 90°-150°  | 5771.2  | 39.1      |
| 90°-180°  | 7940.0  | 53.8      |
| 0°-180°   | 14766.7 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 3317 | 3317  | 3317 | 3317  | 3317 |      |
| 5°   | 3317 | 3302  | 3263 | 3290  | 3281 | 315  |
| 15°  | 3155 | 3122  | 3020 | 2963  | 2933 | 889  |
| 25°  | 2864 | 2768  | 2570 | 2446  | 2401 | 1317 |
| 35°  | 2468 | 2314  | 2050 | 1861  | 1795 | 1544 |
| 45°  | 2017 | 1816  | 1501 | 1288  | 1216 | 1558 |
| 55°  | 1534 | 1300  | 975  | 796   | 738  | 1371 |
| 65°  | 1036 | 792   | 522  | 420   | 411  | 1027 |
| 75°  | 552  | 342   | 240  | 219   | 216  | 584  |
| 85°  | 129  | 66    | 57   | 57    | 57   | 148  |
| 90°  | 2    | 24    | 39   | 49    | 53   | 14   |
| 95°  | 127  | 63    | 76   | 86    | 84   | 151  |
| 105° | 596  | 655   | 120  | 141   | 149  | 637  |
| 115° | 1127 | 1160  | 1209 | 302   | 161  | 1109 |
| 125° | 1593 | 1619  | 1656 | 1670  | 1676 | 1421 |
| 135° | 1972 | 2003  | 2020 | 2040  | 2036 | 1523 |
| 145° | 2287 | 2285  | 2318 | 2332  | 2322 | 1431 |
| 155° | 2518 | 2501  | 2524 | 2536  | 2520 | 1161 |
| 165° | 2654 | 2642  | 2648 | 2662  | 2648 | 750  |
| 175° | 2714 | 2700  | 2705 | 2718  | 2699 | 258  |
| 180° | 2708 | 2708  | 2708 | 2708  | 2708 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 3316.9 | 3316.9 | 3316.9 | 3316.9 | 3316.9 |
| 2.5°   | 3331.9 | 3316.9 | 3283.7 | 3314.0 | 3308.0 |
| 5°     | 3316.9 | 3301.9 | 3262.8 | 3289.8 | 3280.9 |
| 7.5°   | 3289.8 | 3272.0 | 3230.0 | 3241.7 | 3226.7 |
| 10°    | 3253.9 | 3232.8 | 3173.0 | 3163.7 | 3145.9 |
| 12.5°  | 3208.9 | 3181.9 | 3100.7 | 3082.8 | 3049.6 |
| 15°    | 3154.8 | 3121.7 | 3019.8 | 2962.7 | 2932.8 |
| 17.5°  | 3091.7 | 3043.7 | 2917.5 | 2851.6 | 2803.5 |
| 20°    | 3019.8 | 2959.6 | 2809.5 | 2734.7 | 2668.4 |
| 22.5°  | 2941.8 | 2872.6 | 2698.4 | 2596.5 | 2551.6 |
| 25°    | 2863.7 | 2767.5 | 2569.5 | 2446.5 | 2401.3 |
| 27.5°  | 2770.7 | 2668.4 | 2449.4 | 2308.3 | 2239.2 |
| 30°    | 2671.7 | 2557.3 | 2317.2 | 2164.4 | 2083.1 |
| 32.5°  | 2575.4 | 2437.2 | 2191.4 | 2011.2 | 1936.0 |
| 35°    | 2467.5 | 2314.3 | 2050.3 | 1861.2 | 1794.9 |
| 37.5°  | 2362.4 | 2197.2 | 1918.2 | 1710.8 | 1636.0 |
| 40°    | 2251.3 | 2071.4 | 1779.9 | 1566.9 | 1488.9 |
| 42.5°  | 2137.3 | 1945.3 | 1642.0 | 1419.8 | 1344.9 |
| 45°    | 2017.2 | 1816.0 | 1500.9 | 1287.5 | 1215.6 |
| 47.5°  | 1903.2 | 1690.1 | 1365.9 | 1152.5 | 1086.6 |
| 50°    | 1777.1 | 1564.0 | 1233.8 | 1026.4 | 963.7  |
| 52.5°  | 1653.9 | 1428.7 | 1107.7 | 909.5  | 852.6  |
| 55°    | 1533.7 | 1299.7 | 975.4  | 795.6  | 738.5  |
| 57.5°  | 1410.9 | 1170.7 | 858.6  | 690.5  | 642.4  |
| 60°    | 1284.7 | 1044.5 | 735.4  | 582.5  | 534.4  |
