

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: P921197

Luminaire Tested: DFN2DIP-TR4F0-110D120US935-RLONL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P921197  
REPORT IS A COMBINATION OF REPORTS P902048 AND P898849  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-TR4F0-110D120US935-RLLONL  
Description: 4 foot, Triangle Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

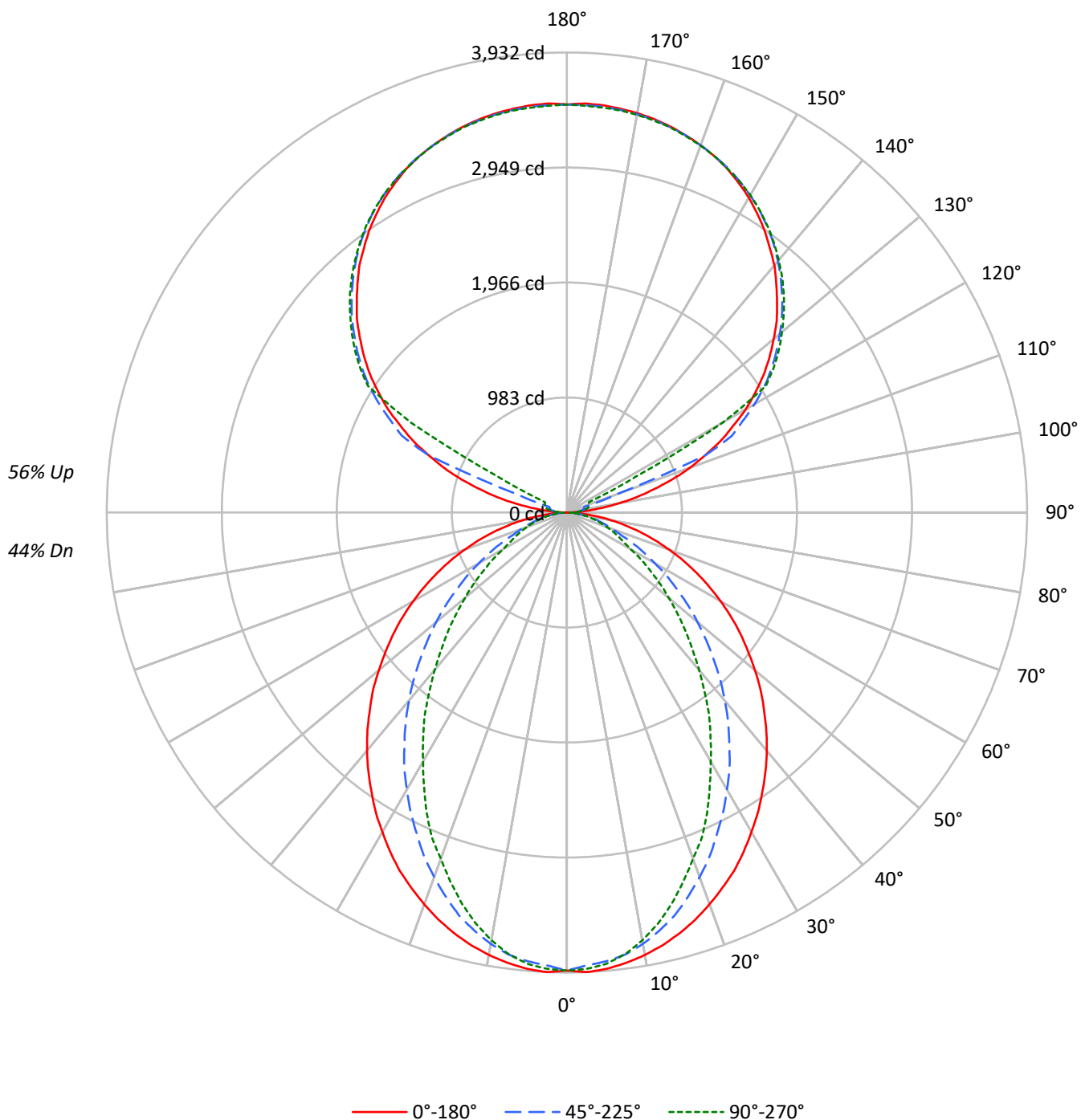
**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 18279.0 lumens  
Efficiency: N/A  
Efficacy: 89.6 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): 204  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9613  
Total Harmonic Distortion (THDi): 0.083  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT

