

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: P929286

Luminaire Tested: DFN2DIP-HX4F0-080D040US940-RLLONL

Issue Date: 12/12/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P929286  
REPORT IS A COMBINATION OF REPORTS P900828 AND P896187  
Test Lab: INNOVATION CENTER  
Issue Date: 12/12/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-HX4F0-080D040US940-RLLONL  
Description: 4 foot, Hexagon Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

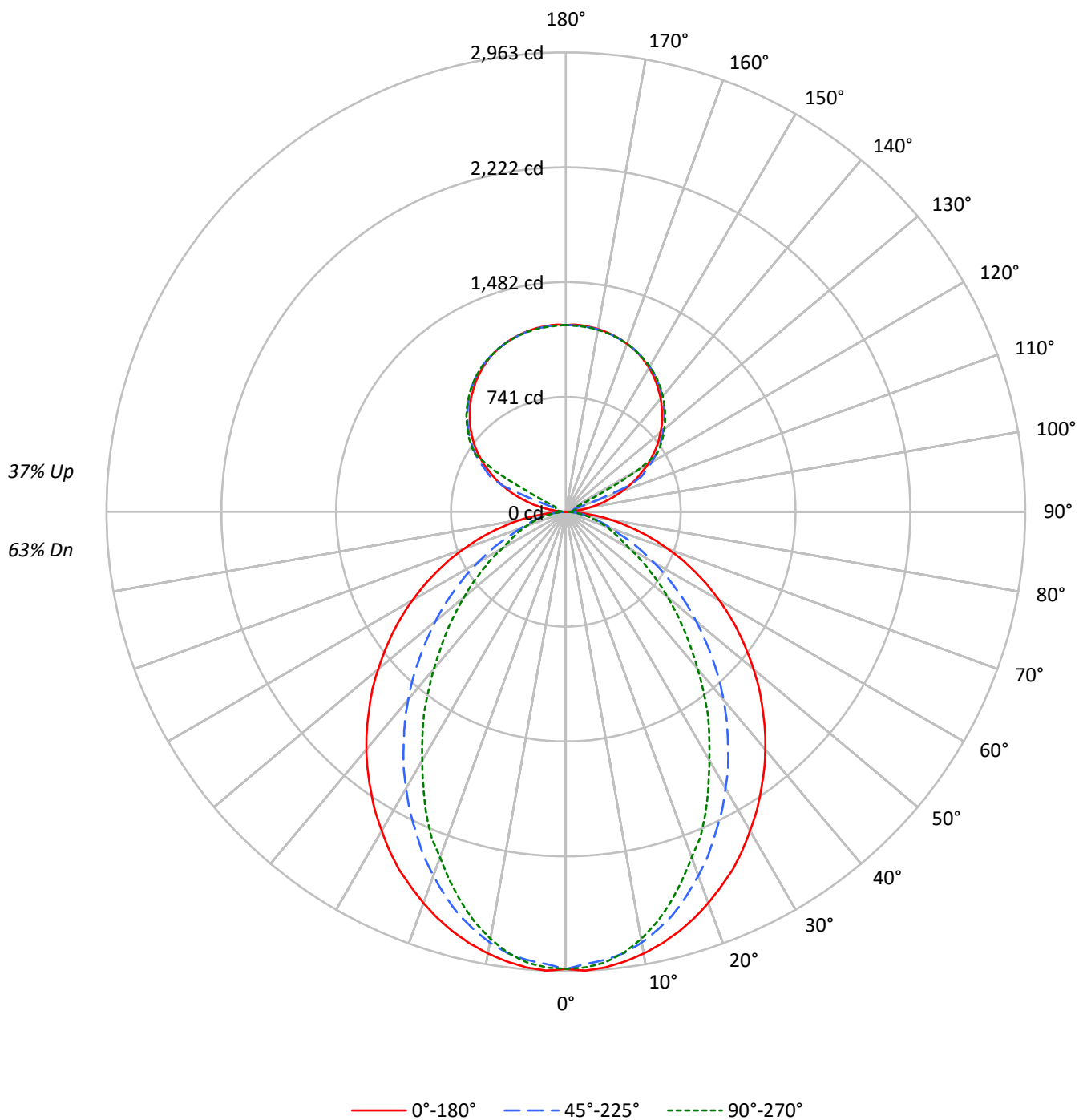
**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 9597.9 lumens  
Efficiency: N/A  
Efficacy: 89.9 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-Direct  
  
