

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: P927010

Luminaire Tested: DFN2DIP-HX4F0-070D110US830-RLLONL

Issue Date: 12/12/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P927010  
REPORT IS A COMBINATION OF REPORTS P900952 AND P896187  
Test Lab: INNOVATION CENTER  
Issue Date: 12/12/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-HX4F0-070D110US830-RLLONL  
Description: 4 foot, Hexagon Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

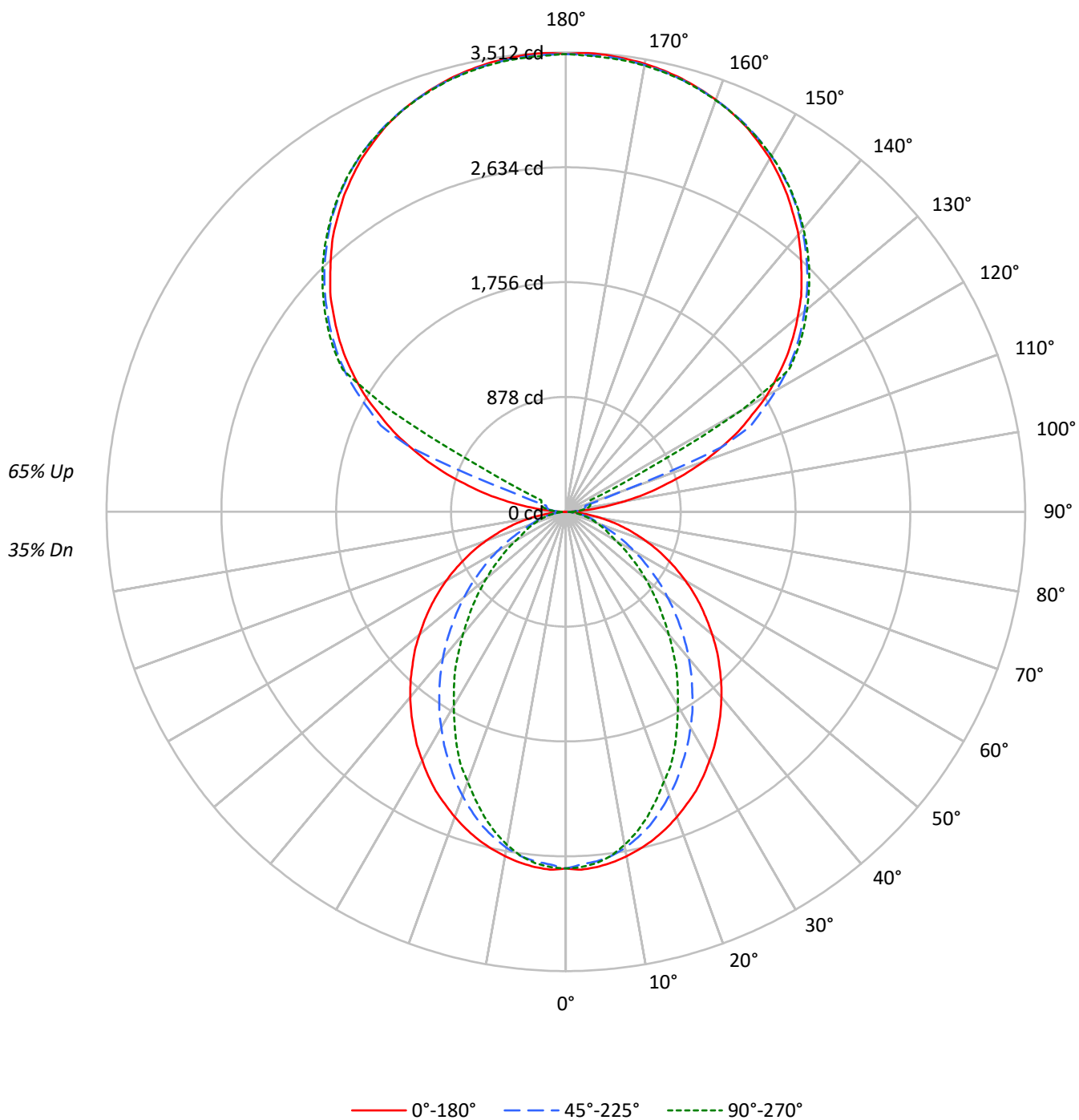
**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 15871.6 lumens  
Efficiency: N/A  
Efficacy: 103.4 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 0.99 / 1.16  
Luminous Opening: Rectangular w/ Sides (W: 3.54' x L: 4.09' x H: 0.1')  
CIE Type: Semi-Indirect  
  
