

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: P921229

Luminaire Tested: DFN2DIP-TR4F0-120D110US935-RLONL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P921229  
REPORT IS A COMBINATION OF REPORTS P902032 AND P898849  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-TR4F0-120D110US935-RLLONL  
Description: 4 foot, Triangle Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

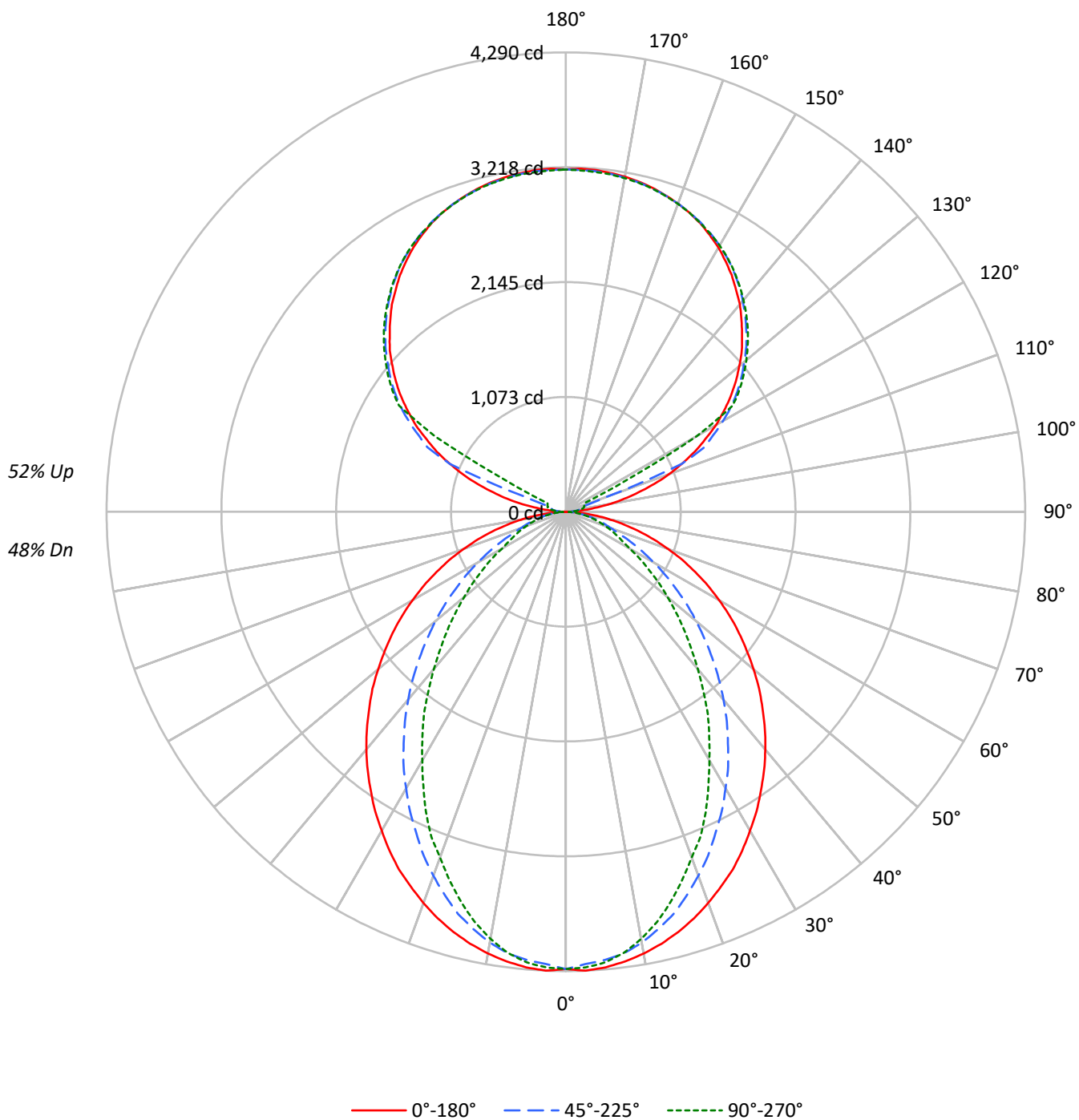
**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 18158.4 lumens  
Efficiency: N/A  
Efficacy: 86.3 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): 210.4  
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   | 107 | 107 | 107 | 107 | 98 | 98 | 98 | 98 | 82 | 82 | 82 | 68 | 68 | 68 | 55 | 55 | 55 |
| 1   | 98  | 94  | 90  | 87  | 90 | 87 | 83 | 80 | 73 | 71 | 69 | 60 | 59 | 58 | 49 | 48 | 47 |
| 2   | 90  | 82  | 77  | 72  | 82 | 76 | 71 | 67 | 64 | 61 | 58 | 54 | 51 | 49 | 44 | 42 | 40 |
| 3   | 82  | 73  | 66  | 60  | 75 | 67 | 61 | 56 | 57 | 53 | 49 | 48 | 45 | 42 | 39 | 37 | 35 |
| 4   | 75  | 65  | 57  | 51  | 69 | 60 | 53 | 48 | 51 | 46 | 42 | 43 | 39 | 36 | 35 | 33 | 30 |
| 5   | 69  | 58  | 50  | 44  | 64 | 54 | 47 | 42 | 46 | 41 | 37 | 39 | 35 | 32 | 32 | 29 | 27 |
| 6   | 64  | 52  | 44  | 39  | 59 | 49 | 42 | 36 | 42 | 36 | 32 | 35 | 31 | 28 | 29 | 26 | 24 |
| 7   | 59  | 47  | 39  | 34  | 54 | 44 | 37 | 32 | 38 | 32 | 29 | 32 | 28 | 25 | 27 | 24 | 21 |
| 8   | 55  | 43  | 35  | 30  | 51 | 40 | 33 | 29 | 35 | 29 | 25 | 30 | 25 | 22 | 25 | 22 | 19 |
| 9   | 51  | 39  | 32  | 27  | 47 | 37 | 30 | 26 | 32 | 27 | 23 | 27 | 23 | 20 | 23 | 20 | 18 |
| 10  | 48  | 36  | 29  | 24  | 44 | 34 | 27 | 23 | 29 | 24 | 21 | 25 | 21 | 18 | 21 | 18 | 16 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 3392 | 3392 | 3392 |
| 5°  | 3398 | 3339 | 3360 |
| 10° | 3364 | 3273 | 3250 |
| 15° | 3318 | 3165 | 3081 |
| 20° | 3257 | 3016 | 2874 |
| 25° | 3194 | 2848 | 2673 |
| 30° | 3110 | 2677 | 2419 |
| 35° | 3027 | 2493 | 2196 |
| 40° | 2943 | 2302 | 1940 |
| 45° | 2846 | 2090 | 1708 |
| 50° | 2745 | 1877 | 1482 |
| 55° | 2640 | 1649 | 1264 |
| 60° | 2518 | 1410 | 1041 |
| 65° | 2377 | 1168 | 936  |
| 70° | 2208 | 941  | 847  |
| 75° | 1994 | 830  | 771  |