Input Watts (W): 106.8  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9613  
Total Harmonic Distortion (THDi): 0.083  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT

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CATALOG NUMBER: DFN2DIP-HX4F0-080D040US940-RLONL

### 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   | 110 | 110 | 110 | 110 | 103 | 103 | 103 | 103 | 91 | 91 | 91 | 79 | 79 | 79 | 68 | 68 | 68 |
| 1   | 101 | 97  | 93  | 90  | 95  | 91  | 88  | 85  | 80 | 78 | 76 | 71 | 69 | 67 | 61 | 60 | 59 |
| 2   | 93  | 86  | 80  | 75  | 87  | 81  | 75  | 71  | 71 | 67 | 64 | 63 | 60 | 57 | 55 | 52 | 51 |
| 3   | 85  | 76  | 69  | 63  | 80  | 72  | 65  | 60  | 63 | 58 | 54 | 56 | 52 | 49 | 49 | 46 | 44 |
| 4   | 78  | 68  | 60  | 54  | 73  | 64  | 57  | 52  | 57 | 51 | 47 | 50 | 46 | 43 | 44 | 41 | 38 |
| 5   | 72  | 61  | 53  | 47  | 67  | 57  | 50  | 45  | 51 | 45 | 41 | 46 | 41 | 37 | 40 | 37 | 34 |
| 6   | 67  | 55  | 47  | 41  | 62  | 52  | 45  | 39  | 46 | 41 | 36 | 41 | 37 | 33 | 37 | 33 | 30 |
| 7   | 62  | 50  | 42  | 36  | 58  | 47  | 40  | 35  | 42 | 36 | 32 | 38 | 33 | 30 | 34 | 30 | 27 |
| 8   | 58  | 45  | 38  | 32  | 54  | 43  | 36  | 31  | 39 | 33 | 29 | 35 | 30 | 27 | 31 | 27 | 24 |
| 9   | 54  | 42  | 34  | 29  | 51  | 40  | 33  | 28  | 36 | 30 | 26 | 32 | 27 | 24 | 29 | 25 | 22 |
| 10  | 50  | 38  | 31  | 26  | 47  | 37  | 30  | 25  | 33 | 28 | 24 | 30 | 25 | 22 | 27 | 23 | 20 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 2193 | 2193 | 2193 |
| 5°  | 2197 | 2158 | 2172 |
| 10° | 2175 | 2116 | 2102 |
| 15° | 2145 | 2047 | 1992 |
| 20° | 2106 | 1950 | 1858 |
| 25° | 2066 | 1842 | 1729 |
| 30° | 2011 | 1732 | 1565 |
| 35° | 1958 | 1613 | 1421 |
| 40° | 1904 | 1490 | 1255 |
| 45° | 1841 | 1353 | 1105 |
| 50° | 1776 | 1215 | 959  |
| 55° | 1708 | 1068 | 818  |
| 60° | 1630 | 913  | 674  |
| 65° | 1539 | 757  | 606  |
| 70° | 1430 | 610  | 549  |
| 75° | 1293 | 538  | 500  |
| 80° | 1094 | 452  | 434  |
| 85° | 765  | 303  | 327  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 1841 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 276.4  | 2.9       |
| 10°-20°   | 758.8  | 7.9       |
| 20°-30°   | 1065.3 | 11.1      |
| 30°-40°   | 1161.3 | 12.1      |
| 40°-50°   | 1067.3 | 11.1      |
| 50°-60°   | 838.3  | 8.7       |
| 60°-70°   | 545.6  | 5.7       |
| 70°-80°   | 280.9  | 2.9       |
| 80°-90°   | 73.8   | 0.8       |
| 90°-100°  | 39.7   | 0.4       |
| 100°-110° | 148.0  | 1.5       |
| 110°-120° | 392.6  | 4.1       |
| 120°-130° | 651.1  | 6.8       |
| 130°-140° | 691.6  | 7.2       |
| 140°-150° | 642.8  | 6.7       |
| 150°-160° | 516.8  | 5.4       |
| 160°-170° | 333.0  | 3.5       |
| 170°-180° | 114.6  | 1.2       |
| 0°-30°    | 2100.6 | 21.9      |
