

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: P928560

Luminaire Tested: DFN2DIP-HX4F0-050D120US930-FLLONL

Issue Date: 12/12/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P928560  
REPORT IS A COMBINATION OF REPORTS P900965 AND P896187  
Test Lab: INNOVATION CENTER  
Issue Date: 12/12/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-HX4F0-050D120US930-FLLONL  
Description: 4 foot, Hexagon Define Geo, with Direct Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

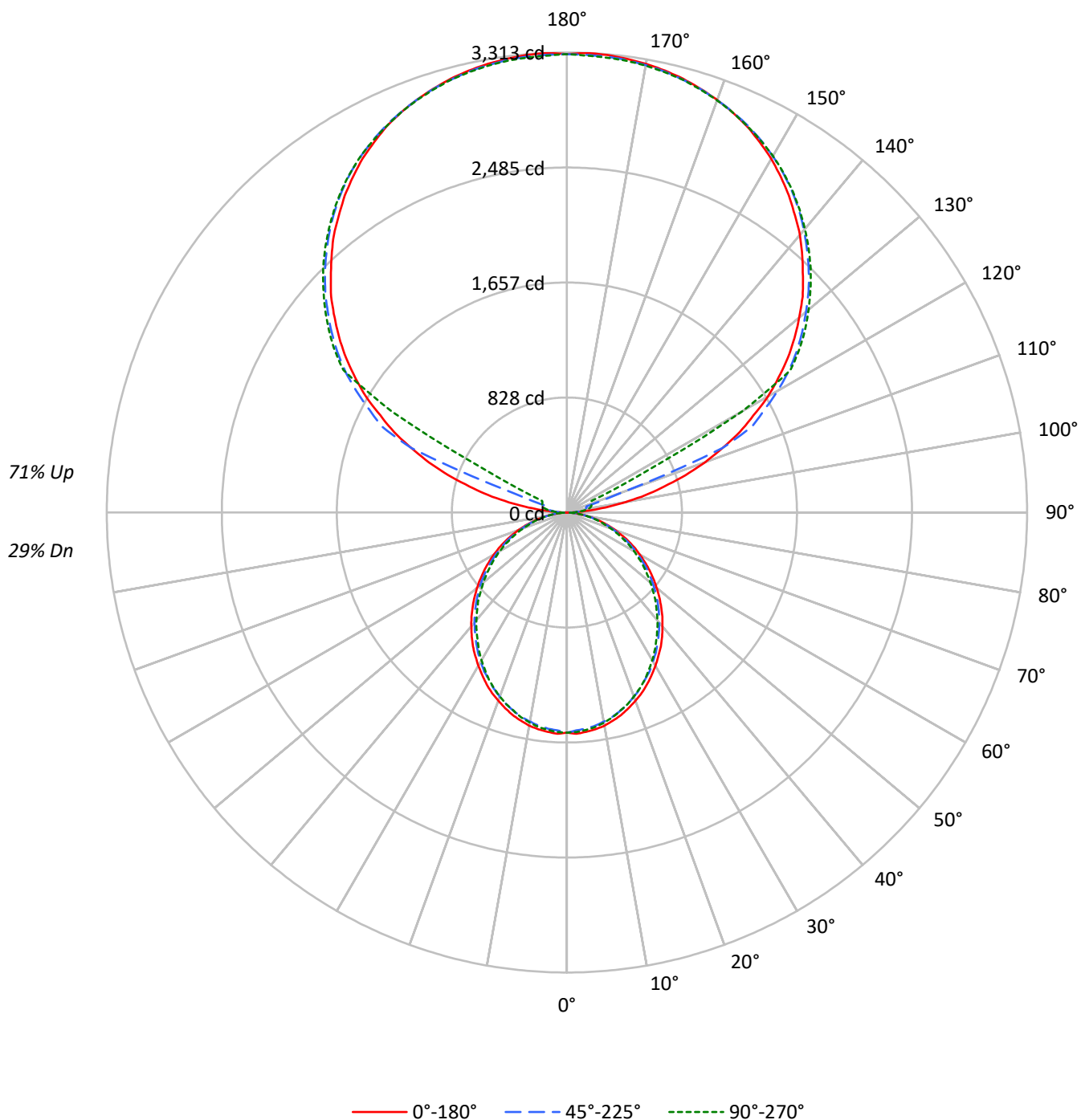
Lumens per Lamp: N/A  
Luminaire Lumens: 13716.5 lumens  
Efficiency: N/A  
Efficacy: 98.3 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 3.54' x L: 4.09' x H: 0.1')  
CIE Type: Semi-Indirect

