

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: P929238

Luminaire Tested: DFN2DIP-HX4F0-060D100US940-RLLONL

Issue Date: 12/12/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P929238  
REPORT IS A COMBINATION OF REPORTS P900932 AND P896187  
Test Lab: INNOVATION CENTER  
Issue Date: 12/12/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-HX4F0-060D100US940-RLLONL  
Description: 4 foot, Hexagon Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

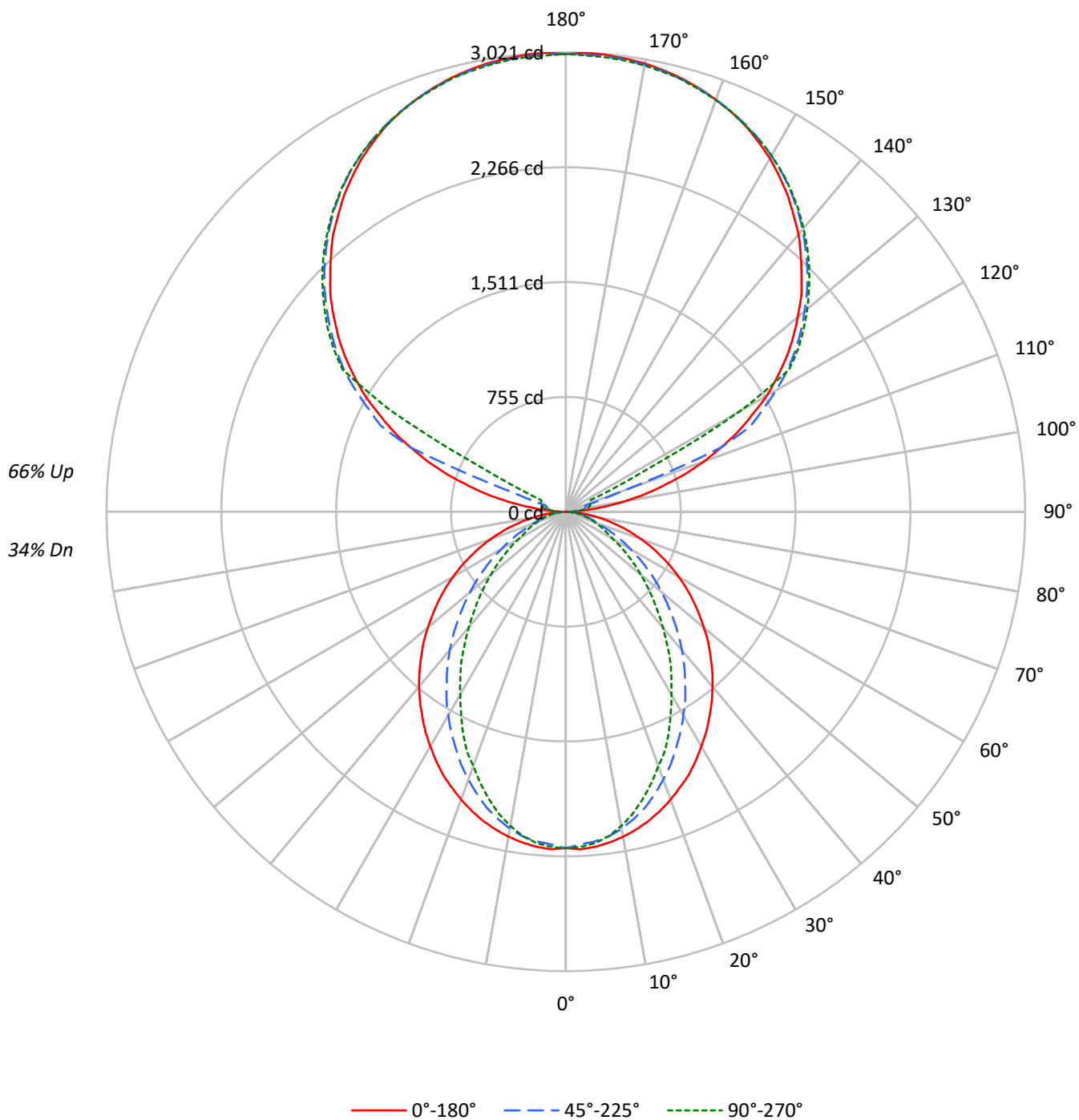
Lumens per Lamp: N/A  
Luminaire Lumens: 13380.0 lumens  
Efficiency: N/A  
Efficacy: 102.7 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 0.99 / 1.16  
Luminous Opening: Rectangular w/ Sides (W: 3.54' x L: 4.09' x H: 0.1')  
CIE Type: Semi-Indirect