| 0°-40°    | 3261.8 | 34.0      |
| 0°-60°    | 5167.4 | 53.8      |
| 0°-90°    | 6067.7 | 63.2      |
| 90°-120°  | 580.3  | 6.0       |
| 90°-150°  | 2565.8 | 26.7      |
| 90°-180°  | 3530.0 | 36.8      |
| 0°-180°   | 9597.9 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 2949 | 2949  | 2949 | 2949  | 2949 |      |
| 5°   | 2949 | 2936  | 2901 | 2925  | 2917 | 280  |
| 15°  | 2805 | 2776  | 2685 | 2634  | 2608 | 790  |
| 25°  | 2546 | 2461  | 2285 | 2175  | 2135 | 1171 |
| 35°  | 2194 | 2058  | 1823 | 1655  | 1596 | 1373 |
| 45°  | 1794 | 1615  | 1335 | 1145  | 1081 | 1385 |
| 55°  | 1364 | 1156  | 867  | 707   | 657  | 1219 |
| 65°  | 921  | 704   | 464  | 374   | 366  | 913  |
| 75°  | 491  | 304   | 214  | 195   | 192  | 519  |
| 85°  | 115  | 59    | 51   | 51    | 51   | 132  |
| 90°  | 1    | 10    | 17   | 22    | 24   | 9    |
| 95°  | 57   | 28    | 34   | 38    | 38   | 67   |
| 105° | 265  | 291   | 53   | 63    | 66   | 283  |
| 115° | 501  | 516   | 538  | 134   | 72   | 493  |
| 125° | 708  | 720   | 736  | 742   | 745  | 632  |
| 135° | 877  | 891   | 898  | 907   | 905  | 677  |
| 145° | 1017 | 1016  | 1031 | 1037  | 1032 | 636  |
| 155° | 1120 | 1112  | 1122 | 1128  | 1120 | 516  |
| 165° | 1180 | 1175  | 1177 | 1183  | 1177 | 333  |
| 175° | 1207 | 1201  | 1202 | 1208  | 1200 | 115  |
| 180° | 1204 | 1204  | 1204 | 1204  | 1204 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 2949.3 | 2949.3 | 2949.3 | 2949.3 | 2949.3 |
| 2.5°   | 2962.6 | 2949.3 | 2919.9 | 2946.7 | 2941.4 |
| 5°     | 2949.3 | 2936.0 | 2901.1 | 2925.2 | 2917.3 |
| 7.5°   | 2925.2 | 2909.3 | 2872.0 | 2882.5 | 2869.1 |
| 10°    | 2893.2 | 2874.6 | 2821.3 | 2813.1 | 2797.2 |
| 12.5°  | 2853.3 | 2829.2 | 2757.0 | 2741.1 | 2711.7 |
| 15°    | 2805.2 | 2775.7 | 2685.1 | 2634.4 | 2607.8 |
| 17.5°  | 2749.1 | 2706.3 | 2594.2 | 2535.6 | 2492.8 |
| 20°    | 2685.1 | 2631.6 | 2498.2 | 2431.7 | 2372.7 |
| 22.5°  | 2615.7 | 2554.2 | 2399.4 | 2308.8 | 2268.8 |
| 25°    | 2546.3 | 2460.8 | 2284.7 | 2175.4 | 2135.2 |
| 27.5°  | 2463.6 | 2372.7 | 2177.9 | 2052.5 | 1991.0 |
| 30°    | 2375.6 | 2273.9 | 2060.4 | 1924.5 | 1852.2 |
| 32.5°  | 2290.0 | 2167.2 | 1948.6 | 1788.3 | 1721.5 |
| 35°    | 2194.1 | 2057.8 | 1823.1 | 1654.9 | 1596.0 |
| 37.5°  | 2100.6 | 1953.7 | 1705.6 | 1521.2 | 1454.7 |
| 40°    | 2001.8 | 1841.8 | 1582.7 | 1393.2 | 1323.8 |
| 42.5°  | 1900.4 | 1729.7 | 1460.0 | 1262.4 | 1195.8 |
| 45°    | 1793.6 | 1614.7 | 1334.6 | 1144.9 | 1080.9 |
| 47.5°  | 1692.3 | 1502.8 | 1214.5 | 1024.8 | 966.2  |
| 50°    | 1580.1 | 1390.7 | 1097.1 | 912.7  | 856.9  |
| 52.5°  | 1470.6 | 1270.3 | 984.9  | 808.8  | 758.1  |
| 55°    | 1363.8 | 1155.7 | 867.4  | 707.4  | 656.7  |
| 57.5°  | 1254.5 | 1041.0 | 763.5  | 614.0  | 571.1  |