Input Watts (W): 139.6  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9957  
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 | 92 | 92 | 92 | 92 | 72 | 72 | 72 | 54 | 54 | 54 | 37 | 37 | 37 |
| 1   | 93  | 89  | 85  | 82  | 83 | 80 | 77 | 74 | 63 | 61 | 59 | 47 | 46 | 45 | 33 | 32 | 31 |
| 2   | 85  | 78  | 72  | 67  | 76 | 70 | 65 | 61 | 55 | 52 | 49 | 41 | 39 | 37 | 29 | 28 | 26 |
| 3   | 77  | 68  | 61  | 56  | 69 | 61 | 55 | 51 | 49 | 44 | 41 | 37 | 34 | 32 | 26 | 24 | 22 |
| 4   | 71  | 60  | 53  | 47  | 63 | 54 | 48 | 43 | 43 | 38 | 35 | 33 | 29 | 27 | 23 | 21 | 19 |
| 5   | 65  | 54  | 46  | 40  | 58 | 48 | 42 | 37 | 38 | 34 | 30 | 29 | 26 | 23 | 21 | 19 | 17 |
| 6   | 60  | 48  | 40  | 34  | 53 | 43 | 36 | 32 | 35 | 30 | 26 | 26 | 23 | 20 | 19 | 16 | 15 |
| 7   | 55  | 43  | 35  | 30  | 49 | 39 | 32 | 28 | 31 | 26 | 23 | 24 | 20 | 18 | 17 | 15 | 13 |
| 8   | 51  | 39  | 32  | 26  | 46 | 35 | 29 | 24 | 28 | 23 | 20 | 22 | 18 | 16 | 16 | 13 | 12 |
| 9   | 47  | 35  | 28  | 23  | 42 | 32 | 26 | 22 | 26 | 21 | 18 | 20 | 17 | 14 | 14 | 12 | 11 |
| 10  | 44  | 32  | 25  | 21  | 40 | 29 | 23 | 19 | 24 | 19 | 16 | 18 | 15 | 13 | 13 | 11 | 10 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 1179 | 1179 | 1179 |
| 5°  | 1181 | 1163 | 1171 |
| 10° | 1172 | 1147 | 1155 |
| 15° | 1154 | 1128 | 1130 |
| 20° | 1131 | 1102 | 1105 |
| 25° | 1108 | 1071 | 1075 |
| 30° | 1079 | 1042 | 1038 |
| 35° | 1052 | 1008 | 999  |
| 40° | 1018 | 973  | 961  |
| 45° | 984  | 938  | 923  |
| 50° | 948  | 902  | 879  |
| 55° | 909  | 860  | 838  |
| 60° | 866  | 810  | 791  |
| 65° | 818  | 758  | 736  |
| 70° | 758  | 695  | 677  |
| 75° | 674  | 619  | 622  |
| 80° | 574  | 522  | 518  |
| 85° | 416  | 356  | 344  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 90°

