

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: P928840

Luminaire Tested: DFN2DIP-HX4F0-040D100US935-FLLONL

Issue Date: 12/12/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P928840  
REPORT IS A COMBINATION OF REPORTS P900927 AND P896187  
Test Lab: INNOVATION CENTER  
Issue Date: 12/12/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-HX4F0-040D100US935-FLLONL  
Description: 4 foot, Hexagon Define Geo, with Direct Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

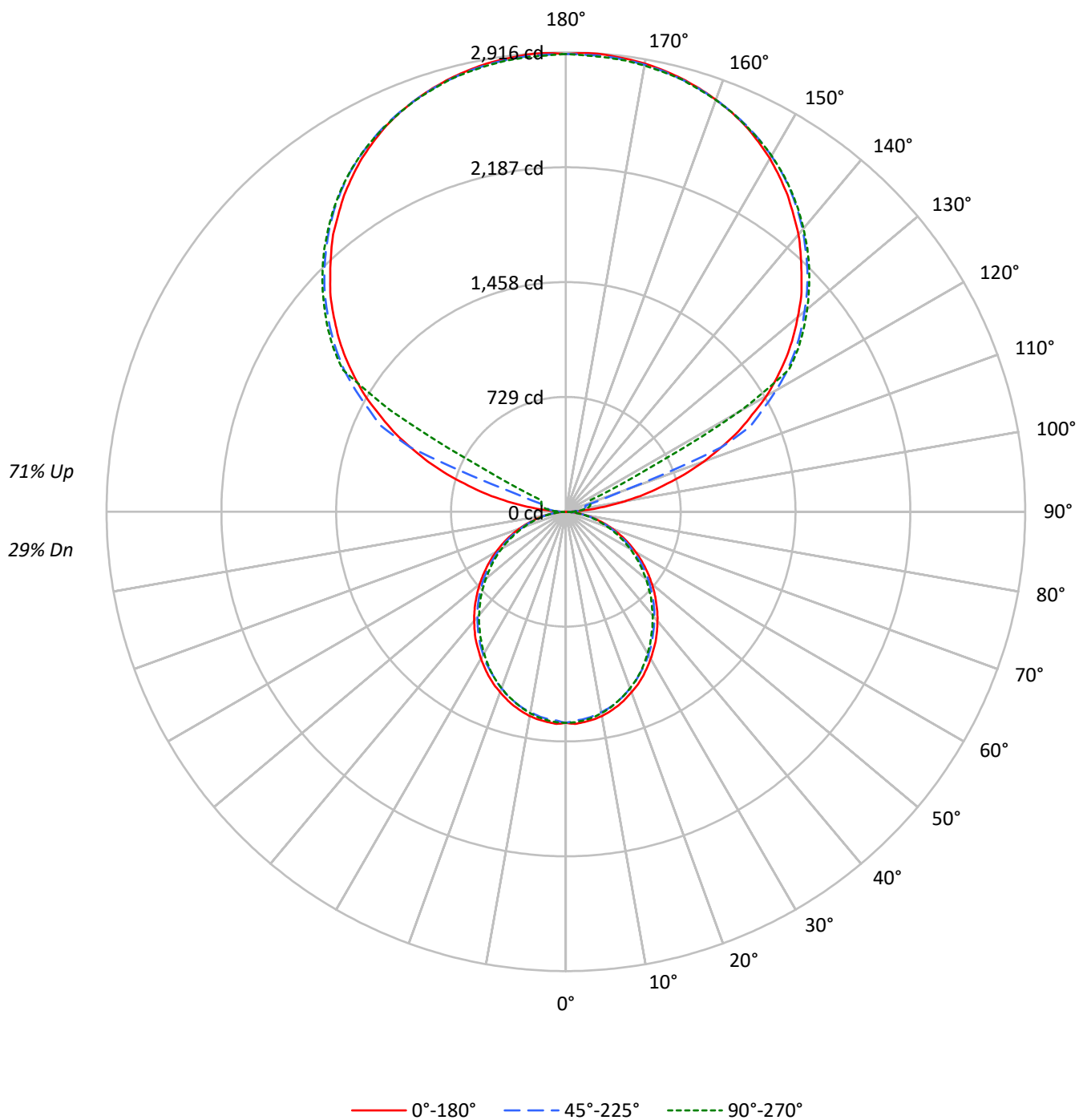
Lumens per Lamp: N/A  
Luminaire Lumens: 11933.5 lumens  
Efficiency: N/A  
Efficacy: 109.1 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 3.54' x L: 4.09' x H: 0.1')  
CIE Type: Semi-Indirect