TEST NUMBER: P921197

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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 | 97 | 97 | 97 | 97 | 80 | 80 | 80 | 65 | 65 | 65 | 51 | 51 | 51 |
| 1   | 97  | 93  | 89  | 86  | 89 | 85 | 82 | 79 | 71 | 69 | 67 | 58 | 56 | 55 | 45 | 44 | 44 |
| 2   | 89  | 81  | 76  | 71  | 81 | 75 | 70 | 66 | 62 | 59 | 56 | 51 | 49 | 46 | 40 | 39 | 37 |
| 3   | 81  | 72  | 65  | 59  | 74 | 66 | 60 | 55 | 55 | 51 | 47 | 46 | 42 | 40 | 36 | 34 | 32 |
| 4   | 74  | 64  | 56  | 51  | 68 | 59 | 52 | 47 | 50 | 45 | 41 | 41 | 37 | 34 | 33 | 30 | 28 |
| 5   | 68  | 57  | 49  | 44  | 62 | 53 | 46 | 41 | 45 | 39 | 35 | 37 | 33 | 30 | 30 | 27 | 25 |
| 6   | 63  | 51  | 44  | 38  | 58 | 48 | 41 | 36 | 40 | 35 | 31 | 33 | 29 | 26 | 27 | 24 | 22 |
| 7   | 58  | 46  | 39  | 33  | 53 | 43 | 36 | 31 | 37 | 31 | 27 | 31 | 27 | 24 | 25 | 22 | 20 |
| 8   | 54  | 42  | 35  | 30  | 50 | 39 | 33 | 28 | 33 | 28 | 24 | 28 | 24 | 21 | 23 | 20 | 18 |
| 9   | 51  | 39  | 31  | 26  | 46 | 36 | 29 | 25 | 31 | 26 | 22 | 26 | 22 | 19 | 21 | 18 | 16 |
| 10  | 47  | 35  | 28  | 24  | 43 | 33 | 27 | 22 | 28 | 23 | 20 | 24 | 20 | 17 | 20 | 17 | 15 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 3110 | 3110 | 3110 |
| 5°  | 3115 | 3060 | 3080 |
| 10° | 3084 | 3000 | 2979 |
| 15° | 3041 | 2901 | 2824 |
| 20° | 2985 | 2764 | 2634 |
| 25° | 2928 | 2611 | 2451 |
| 30° | 2851 | 2454 | 2218 |
| 35° | 2775 | 2285 | 2013 |
| 40° | 2698 | 2110 | 1779 |
| 45° | 2609 | 1916 | 1566 |
| 50° | 2516 | 1721 | 1358 |
| 55° | 2420 | 1511 | 1159 |
| 60° | 2308 | 1293 | 954  |
| 65° | 2179 | 1070 | 858  |
| 70° | 2024 | 863  | 777  |
| 75° | 1828 | 761  | 706  |
| 80° | 1544 | 638  | 612  |
| 85° | 1076 | 425  | 459  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°  
Vertical Angle: 45°  
Luminance: 2609 cd/sqm