Vertical Angle: 90°

Luminance: 1696 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 149.2   | 1.1       |
| 10°-20°   | 419.9   | 3.1       |
| 20°-30°   | 617.1   | 4.5       |
| 30°-40°   | 716.7   | 5.2       |
| 40°-50°   | 715.8   | 5.2       |
| 50°-60°   | 624.2   | 4.6       |
| 60°-70°   | 461.4   | 3.4       |
| 70°-80°   | 261.0   | 1.9       |
| 80°-90°   | 74.7    | 0.5       |
| 90°-100°  | 108.8   | 0.8       |
| 100°-110° | 405.7   | 3.0       |
| 110°-120° | 1076.0  | 7.8       |
| 120°-130° | 1784.7  | 13.0      |
| 130°-140° | 1895.8  | 13.8      |
| 140°-150° | 1761.9  | 12.8      |
| 150°-160° | 1416.5  | 10.3      |
| 160°-170° | 912.8   | 6.7       |
| 170°-180° | 314.2   | 2.3       |
| 0°-30°    | 1186.2  | 8.6       |
| 0°-40°    | 1902.9  | 13.9      |
| 0°-60°    | 3242.9  | 23.6      |
| 0°-90°    | 4040.0  | 29.5      |
| 90°-120°  | 1590.6  | 11.6      |
| 90°-150°  | 7033.0  | 51.3      |
| 90°-180°  | 9676.0  | 70.5      |
| 0°-180°   | 13716.5 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 1586 | 1586  | 1586 | 1586  | 1586 |      |
| 5°   | 1586 | 1580  | 1563 | 1575  | 1572 | 151  |
| 15°  | 1509 | 1500  | 1480 | 1487  | 1479 | 425  |
| 25°  | 1366 | 1354  | 1328 | 1331  | 1328 | 629  |
| 35°  | 1179 | 1163  | 1139 | 1130  | 1122 | 736  |
| 45°  | 959  | 948   | 925  | 909   | 903  | 740  |
| 55°  | 726  | 717   | 698  | 680   | 672  | 649  |
| 65°  | 490  | 480   | 465  | 451   | 444  | 484  |
| 75°  | 256  | 253   | 245  | 236   | 239  | 273  |
| 85°  | 62   | 61    | 60   | 55    | 53   | 70   |
| 90°  | 2    | 29    | 48   | 60    | 64   | 13   |
| 95°  | 155  | 76    | 93   | 105   | 103  | 184  |
| 105° | 726  | 798   | 146  | 172   | 182  | 776  |
| 115° | 1373 | 1414  | 1474 | 368   | 196  | 1352 |
| 125° | 1942 | 1973  | 2018 | 2035  | 2042 | 1732 |
| 135° | 2403 | 2441  | 2462 | 2486  | 2482 | 1856 |
| 145° | 2787 | 2785  | 2825 | 2842  | 2830 | 1743 |
| 155° | 3069 | 3048  | 3076 | 3090  | 3072 | 1414 |
| 165° | 3234 | 3220  | 3227 | 3243  | 3227 | 914  |
| 175° | 3308 | 3291  | 3296 | 3313  | 3289 | 315  |
| 180° | 3301 | 3301  | 3301 | 3301  | 3301 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 1585.6 | 1585.6 | 1585.6 | 1585.6 | 1585.6 |
| 2.5°   | 1594.8 | 1587.2 | 1570.4 | 1585.6 | 1582.7 |
| 5°     | 1585.6 | 1579.6 | 1562.8 | 1574.9 | 1572.1 |
| 7.5°   | 1574.9 | 1565.9 | 1549.1 | 1561.4 | 1558.3 |
| 10°    | 1558.3 | 1547.6 | 1529.3 | 1541.4 | 1536.9 |
| 12.5°  | 1535.3 | 1526.3 | 1508.0 | 1515.6 | 1512.5 |
| 15°    | 1509.4 | 1500.3 | 1480.4 | 1486.6 | 1479.0 |
| 17.5°  | 1477.4 | 1468.3 | 1448.4 | 1456.0 | 1448.4 |
| 20°    | 1442.3 | 1433.3 | 1411.9 | 1416.4 | 1410.4 |
| 22.5°  | 1407.3 | 1393.6 | 1373.7 | 1373.7 | 1370.6 |
| 25°    | 1366.1 | 1354.0 | 1328.0 | 1331.0 | 1328.0 |
| 27.5°  | 1320.3 | 1309.6 | 1289.9 | 1285.3 | 1277.8 |
| 30°    | 1274.7 | 1262.4 | 1239.6 | 1235.1 | 1228.9 |
| 32.5°  | 1225.8 | 1216.8 | 1192.3 | 1183.1 | 1177.0 |
| 35°    | 1178.6 | 1163.4 | 1139.0 | 1129.8 | 1122.2 |
| 37.5°  | 1125.2 | 1111.5 | 1087.0 | 1076.4 | 1068.8 |
| 40°    | 1070.4 | 1058.1 | 1033.7 | 1020.1 | 1013.9 |