| 80° | 1685 | 696  | 668  |
| 85° | 1175 | 465  | 502  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 2846 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 400.2   | 2.2       |
| 10°-20°   | 1098.7  | 6.1       |
| 20°-30°   | 1542.5  | 8.5       |
| 30°-40°   | 1681.4  | 9.3       |
| 40°-50°   | 1545.4  | 8.5       |
| 50°-60°   | 1213.7  | 6.7       |
| 60°-70°   | 790.0   | 4.4       |
| 70°-80°   | 406.7   | 2.2       |
| 80°-90°   | 109.4   | 0.6       |
| 90°-100°  | 105.4   | 0.6       |
| 100°-110° | 392.9   | 2.2       |
| 110°-120° | 1042.0  | 5.7       |
| 120°-130° | 1728.3  | 9.5       |
| 130°-140° | 1835.9  | 10.1      |
| 140°-150° | 1706.2  | 9.4       |
| 150°-160° | 1371.8  | 7.6       |
| 160°-170° | 883.9   | 4.9       |
| 170°-180° | 304.2   | 1.7       |
| 0°-30°    | 3041.3  | 16.7      |
| 0°-40°    | 4722.7  | 26.0      |
| 0°-60°    | 7481.7  | 41.2      |
| 0°-90°    | 8787.8  | 48.4      |
| 90°-120°  | 1540.3  | 8.5       |
| 90°-150°  | 6810.7  | 37.5      |
| 90°-180°  | 9371.0  | 51.6      |
| 0°-180°   | 18158.4 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 4270 | 4270  | 4270 | 4270  | 4270 |      |
| 5°   | 4270 | 4251  | 4200 | 4235  | 4224 | 405  |
| 15°  | 4062 | 4019  | 3888 | 3814  | 3776 | 1144 |
| 25°  | 3687 | 3563  | 3308 | 3150  | 3091 | 1696 |
| 35°  | 3177 | 2980  | 2640 | 2396  | 2311 | 1988 |
| 45°  | 2597 | 2338  | 1932 | 1658  | 1565 | 2006 |
| 55°  | 1975 | 1673  | 1256 | 1024  | 951  | 1764 |
| 65°  | 1333 | 1020  | 672  | 541   | 529  | 1322 |
| 75°  | 711  | 440   | 309  | 282   | 278  | 752  |
| 85°  | 166  | 85    | 73   | 73    | 73   | 191  |
| 90°  | 2    | 28    | 46   | 58    | 62   | 17   |
| 95°  | 150  | 74    | 90   | 102   | 99   | 178  |
| 105° | 703  | 773   | 141  | 166   | 176  | 751  |
| 115° | 1330 | 1369  | 1427 | 356   | 190  | 1309 |
| 125° | 1880 | 1910  | 1954 | 1971  | 1978 | 1677 |
| 135° | 2327 | 2364  | 2384 | 2408  | 2403 | 1797 |
| 145° | 2699 | 2697  | 2736 | 2752  | 2741 | 1688 |
| 155° | 2972 | 2951  | 2979 | 2993  | 2974 | 1370 |
| 165° | 3132 | 3118  | 3125 | 3141  | 3125 | 885  |
| 175° | 3203 | 3187  | 3192 | 3208  | 3185 | 305  |
