

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: P902213

Luminaire Tested: DFN2DIP-4P3F0-030D060US830-RLONL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P902213  
REPORT IS A COMBINATION OF REPORTS P900592 AND P897473  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-4P3F0-030D060US830-RLLONL  
Description: 3 foot, 90deg - 4way Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

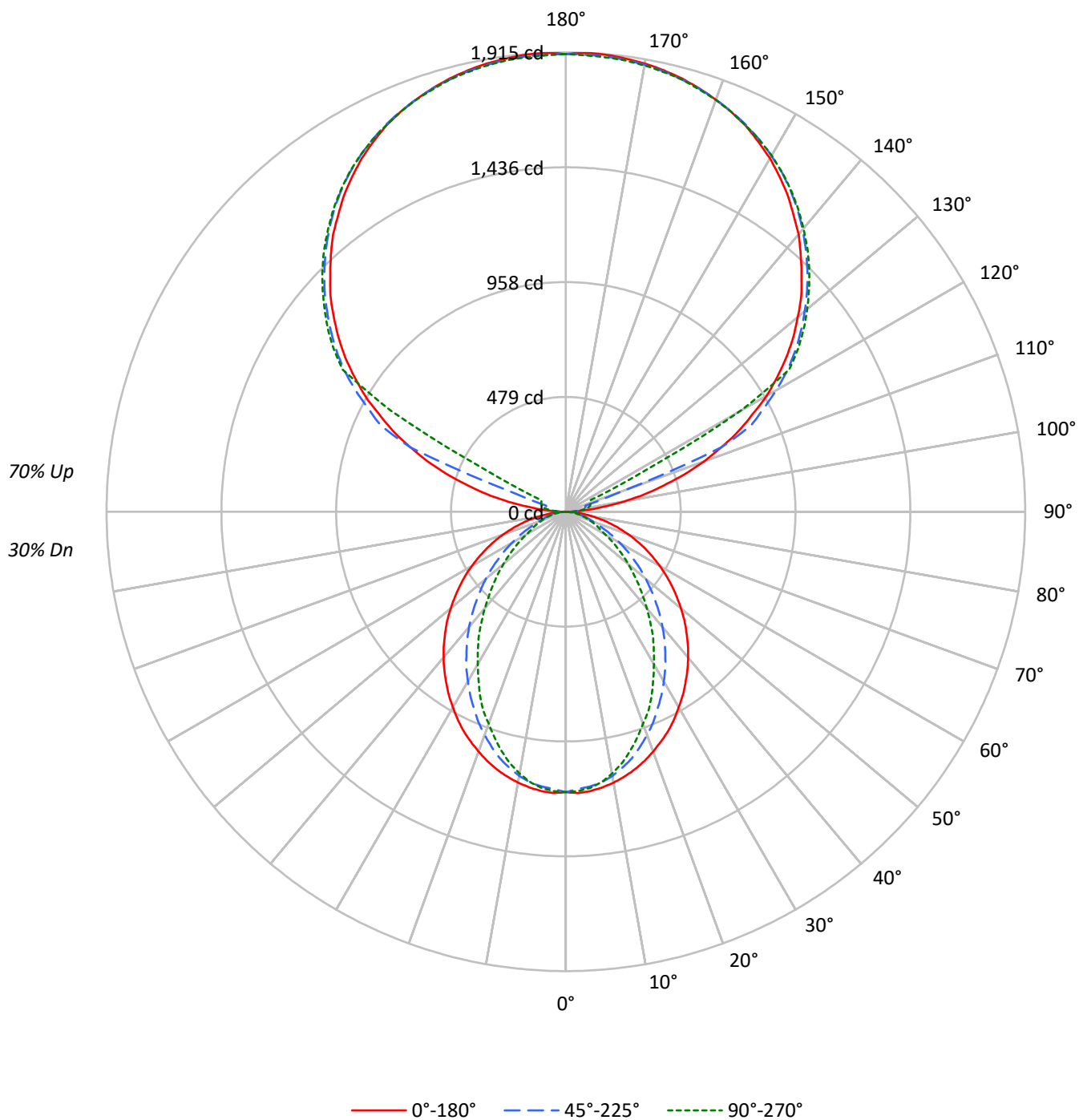
**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 8002.2 lumens  
Efficiency: N/A  
Efficacy: 109.5 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 0.99 / 1.16  
Luminous Opening: Rectangular w/ Sides (W: 3.07' x L: 3.07' x H: 0.1')  
CIE Type: Semi-Indirect  
  