Input Watts (W): 109.4  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9977  
Total Harmonic Distortion (THDi): 0.049  
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   | 102 | 102 | 102 | 102 | 91 | 91 | 91 | 91 | 71 | 71 | 71 | 53 | 53 | 53 | 36 | 36 | 36 |
| 1   | 93  | 89  | 85  | 82  | 83 | 80 | 77 | 74 | 62 | 60 | 58 | 47 | 45 | 44 | 32 | 31 | 31 |
| 2   | 85  | 77  | 72  | 67  | 76 | 70 | 65 | 60 | 55 | 51 | 48 | 41 | 39 | 37 | 28 | 27 | 26 |
| 3   | 77  | 68  | 61  | 55  | 69 | 61 | 55 | 50 | 48 | 44 | 41 | 36 | 33 | 31 | 25 | 23 | 22 |
| 4   | 71  | 60  | 53  | 47  | 63 | 54 | 48 | 43 | 43 | 38 | 34 | 32 | 29 | 27 | 22 | 21 | 19 |
| 5   | 65  | 53  | 46  | 40  | 58 | 48 | 41 | 36 | 38 | 33 | 30 | 29 | 26 | 23 | 20 | 18 | 16 |
| 6   | 59  | 48  | 40  | 34  | 53 | 43 | 36 | 31 | 34 | 29 | 26 | 26 | 23 | 20 | 18 | 16 | 14 |
| 7   | 55  | 43  | 35  | 30  | 49 | 39 | 32 | 27 | 31 | 26 | 23 | 24 | 20 | 18 | 17 | 14 | 13 |
| 8   | 51  | 39  | 31  | 26  | 45 | 35 | 29 | 24 | 28 | 23 | 20 | 22 | 18 | 16 | 15 | 13 | 11 |
| 9   | 47  | 35  | 28  | 23  | 42 | 32 | 26 | 21 | 26 | 21 | 18 | 20 | 16 | 14 | 14 | 12 | 10 |
| 10  | 44  | 32  | 25  | 21  | 39 | 29 | 23 | 19 | 24 | 19 | 16 | 18 | 15 | 13 | 13 | 11 | 9  |

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

|     | 0°  | 45° | 90° |
|-----|-----|-----|-----|
| 0°  | 996 | 996 | 996 |
| 5°  | 998 | 983 | 989 |
| 10° | 990 | 970 | 976 |
| 15° | 976 | 954 | 955 |
| 20° | 956 | 932 | 934 |
| 25° | 937 | 905 | 909 |
| 30° | 912 | 881 | 877 |
| 35° | 889 | 852 | 844 |
| 40° | 860 | 822 | 813 |
| 45° | 832 | 793 | 780 |
| 50° | 801 | 762 | 743 |
| 55° | 768 | 726 | 708 |
| 60° | 732 | 684 | 669 |
| 65° | 692 | 640 | 622 |
| 70° | 640 | 587 | 572 |
| 75° | 570 | 523 | 526 |
| 80° | 485 | 442 | 438 |
| 85° | 352 | 301 | 291 |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 90°