Input Watts (W): 153.5  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9972  
Total Harmonic Distortion (THDi): 0.128  
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   | 104 | 104 | 104 | 104 | 94 | 94 | 94 | 94 | 75 | 75 | 75 | 58 | 58 | 58 | 43 | 43 | 43 |
| 1   | 95  | 91  | 87  | 84  | 86 | 82 | 79 | 76 | 66 | 64 | 62 | 52 | 50 | 49 | 38 | 37 | 37 |
| 2   | 87  | 80  | 74  | 69  | 78 | 72 | 67 | 63 | 58 | 55 | 52 | 46 | 44 | 41 | 34 | 33 | 31 |
| 3   | 79  | 70  | 63  | 58  | 71 | 64 | 58 | 53 | 52 | 48 | 44 | 41 | 38 | 35 | 30 | 29 | 27 |
| 4   | 73  | 62  | 55  | 49  | 65 | 57 | 50 | 45 | 46 | 42 | 38 | 36 | 33 | 31 | 27 | 25 | 24 |
| 5   | 67  | 56  | 48  | 42  | 60 | 51 | 44 | 39 | 41 | 37 | 33 | 33 | 29 | 27 | 25 | 23 | 21 |
| 6   | 61  | 50  | 42  | 37  | 55 | 46 | 39 | 34 | 37 | 32 | 29 | 30 | 26 | 24 | 23 | 20 | 18 |
| 7   | 57  | 45  | 37  | 32  | 51 | 41 | 35 | 30 | 34 | 29 | 25 | 27 | 24 | 21 | 21 | 18 | 16 |
| 8   | 53  | 41  | 33  | 28  | 48 | 37 | 31 | 26 | 31 | 26 | 23 | 25 | 21 | 19 | 19 | 17 | 15 |
| 9   | 49  | 37  | 30  | 25  | 44 | 34 | 28 | 24 | 28 | 24 | 20 | 23 | 19 | 17 | 18 | 15 | 13 |
| 10  | 46  | 34  | 27  | 23  | 42 | 31 | 25 | 21 | 26 | 21 | 18 | 21 | 18 | 15 | 16 | 14 | 12 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 2027 | 2027 | 2027 |
| 5°  | 2031 | 1996 | 2008 |
| 10° | 2011 | 1957 | 1943 |
| 15° | 1983 | 1892 | 1842 |
| 20° | 1947 | 1803 | 1718 |
| 25° | 1910 | 1703 | 1599 |
| 30° | 1859 | 1601 | 1447 |
| 35° | 1810 | 1491 | 1313 |
| 40° | 1760 | 1377 | 1160 |
| 45° | 1702 | 1251 | 1022 |
| 50° | 1642 | 1123 | 887  |
| 55° | 1579 | 987  | 757  |
| 60° | 1507 | 844  | 623  |
| 65° | 1423 | 700  | 561  |
| 70° | 1322 | 564  | 508  |
| 75° | 1195 | 498  | 462  |
| 80° | 1011 | 419  | 401  |
| 85° | 707  | 280  | 302  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 90°