Input Watts (W): 130.3  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.099  
Total Harmonic Distortion (THDi): 0.979  
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   | 103 | 103 | 103 | 103 | 93 | 93 | 93 | 93 | 74 | 74 | 74 | 57 | 57 | 57 | 41 | 41 | 41 |
| 1   | 95  | 90  | 87  | 83  | 85 | 82 | 79 | 76 | 66 | 64 | 62 | 51 | 49 | 48 | 37 | 36 | 36 |
| 2   | 86  | 79  | 74  | 69  | 78 | 72 | 67 | 63 | 58 | 54 | 52 | 45 | 43 | 41 | 33 | 32 | 30 |
| 3   | 79  | 70  | 63  | 58  | 71 | 63 | 58 | 53 | 51 | 47 | 44 | 40 | 37 | 35 | 30 | 28 | 26 |
| 4   | 72  | 62  | 55  | 49  | 65 | 56 | 50 | 45 | 46 | 41 | 37 | 36 | 33 | 30 | 27 | 25 | 23 |
| 5   | 66  | 55  | 48  | 42  | 60 | 50 | 44 | 39 | 41 | 36 | 32 | 32 | 29 | 26 | 24 | 22 | 20 |
| 6   | 61  | 50  | 42  | 36  | 55 | 45 | 39 | 34 | 37 | 32 | 28 | 29 | 26 | 23 | 22 | 20 | 18 |
| 7   | 57  | 45  | 37  | 32  | 51 | 41 | 34 | 30 | 34 | 29 | 25 | 27 | 23 | 20 | 20 | 18 | 16 |
| 8   | 52  | 41  | 33  | 28  | 47 | 37 | 31 | 26 | 31 | 26 | 22 | 24 | 21 | 18 | 19 | 16 | 14 |
| 9   | 49  | 37  | 30  | 25  | 44 | 34 | 28 | 23 | 28 | 23 | 20 | 22 | 19 | 16 | 17 | 15 | 13 |
| 10  | 46  | 34  | 27  | 22  | 41 | 31 | 25 | 21 | 26 | 21 | 18 | 21 | 17 | 15 | 16 | 14 | 12 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 1645 | 1645 | 1645 |
| 5°  | 1648 | 1619 | 1629 |
| 10° | 1631 | 1587 | 1576 |
| 15° | 1609 | 1535 | 1494 |
| 20° | 1579 | 1463 | 1394 |
| 25° | 1549 | 1382 | 1297 |
| 30° | 1508 | 1299 | 1174 |
| 35° | 1469 | 1210 | 1065 |
| 40° | 1428 | 1117 | 941  |
| 45° | 1381 | 1015 | 829  |
| 50° | 1332 | 911  | 719  |
| 55° | 1281 | 801  | 614  |
| 60° | 1222 | 685  | 505  |
| 65° | 1155 | 567  | 455  |
| 70° | 1073 | 458  | 412  |
| 75° | 970  | 404  | 375  |
| 80° | 820  | 339  | 325  |
| 85° | 573  | 227  | 245  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 90°

