

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: P911611

Luminaire Tested: DFN2DIP-PN4F0-110D110US850-RLLONL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P911611  
REPORT IS A COMBINATION OF REPORTS P901270 AND P898053  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-PN4F0-110D110US850-RLLONL  
Description: 4 foot, Pentagon Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

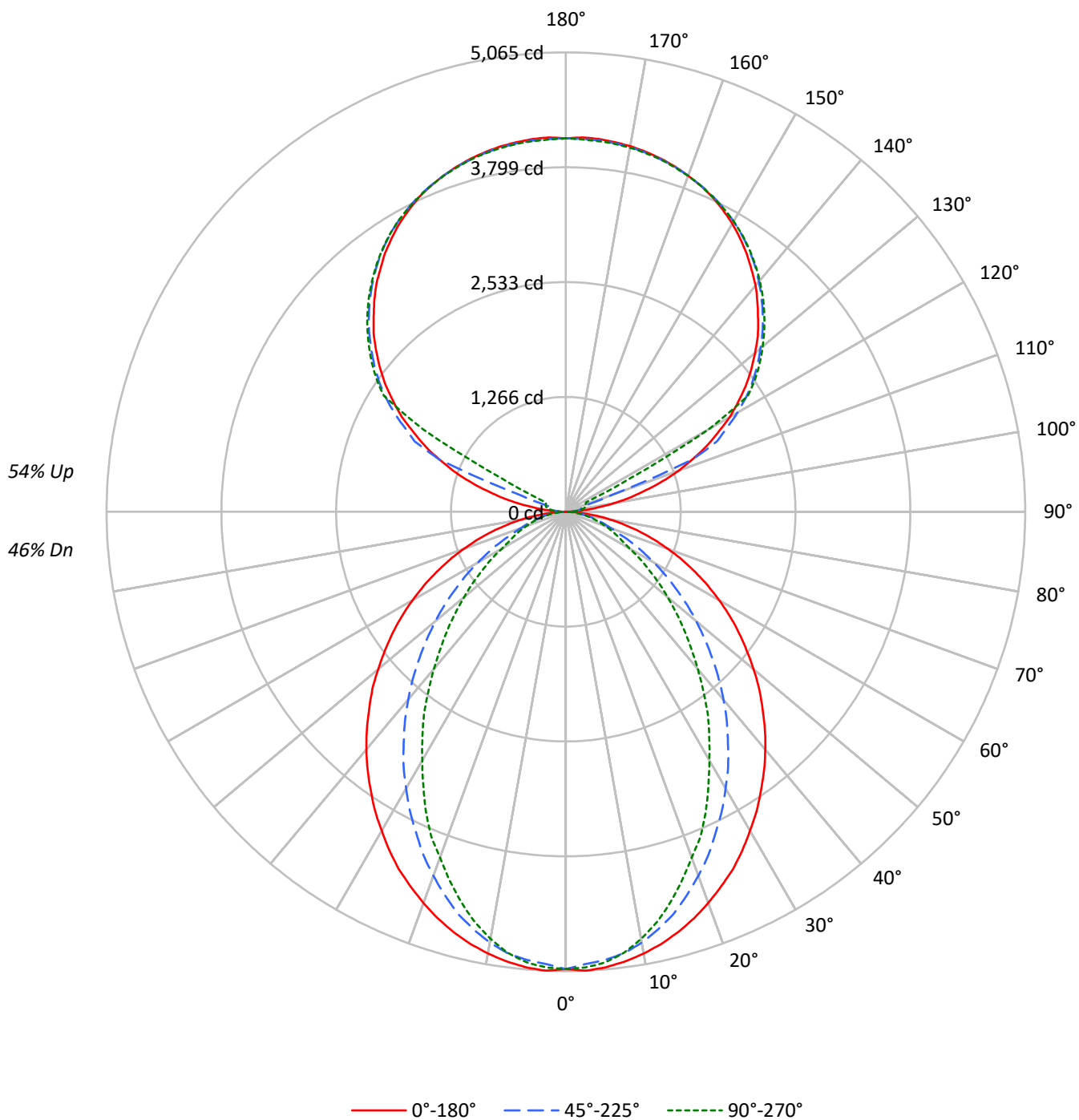
**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 22446.1 lumens  
Efficiency: N/A  
Efficacy: 109.0 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 0.99 / 1.16  
Luminous Opening: Rectangular w/ Sides (W: 3.74' x L: 3.94' x H: 0.1')  
CIE Type: General Diffuse  
  
Input Watts (W): 205.9  
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 |    |    |    | 10 |
| RW  | 70  | 50  | 30  | 10  | 70 | 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 |
| 1   | 97  | 93  | 90  | 86  | 89 | 86 | 83 | 80 | 72 | 70 | 68 | 59 | 58 | 56 | 47 | 46 | 45 |
| 2   | 89  | 82  | 76  | 71  | 82 | 76 | 70 | 66 | 63 | 60 | 57 | 52 | 50 | 48 | 42 | 40 | 39 |
| 3   | 81  | 72  | 65  | 60  | 75 | 67 | 61 | 56 | 56 | 52 | 48 | 47 | 43 | 41 | 38 | 35 | 34 |
| 4   | 75  | 64  | 57  | 51  | 68 | 60 | 53 | 48 | 50 | 45 | 41 | 42 | 38 | 35 | 34 | 31 | 29 |
| 5   | 69  | 58  | 50  | 44  | 63 | 53 | 46 | 41 | 45 | 40 | 36 | 38 | 34 | 31 | 31 | 28 | 26 |
| 6   | 63  | 52  | 44  | 38  | 58 | 48 | 41 | 36 | 41 | 36 | 32 | 34 | 30 | 27 | 28 | 25 | 23 |
| 7   | 59  | 47  | 39  | 34  | 54 | 44 | 37 | 32 | 37 | 32 | 28 | 31 | 27 | 24 | 26 | 23 | 21 |
| 8   | 55  | 43  | 35  | 30  | 50 | 40 | 33 | 28 | 34 | 29 | 25 | 29 | 25 | 22 | 24 | 21 | 19 |
| 9   | 51  | 39  | 32  | 27  | 47 | 36 | 30 | 25 | 31 | 26 | 22 | 27 | 23 | 20 | 22 | 19 | 17 |
| 10  | 48  | 36  | 29  | 24  | 44 | 33 | 27 | 23 | 29 | 24 | 20 | 25 | 21 | 18 | 20 | 18 | 15 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 3680 | 3680 | 3680 |
| 5°  | 3686 | 3622 | 3646 |
| 10° | 3650 | 3552 | 3528 |
| 15° | 3599 | 3435 | 3345 |
| 20° | 3533 | 3274 | 3121 |
| 25° | 3465 | 3093 | 2904 |
| 30° | 3373 | 2907 | 2628 |
| 35° | 3284 | 2707 | 2387 |
| 40° | 3193 | 2501 | 2109 |
| 45° | 3087 | 2272 | 1858 |
| 50° | 2977 | 2040 | 1612 |
| 55° | 2863 | 1793 | 1376 |