Vertical Angle: 90°

Luminance: 1493 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 126.1   | 1.1       |
| 10°-20°   | 354.9   | 3.0       |
| 20°-30°   | 521.5   | 4.4       |
| 30°-40°   | 605.7   | 5.1       |
| 40°-50°   | 605.0   | 5.1       |
| 50°-60°   | 527.5   | 4.4       |
| 60°-70°   | 389.9   | 3.3       |
| 70°-80°   | 220.6   | 1.8       |
| 80°-90°   | 63.3    | 0.5       |
| 90°-100°  | 95.8    | 0.8       |
| 100°-110° | 357.2   | 3.0       |
| 110°-120° | 947.3   | 7.9       |
| 120°-130° | 1571.2  | 13.2      |
| 130°-140° | 1669.0  | 14.0      |
| 140°-150° | 1551.1  | 13.0      |
| 150°-160° | 1247.1  | 10.5      |
| 160°-170° | 803.6   | 6.7       |
| 170°-180° | 276.6   | 2.3       |
| 0°-30°    | 1002.5  | 8.4       |
| 0°-40°    | 1608.3  | 13.5      |
| 0°-60°    | 2740.7  | 23.0      |
| 0°-90°    | 3414.6  | 28.6      |
| 90°-120°  | 1400.3  | 11.7      |
| 90°-150°  | 6191.6  | 51.9      |
| 90°-180°  | 8519.0  | 71.4      |
| 0°-180°   | 11933.5 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 1340 | 1340  | 1340 | 1340  | 1340 |      |
| 5°   | 1340 | 1335  | 1321 | 1331  | 1329 | 127  |
| 15°  | 1276 | 1268  | 1251 | 1256  | 1250 | 359  |
| 25°  | 1154 | 1144  | 1122 | 1125  | 1122 | 531  |
| 35°  | 996  | 983   | 963  | 955   | 948  | 622  |
| 45°  | 810  | 802   | 782  | 768   | 763  | 626  |
| 55°  | 614  | 606   | 590  | 575   | 568  | 548  |
| 65°  | 414  | 406   | 393  | 381   | 375  | 409  |
| 75°  | 216  | 214   | 207  | 200   | 202  | 231  |
| 85°  | 53   | 52    | 50   | 46    | 45   | 59   |
| 90°  | 2    | 25    | 42   | 53    | 57   | 11   |
| 95°  | 137  | 67    | 82   | 93    | 90   | 162  |
| 105° | 639  | 702   | 128  | 151   | 160  | 683  |
| 115° | 1209 | 1245  | 1297 | 324   | 172  | 1190 |
| 125° | 1709 | 1737  | 1777 | 1792  | 1798 | 1525 |
| 135° | 2115 | 2149  | 2168 | 2189  | 2185 | 1634 |
| 145° | 2454 | 2452  | 2487 | 2502  | 2492 | 1535 |
| 155° | 2702 | 2683  | 2708 | 2721  | 2704 | 1245 |
| 165° | 2847 | 2834  | 2841 | 2855  | 2841 | 804  |
| 175° | 2912 | 2897  | 2902 | 2916  | 2895 | 277  |
| 180° | 2906 | 2906  | 2906 | 2906  | 2906 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 1340.1 | 1340.1 | 1340.1 | 1340.1 | 1340.1 |
| 2.5°   | 1347.9 | 1341.4 | 1327.2 | 1340.1 | 1337.6 |
| 5°     | 1340.1 | 1335.0 | 1320.8 | 1331.0 | 1328.6 |
| 7.5°   | 1331.0 | 1323.4 | 1309.2 | 1319.6 | 1317.0 |
| 10°    | 1317.0 | 1307.9 | 1292.5 | 1302.8 | 1298.9 |
| 12.5°  | 1297.5 | 1289.9 | 1274.5 | 1280.9 | 1278.2 |
| 15°    | 1275.7 | 1268.0 | 1251.2 | 1256.4 | 1250.0 |
| 17.5°  | 1248.6 | 1241.0 | 1224.2 | 1230.5 | 1224.2 |
| 20°    | 1218.9 | 1211.3 | 1193.3 | 1197.0 | 1192.1 |
| 22.5°  | 1189.4 | 1177.8 | 1161.0 | 1161.0 | 1158.4 |
| 25°    | 1154.5 | 1144.3 | 1122.4 | 1124.9 | 1122.4 |
| 27.5°  | 1115.9 | 1106.8 | 1090.2 | 1086.3 | 1080.0 |
| 30°    | 1077.3 | 1067.0 | 1047.7 | 1043.8 | 1038.6 |
| 32.5°  | 1036.0 | 1028.4 | 1007.7 | 1000.0 | 994.7  |
| 35°    | 996.1  | 983.3  | 962.6  | 954.8  | 948.4  |
| 37.5°  | 951.0  | 939.4  | 918.7  | 909.7  | 903.3  |
| 40°    | 904.7  | 894.2  | 873.6  | 862.1  | 857.0  |
