

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: P911465

Luminaire Tested: DFN2DIP-PN4F0-070D110US850-FLLONL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P911465  
REPORT IS A COMBINATION OF REPORTS P901261 AND P898053  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-PN4F0-070D110US850-FLLONL  
Description: 4 foot, Pentagon Define Geo, with Direct Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

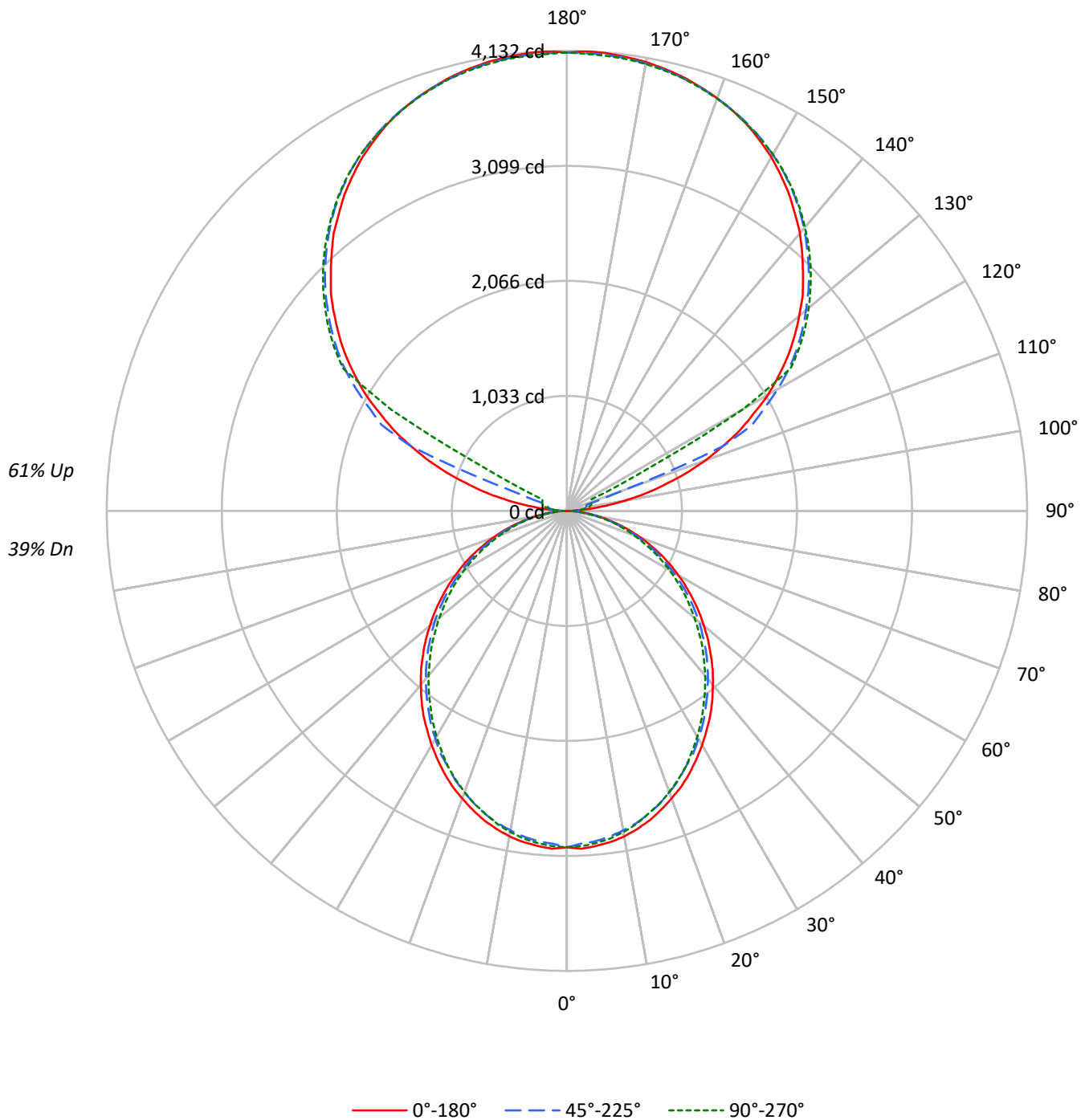
Lumens per Lamp: N/A  
Luminaire Lumens: 19762.4 lumens  
Efficiency: N/A  
Efficacy: 124.8 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 3.74' x L: 3.94' x H: 0.1')  
CIE Type: Semi-Indirect