| 60° | 2731 | 1534 | 1133 |
| 65° | 2579 | 1271 | 1021 |
| 70° | 2394 | 1025 | 925  |
| 75° | 2162 | 905  | 843  |
| 80° | 1827 | 761  | 734  |
| 85° | 1273 | 510  | 556  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°  
Vertical Angle: 45°  
Luminance: 3087 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 472.5   | 2.1       |
| 10°-20°   | 1297.2  | 5.8       |
| 20°-30°   | 1821.2  | 8.1       |
| 30°-40°   | 1985.2  | 8.8       |
| 40°-50°   | 1824.6  | 8.1       |
| 50°-60°   | 1433.0  | 6.4       |
| 60°-70°   | 932.7   | 4.2       |
| 70°-80°   | 480.1   | 2.1       |
| 80°-90°   | 129.8   | 0.6       |
| 90°-100°  | 135.7   | 0.6       |
| 100°-110° | 506.1   | 2.3       |
| 110°-120° | 1342.2  | 6.0       |
| 120°-130° | 2226.1  | 9.9       |
| 130°-140° | 2364.7  | 10.5      |
| 140°-150° | 2197.7  | 9.8       |
| 150°-160° | 1766.9  | 7.9       |
| 160°-170° | 1138.5  | 5.1       |
| 170°-180° | 391.9   | 1.7       |
| 0°-30°    | 3590.9  | 16.0      |
| 0°-40°    | 5576.1  | 24.8      |
| 0°-60°    | 8833.7  | 39.4      |
| 0°-90°    | 10376.4 | 46.2      |
| 90°-120°  | 1984.0  | 8.8       |
| 90°-150°  | 8772.5  | 39.1      |
| 90°-180°  | 12070.0 | 53.8      |
| 0°-180°   | 22446.1 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 5042 | 5042  | 5042 | 5042  | 5042 |      |
| 5°   | 5042 | 5019  | 4960 | 5001  | 4987 | 478  |
| 15°  | 4795 | 4745  | 4590 | 4504  | 4458 | 1351 |
| 25°  | 4353 | 4207  | 3906 | 3719  | 3650 | 2002 |
| 35°  | 3751 | 3518  | 3117 | 2829  | 2728 | 2348 |
| 45°  | 3066 | 2760  | 2282 | 1957  | 1848 | 2368 |
| 55°  | 2331 | 1976  | 1483 | 1209  | 1123 | 2083 |
| 65°  | 1574 | 1204  | 794  | 639   | 625  | 1561 |
| 75°  | 839  | 520   | 365  | 333   | 329  | 888  |
| 85°  | 196  | 100   | 87   | 87    | 87   | 225  |
| 90°  | 3    | 36    | 59   | 75    | 80   | 21   |
| 95°  | 194  | 95    | 116  | 131   | 128  | 229  |
| 105° | 906  | 995   | 182  | 214   | 226  | 968  |
| 115° | 1713 | 1763  | 1838 | 459   | 244  | 1686 |
| 125° | 2422 | 2461  | 2517 | 2538  | 2547 | 2160 |
| 135° | 2997 | 3045  | 3071 | 3101  | 3095 | 2315 |
| 145° | 3477 | 3474  | 3524 | 3545  | 3530 | 2174 |
| 155° | 3828 | 3801  | 3837 | 3855  | 3831 | 1764 |
| 165° | 4034 | 4016  | 4025 | 4046  | 4025 | 1140 |