| 42.5°  | 1017.0 | 1004.7 | 980.4  | 965.0  | 956.0  |
| 45°    | 959.1  | 948.4  | 925.4  | 908.8  | 902.6  |
| 47.5°  | 902.6  | 891.9  | 867.6  | 850.7  | 841.7  |
| 50°    | 843.1  | 835.5  | 814.2  | 792.8  | 785.2  |
| 52.5°  | 785.2  | 774.5  | 754.8  | 738.0  | 727.3  |
| 55°    | 725.8  | 716.6  | 698.3  | 680.0  | 672.5  |
| 57.5°  | 666.3  | 658.7  | 638.8  | 620.5  | 614.3  |
| 60°    | 606.8  | 600.8  | 579.5  | 562.6  | 558.1  |
| 62.5°  | 548.9  | 538.2  | 523.0  | 507.7  | 501.6  |
| 65°    | 489.5  | 480.3  | 465.0  | 451.3  | 443.7  |
| 67.5°  | 428.5  | 420.8  | 407.2  | 396.5  | 390.3  |
| 70°    | 372.0  | 365.9  | 352.2  | 341.5  | 335.5  |
| 72.5°  | 314.2  | 308.0  | 300.4  | 289.7  | 285.2  |
| 75°    | 256.1  | 253.1  | 245.4  | 236.4  | 239.4  |
| 77.5°  | 204.3  | 198.1  | 195.1  | 190.5  | 186.1  |
| 80°    | 152.6  | 150.9  | 147.8  | 143.4  | 140.3  |
| 82.5°  | 103.7  | 103.7  | 102.2  | 96.1   | 96.1   |
| 85°    | 62.4   | 61.0   | 59.5   | 54.8   | 53.4   |
| 87.5°  | 27.5   | 24.4   | 21.4   | 16.8   | 15.2   |
| 90°    | 2.3    | 28.6   | 47.7   | 59.8   | 64.4   |
| 92.5°  | 59.8   | 50.2   | 57.3   | 62.1   | 64.4   |
| 95°    | 155.1  | 76.3   | 93.0   | 105.2  | 102.7  |
| 97.5°  | 279.4  | 83.7   | 121.7  | 129.0  | 131.3  |
| 100°   | 422.8  | 95.6   | 136.1  | 155.1  | 160.0  |
| 102.5° | 580.3  | 575.7  | 140.9  | 167.1  | 174.4  |
| 105°   | 726.0  | 797.8  | 145.8  | 171.9  | 181.5  |
| 107.5° | 895.6  | 955.2  | 150.6  | 176.7  | 186.3  |
| 110°   | 1058.1 | 1108.1 | 418.0  | 179.2  | 188.6  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 1211.0 | 1253.8 | 1213.3 | 183.8  | 191.1  |
| 115°   | 1373.2 | 1413.8 | 1473.6 | 367.8  | 196.0  |
| 117.5° | 1514.2 | 1561.9 | 1602.7 | 1260.9 | 635.3  |
| 120°   | 1671.9 | 1707.6 | 1750.7 | 1779.4 | 1456.9 |
| 122.5° | 1805.5 | 1843.8 | 1891.7 | 1905.9 | 1908.4 |
| 125°   | 1941.6 | 1972.8 | 2018.2 | 2034.9 | 2042.0 |
| 127.5° | 2065.8 | 2099.3 | 2135.3 | 2159.1 | 2161.4 |
| 130°   | 2182.9 | 2221.2 | 2247.3 | 2273.7 | 2271.4 |
| 132.5° | 2302.3 | 2333.5 | 2359.6 | 2381.2 | 2378.9 |
| 135°   | 2402.7 | 2441.0 | 2462.3 | 2486.4 | 2481.6 |
| 137.5° | 2507.7 | 2536.3 | 2560.4 | 2584.2 | 2577.1 |
| 140°   | 2610.4 | 2629.6 | 2655.7 | 2677.3 | 2665.4 |
| 142.5° | 2696.5 | 2713.3 | 2744.2 | 2763.2 | 2751.3 |
| 145°   | 2787.3 | 2784.8 | 2825.3 | 2842.1 | 2830.1 |
| 147.5° | 2865.9 | 2858.8 | 2899.4 | 2911.3 | 2901.9 |
| 150°   | 2942.4 | 2925.7 | 2964.0 | 2978.2 | 2966.3 |
| 152.5° | 3006.8 | 2987.8 | 3023.6 | 3038.0 | 3021.3 |
| 155°   | 3068.9 | 3047.6 | 3076.3 | 3090.5 | 3071.5 |
| 157.5° | 3119.1 | 3100.1 | 3121.7 | 3138.4 | 3119.1 |
| 160°   | 3162.2 | 3147.8 | 3162.2 | 3176.4 | 3159.7 |
| 162.5° | 3200.3 | 3186.1 | 3198.0 | 3214.7 | 3193.2 |
| 165°   | 3233.7 | 3219.5 | 3226.6 | 3243.4 | 3226.6 |
| 167.5° | 3260.1 | 3245.6 | 3253.0 | 3269.7 | 3248.2 |
| 170°   | 3281.6 | 3267.2 | 3272.0 | 3288.7 | 3267.2 |
| 172.5° | 3295.8 | 3281.6 | 3286.5 | 3303.2 | 3281.6 |
| 175°   | 3307.7 | 3291.0 | 3295.8 | 3312.6 | 3288.7 |
| 177.5° | 3312.6 | 3295.8 | 3298.4 | 3315.1 | 3293.6 |
| 180°   | 3300.7 | 3300.7 | 3300.7 | 3300.7 | 3300.7 |