Input Watts (W): 158.3  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9789  
Total Harmonic Distortion (THDi): 0.074  
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   | 105 | 105 | 105 | 105 | 95 | 95 | 95 | 95 | 77 | 77 | 77 | 61 | 61 | 61 | 46 | 46 | 46 |
| 1   | 95  | 91  | 87  | 84  | 86 | 83 | 80 | 77 | 68 | 65 | 63 | 54 | 52 | 51 | 41 | 40 | 39 |
| 2   | 87  | 79  | 73  | 68  | 79 | 72 | 67 | 63 | 59 | 56 | 52 | 47 | 44 | 42 | 36 | 34 | 33 |
| 3   | 79  | 70  | 63  | 57  | 72 | 64 | 58 | 53 | 52 | 48 | 44 | 42 | 38 | 36 | 32 | 30 | 28 |
| 4   | 72  | 62  | 54  | 48  | 65 | 56 | 50 | 44 | 46 | 41 | 37 | 37 | 33 | 31 | 28 | 26 | 24 |
| 5   | 66  | 55  | 47  | 41  | 60 | 50 | 43 | 38 | 41 | 36 | 32 | 33 | 29 | 26 | 25 | 23 | 21 |
| 6   | 61  | 49  | 41  | 36  | 55 | 45 | 38 | 33 | 37 | 32 | 28 | 30 | 26 | 23 | 23 | 20 | 18 |
| 7   | 56  | 44  | 37  | 31  | 51 | 41 | 34 | 29 | 34 | 28 | 25 | 27 | 23 | 20 | 21 | 18 | 16 |
| 8   | 52  | 40  | 33  | 27  | 47 | 37 | 30 | 26 | 31 | 26 | 22 | 25 | 21 | 18 | 19 | 17 | 15 |
| 9   | 49  | 37  | 29  | 24  | 44 | 34 | 27 | 23 | 28 | 23 | 19 | 23 | 19 | 16 | 18 | 15 | 13 |
| 10  | 45  | 34  | 26  | 22  | 41 | 31 | 25 | 20 | 26 | 21 | 17 | 21 | 17 | 15 | 17 | 14 | 12 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 2205 | 2205 | 2205 |
| 5°  | 2208 | 2175 | 2189 |
| 10° | 2191 | 2145 | 2160 |
| 15° | 2158 | 2110 | 2114 |
| 20° | 2115 | 2062 | 2067 |
| 25° | 2072 | 2003 | 2013 |
| 30° | 2017 | 1949 | 1943 |
| 35° | 1966 | 1885 | 1870 |
| 40° | 1902 | 1820 | 1800 |
| 45° | 1839 | 1755 | 1729 |
| 50° | 1770 | 1687 | 1646 |
| 55° | 1698 | 1608 | 1570 |
| 60° | 1616 | 1515 | 1484 |
| 65° | 1528 | 1418 | 1381 |
| 70° | 1414 | 1300 | 1271 |
| 75° | 1257 | 1159 | 1170 |
| 80° | 1068 | 980  | 975  |
| 85° | 772  | 669  | 653  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 90°