| 175° | 4126 | 4105  | 4111 | 4132  | 4102 | 393  |
| 180° | 4117 | 4117  | 4117 | 4117  | 4117 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 5041.8 | 5041.8 | 5041.8 | 5041.8 | 5041.8 |
| 2.5°   | 5064.6 | 5041.8 | 4991.5 | 5037.5 | 5028.3 |
| 5°     | 5041.8 | 5019.1 | 4959.6 | 5000.7 | 4987.2 |
| 7.5°   | 5000.7 | 4973.5 | 4909.7 | 4927.6 | 4904.8 |
| 10°    | 4946.0 | 4914.0 | 4823.0 | 4809.0 | 4781.9 |
| 12.5°  | 4877.7 | 4836.6 | 4713.1 | 4686.0 | 4635.6 |
| 15°    | 4795.4 | 4745.1 | 4590.2 | 4503.5 | 4458.0 |
| 17.5°  | 4699.6 | 4626.5 | 4434.8 | 4334.5 | 4261.4 |
| 20°    | 4590.2 | 4498.7 | 4270.6 | 4156.9 | 4056.2 |
| 22.5°  | 4471.6 | 4366.5 | 4101.7 | 3946.8 | 3878.5 |
| 25°    | 4352.9 | 4206.8 | 3905.7 | 3718.8 | 3650.1 |
| 27.5°  | 4211.6 | 4056.2 | 3723.1 | 3508.7 | 3403.6 |
| 30°    | 4061.0 | 3887.3 | 3522.3 | 3289.8 | 3166.4 |
| 32.5°  | 3914.9 | 3704.7 | 3331.0 | 3057.1 | 2942.8 |
| 35°    | 3750.7 | 3517.9 | 3116.6 | 2829.1 | 2728.4 |
| 37.5°  | 3591.1 | 3339.8 | 2915.7 | 2600.5 | 2486.8 |
| 40°    | 3422.0 | 3148.6 | 2705.6 | 2381.7 | 2263.1 |
| 42.5°  | 3248.7 | 2956.8 | 2496.0 | 2158.1 | 2044.3 |
| 45°    | 3066.3 | 2760.3 | 2281.5 | 1957.2 | 1847.8 |
| 47.5°  | 2892.9 | 2569.1 | 2076.3 | 1751.9 | 1651.7 |
| 50°    | 2701.2 | 2377.4 | 1875.4 | 1560.3 | 1464.9 |
| 52.5°  | 2513.9 | 2171.6 | 1683.7 | 1382.6 | 1295.9 |
| 55°    | 2331.3 | 1975.6 | 1482.7 | 1209.3 | 1122.6 |
| 57.5°  | 2144.6 | 1779.5 | 1305.1 | 1049.6 | 976.4  |
| 60°    | 1952.8 | 1587.9 | 1117.8 | 885.4  | 812.3  |
| 62.5°  | 1766.0 | 1401.0 | 958.1  | 739.3  | 702.9  |
| 65°    | 1574.2 | 1204.4 | 793.9  | 639.0  | 624.9  |
| 67.5°  | 1391.8 | 1021.9 | 639.0  | 561.0  | 547.5  |
| 70°    | 1200.0 | 844.3  | 529.1  | 483.6  | 465.2  |
| 72.5°  | 1017.5 | 679.7  | 442.5  | 406.1  | 396.9  |
| 75°    | 839.4  | 519.9  | 365.0  | 333.0  | 328.7  |
| 77.5°  | 661.7  | 369.4  | 287.6  | 269.2  | 259.9  |
| 80°    | 497.2  | 264.8  | 218.8  | 201.0  | 201.0  |
| 82.5°  | 346.6  | 178.1  | 150.6  | 141.4  | 141.4  |
| 85°    | 196.1  | 100.3  | 86.6   | 86.6   | 86.6   |
| 87.5°  | 73.1   | 36.3   | 36.3   | 31.9   | 31.9   |
| 90°    | 2.9    | 35.7   | 59.4   | 74.6   | 80.3   |
| 92.5°  | 74.6   | 62.7   | 71.4   | 77.5   | 80.3   |