Vertical Angle: 90°

Luminance: 1545 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 207.3   | 1.5       |
| 10°-20°   | 569.1   | 4.3       |
| 20°-30°   | 799.0   | 6.0       |
| 30°-40°   | 871.0   | 6.5       |
| 40°-50°   | 800.5   | 6.0       |
| 50°-60°   | 628.7   | 4.7       |
| 60°-70°   | 409.2   | 3.1       |
| 70°-80°   | 210.6   | 1.6       |
| 80°-90°   | 59.1    | 0.4       |
| 90°-100°  | 99.3    | 0.7       |
| 100°-110° | 370.0   | 2.8       |
| 110°-120° | 981.4   | 7.3       |
| 120°-130° | 1627.8  | 12.2      |
| 130°-140° | 1729.1  | 12.9      |
| 140°-150° | 1607.0  | 12.0      |
| 150°-160° | 1292.0  | 9.7       |
| 160°-170° | 832.5   | 6.2       |
| 170°-180° | 286.5   | 2.1       |
| 0°-30°    | 1575.4  | 11.8      |
| 0°-40°    | 2446.4  | 18.3      |
| 0°-60°    | 3875.6  | 29.0      |
| 0°-90°    | 4554.5  | 34.0      |
| 90°-120°  | 1450.7  | 10.8      |
| 90°-150°  | 6414.5  | 47.9      |
| 90°-180°  | 8826.0  | 66.0      |
| 0°-180°   | 13380.0 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 2212 | 2212  | 2212 | 2212  | 2212 |      |
| 5°   | 2212 | 2202  | 2176 | 2194  | 2188 | 210  |
| 15°  | 2104 | 2082  | 2014 | 1976  | 1956 | 593  |
| 25°  | 1910 | 1846  | 1714 | 1632  | 1601 | 878  |
| 35°  | 1646 | 1543  | 1367 | 1241  | 1197 | 1030 |
| 45°  | 1345 | 1211  | 1001 | 859   | 811  | 1039 |
| 55°  | 1023 | 867   | 650  | 531   | 492  | 914  |
| 65°  | 691  | 528   | 348  | 280   | 274  | 685  |
| 75°  | 368  | 228   | 160  | 146   | 144  | 390  |
| 85°  | 86   | 44    | 38   | 38    | 38   | 99   |
| 90°  | 2    | 26    | 43   | 55    | 59   | 12   |
| 95°  | 142  | 70    | 85   | 96    | 94   | 168  |
| 105° | 662  | 728   | 133  | 157   | 166  | 708  |
| 115° | 1252 | 1290  | 1344 | 336   | 179  | 1233 |
| 125° | 1771 | 1799  | 1841 | 1856  | 1862 | 1579 |
| 135° | 2192 | 2226  | 2246 | 2268  | 2263 | 1693 |
| 145° | 2542 | 2540  | 2577 | 2592  | 2581 | 1590 |
| 155° | 2799 | 2780  | 2806 | 2819  | 2801 | 1290 |
| 165° | 2949 | 2936  | 2943 | 2958  | 2943 | 833  |
| 175° | 3017 | 3002  | 3006 | 3021  | 3000 | 287  |
| 180° | 3010 | 3010  | 3010 | 3010  | 3010 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 2212.0 | 2212.0 | 2212.0 | 2212.0 | 2212.0 |
| 2.5°   | 2222.0 | 2212.0 | 2189.9 | 2210.0 | 2206.0 |
| 5°     | 2212.0 | 2202.0 | 2175.9 | 2194.0 | 2188.0 |
| 7.5°   | 2194.0 | 2182.0 | 2154.0 | 2161.9 | 2151.9 |
| 10°    | 2169.9 | 2155.9 | 2116.0 | 2109.8 | 2097.9 |
| 12.5°  | 2140.0 | 2121.9 | 2067.7 | 2055.9 | 2033.8 |
| 15°    | 2103.9 | 2081.7 | 2013.8 | 1975.8 | 1955.8 |
| 17.5°  | 2061.9 | 2029.7 | 1945.6 | 1901.7 | 1869.6 |
| 20°    | 2013.8 | 1973.6 | 1873.6 | 1823.7 | 1779.5 |
| 22.5°  | 1961.8 | 1915.7 | 1799.5 | 1731.6 | 1701.6 |
| 25°    | 1909.8 | 1845.6 | 1713.5 | 1631.6 | 1601.4 |
| 27.5°  | 1847.8 | 1779.5 | 1633.4 | 1539.3 | 1493.3 |
| 30°    | 1781.7 | 1705.4 | 1545.3 | 1443.3 | 1389.2 |
| 32.5°  | 1717.5 | 1625.4 | 1461.5 | 1341.2 | 1291.1 |
| 35°    | 1645.6 | 1543.4 | 1367.3 | 1241.1 | 1197.0 |
| 37.5°  | 1575.5 | 1465.2 | 1279.2 | 1141.0 | 1091.0 |
| 40°    | 1501.3 | 1381.4 | 1187.0 | 1044.9 | 992.9  |