| 62.5°  | 1161.8 | 921.7  | 630.3  | 486.3  | 462.4  |
| 65°    | 1035.6 | 792.4  | 522.3  | 420.4  | 411.2  |
| 67.5°  | 915.6  | 672.3  | 420.4  | 369.1  | 360.2  |
| 70°    | 789.5  | 555.4  | 348.1  | 318.2  | 306.0  |
| 72.5°  | 669.4  | 447.1  | 291.1  | 267.2  | 261.2  |
| 75°    | 552.2  | 342.1  | 240.1  | 219.1  | 216.2  |
| 77.5°  | 435.3  | 243.0  | 189.1  | 177.1  | 171.0  |
| 80°    | 327.1  | 174.2  | 143.9  | 132.2  | 132.2  |
| 82.5°  | 228.0  | 117.2  | 99.1   | 93.0   | 93.0   |
| 85°    | 128.9  | 65.9   | 57.0   | 57.0   | 57.0   |
| 87.5°  | 48.1   | 23.9   | 23.9   | 21.0   | 21.0   |
| 90°    | 1.9    | 23.5   | 39.1   | 49.1   | 52.8   |
| 92.5°  | 49.1   | 41.2   | 47.0   | 51.0   | 52.8   |
| 95°    | 127.3  | 62.6   | 76.3   | 86.3   | 84.3   |
| 97.5°  | 229.3  | 68.7   | 99.9   | 105.8  | 107.7  |
| 100°   | 347.0  | 78.5   | 111.7  | 127.3  | 131.3  |
| 102.5° | 476.2  | 472.4  | 115.7  | 137.1  | 143.1  |
| 105°   | 595.8  | 654.7  | 119.6  | 141.1  | 148.9  |
| 107.5° | 734.9  | 783.8  | 123.6  | 145.0  | 152.9  |
| 110°   | 868.3  | 909.3  | 343.0  | 147.0  | 154.8  |



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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 993.7  | 1028.9 | 995.6  | 150.8  | 156.9  |
| 115°   | 1126.9 | 1160.1 | 1209.2 | 301.8  | 160.8  |
| 117.5° | 1242.5 | 1281.7 | 1315.1 | 1034.7 | 521.3  |
| 120°   | 1371.9 | 1401.2 | 1436.6 | 1460.1 | 1195.5 |
| 122.5° | 1481.6 | 1513.0 | 1552.3 | 1563.9 | 1566.0 |
| 125°   | 1593.2 | 1618.8 | 1656.1 | 1669.8 | 1675.6 |
| 127.5° | 1695.1 | 1722.6 | 1752.2 | 1771.7 | 1773.6 |
| 130°   | 1791.3 | 1822.7 | 1844.1 | 1865.7 | 1863.9 |
| 132.5° | 1889.3 | 1914.9 | 1936.3 | 1954.0 | 1952.1 |
| 135°   | 1971.7 | 2003.0 | 2020.5 | 2040.3 | 2036.4 |
| 137.5° | 2057.8 | 2081.3 | 2101.0 | 2120.6 | 2114.8 |
| 140°   | 2142.0 | 2157.8 | 2179.3 | 2196.9 | 2187.2 |
| 142.5° | 2212.8 | 2226.5 | 2251.8 | 2267.4 | 2257.7 |
| 145°   | 2287.2 | 2285.1 | 2318.4 | 2332.2 | 2322.4 |
| 147.5° | 2351.7 | 2345.9 | 2379.2 | 2389.0 | 2381.2 |
| 150°   | 2414.6 | 2400.8 | 2432.2 | 2443.8 | 2434.1 |
| 152.5° | 2467.4 | 2451.8 | 2481.1 | 2493.0 | 2479.2 |
| 155°   | 2518.4 | 2500.9 | 2524.3 | 2536.0 | 2520.4 |
| 157.5° | 2559.6 | 2544.0 | 2561.6 | 2575.3 | 2559.6 |
| 160°   | 2594.9 | 2583.0 | 2594.9 | 2606.6 | 2592.8 |
| 162.5° | 2626.1 | 2614.4 | 2624.2 | 2637.9 | 2620.3 |
| 165°   | 2653.6 | 2641.9 | 2647.8 | 2661.5 | 2647.8 |
| 167.5° | 2675.2 | 2663.4 | 2669.3 | 2683.1 | 2665.4 |
| 170°   | 2692.9 | 2681.0 | 2684.9 | 2698.7 | 2681.0 |
| 172.5° | 2704.6 | 2692.9 | 2696.8 | 2710.5 | 2692.9 |