Vertical Angle: 90°

Luminance: 2195 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 284.3   | 1.4       |
| 10°-20°   | 799.9   | 4.0       |
| 20°-30°   | 1175.6  | 5.9       |
| 30°-40°   | 1365.3  | 6.9       |
| 40°-50°   | 1363.6  | 6.9       |
| 50°-60°   | 1189.1  | 6.0       |
| 60°-70°   | 879.0   | 4.4       |
| 70°-80°   | 497.3   | 2.5       |
| 80°-90°   | 138.5   | 0.7       |
| 90°-100°  | 135.7   | 0.7       |
| 100°-110° | 506.1   | 2.6       |
| 110°-120° | 1342.2  | 6.8       |
| 120°-130° | 2226.1  | 11.3      |
| 130°-140° | 2364.7  | 12.0      |
| 140°-150° | 2197.7  | 11.1      |
| 150°-160° | 1766.9  | 8.9       |
| 160°-170° | 1138.5  | 5.8       |
| 170°-180° | 391.9   | 2.0       |
| 0°-30°    | 2259.8  | 11.4      |
| 0°-40°    | 3625.1  | 18.3      |
| 0°-60°    | 6177.8  | 31.3      |
| 0°-90°    | 7692.6  | 38.9      |
| 90°-120°  | 1984.0  | 10.0      |
| 90°-150°  | 8772.5  | 44.4      |
| 90°-180°  | 12070.0 | 61.1      |
| 0°-180°   | 19762.4 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 3021 | 3021  | 3021 | 3021  | 3021 |      |
| 5°   | 3021 | 3009  | 2977 | 3000  | 2995 | 287  |
| 15°  | 2876 | 2858  | 2820 | 2832  | 2818 | 810  |
| 25°  | 2602 | 2579  | 2530 | 2536  | 2530 | 1198 |
| 35°  | 2245 | 2216  | 2170 | 2152  | 2138 | 1402 |
| 45°  | 1827 | 1807  | 1763 | 1731  | 1720 | 1410 |
| 55°  | 1383 | 1365  | 1330 | 1296  | 1281 | 1236 |
| 65°  | 933  | 915   | 886  | 860   | 845  | 922  |
| 75°  | 488  | 482   | 467  | 450   | 456  | 521  |
| 85°  | 119  | 116   | 114  | 104   | 102  | 133  |
| 90°  | 3    | 36    | 59   | 75    | 80   | 18   |
| 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°     | 3020.6 | 3020.6 | 3020.6 | 3020.6 | 3020.6 |
| 2.5°   | 3038.2 | 3023.7 | 2991.6 | 3020.6 | 3015.0 |
| 5°     | 3020.6 | 3009.3 | 2977.2 | 3000.3 | 2994.7 |
| 7.5°   | 3000.3 | 2983.0 | 2950.9 | 2974.4 | 2968.6 |
| 10°    | 2968.6 | 2948.2 | 2913.3 | 2936.5 | 2927.9 |
| 12.5°  | 2924.8 | 2907.6 | 2872.8 | 2887.2 | 2881.3 |
| 15°    | 2875.5 | 2858.2 | 2820.3 | 2832.1 | 2817.5 |
| 17.5°  | 2814.4 | 2797.2 | 2759.3 | 2773.8 | 2759.3 |
| 20°    | 2747.5 | 2730.4 | 2689.7 | 2698.3 | 2686.9 |
| 22.5°  | 2681.0 | 2654.8 | 2616.9 | 2616.9 | 2611.0 |
| 25°    | 2602.5 | 2579.3 | 2530.1 | 2535.6 | 2530.1 |
| 27.5°  | 2515.2 | 2494.9 | 2457.3 | 2448.7 | 2434.1 |
| 30°    | 2428.4 | 2404.9 | 2361.5 | 2352.9 | 2341.1 |
| 32.5°  | 2335.2 | 2318.0 | 2271.5 | 2253.9 | 2242.2 |
| 35°    | 2245.3 | 2216.3 | 2169.8 | 2152.2 | 2137.7 |
| 37.5°  | 2143.6 | 2117.4 | 2070.8 | 2050.5 | 2036.0 |
| 40°    | 2039.1 | 2015.7 | 1969.1 | 1943.3 | 1931.5 |
| 42.5°  | 1937.4 | 1914.0 | 1867.8 | 1838.5 | 1821.2 |
| 45°    | 1827.1 | 1806.8 | 1763.0 | 1731.3 | 1719.5 |
| 47.5°  | 1719.5 | 1699.2 | 1652.6 | 1620.6 | 1603.4 |
| 50°    | 1606.2 | 1591.6 | 1550.9 | 1510.3 | 1495.8 |
| 52.5°  | 1495.8 | 1475.5 | 1437.9 | 1405.9 | 1385.5 |
| 55°    | 1382.7 | 1365.2 | 1330.4 | 1295.5 | 1281.0 |
| 57.5°  | 1269.4 | 1254.8 | 1216.9 | 1182.1 | 1170.4 |
| 60°    | 1155.9 | 1144.5 | 1103.9 | 1071.8 | 1063.2 |