| 95°    | 193.5  | 95.2   | 116.0  | 131.2  | 128.1  |
| 97.5°  | 348.4  | 104.4  | 151.7  | 160.9  | 163.8  |
| 100°   | 527.4  | 119.2  | 169.8  | 193.5  | 199.5  |
| 102.5° | 723.7  | 718.1  | 175.8  | 208.4  | 217.6  |
| 105°   | 905.6  | 995.1  | 181.9  | 214.4  | 226.5  |
| 107.5° | 1117.2 | 1191.4 | 187.9  | 220.4  | 232.4  |
| 110°   | 1319.8 | 1382.1 | 521.5  | 223.6  | 235.2  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 1510.6 | 1563.9 | 1513.3 | 229.2  | 238.4  |
| 115°   | 1712.9 | 1763.4 | 1838.2 | 458.8  | 244.4  |
| 117.5° | 1888.7 | 1948.2 | 1999.1 | 1572.8 | 792.4  |
| 120°   | 2085.4 | 2129.9 | 2183.7 | 2219.4 | 1817.2 |
| 122.5° | 2252.0 | 2299.7 | 2359.5 | 2377.3 | 2380.5 |
| 125°   | 2421.8 | 2460.8 | 2517.3 | 2538.2 | 2547.0 |
| 127.5° | 2576.8 | 2618.5 | 2663.4 | 2693.1 | 2696.0 |
| 130°   | 2722.8 | 2770.6 | 2803.1 | 2836.0 | 2833.3 |
| 132.5° | 2871.8 | 2910.7 | 2943.3 | 2970.1 | 2967.4 |
| 135°   | 2997.1 | 3044.8 | 3071.3 | 3101.4 | 3095.3 |
| 137.5° | 3127.9 | 3163.6 | 3193.7 | 3223.4 | 3214.5 |
| 140°   | 3256.0 | 3280.0 | 3312.6 | 3339.4 | 3324.6 |
| 142.5° | 3363.5 | 3384.3 | 3422.9 | 3446.7 | 3431.8 |
| 145°   | 3476.7 | 3473.5 | 3524.1 | 3545.0 | 3530.2 |
| 147.5° | 3574.8 | 3565.9 | 3616.4 | 3631.3 | 3619.7 |
| 150°   | 3670.2 | 3649.4 | 3697.1 | 3714.8 | 3700.0 |
| 152.5° | 3750.5 | 3726.8 | 3771.4 | 3789.5 | 3768.6 |
| 155°   | 3828.0 | 3801.4 | 3837.1 | 3854.9 | 3831.2 |
| 157.5° | 3890.6 | 3866.9 | 3893.8 | 3914.7 | 3890.6 |
| 160°   | 3944.4 | 3926.3 | 3944.4 | 3962.0 | 3941.2 |
| 162.5° | 3991.7 | 3974.1 | 3989.0 | 4009.8 | 3983.0 |
| 165°   | 4033.5 | 4015.8 | 4024.7 | 4045.5 | 4024.7 |
| 167.5° | 4066.4 | 4048.4 | 4057.6 | 4078.5 | 4051.6 |
| 170°   | 4093.3 | 4075.2 | 4081.2 | 4102.2 | 4075.2 |
| 172.5° | 4111.0 | 4093.3 | 4099.3 | 4120.2 | 4093.3 |
| 175°   | 4125.8 | 4105.0 | 4111.0 | 4131.9 | 4102.2 |
| 177.5° | 4131.9 | 4111.0 | 4114.2 | 4135.0 | 4108.2 |
| 180°   | 4117.1 | 4117.1 | 4117.1 | 4117.1 | 4117.1 |

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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 | 11.32            | 12.12 | 12.31 | 13.12 | 14.45 | 7.28           | 8.08  | 8.28  | 9.09  | 10.41 |