| 175°   | 2714.3 | 2700.5 | 2704.6 | 2718.2 | 2698.7 |
| 177.5° | 2718.2 | 2704.6 | 2706.6 | 2720.3 | 2702.7 |
| 180°   | 2708.5 | 2708.5 | 2708.5 | 2708.5 | 2708.5 |

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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 | 11.39            | 12.19 | 12.38 | 13.19 | 14.52 | 7.35           | 8.15  | 8.35  | 9.15  | 10.48 |
|                 | 3H   | 13.06            | 13.77 | 14.07 | 14.79 | 16.13 | 8.53           | 9.25  | 9.54  | 10.26 | 11.60 |
|                 | 4H   | 13.66            | 14.34 | 14.68 | 15.35 | 16.71 | 8.97           | 9.65  | 9.99  | 10.67 | 12.02 |
|                 | 6H   | 14.08            | 14.70 | 15.11 | 15.72 | 17.09 | 9.29           | 9.91  | 10.32 | 10.93 | 12.30 |
|                 | 8H   | 14.20            | 14.80 | 15.24 | 15.83 | 17.19 | 9.37           | 9.97  | 10.41 | 11.00 | 12.37 |
|                 | 12H  | 14.26            | 14.83 | 15.30 | 15.85 | 17.24 | 9.41           | 9.98  | 10.45 | 11.01 | 12.39 |
| 4H              | 2H   | 11.40            | 12.08 | 12.43 | 13.09 | 14.45 | 7.94           | 8.62  | 8.96  | 9.63  | 10.99 |
|                 | 3H   | 13.22            | 13.79 | 14.26 | 14.83 | 16.20 | 9.28           | 9.84  | 10.31 | 10.88 | 12.25 |
|                 | 4H   | 13.91            | 14.42 | 14.95 | 15.46 | 16.85 | 9.82           | 10.34 | 10.86 | 11.37 | 12.76 |
|                 | 6H   | 14.42            | 14.86 | 15.47 | 15.92 | 17.31 | 10.23          | 10.67 | 11.28 | 11.73 | 13.12 |
|                 | 8H   | 14.59            | 15.00 | 15.64 | 16.05 | 17.46 | 10.36          | 10.77 | 11.41 | 11.82 | 13.22 |
|                 | 12H  | 14.68            | 15.05 | 15.75 | 16.12 | 17.53 | 10.42          | 10.79 | 11.48 | 11.85 | 13.26 |
| 8H              | 4H   | 13.87            | 14.29 | 14.92 | 15.34 | 16.74 | 10.10          | 10.51 | 11.15 | 11.56 | 12.96 |
|                 | 6H   | 14.43            | 14.77 | 15.51 | 15.87 | 17.27 | 10.60          | 10.94 | 11.68 | 12.04 | 13.44 |
|                 | 8H   | 14.65            | 14.95 | 15.73 | 16.02 | 17.44 | 10.79          | 11.09 | 11.87 | 12.17 | 13.59 |
|                 | 12H  | 14.78            | 15.04 | 15.86 | 16.11 | 17.58 | 10.90          | 11.17 | 11.99 | 12.24 | 13.70 |
| 12H             | 4H   | 13.82            | 14.20 | 14.89 | 15.26 | 16.67 | 10.10          | 10.47 | 11.17 | 11.54 | 12.94 |
|                 | 6H   | 14.41            | 14.71 | 15.49 | 15.78 | 17.20 | 10.65          | 10.95 | 11.73 | 12.03 | 13.45 |
|                 | 8H   | 14.62            | 14.89 | 15.71 | 15.96 | 17.42 | 10.86          | 11.12 | 11.94 | 12.19 | 13.65 |

END OF REPORT