TEST NUMBER: P921197

CATALOG NUMBER: DFN2DIP-TR4F0-110D120US935-RLONL

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 366.9   | 2.0       |
| 10°-20°   | 1007.1  | 5.5       |
| 20°-30°   | 1413.9  | 7.7       |
| 30°-40°   | 1541.3  | 8.4       |
| 40°-50°   | 1416.6  | 7.7       |
| 50°-60°   | 1112.5  | 6.1       |
| 60°-70°   | 724.2   | 4.0       |
| 70°-80°   | 372.8   | 2.0       |
| 80°-90°   | 101.3   | 0.6       |
| 90°-100°  | 115.0   | 0.6       |
| 100°-110° | 428.6   | 2.3       |
| 110°-120° | 1136.8  | 6.2       |
| 120°-130° | 1885.4  | 10.3      |
| 130°-140° | 2002.8  | 11.0      |
| 140°-150° | 1861.3  | 10.2      |
| 150°-160° | 1496.5  | 8.2       |
| 160°-170° | 964.3   | 5.3       |
| 170°-180° | 331.9   | 1.8       |
| 0°-30°    | 2787.9  | 15.3      |
| 0°-40°    | 4329.1  | 23.7      |
| 0°-60°    | 6858.3  | 37.5      |
| 0°-90°    | 8056.5  | 44.1      |
| 90°-120°  | 1680.4  | 9.2       |
| 90°-150°  | 7429.9  | 40.6      |
| 90°-180°  | 10223.0 | 55.9      |
| 0°-180°   | 18279.0 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 3914 | 3914  | 3914 | 3914  | 3914 |      |
| 5°   | 3914 | 3897  | 3850 | 3882  | 3872 | 371  |
| 15°  | 3723 | 3684  | 3564 | 3496  | 3461 | 1049 |
| 25°  | 3380 | 3266  | 3032 | 2887  | 2834 | 1554 |
| 35°  | 2912 | 2731  | 2420 | 2196  | 2118 | 1823 |
| 45°  | 2381 | 2143  | 1771 | 1520  | 1435 | 1838 |
| 55°  | 1810 | 1534  | 1151 | 939   | 872  | 1617 |
| 65°  | 1222 | 935   | 616  | 496   | 485  | 1212 |
| 75°  | 652  | 404   | 283  | 259   | 255  | 689  |
| 85°  | 152  | 78    | 67   | 67    | 67   | 175  |
| 90°  | 2    | 30    | 50   | 63    | 68   | 17   |
| 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 |      |

TEST NUMBER: P921197

CATALOG NUMBER: DFN2DIP-TR4F0-110D120US935-RLLONL

**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 3914.4 | 3914.4 | 3914.4 | 3914.4 | 3914.4 |
| 2.5°   | 3932.0 | 3914.4 | 3875.3 | 3911.0 | 3903.9 |
| 5°     | 3914.4 | 3896.7 | 3850.5 | 3882.4 | 3871.9 |
| 7.5°   | 3882.4 | 3861.3 | 3811.7 | 3825.7 | 3807.9 |
| 10°    | 3840.0 | 3815.1 | 3744.5 | 3733.5 | 3712.5 |
| 12.5°  | 3786.9 | 3755.0 | 3659.2 | 3638.1 | 3599.0 |
| 15°    | 3723.0 | 3684.0 | 3563.7 | 3496.4 | 3461.0 |
| 17.5°  | 3648.7 | 3591.9 | 3443.0 | 3365.2 | 3308.5 |
| 20°    | 3563.7 | 3492.6 | 3315.6 | 3227.3 | 3149.1 |
| 22.5°  | 3471.6 | 3390.0 | 3184.5 | 3064.2 | 3011.2 |
| 25°    | 3379.5 | 3266.0 | 3032.3 | 2887.2 | 2833.8 |
| 27.5°  | 3269.8 | 3149.1 | 2890.5 | 2724.0 | 2642.5 |
| 30°    | 3152.9 | 3018.0 | 2734.6 | 2554.2 | 2458.3 |
| 32.5°  | 3039.4 | 2876.2 | 2586.1 | 2373.4 | 2284.7 |
| 35°    | 2912.0 | 2731.2 | 2419.7 | 2196.4 | 2118.2 |
| 37.5°  | 2788.0 | 2592.9 | 2263.6 | 2019.0 | 1930.7 |
| 40°    | 2656.8 | 2444.5 | 2100.6 | 1849.1 | 1757.0 |
| 42.5°  | 2522.2 | 2295.6 | 1937.8 | 1675.5 | 1587.2 |
| 45°    | 2380.6 | 2143.0 | 1771.3 | 1519.5 | 1434.6 |
| 47.5°  | 2246.0 | 1994.6 | 1612.0 | 1360.1 | 1282.4 |
| 50°    | 2097.1 | 1845.7 | 1456.0 | 1211.3 | 1137.3 |
| 52.5°  | 1951.7 | 1686.0 | 1307.2 | 1073.4 | 1006.1 |
| 55°    | 1810.0 | 1533.8 | 1151.2 | 938.8  | 871.6  |
| 57.5°  | 1665.0 | 1381.6 | 1013.2 | 814.8  | 758.0  |
| 60°    | 1516.1 | 1232.8 | 867.8  | 687.4  | 630.7  |
| 62.5°  | 1371.1 | 1087.7 | 743.8  | 573.9  | 545.7  |
| 65°    | 1222.2 | 935.0  | 616.4  | 496.1  | 485.2  |
| 67.5°  | 1080.6 | 793.4  | 496.1  | 435.6  | 425.1  |
| 70°    | 931.7  | 655.5  | 410.8  | 375.5  | 361.2  |
| 72.5°  | 790.0  | 527.7  | 343.5  | 315.3  | 308.2  |
| 75°    | 651.7  | 403.6  | 283.4  | 258.6  | 255.2  |
| 77.5°  | 513.8  | 286.8  | 223.3  | 209.0  | 201.8  |
| 80°    | 386.0  | 205.6  | 169.9  | 156.0  | 156.0  |
| 82.5°  | 269.1  | 138.3  | 116.9  | 109.8  | 109.8  |
| 85°    | 152.2  | 77.8   | 67.2   | 67.2   | 67.2   |
| 87.5°  | 56.7   | 28.2   | 28.2   | 24.8   | 24.8   |
| 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  |