| 60°    | 1142.3 | 928.8  | 653.8  | 517.9  | 475.2  |
| 62.5°  | 1033.0 | 819.5  | 560.4  | 432.4  | 411.2  |
| 65°    | 920.9  | 704.5  | 464.4  | 373.8  | 365.5  |
| 67.5°  | 814.1  | 597.8  | 373.8  | 328.2  | 320.3  |
| 70°    | 702.0  | 493.9  | 309.5  | 282.9  | 272.1  |
| 72.5°  | 595.2  | 397.6  | 258.9  | 237.6  | 232.2  |
| 75°    | 491.0  | 304.2  | 213.5  | 194.8  | 192.3  |
| 77.5°  | 387.1  | 216.0  | 168.2  | 157.4  | 152.1  |
| 80°    | 290.8  | 154.9  | 128.0  | 117.5  | 117.5  |
| 82.5°  | 202.8  | 104.2  | 88.0   | 82.7   | 82.7   |
| 85°    | 114.7  | 58.6   | 50.7   | 50.7   | 50.7   |
| 87.5°  | 42.7   | 21.2   | 21.2   | 18.7   | 18.7   |
| 90°    | 0.8    | 10.4   | 17.4   | 21.9   | 23.5   |
| 92.5°  | 21.9   | 18.3   | 20.9   | 22.7   | 23.5   |
| 95°    | 56.6   | 27.8   | 33.9   | 38.4   | 37.5   |
| 97.5°  | 102.0  | 30.5   | 44.4   | 47.1   | 47.9   |
| 100°   | 154.2  | 34.9   | 49.7   | 56.6   | 58.3   |
| 102.5° | 211.7  | 210.1  | 51.4   | 60.9   | 63.6   |
| 105°   | 264.8  | 291.1  | 53.2   | 62.7   | 66.2   |
| 107.5° | 326.7  | 348.5  | 54.9   | 64.5   | 68.0   |
| 110°   | 386.1  | 404.3  | 152.5  | 65.4   | 68.8   |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 441.8  | 457.4  | 442.6  | 67.1   | 69.8   |
| 115°   | 500.9  | 515.8  | 537.6  | 134.2  | 71.5   |
| 117.5° | 552.4  | 569.8  | 584.7  | 460.0  | 231.7  |
| 120°   | 609.9  | 623.0  | 638.7  | 649.2  | 531.5  |
| 122.5° | 658.7  | 672.7  | 690.1  | 695.3  | 696.2  |
| 125°   | 708.3  | 719.8  | 736.3  | 742.4  | 745.0  |
| 127.5° | 753.7  | 765.9  | 779.0  | 787.7  | 788.5  |
| 130°   | 796.4  | 810.4  | 819.8  | 829.5  | 828.7  |
| 132.5° | 839.9  | 851.3  | 860.9  | 868.7  | 867.9  |
| 135°   | 876.6  | 890.6  | 898.3  | 907.1  | 905.4  |
| 137.5° | 914.8  | 925.3  | 934.1  | 942.8  | 940.2  |
| 140°   | 952.3  | 959.3  | 968.9  | 976.7  | 972.4  |
| 142.5° | 983.8  | 989.9  | 1001.2 | 1008.0 | 1003.8 |
| 145°   | 1016.9 | 1016.0 | 1030.7 | 1036.9 | 1032.5 |
| 147.5° | 1045.5 | 1042.9 | 1057.7 | 1062.1 | 1058.7 |
| 150°   | 1073.4 | 1067.4 | 1081.4 | 1086.5 | 1082.2 |
| 152.5° | 1097.0 | 1090.0 | 1103.0 | 1108.3 | 1102.2 |
| 155°   | 1119.6 | 1111.9 | 1122.3 | 1127.5 | 1120.5 |
| 157.5° | 1137.9 | 1131.0 | 1138.9 | 1145.0 | 1137.9 |
| 160°   | 1153.6 | 1148.4 | 1153.6 | 1158.8 | 1152.7 |
| 162.5° | 1167.5 | 1162.4 | 1166.7 | 1172.8 | 1165.0 |
| 165°   | 1179.8 | 1174.6 | 1177.2 | 1183.2 | 1177.2 |
| 167.5° | 1189.4 | 1184.0 | 1186.8 | 1192.9 | 1185.0 |
| 170°   | 1197.2 | 1192.0 | 1193.7 | 1199.8 | 1192.0 |
| 172.5° | 1202.4 | 1197.2 | 1199.0 | 1205.1 | 1197.2 |
| 175°   | 1206.7 | 1200.6 | 1202.4 | 1208.5 | 1199.8 |
| 177.5° | 1208.5 | 1202.4 | 1203.3 | 1209.5 | 1201.6 |
| 180°   | 1204.2 | 1204.2 | 1204.2 | 1204.2 | 1204.2 |