Vertical Angle: 90°

Luminance: 1796 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 255.6   | 1.6       |
| 10°-20°   | 701.5   | 4.4       |
| 20°-30°   | 984.9   | 6.2       |
| 30°-40°   | 1073.7  | 6.8       |
| 40°-50°   | 986.8   | 6.2       |
| 50°-60°   | 775.0   | 4.9       |
| 60°-70°   | 504.4   | 3.2       |
| 70°-80°   | 259.7   | 1.6       |
| 80°-90°   | 72.4    | 0.5       |
| 90°-100°  | 115.4   | 0.7       |
| 100°-110° | 430.1   | 2.7       |
| 110°-120° | 1140.7  | 7.2       |
| 120°-130° | 1891.9  | 11.9      |
| 130°-140° | 2009.6  | 12.7      |
| 140°-150° | 1867.7  | 11.8      |
| 150°-160° | 1501.6  | 9.5       |
| 160°-170° | 967.6   | 6.1       |
| 170°-180° | 333.0   | 2.1       |
| 0°-30°    | 1942.0  | 12.2      |
| 0°-40°    | 3015.7  | 19.0      |
| 0°-60°    | 4777.5  | 30.1      |
| 0°-90°    | 5614.0  | 35.4      |
| 90°-120°  | 1686.2  | 10.6      |
| 90°-150°  | 7455.4  | 47.0      |
| 90°-180°  | 10258.0 | 64.6      |
| 0°-180°   | 15871.6 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 2727 | 2727  | 2727 | 2727  | 2727 |      |
| 5°   | 2727 | 2714  | 2682 | 2704  | 2697 | 259  |
| 15°  | 2594 | 2566  | 2482 | 2436  | 2411 | 731  |
| 25°  | 2354 | 2275  | 2112 | 2011  | 1974 | 1083 |
| 35°  | 2028 | 1902  | 1686 | 1530  | 1476 | 1270 |
| 45°  | 1658 | 1493  | 1234 | 1058  | 999  | 1281 |
| 55°  | 1261 | 1068  | 802  | 654   | 607  | 1127 |
| 65°  | 851  | 651   | 429  | 346   | 338  | 844  |
| 75°  | 454  | 281   | 197  | 180   | 178  | 480  |
| 85°  | 106  | 54    | 47   | 47    | 47   | 122  |
| 90°  | 2    | 30    | 50   | 63    | 68   | 15   |
| 95°  | 164  | 81    | 99   | 112   | 109  | 195  |
| 105° | 770  | 846   | 155  | 182   | 192  | 822  |
| 115° | 1456 | 1499  | 1562 | 390   | 208  | 1433 |
| 125° | 2058 | 2091  | 2139 | 2157  | 2165 | 1836 |
| 135° | 2547 | 2588  | 2610 | 2636  | 2631 | 1968 |
| 145° | 2955 | 2952  | 2995 | 3013  | 3000 | 1848 |
| 155° | 3253 | 3231  | 3261 | 3276  | 3256 | 1499 |
| 165° | 3428 | 3413  | 3420 | 3438  | 3420 | 968  |
| 175° | 3506 | 3489  | 3494 | 3512  | 3486 | 334  |
| 180° | 3499 | 3499  | 3499 | 3499  | 3499 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 2726.7 | 2726.7 | 2726.7 | 2726.7 | 2726.7 |
| 2.5°   | 2739.0 | 2726.7 | 2699.5 | 2724.4 | 2719.4 |
| 5°     | 2726.7 | 2714.4 | 2682.3 | 2704.5 | 2697.2 |
| 7.5°   | 2704.5 | 2689.8 | 2655.3 | 2664.9 | 2652.7 |
| 10°    | 2674.9 | 2657.7 | 2608.4 | 2600.8 | 2586.1 |
| 12.5°  | 2638.0 | 2615.7 | 2549.0 | 2534.3 | 2507.0 |
| 15°    | 2593.5 | 2566.2 | 2482.5 | 2435.6 | 2411.0 |
| 17.5°  | 2541.6 | 2502.1 | 2398.5 | 2344.2 | 2304.7 |
| 20°    | 2482.5 | 2433.0 | 2309.7 | 2248.1 | 2193.7 |
| 22.5°  | 2418.4 | 2361.5 | 2218.3 | 2134.5 | 2097.6 |
| 25°    | 2354.2 | 2275.1 | 2112.2 | 2011.2 | 1974.1 |
| 27.5°  | 2277.7 | 2193.7 | 2013.6 | 1897.6 | 1840.8 |
| 30°    | 2196.3 | 2102.3 | 1904.9 | 1779.3 | 1712.5 |
| 32.5°  | 2117.2 | 2003.7 | 1801.5 | 1653.3 | 1591.5 |
| 35°    | 2028.4 | 1902.5 | 1685.6 | 1530.1 | 1475.6 |
| 37.5°  | 1942.1 | 1806.2 | 1576.9 | 1406.4 | 1344.9 |
| 40°    | 1850.7 | 1702.8 | 1463.2 | 1288.1 | 1223.9 |