|                 | 3H   | 13.00            | 13.71 | 14.00 | 14.72 | 16.07 | 8.47           | 9.19  | 9.48  | 10.20 | 11.55 |
|                 | 4H   | 13.61            | 14.28 | 14.62 | 15.30 | 16.65 | 8.92           | 9.60  | 9.94  | 10.61 | 11.97 |
|                 | 6H   | 14.03            | 14.65 | 15.06 | 15.67 | 17.04 | 9.24           | 9.86  | 10.27 | 10.88 | 12.25 |
|                 | 8H   | 14.15            | 14.75 | 15.19 | 15.78 | 17.15 | 9.33           | 9.92  | 10.36 | 10.96 | 12.32 |
|                 | 12H  | 14.22            | 14.78 | 15.26 | 15.81 | 17.20 | 9.37           | 9.94  | 10.41 | 10.96 | 12.35 |
| 4H              | 2H   | 11.33            | 12.01 | 12.36 | 13.02 | 14.38 | 7.88           | 8.55  | 8.90  | 9.57  | 10.92 |
|                 | 3H   | 13.16            | 13.73 | 14.20 | 14.77 | 16.14 | 9.22           | 9.79  | 10.26 | 10.83 | 12.20 |
|                 | 4H   | 13.86            | 14.37 | 14.90 | 15.41 | 16.80 | 9.77           | 10.29 | 10.81 | 11.32 | 12.71 |
|                 | 6H   | 14.37            | 14.81 | 15.42 | 15.87 | 17.26 | 10.19          | 10.63 | 11.24 | 11.69 | 13.08 |
|                 | 8H   | 14.55            | 14.96 | 15.60 | 16.01 | 17.41 | 10.32          | 10.73 | 11.37 | 11.78 | 13.19 |
|                 | 12H  | 14.64            | 15.02 | 15.71 | 16.08 | 17.49 | 10.38          | 10.76 | 11.45 | 11.82 | 13.23 |
| 8H              | 4H   | 13.82            | 14.23 | 14.87 | 15.28 | 16.69 | 10.05          | 10.46 | 11.10 | 11.52 | 12.92 |
|                 | 6H   | 14.39            | 14.73 | 15.46 | 15.82 | 17.22 | 10.57          | 10.91 | 11.64 | 12.00 | 13.40 |
|                 | 8H   | 14.61            | 14.91 | 15.69 | 15.98 | 17.40 | 10.76          | 11.06 | 11.84 | 12.14 | 13.56 |
|                 | 12H  | 14.75            | 15.01 | 15.83 | 16.08 | 17.54 | 10.88          | 11.14 | 11.97 | 12.22 | 13.68 |
| 12H             | 4H   | 13.77            | 14.14 | 14.84 | 15.21 | 16.62 | 10.06          | 10.43 | 11.12 | 11.49 | 12.90 |
|                 | 6H   | 14.36            | 14.66 | 15.45 | 15.74 | 17.16 | 10.62          | 10.92 | 11.70 | 12.00 | 13.42 |
|                 | 8H   | 14.59            | 14.85 | 15.67 | 15.92 | 17.38 | 10.83          | 11.09 | 11.92 | 12.17 | 13.63 |

END OF REPORT