| 42.5°  | 1425.3 | 1297.2 | 1095.0 | 946.8  | 896.9  |
| 45°    | 1345.2 | 1211.0 | 1001.0 | 858.6  | 810.6  |
| 47.5°  | 1269.2 | 1127.1 | 910.9  | 768.6  | 724.7  |
| 50°    | 1185.1 | 1043.0 | 822.8  | 684.5  | 642.7  |
| 52.5°  | 1102.9 | 952.7  | 738.7  | 606.6  | 568.6  |
| 55°    | 1022.9 | 866.8  | 650.5  | 530.6  | 492.5  |
| 57.5°  | 940.9  | 780.7  | 572.6  | 460.5  | 428.3  |
| 60°    | 856.8  | 696.7  | 490.4  | 388.5  | 356.4  |
| 62.5°  | 774.8  | 614.7  | 420.3  | 324.3  | 308.4  |
| 65°    | 690.7  | 528.4  | 348.3  | 280.4  | 274.2  |
| 67.5°  | 610.6  | 448.3  | 280.4  | 246.2  | 240.2  |
| 70°    | 526.5  | 370.4  | 232.1  | 212.2  | 204.1  |
| 72.5°  | 446.4  | 298.2  | 194.1  | 178.2  | 174.1  |
| 75°    | 368.3  | 228.1  | 160.1  | 146.1  | 144.2  |
| 77.5°  | 290.3  | 162.1  | 126.1  | 118.1  | 114.1  |
| 80°    | 218.1  | 116.1  | 96.0   | 88.1   | 88.1   |
| 82.5°  | 152.1  | 78.1   | 66.0   | 62.0   | 62.0   |
| 85°    | 86.0   | 44.0   | 38.0   | 38.0   | 38.0   |
| 87.5°  | 32.1   | 16.0   | 16.0   | 14.0   | 14.0   |
| 90°    | 2.1    | 26.1   | 43.4   | 54.6   | 58.7   |
| 92.5°  | 54.6   | 45.8   | 52.3   | 56.6   | 58.7   |
| 95°    | 141.5  | 69.6   | 84.8   | 96.0   | 93.7   |
| 97.5°  | 254.8  | 76.3   | 111.0  | 117.7  | 119.8  |
| 100°   | 385.7  | 87.1   | 124.2  | 141.5  | 145.9  |
| 102.5° | 529.2  | 525.1  | 128.5  | 152.4  | 159.0  |
| 105°   | 662.2  | 727.6  | 133.0  | 156.7  | 165.6  |
| 107.5° | 816.9  | 871.2  | 137.4  | 161.2  | 169.9  |
| 110°   | 965.1  | 1010.6 | 381.2  | 163.5  | 172.0  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 1104.5 | 1143.5 | 1106.6 | 167.6  | 174.4  |
| 115°   | 1252.5 | 1289.5 | 1344.1 | 335.5  | 178.8  |
| 117.5° | 1381.0 | 1424.5 | 1461.7 | 1150.1 | 579.4  |
| 120°   | 1524.9 | 1557.4 | 1596.8 | 1622.9 | 1328.8 |
| 122.5° | 1646.7 | 1681.6 | 1725.3 | 1738.2 | 1740.6 |
| 125°   | 1770.9 | 1799.3 | 1840.7 | 1856.0 | 1862.4 |
| 127.5° | 1884.2 | 1914.7 | 1947.5 | 1969.3 | 1971.3 |
| 130°   | 1990.9 | 2025.9 | 2049.7 | 2073.7 | 2071.7 |
| 132.5° | 2099.9 | 2128.3 | 2152.1 | 2171.8 | 2169.7 |
| 135°   | 2191.5 | 2226.3 | 2245.8 | 2267.7 | 2263.4 |
| 137.5° | 2287.2 | 2313.3 | 2335.3 | 2357.0 | 2350.5 |
| 140°   | 2380.7 | 2398.4 | 2422.1 | 2441.8 | 2431.0 |
| 142.5° | 2459.4 | 2474.7 | 2502.9 | 2520.2 | 2509.4 |
| 145°   | 2542.2 | 2539.9 | 2576.9 | 2592.2 | 2581.3 |
| 147.5° | 2613.8 | 2607.4 | 2644.3 | 2655.2 | 2646.7 |
| 150°   | 2683.7 | 2668.4 | 2703.4 | 2716.3 | 2705.4 |
| 152.5° | 2742.4 | 2725.1 | 2757.7 | 2770.8 | 2755.6 |
| 155°   | 2799.1 | 2779.7 | 2805.8 | 2818.7 | 2801.4 |
| 157.5° | 2844.9 | 2827.6 | 2847.2 | 2862.4 | 2844.9 |
| 160°   | 2884.2 | 2871.0 | 2884.2 | 2897.1 | 2881.9 |
| 162.5° | 2918.8 | 2905.9 | 2916.8 | 2932.0 | 2912.4 |
| 165°   | 2949.3 | 2936.4 | 2942.9 | 2958.1 | 2942.9 |
| 167.5° | 2973.4 | 2960.2 | 2967.0 | 2982.2 | 2962.5 |
| 170°   | 2993.0 | 2979.9 | 2984.3 | 2999.5 | 2979.9 |
| 172.5° | 3006.0 | 2993.0 | 2997.5 | 3012.7 | 2993.0 |
| 175°   | 3016.8 | 3001.6 | 3006.0 | 3021.3 | 2999.5 |
| 177.5° | 3021.3 | 3006.0 | 3008.4 | 3023.6 | 3003.9 |
| 180°   | 3010.4 | 3010.4 | 3010.4 | 3010.4 | 3010.4 |