| 42.5°  | 1757.0 | 1599.1 | 1349.8 | 1167.1 | 1105.6 |
| 45°    | 1658.3 | 1492.8 | 1233.9 | 1058.5 | 999.3  |
| 47.5°  | 1564.6 | 1389.4 | 1122.9 | 947.5  | 893.3  |
| 50°    | 1460.9 | 1285.8 | 1014.2 | 843.8  | 792.3  |
| 52.5°  | 1359.6 | 1174.4 | 910.5  | 747.7  | 700.8  |
| 55°    | 1260.9 | 1068.4 | 801.9  | 654.0  | 607.2  |
| 57.5°  | 1159.8 | 962.4  | 705.8  | 567.6  | 528.1  |
| 60°    | 1056.2 | 858.7  | 604.5  | 478.9  | 439.3  |
| 62.5°  | 955.0  | 757.7  | 518.1  | 399.8  | 380.1  |
| 65°    | 851.4  | 651.4  | 429.4  | 345.6  | 338.0  |
| 67.5°  | 752.7  | 552.7  | 345.6  | 303.4  | 296.1  |
| 70°    | 649.0  | 456.5  | 286.1  | 261.5  | 251.6  |
| 72.5°  | 550.3  | 367.6  | 239.3  | 219.7  | 214.7  |
| 75°    | 454.0  | 281.1  | 197.4  | 180.1  | 177.8  |
| 77.5°  | 357.9  | 199.7  | 155.5  | 145.5  | 140.6  |
| 80°    | 268.9  | 143.2  | 118.4  | 108.7  | 108.7  |
| 82.5°  | 187.5  | 96.3   | 81.4   | 76.4   | 76.4   |
| 85°    | 106.0  | 54.2   | 46.8   | 46.8   | 46.8   |
| 87.5°  | 39.5   | 19.6   | 19.6   | 17.2   | 17.2   |
| 90°    | 2.5    | 30.3   | 50.5   | 63.4   | 68.2   |
| 92.5°  | 63.4   | 53.3   | 60.7   | 65.9   | 68.2   |
| 95°    | 164.5  | 80.9   | 98.6   | 111.5  | 108.9  |
| 97.5°  | 296.1  | 88.7   | 128.9  | 136.8  | 139.2  |
| 100°   | 448.3  | 101.3  | 144.3  | 164.5  | 169.6  |
| 102.5° | 615.1  | 610.3  | 149.4  | 177.1  | 184.9  |
| 105°   | 769.6  | 845.7  | 154.6  | 182.2  | 192.5  |
| 107.5° | 949.5  | 1012.5 | 159.7  | 187.3  | 197.5  |
| 110°   | 1121.7 | 1174.6 | 443.2  | 190.0  | 199.9  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 1283.8 | 1329.1 | 1286.1 | 194.8  | 202.6  |
| 115°   | 1455.7 | 1498.7 | 1562.2 | 389.9  | 207.7  |
| 117.5° | 1605.2 | 1655.7 | 1699.0 | 1336.7 | 673.4  |
| 120°   | 1772.3 | 1810.2 | 1855.9 | 1886.2 | 1544.4 |
| 122.5° | 1913.9 | 1954.5 | 2005.3 | 2020.3 | 2023.1 |
| 125°   | 2058.2 | 2091.3 | 2139.4 | 2157.1 | 2164.6 |
| 127.5° | 2189.9 | 2225.3 | 2263.5 | 2288.8 | 2291.2 |
| 130°   | 2314.0 | 2354.6 | 2382.3 | 2410.3 | 2407.9 |
| 132.5° | 2440.6 | 2473.7 | 2501.4 | 2524.2 | 2521.8 |
| 135°   | 2547.1 | 2587.6 | 2610.2 | 2635.8 | 2630.6 |
| 137.5° | 2658.3 | 2688.7 | 2714.2 | 2739.5 | 2731.9 |
| 140°   | 2767.2 | 2787.5 | 2815.2 | 2838.1 | 2825.4 |
| 142.5° | 2858.5 | 2876.2 | 2909.0 | 2929.2 | 2916.6 |
| 145°   | 2954.7 | 2952.0 | 2995.0 | 3012.8 | 3000.2 |
| 147.5° | 3038.1 | 3030.5 | 3073.5 | 3086.1 | 3076.2 |
| 150°   | 3119.2 | 3101.5 | 3142.0 | 3157.1 | 3144.5 |
| 152.5° | 3187.4 | 3167.3 | 3205.2 | 3220.5 | 3202.8 |
| 155°   | 3253.3 | 3230.7 | 3261.0 | 3276.1 | 3256.0 |
| 157.5° | 3306.5 | 3286.3 | 3309.2 | 3326.9 | 3306.5 |
| 160°   | 3352.2 | 3336.8 | 3352.2 | 3367.2 | 3349.5 |
| 162.5° | 3392.4 | 3377.4 | 3390.1 | 3407.8 | 3385.0 |
| 165°   | 3428.0 | 3412.9 | 3420.4 | 3438.1 | 3420.4 |
| 167.5° | 3455.9 | 3440.6 | 3448.4 | 3466.1 | 3443.3 |
| 170°   | 3478.8 | 3463.4 | 3468.5 | 3486.3 | 3463.4 |
| 172.5° | 3493.8 | 3478.8 | 3483.9 | 3501.6 | 3478.8 |
| 175°   | 3506.4 | 3488.7 | 3493.8 | 3511.6 | 3486.3 |
| 177.5° | 3511.6 | 3493.8 | 3496.5 | 3514.2 | 3491.4 |
| 180°   | 3498.9 | 3498.9 | 3498.9 | 3498.9 | 3498.9 |