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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 | 5.56             | 6.26 | 6.67  | 7.37  | 8.91  | 5.12           | 5.83 | 6.24  | 6.94  | 8.47  |
|                 | 3H   | 7.21             | 7.83 | 8.33  | 8.95  | 10.51 | 6.73           | 7.36 | 7.86  | 8.48  | 10.03 |
|                 | 4H   | 7.79             | 8.38 | 8.92  | 9.50  | 11.06 | 7.31           | 7.91 | 8.45  | 9.03  | 10.59 |
|                 | 6H   | 8.18             | 8.73 | 9.32  | 9.85  | 11.42 | 7.70           | 8.25 | 8.84  | 9.37  | 10.94 |
|                 | 8H   | 8.28             | 8.80 | 9.42  | 9.94  | 11.50 | 7.80           | 8.33 | 8.95  | 9.46  | 11.03 |
|                 | 12H  | 8.32             | 8.82 | 9.47  | 9.95  | 11.54 | 7.84           | 8.34 | 8.99  | 9.47  | 11.05 |
| 4H              | 2H   | 6.00             | 6.60 | 7.14  | 7.72  | 9.27  | 5.65           | 6.25 | 6.79  | 7.37  | 8.93  |
|                 | 3H   | 7.85             | 8.35 | 9.00  | 9.49  | 11.07 | 7.46           | 7.96 | 8.60  | 9.10  | 10.67 |
|                 | 4H   | 8.56             | 9.02 | 9.71  | 10.15 | 11.74 | 8.15           | 8.61 | 9.30  | 9.75  | 11.34 |
|                 | 6H   | 9.07             | 9.46 | 10.22 | 10.62 | 12.20 | 8.66           | 9.05 | 9.81  | 10.21 | 11.79 |
|                 | 8H   | 9.21             | 9.58 | 10.37 | 10.73 | 12.33 | 8.80           | 9.17 | 9.96  | 10.32 | 11.91 |
|                 | 12H  | 9.28             | 9.61 | 10.45 | 10.77 | 12.37 | 8.86           | 9.19 | 10.03 | 10.35 | 11.95 |
| 8H              | 4H   | 8.74             | 9.11 | 9.90  | 10.26 | 11.86 | 8.38           | 8.75 | 9.54  | 9.90  | 11.50 |
|                 | 6H   | 9.37             | 9.67 | 10.55 | 10.86 | 12.46 | 9.01           | 9.31 | 10.18 | 10.50 | 12.10 |
|                 | 8H   | 9.59             | 9.85 | 10.77 | 11.02 | 12.64 | 9.22           | 9.49 | 10.40 | 10.65 | 12.27 |
|                 | 12H  | 9.71             | 9.95 | 10.90 | 11.11 | 12.76 | 9.33           | 9.56 | 10.51 | 10.73 | 12.38 |
| 12H             | 4H   | 8.72             | 9.05 | 9.89  | 10.21 | 11.82 | 8.37           | 8.70 | 9.54  | 9.86  | 11.47 |
|                 | 6H   | 9.40             | 9.66 | 10.58 | 10.83 | 12.45 | 9.05           | 9.31 | 10.23 | 10.48 | 12.10 |
|                 | 8H   | 9.63             | 9.87 | 10.82 | 11.03 | 12.68 | 9.28           | 9.51 | 10.46 | 10.68 | 12.32 |

END OF REPORT