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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 | 7.17             | 7.89  | 8.26  | 8.97  | 10.45 | 3.15           | 3.86 | 4.23 | 4.94 | 6.43 |
|                 | 3H   | 8.84             | 9.48  | 9.94  | 10.57 | 12.07 | 4.33           | 4.97 | 5.42 | 6.06 | 7.56 |
|                 | 4H   | 9.44             | 10.05 | 10.55 | 11.14 | 12.65 | 4.77           | 5.38 | 5.88 | 6.47 | 7.98 |
|                 | 6H   | 9.86             | 10.42 | 10.98 | 11.52 | 13.03 | 5.09           | 5.65 | 6.21 | 6.74 | 8.26 |
|                 | 8H   | 9.99             | 10.52 | 11.11 | 11.63 | 13.14 | 5.18           | 5.71 | 6.30 | 6.82 | 8.33 |
|                 | 12H  | 10.04            | 10.55 | 11.17 | 11.65 | 13.19 | 5.22           | 5.72 | 6.34 | 6.83 | 8.36 |
| 4H              | 2H   | 7.18             | 7.78  | 8.29  | 8.88  | 10.38 | 3.73           | 4.33 | 4.84 | 5.43 | 6.93 |
|                 | 3H   | 9.00             | 9.50  | 10.12 | 10.62 | 12.14 | 5.07           | 5.57 | 6.19 | 6.69 | 8.21 |
|                 | 4H   | 9.68             | 10.15 | 10.81 | 11.26 | 12.80 | 5.61           | 6.08 | 6.74 | 7.19 | 8.73 |
|                 | 6H   | 10.19            | 10.59 | 11.33 | 11.72 | 13.26 | 6.03           | 6.42 | 7.16 | 7.56 | 9.09 |
|                 | 8H   | 10.37            | 10.74 | 11.50 | 11.86 | 13.41 | 6.16           | 6.53 | 7.29 | 7.65 | 9.20 |
|                 | 12H  | 10.46            | 10.79 | 11.61 | 11.93 | 13.48 | 6.22           | 6.55 | 7.36 | 7.69 | 9.24 |
| 8H              | 4H   | 9.64             | 10.01 | 10.77 | 11.14 | 12.69 | 5.89           | 6.26 | 7.02 | 7.38 | 8.93 |
|                 | 6H   | 10.21            | 10.51 | 11.36 | 11.68 | 13.22 | 6.40           | 6.71 | 7.55 | 7.87 | 9.42 |
|                 | 8H   | 10.42            | 10.69 | 11.58 | 11.84 | 13.40 | 6.59           | 6.86 | 7.75 | 8.01 | 9.57 |
|                 | 12H  | 10.56            | 10.79 | 11.72 | 11.94 | 13.54 | 6.71           | 6.94 | 7.87 | 8.09 | 9.69 |
| 12H             | 4H   | 9.59             | 9.93  | 10.74 | 11.06 | 12.62 | 5.88           | 6.22 | 7.03 | 7.36 | 8.91 |
|                 | 6H   | 10.18            | 10.45 | 11.34 | 11.60 | 13.16 | 6.45           | 6.72 | 7.61 | 7.86 | 9.43 |
|                 | 8H   | 10.40            | 10.63 | 11.56 | 11.78 | 13.38 | 6.66           | 6.89 | 7.82 | 8.03 | 9.64 |

END OF REPORT