| 180° | 3196 | 3196  | 3196 | 3196  | 3196 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 4270.2 | 4270.2 | 4270.2 | 4270.2 | 4270.2 |
| 2.5°   | 4289.5 | 4270.2 | 4227.6 | 4266.5 | 4258.7 |
| 5°     | 4270.2 | 4250.9 | 4200.5 | 4235.3 | 4223.9 |
| 7.5°   | 4235.3 | 4212.3 | 4158.3 | 4173.4 | 4154.1 |
| 10°    | 4189.0 | 4162.0 | 4084.8 | 4073.0 | 4050.0 |
| 12.5°  | 4131.2 | 4096.4 | 3991.8 | 3968.9 | 3926.2 |
| 15°    | 4061.5 | 4018.9 | 3887.7 | 3814.2 | 3775.7 |
| 17.5°  | 3980.3 | 3918.4 | 3756.0 | 3671.2 | 3609.3 |
| 20°    | 3887.7 | 3810.2 | 3617.1 | 3520.7 | 3435.4 |
| 22.5°  | 3787.2 | 3698.2 | 3474.0 | 3342.7 | 3285.0 |
| 25°    | 3686.8 | 3562.9 | 3307.9 | 3149.6 | 3091.4 |
| 27.5°  | 3567.0 | 3435.4 | 3153.3 | 2971.7 | 2882.7 |
| 30°    | 3439.5 | 3292.4 | 2983.2 | 2786.4 | 2681.8 |
| 32.5°  | 3315.7 | 3137.7 | 2821.2 | 2589.2 | 2492.4 |
| 35°    | 3176.7 | 2979.5 | 2639.6 | 2396.1 | 2310.7 |
| 37.5°  | 3041.4 | 2828.6 | 2469.4 | 2202.5 | 2106.2 |
| 40°    | 2898.3 | 2666.7 | 2291.5 | 2017.2 | 1916.8 |
| 42.5°  | 2751.5 | 2504.3 | 2114.0 | 1827.8 | 1731.5 |
| 45°    | 2596.9 | 2337.9 | 1932.3 | 1657.7 | 1564.9 |
| 47.5°  | 2450.1 | 2175.9 | 1758.5 | 1483.8 | 1398.9 |
| 50°    | 2287.8 | 2013.5 | 1588.4 | 1321.5 | 1240.7 |
| 52.5°  | 2129.2 | 1839.3 | 1426.0 | 1171.0 | 1097.6 |
| 55°    | 1974.6 | 1673.3 | 1255.9 | 1024.2 | 950.8  |
| 57.5°  | 1816.3 | 1507.2 | 1105.3 | 888.9  | 827.0  |
| 60°    | 1654.0 | 1344.8 | 946.7  | 749.9  | 688.0  |
| 62.5°  | 1495.7 | 1186.5 | 811.4  | 626.1  | 595.3  |
| 65°    | 1333.3 | 1020.1 | 672.4  | 541.2  | 529.3  |
| 67.5°  | 1178.8 | 865.5  | 541.2  | 475.2  | 463.7  |
| 70°    | 1016.4 | 715.1  | 448.1  | 409.6  | 394.0  |
| 72.5°  | 861.9  | 575.7  | 374.7  | 344.0  | 336.2  |
| 75°    | 710.9  | 440.3  | 309.2  | 282.1  | 278.4  |
| 77.5°  | 560.5  | 312.8  | 243.6  | 228.0  | 220.2  |
| 80°    | 421.1  | 224.3  | 185.3  | 170.1  | 170.1  |
| 82.5°  | 293.6  | 150.8  | 127.5  | 119.7  | 119.7  |
| 85°    | 166.1  | 84.9   | 73.4   | 73.4   | 73.4   |
| 87.5°  | 61.9   | 30.7   | 30.7   | 27.0   | 27.0   |
| 90°    | 2.2    | 27.7   | 46.1   | 57.9   | 62.3   |
| 92.5°  | 57.9   | 48.6   | 55.4   | 60.2   | 62.3   |
| 95°    | 150.2  | 73.9   | 90.1   | 101.9  | 99.4   |
| 97.5°  | 270.5  | 81.0   | 117.8  | 124.9  | 127.2  |