TEST NUMBER: P921197

CATALOG NUMBER: DFN2DIP-TR4F0-110D120US935-RLLONL

**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 |

TEST NUMBER: P921197

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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 | 10.50            | 11.29 | 11.52 | 12.31 | 13.66 | 6.48           | 7.26  | 7.49  | 8.28  | 9.64  |
|                 | 3H   | 12.18            | 12.88 | 13.20 | 13.91 | 15.28 | 7.66           | 8.36  | 8.69  | 9.39  | 10.77 |
|                 | 4H   | 12.78            | 13.45 | 13.82 | 14.48 | 15.86 | 8.11           | 8.78  | 9.15  | 9.81  | 11.19 |
|                 | 6H   | 13.20            | 13.81 | 14.25 | 14.85 | 16.24 | 8.43           | 9.04  | 9.48  | 10.08 | 11.47 |
|                 | 8H   | 13.33            | 13.91 | 14.38 | 14.96 | 16.35 | 8.52           | 9.10  | 9.57  | 10.15 | 11.54 |
|                 | 12H  | 13.39            | 13.94 | 14.44 | 14.98 | 16.40 | 8.56           | 9.12  | 9.62  | 10.16 | 11.57 |
| 4H              | 2H   | 10.52            | 11.18 | 11.56 | 12.21 | 13.59 | 7.07           | 7.73  | 8.11  | 8.76  | 10.14 |
|                 | 3H   | 12.34            | 12.89 | 13.39 | 13.95 | 15.35 | 8.41           | 8.97  | 9.46  | 10.02 | 11.42 |
|                 | 4H   | 13.03            | 13.54 | 14.09 | 14.59 | 16.01 | 8.96           | 9.47  | 10.02 | 10.52 | 11.93 |
|                 | 6H   | 13.54            | 13.98 | 14.61 | 15.05 | 16.46 | 9.38           | 9.81  | 10.44 | 10.88 | 12.30 |
|                 | 8H   | 13.72            | 14.12 | 14.78 | 15.19 | 16.62 | 9.51           | 9.91  | 10.57 | 10.98 | 12.41 |
|                 | 12H  | 13.81            | 14.18 | 14.89 | 15.26 | 16.69 | 9.57           | 9.94  | 10.65 | 11.02 | 12.45 |
| 8H              | 4H   | 13.00            | 13.40 | 14.06 | 14.47 | 15.90 | 9.24           | 9.64  | 10.30 | 10.71 | 12.14 |
|                 | 6H   | 13.56            | 13.89 | 14.65 | 15.00 | 16.43 | 9.76           | 10.09 | 10.84 | 11.20 | 12.62 |
|                 | 8H   | 13.78            | 14.07 | 14.87 | 15.16 | 16.61 | 9.95           | 10.24 | 11.04 | 11.33 | 12.78 |
|                 | 12H  | 13.91            | 14.17 | 15.01 | 15.26 | 16.74 | 10.07          | 10.32 | 11.16 | 11.41 | 12.89 |
| 12H             | 4H   | 12.95            | 13.31 | 14.03 | 14.39 | 15.82 | 9.24           | 9.61  | 10.32 | 10.68 | 12.12 |
|                 | 6H   | 13.54            | 13.83 | 14.63 | 14.92 | 16.37 | 9.80           | 10.10 | 10.90 | 11.19 | 12.63 |
|                 | 8H   | 13.75            | 14.01 | 14.85 | 15.10 | 16.58 | 10.01          | 10.27 | 11.11 | 11.36 | 12.84 |

END OF REPORT