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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 | 8.06             | 8.79  | 9.14  | 9.86  | 11.33 | 4.03           | 4.76 | 5.11 | 5.83 | 7.30  |
|                 | 3H   | 9.73             | 10.38 | 10.82 | 11.46 | 12.95 | 5.22           | 5.86 | 6.30 | 6.95 | 8.43  |
|                 | 4H   | 10.34            | 10.95 | 11.43 | 12.03 | 13.53 | 5.66           | 6.28 | 6.76 | 7.36 | 8.85  |
|                 | 6H   | 10.75            | 11.32 | 11.86 | 12.41 | 13.91 | 5.98           | 6.54 | 7.09 | 7.63 | 9.14  |
|                 | 8H   | 10.88            | 11.41 | 11.99 | 12.52 | 14.01 | 6.07           | 6.61 | 7.18 | 7.71 | 9.21  |
|                 | 12H  | 10.94            | 11.44 | 12.05 | 12.54 | 14.06 | 6.11           | 6.62 | 7.23 | 7.72 | 9.24  |
| 4H              | 2H   | 8.07             | 8.68  | 9.17  | 9.77  | 11.26 | 4.62           | 5.23 | 5.72 | 6.32 | 7.81  |
|                 | 3H   | 9.89             | 10.40 | 11.00 | 11.51 | 13.01 | 5.96           | 6.47 | 7.07 | 7.58 | 9.09  |
|                 | 4H   | 10.58            | 11.04 | 11.69 | 12.15 | 13.67 | 6.50           | 6.97 | 7.62 | 8.08 | 9.60  |
|                 | 6H   | 11.09            | 11.49 | 12.21 | 12.61 | 14.13 | 6.92           | 7.32 | 8.04 | 8.45 | 9.96  |
|                 | 8H   | 11.26            | 11.63 | 12.38 | 12.75 | 14.28 | 7.05           | 7.42 | 8.17 | 8.54 | 10.07 |
|                 | 12H  | 11.35            | 11.69 | 12.49 | 12.82 | 14.36 | 7.11           | 7.45 | 8.25 | 8.58 | 10.12 |
| 8H              | 4H   | 10.54            | 10.91 | 11.66 | 12.03 | 13.56 | 6.78           | 7.15 | 7.90 | 8.27 | 9.80  |
|                 | 6H   | 11.10            | 11.41 | 12.24 | 12.57 | 14.10 | 7.29           | 7.60 | 8.44 | 8.76 | 10.29 |
|                 | 8H   | 11.32            | 11.59 | 12.47 | 12.73 | 14.28 | 7.49           | 7.76 | 8.64 | 8.90 | 10.45 |
|                 | 12H  | 11.45            | 11.69 | 12.60 | 12.82 | 14.41 | 7.60           | 7.84 | 8.76 | 8.97 | 10.56 |
| 12H             | 4H   | 10.48            | 10.82 | 11.62 | 11.95 | 13.49 | 6.78           | 7.12 | 7.92 | 8.25 | 9.78  |
|                 | 6H   | 11.07            | 11.34 | 12.22 | 12.48 | 14.03 | 7.34           | 7.61 | 8.49 | 8.75 | 10.30 |
|                 | 8H   | 11.29            | 11.53 | 12.44 | 12.66 | 14.25 | 7.55           | 7.79 | 8.70 | 8.92 | 10.51 |

END OF REPORT