| 100°   | 409.5  | 92.6   | 131.8  | 150.2  | 154.9  |
| 102.5° | 561.9  | 557.5  | 136.5  | 161.8  | 168.9  |
| 105°   | 703.1  | 772.6  | 141.2  | 166.4  | 175.8  |
| 107.5° | 867.4  | 925.0  | 145.9  | 171.1  | 180.5  |
| 110°   | 1024.7 | 1073.1 | 404.8  | 173.6  | 182.6  |



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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 1172.8 | 1214.2 | 1174.9 | 178.0  | 185.1  |
| 115°   | 1329.8 | 1369.1 | 1427.1 | 356.2  | 189.8  |
| 117.5° | 1466.4 | 1512.5 | 1552.0 | 1221.1 | 615.2  |
| 120°   | 1619.0 | 1653.6 | 1695.4 | 1723.1 | 1410.8 |
| 122.5° | 1748.4 | 1785.5 | 1831.9 | 1845.6 | 1848.1 |
| 125°   | 1880.2 | 1910.5 | 1954.4 | 1970.6 | 1977.5 |
| 127.5° | 2000.5 | 2032.9 | 2067.8 | 2090.8 | 2093.1 |
| 130°   | 2113.9 | 2151.0 | 2176.3 | 2201.8 | 2199.7 |
| 132.5° | 2229.6 | 2259.8 | 2285.1 | 2305.9 | 2303.8 |
| 135°   | 2326.8 | 2363.9 | 2384.4 | 2407.9 | 2403.1 |
| 137.5° | 2428.4 | 2456.2 | 2479.5 | 2502.6 | 2495.7 |
| 140°   | 2527.9 | 2546.5 | 2571.8 | 2592.6 | 2581.1 |
| 142.5° | 2611.3 | 2627.5 | 2657.5 | 2675.9 | 2664.4 |
| 145°   | 2699.2 | 2696.7 | 2736.0 | 2752.3 | 2740.7 |
| 147.5° | 2775.3 | 2768.5 | 2807.7 | 2819.3 | 2810.2 |
| 150°   | 2849.5 | 2833.3 | 2870.3 | 2884.1 | 2872.5 |
| 152.5° | 2911.8 | 2893.4 | 2928.0 | 2942.0 | 2925.8 |
| 155°   | 2972.0 | 2951.3 | 2979.1 | 2992.8 | 2974.4 |
| 157.5° | 3020.6 | 3002.1 | 3023.0 | 3039.2 | 3020.6 |
| 160°   | 3062.3 | 3048.3 | 3062.3 | 3076.0 | 3059.8 |
| 162.5° | 3099.1 | 3085.4 | 3096.9 | 3113.1 | 3092.3 |
| 165°   | 3131.5 | 3117.8 | 3124.6 | 3140.8 | 3124.6 |
| 167.5° | 3157.0 | 3143.1 | 3150.2 | 3166.4 | 3145.6 |
| 170°   | 3177.9 | 3163.9 | 3168.6 | 3184.8 | 3163.9 |
| 172.5° | 3191.6 | 3177.9 | 3182.6 | 3198.8 | 3177.9 |
| 175°   | 3203.2 | 3187.0 | 3191.6 | 3207.9 | 3184.8 |
| 177.5° | 3207.9 | 3191.6 | 3194.1 | 3210.3 | 3189.5 |
| 180°   | 3196.4 | 3196.4 | 3196.4 | 3196.4 | 3196.4 |

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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 | 11.23            | 12.05 | 12.21 | 13.04 | 14.33 | 7.21           | 8.02  | 8.18  | 9.01  | 10.31 |