| 42.5°  | 859.5  | 849.1  | 828.6  | 815.6  | 808.0  |
| 45°    | 810.5  | 801.6  | 782.1  | 768.1  | 762.8  |
| 47.5°  | 762.8  | 753.8  | 733.2  | 719.0  | 711.4  |
| 50°    | 712.6  | 706.1  | 688.1  | 670.0  | 663.6  |
| 52.5°  | 663.6  | 654.6  | 637.9  | 623.7  | 614.7  |
| 55°    | 613.5  | 605.6  | 590.2  | 574.7  | 568.3  |
| 57.5°  | 563.1  | 556.7  | 539.8  | 524.4  | 519.3  |
| 60°    | 512.8  | 507.7  | 489.7  | 475.5  | 471.7  |
| 62.5°  | 463.9  | 454.9  | 442.0  | 429.1  | 424.0  |
| 65°    | 413.7  | 405.9  | 393.0  | 381.4  | 375.1  |
| 67.5°  | 362.1  | 355.6  | 344.1  | 335.1  | 329.9  |
| 70°    | 314.4  | 309.3  | 297.6  | 288.6  | 283.5  |
| 72.5°  | 265.5  | 260.3  | 253.9  | 244.9  | 241.0  |
| 75°    | 216.5  | 214.0  | 207.4  | 199.8  | 202.3  |
| 77.5°  | 172.6  | 167.5  | 164.9  | 161.0  | 157.2  |
| 80°    | 128.9  | 127.5  | 124.9  | 121.1  | 118.6  |
| 82.5°  | 87.6   | 87.6   | 86.4   | 81.2   | 81.2   |
| 85°    | 52.8   | 51.6   | 50.3   | 46.3   | 45.1   |
| 87.5°  | 23.2   | 20.7   | 18.1   | 14.2   | 12.8   |
| 90°    | 2.0    | 25.2   | 41.9   | 52.7   | 56.7   |
| 92.5°  | 52.7   | 44.2   | 50.5   | 54.7   | 56.7   |
| 95°    | 136.6  | 67.2   | 81.9   | 92.6   | 90.4   |
| 97.5°  | 245.9  | 73.6   | 107.1  | 113.6  | 115.6  |
| 100°   | 372.3  | 84.1   | 119.9  | 136.6  | 140.9  |
| 102.5° | 510.8  | 506.9  | 124.1  | 147.1  | 153.5  |
| 105°   | 639.2  | 702.3  | 128.4  | 151.3  | 159.8  |
| 107.5° | 788.5  | 840.9  | 132.6  | 155.6  | 164.0  |
| 110°   | 931.5  | 975.5  | 368.0  | 157.8  | 166.0  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 1066.1 | 1103.8 | 1068.2 | 161.8  | 168.3  |
| 115°   | 1208.9 | 1244.7 | 1297.4 | 323.8  | 172.5  |
| 117.5° | 1333.0 | 1375.0 | 1410.9 | 1110.1 | 559.3  |
| 120°   | 1471.9 | 1503.3 | 1541.3 | 1566.5 | 1282.6 |
| 122.5° | 1589.5 | 1623.2 | 1665.3 | 1677.8 | 1680.1 |
| 125°   | 1709.3 | 1736.8 | 1776.8 | 1791.5 | 1797.7 |
| 127.5° | 1818.7 | 1848.1 | 1879.8 | 1900.8 | 1902.8 |
| 130°   | 1921.8 | 1955.5 | 1978.5 | 2001.7 | 1999.7 |
| 132.5° | 2026.9 | 2054.3 | 2077.3 | 2096.3 | 2094.3 |
| 135°   | 2115.3 | 2149.0 | 2167.7 | 2188.9 | 2184.7 |
| 137.5° | 2207.7 | 2232.9 | 2254.1 | 2275.1 | 2268.8 |
| 140°   | 2298.0 | 2315.1 | 2338.0 | 2357.0 | 2346.5 |
| 142.5° | 2373.9 | 2388.7 | 2415.9 | 2432.6 | 2422.2 |
| 145°   | 2453.8 | 2451.6 | 2487.3 | 2502.1 | 2491.6 |
| 147.5° | 2523.0 | 2516.8 | 2552.4 | 2562.9 | 2554.8 |
| 150°   | 2590.4 | 2575.7 | 2609.4 | 2621.9 | 2611.4 |
| 152.5° | 2647.1 | 2630.4 | 2661.9 | 2674.5 | 2659.8 |
| 155°   | 2701.8 | 2683.0 | 2708.3 | 2720.8 | 2704.1 |
| 157.5° | 2746.0 | 2729.3 | 2748.2 | 2762.9 | 2746.0 |
| 160°   | 2784.0 | 2771.2 | 2784.0 | 2796.4 | 2781.7 |
| 162.5° | 2817.4 | 2804.9 | 2815.4 | 2830.1 | 2811.2 |
| 165°   | 2846.8 | 2834.3 | 2840.6 | 2855.3 | 2840.6 |
| 167.5° | 2870.1 | 2857.3 | 2863.9 | 2878.6 | 2859.6 |
| 170°   | 2889.0 | 2876.3 | 2880.6 | 2895.3 | 2876.3 |
| 172.5° | 2901.5 | 2889.0 | 2893.3 | 2908.0 | 2889.0 |
| 175°   | 2912.0 | 2897.3 | 2901.5 | 2916.3 | 2895.3 |
| 177.5° | 2916.3 | 2901.5 | 2903.8 | 2918.5 | 2899.5 |
| 180°   | 2905.8 | 2905.8 | 2905.8 | 2905.8 | 2905.8 |