| 62.5°  | 1045.6 | 1025.3 | 996.3  | 967.4  | 955.6  |
| 65°    | 932.6  | 914.9  | 886.0  | 859.8  | 845.3  |
| 67.5°  | 816.3  | 801.6  | 775.6  | 755.3  | 743.6  |
| 70°    | 708.8  | 697.1  | 670.8  | 650.5  | 639.1  |
| 72.5°  | 598.4  | 586.8  | 572.2  | 551.9  | 543.3  |
| 75°    | 487.8  | 482.3  | 467.4  | 450.3  | 456.1  |
| 77.5°  | 389.3  | 377.5  | 371.6  | 363.0  | 354.4  |
| 80°    | 290.6  | 287.6  | 281.7  | 273.0  | 267.2  |
| 82.5°  | 197.5  | 197.5  | 194.7  | 183.1  | 183.1  |
| 85°    | 119.0  | 116.2  | 113.5  | 104.5  | 101.7  |
| 87.5°  | 52.3   | 46.6   | 40.7   | 32.1   | 28.9   |
| 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 | 8.91             | 9.68  | 9.95  | 10.73 | 12.15 | 8.47           | 9.24  | 9.51  | 10.29 | 11.71 |
|                 | 3H   | 10.56            | 11.25 | 11.62 | 12.31 | 13.75 | 10.08          | 10.77 | 11.13 | 11.83 | 13.27 |
|                 | 4H   | 11.15            | 11.80 | 12.22 | 12.87 | 14.31 | 10.66          | 11.32 | 11.73 | 12.38 | 13.82 |
|                 | 6H   | 11.55            | 12.15 | 12.62 | 13.21 | 14.67 | 11.05          | 11.66 | 12.13 | 12.72 | 14.18 |
|                 | 8H   | 11.65            | 12.22 | 12.73 | 13.30 | 14.76 | 11.16          | 11.73 | 12.24 | 12.81 | 14.27 |
|                 | 12H  | 11.70            | 12.24 | 12.78 | 13.32 | 14.79 | 11.20          | 11.74 | 12.28 | 12.82 | 14.29 |
| 4H              | 2H   | 9.36             | 10.01 | 10.43 | 11.07 | 12.52 | 9.01           | 9.66  | 10.08 | 10.72 | 12.17 |
|                 | 3H   | 11.22            | 11.76 | 12.30 | 12.85 | 14.31 | 10.82          | 11.36 | 11.90 | 12.45 | 13.91 |
|                 | 4H   | 11.93            | 12.43 | 13.02 | 13.51 | 14.99 | 11.51          | 12.01 | 12.60 | 13.09 | 14.58 |
|                 | 6H   | 12.44            | 12.87 | 13.54 | 13.98 | 15.45 | 12.02          | 12.45 | 13.11 | 13.55 | 15.03 |
|                 | 8H   | 12.59            | 12.99 | 13.69 | 14.09 | 15.58 | 12.16          | 12.57 | 13.26 | 13.66 | 15.15 |
|                 | 12H  | 12.66            | 13.03 | 13.78 | 14.14 | 15.63 | 12.22          | 12.59 | 13.34 | 13.69 | 15.19 |
| 8H              | 4H   | 12.12            | 12.52 | 13.22 | 13.62 | 15.11 | 11.75          | 12.15 | 12.85 | 13.25 | 14.74 |
|                 | 6H   | 12.75            | 13.08 | 13.87 | 14.22 | 15.71 | 12.37          | 12.71 | 13.49 | 13.84 | 15.33 |
|                 | 8H   | 12.97            | 13.26 | 14.10 | 14.38 | 15.89 | 12.59          | 12.88 | 13.71 | 14.00 | 15.51 |
|                 | 12H  | 13.10            | 13.36 | 14.23 | 14.47 | 16.02 | 12.70          | 12.96 | 13.83 | 14.07 | 15.62 |
| 12H             | 4H   | 12.10            | 12.47 | 13.22 | 13.57 | 15.07 | 11.74          | 12.10 | 12.85 | 13.21 | 14.71 |
|                 | 6H   | 12.78            | 13.07 | 13.91 | 14.19 | 15.70 | 12.42          | 12.71 | 13.54 | 13.83 | 15.33 |
|                 | 8H   | 13.02            | 13.28 | 14.15 | 14.39 | 15.94 | 12.65          | 12.90 | 13.78 | 14.02 | 15.56 |

END OF REPORT