|                 | 3H   | 12.91            | 13.64 | 13.90 | 14.64 | 15.95 | 8.40           | 9.13  | 9.38  | 10.12 | 11.44 |
|                 | 4H   | 13.52            | 14.21 | 14.52 | 15.21 | 16.53 | 8.85           | 9.54  | 9.85  | 10.54 | 11.86 |
|                 | 6H   | 13.94            | 14.57 | 14.95 | 15.58 | 16.92 | 9.17           | 9.80  | 10.18 | 10.81 | 12.15 |
|                 | 8H   | 14.06            | 14.67 | 15.08 | 15.69 | 17.02 | 9.26           | 9.86  | 10.28 | 10.88 | 12.22 |
|                 | 12H  | 14.13            | 14.70 | 15.15 | 15.71 | 17.07 | 9.30           | 9.88  | 10.32 | 10.89 | 12.25 |
| 4H              | 2H   | 11.25            | 11.94 | 12.26 | 12.94 | 14.27 | 7.80           | 8.49  | 8.81  | 9.49  | 10.82 |
|                 | 3H   | 13.08            | 13.65 | 14.10 | 14.68 | 16.02 | 9.15           | 9.73  | 10.17 | 10.75 | 12.09 |
|                 | 4H   | 13.77            | 14.29 | 14.79 | 15.32 | 16.68 | 9.70           | 10.22 | 10.72 | 11.24 | 12.61 |
|                 | 6H   | 14.28            | 14.74 | 15.32 | 15.78 | 17.14 | 10.12          | 10.57 | 11.15 | 11.61 | 12.97 |
|                 | 8H   | 14.46            | 14.88 | 15.49 | 15.92 | 17.29 | 10.25          | 10.67 | 11.28 | 11.71 | 13.08 |
|                 | 12H  | 14.55            | 14.93 | 15.61 | 15.98 | 17.36 | 10.31          | 10.69 | 11.37 | 11.74 | 13.12 |
| 8H              | 4H   | 13.74            | 14.16 | 14.77 | 15.19 | 16.57 | 9.98           | 10.40 | 11.01 | 11.44 | 12.81 |
|                 | 6H   | 14.30            | 14.65 | 15.36 | 15.73 | 17.10 | 10.50          | 10.84 | 11.56 | 11.92 | 13.29 |
|                 | 8H   | 14.52            | 14.82 | 15.59 | 15.89 | 17.28 | 10.69          | 10.99 | 11.76 | 12.06 | 13.45 |
|                 | 12H  | 14.66            | 14.93 | 15.73 | 15.98 | 17.42 | 10.81          | 11.08 | 11.88 | 12.13 | 13.57 |
| 12H             | 4H   | 13.69            | 14.07 | 14.74 | 15.12 | 16.50 | 9.98           | 10.36 | 11.04 | 11.41 | 12.79 |
|                 | 6H   | 14.28            | 14.58 | 15.34 | 15.65 | 17.04 | 10.55          | 10.85 | 11.61 | 11.92 | 13.31 |
|                 | 8H   | 14.50            | 14.77 | 15.57 | 15.82 | 17.26 | 10.76          | 11.03 | 11.83 | 12.08 | 13.52 |

END OF REPORT