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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 | 4.85             | 5.55 | 5.98  | 6.67  | 8.21  | 4.42           | 5.12 | 5.54 | 6.23  | 7.78  |
|                 | 3H   | 6.50             | 7.13 | 7.63  | 8.25  | 9.81  | 6.03           | 6.65 | 7.16 | 7.78  | 9.34  |
|                 | 4H   | 7.08             | 7.68 | 8.22  | 8.80  | 10.37 | 6.61           | 7.20 | 7.75 | 8.33  | 9.89  |
|                 | 6H   | 7.47             | 8.02 | 8.62  | 9.15  | 10.73 | 7.00           | 7.54 | 8.15 | 8.67  | 10.25 |
|                 | 8H   | 7.57             | 8.09 | 8.73  | 9.24  | 10.81 | 7.10           | 7.62 | 8.25 | 8.76  | 10.33 |
|                 | 12H  | 7.62             | 8.11 | 8.77  | 9.25  | 10.84 | 7.14           | 7.63 | 8.29 | 8.76  | 10.36 |
| 4H              | 2H   | 5.30             | 5.89 | 6.44  | 7.01  | 8.58  | 4.95           | 5.54 | 6.10 | 6.67  | 8.24  |
|                 | 3H   | 7.15             | 7.64 | 8.30  | 8.79  | 10.37 | 6.75           | 7.25 | 7.91 | 8.40  | 9.98  |
|                 | 4H   | 7.86             | 8.31 | 9.01  | 9.45  | 11.05 | 7.45           | 7.91 | 8.60 | 9.04  | 10.64 |
|                 | 6H   | 8.36             | 8.75 | 9.52  | 9.91  | 11.50 | 7.95           | 8.34 | 9.11 | 9.50  | 11.09 |
|                 | 8H   | 8.51             | 8.87 | 9.67  | 10.03 | 11.63 | 8.10           | 8.46 | 9.26 | 9.61  | 11.22 |
|                 | 12H  | 8.57             | 8.90 | 9.75  | 10.07 | 11.68 | 8.15           | 8.48 | 9.33 | 9.65  | 11.26 |
| 8H              | 4H   | 8.04             | 8.40 | 9.20  | 9.56  | 11.16 | 7.68           | 8.04 | 8.84 | 9.20  | 10.80 |
|                 | 6H   | 8.67             | 8.97 | 9.85  | 10.16 | 11.76 | 8.30           | 8.60 | 9.48 | 9.80  | 11.40 |
|                 | 8H   | 8.89             | 9.15 | 10.07 | 10.32 | 11.94 | 8.52           | 8.78 | 9.70 | 9.95  | 11.58 |
|                 | 12H  | 9.01             | 9.24 | 10.20 | 10.41 | 12.07 | 8.62           | 8.86 | 9.81 | 10.03 | 11.68 |
| 12H             | 4H   | 8.02             | 8.35 | 9.19  | 9.51  | 11.12 | 7.67           | 8.00 | 8.84 | 9.16  | 10.77 |
|                 | 6H   | 8.69             | 8.96 | 9.88  | 10.13 | 11.75 | 8.34           | 8.60 | 9.53 | 9.78  | 11.40 |
|                 | 8H   | 8.93             | 9.16 | 10.12 | 10.33 | 11.99 | 8.57           | 8.80 | 9.76 | 9.97  | 11.63 |

END OF REPORT