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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 | 11.03            | 11.98 | 11.87 | 12.84 | 13.91 | 7.00           | 7.95  | 7.84  | 8.81  | 9.88  |
|                 | 3H   | 12.72            | 13.57 | 13.57 | 14.44 | 15.54 | 8.20           | 9.05  | 9.06  | 9.92  | 11.02 |
|                 | 4H   | 13.33            | 14.13 | 14.20 | 15.01 | 16.12 | 8.66           | 9.46  | 9.53  | 10.34 | 11.45 |
|                 | 6H   | 13.76            | 14.50 | 14.64 | 15.38 | 16.50 | 8.99           | 9.73  | 9.87  | 10.61 | 11.73 |
|                 | 8H   | 13.89            | 14.59 | 14.78 | 15.49 | 16.61 | 9.08           | 9.79  | 9.97  | 10.69 | 11.81 |
|                 | 12H  | 13.96            | 14.63 | 14.85 | 15.52 | 16.67 | 9.13           | 9.80  | 10.03 | 10.69 | 11.84 |
| 4H              | 2H   | 11.06            | 11.86 | 11.94 | 12.74 | 13.85 | 7.61           | 8.42  | 8.49  | 9.29  | 10.40 |
|                 | 3H   | 12.90            | 13.57 | 13.79 | 14.48 | 15.60 | 8.98           | 9.64  | 9.86  | 10.55 | 11.67 |
|                 | 4H   | 13.60            | 14.21 | 14.50 | 15.11 | 16.26 | 9.53           | 10.14 | 10.43 | 11.04 | 12.19 |
|                 | 6H   | 14.12            | 14.65 | 15.04 | 15.57 | 16.73 | 9.96           | 10.48 | 10.87 | 11.41 | 12.56 |
|                 | 8H   | 14.30            | 14.79 | 15.22 | 15.71 | 16.88 | 10.09          | 10.58 | 11.01 | 11.50 | 12.67 |
|                 | 12H  | 14.40            | 14.84 | 15.34 | 15.78 | 16.95 | 10.16          | 10.60 | 11.10 | 11.54 | 12.71 |
| 8H              | 4H   | 13.58            | 14.07 | 14.49 | 14.99 | 16.15 | 9.82           | 10.31 | 10.74 | 11.23 | 12.40 |
|                 | 6H   | 14.15            | 14.55 | 15.09 | 15.52 | 16.68 | 10.34          | 10.75 | 11.29 | 11.71 | 12.88 |
|                 | 8H   | 14.37            | 14.72 | 15.32 | 15.68 | 16.86 | 10.54          | 10.89 | 11.49 | 11.85 | 13.03 |
|                 | 12H  | 14.51            | 14.83 | 15.47 | 15.77 | 17.01 | 10.66          | 10.98 | 11.62 | 11.92 | 13.16 |
| 12H             | 4H   | 13.54            | 13.97 | 14.47 | 14.92 | 16.09 | 9.83           | 10.27 | 10.76 | 11.21 | 12.38 |
|                 | 6H   | 14.13            | 14.48 | 15.08 | 15.44 | 16.62 | 10.39          | 10.75 | 11.35 | 11.71 | 12.89 |
|                 | 8H   | 14.35            | 14.67 | 15.31 | 15.61 | 16.85 | 10.61          | 10.93 | 11.57 | 11.87 | 13.11 |

END OF REPORT