Input Watts (W): 73.1  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9933  
Total Harmonic Distortion (THDi): 0.066  
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 | 38 | 38 | 38 |
| 1   | 94  | 90  | 86  | 83  | 84 | 81 | 77 | 75 | 64 | 62 | 60 | 48 | 47 | 46 | 34 | 33 | 32 |
| 2   | 85  | 78  | 73  | 68  | 76 | 71 | 66 | 62 | 56 | 53 | 50 | 43 | 40 | 39 | 30 | 29 | 28 |
| 3   | 78  | 69  | 62  | 57  | 70 | 62 | 57 | 52 | 50 | 46 | 42 | 38 | 35 | 33 | 27 | 25 | 24 |
| 4   | 71  | 61  | 54  | 48  | 64 | 55 | 49 | 44 | 44 | 40 | 36 | 34 | 31 | 28 | 24 | 22 | 21 |
| 5   | 66  | 55  | 47  | 41  | 59 | 49 | 43 | 38 | 40 | 35 | 31 | 30 | 27 | 25 | 22 | 20 | 18 |
| 6   | 60  | 49  | 41  | 36  | 54 | 44 | 38 | 33 | 36 | 31 | 27 | 28 | 24 | 22 | 20 | 18 | 16 |
| 7   | 56  | 44  | 37  | 31  | 50 | 40 | 34 | 29 | 32 | 28 | 24 | 25 | 22 | 19 | 18 | 16 | 15 |
| 8   | 52  | 40  | 33  | 28  | 46 | 36 | 30 | 25 | 29 | 25 | 21 | 23 | 20 | 17 | 17 | 15 | 13 |
| 9   | 48  | 37  | 29  | 25  | 43 | 33 | 27 | 23 | 27 | 22 | 19 | 21 | 18 | 15 | 16 | 13 | 12 |
| 10  | 45  | 33  | 27  | 22  | 40 | 30 | 24 | 20 | 25 | 20 | 17 | 20 | 16 | 14 | 14 | 12 | 11 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 1332 | 1332 | 1332 |
| 5°  | 1333 | 1310 | 1319 |
| 10° | 1319 | 1283 | 1275 |
| 15° | 1300 | 1240 | 1209 |
| 20° | 1275 | 1181 | 1127 |
| 25° | 1250 | 1114 | 1048 |
| 30° | 1216 | 1046 | 948  |
| 35° | 1183 | 974  | 860  |
| 40° | 1149 | 898  | 760  |
| 45° | 1109 | 815  | 669  |
| 50° | 1069 | 731  | 579  |
| 55° | 1026 | 641  | 494  |
| 60° | 977  | 547  | 406  |
| 65° | 920  | 452  | 365  |
| 70° | 851  | 363  | 330  |
| 75° | 764  | 318  | 299  |
| 80° | 639  | 264  | 258  |
| 85° | 433  | 172  | 192  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 90°

Vertical Angle: 90°

Luminance: 1303 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 109.5  | 1.4       |
| 10°-20°   | 300.7  | 3.8       |
| 20°-30°   | 422.1  | 5.3       |
| 30°-40°   | 460.2  | 5.8       |
| 40°-50°   | 422.9  | 5.3       |
| 50°-60°   | 332.2  | 4.2       |
| 60°-70°   | 216.2  | 2.7       |
| 70°-80°   | 111.3  | 1.4       |
| 80°-90°   | 31.8   | 0.4       |
| 90°-100°  | 62.9   | 0.8       |
| 100°-110° | 234.6  | 2.9       |
| 110°-120° | 622.2  | 7.8       |
| 120°-130° | 1032.0 | 12.9      |
| 130°-140° | 1096.2 | 13.7      |
| 140°-150° | 1018.8 | 12.7      |
| 150°-160° | 819.1  | 10.2      |
| 160°-170° | 527.8  | 6.6       |
| 170°-180° | 181.7  | 2.3       |
| 0°-30°    | 832.3  | 10.4      |
| 0°-40°    | 1292.5 | 16.2      |
| 0°-60°    | 2047.6 | 25.6      |
| 0°-90°    | 2406.8 | 30.1      |
| 90°-120°  | 919.8  | 11.5      |
| 90°-150°  | 4066.8 | 50.8      |
| 90°-180°  | 5595.0 | 69.9      |
| 0°-180°   | 8002.2 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 1169 | 1169  | 1169 | 1169  | 1169 |      |
| 5°   | 1169 | 1163  | 1150 | 1159  | 1156 | 111  |
| 15°  | 1112 | 1100  | 1064 | 1044  | 1033 | 313  |
| 25°  | 1009 | 975   | 905  | 862   | 846  | 464  |
| 35°  | 869  | 815   | 722  | 656   | 632  | 544  |
| 45°  | 711  | 640   | 529  | 454   | 428  | 549  |
| 55°  | 540  | 458   | 344  | 280   | 260  | 483  |
| 65°  | 365  | 279   | 184  | 148   | 145  | 362  |
| 75°  | 194  | 121   | 85   | 77    | 76   | 206  |
| 85°  | 45   | 23    | 20   | 20    | 20   | 52   |
| 90°  | 1    | 17    | 28   | 35    | 37   | 7    |
| 95°  | 90   | 44    | 54   | 61    | 59   | 106  |
| 105° | 420  | 461   | 84   | 99    | 105  | 449  |
| 115° | 794  | 818   | 852  | 213   | 113  | 782  |
| 125° | 1123 | 1141  | 1167 | 1177  | 1181 | 1001 |
| 135° | 1389 | 1412  | 1424 | 1438  | 1435 | 1073 |
| 145° | 1612 | 1610  | 1634 | 1643  | 1636 | 1008 |
| 155° | 1775 | 1762  | 1779 | 1787  | 1776 | 818  |
| 165° | 1870 | 1862  | 1866 | 1876  | 1866 | 528  |
| 175° | 1913 | 1903  | 1906 | 1915  | 1902 | 182  |
| 180° | 1909 | 1909  | 1909 | 1909  | 1909 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 1168.7 | 1168.7 | 1168.7 | 1168.7 | 1168.7 |
| 2.5°   | 1173.9 | 1168.7 | 1157.0 | 1167.6 | 1165.5 |
| 5°     | 1168.7 | 1163.4 | 1149.6 | 1159.1 | 1155.9 |
| 7.5°   | 1159.1 | 1152.8 | 1138.0 | 1142.2 | 1136.9 |
| 10°    | 1146.4 | 1139.1 | 1117.9 | 1114.7 | 1108.4 |
| 12.5°  | 1130.6 | 1121.1 | 1092.5 | 1086.2 | 1074.5 |
| 15°    | 1111.5 | 1099.9 | 1063.9 | 1043.9 | 1033.3 |
| 17.5°  | 1089.3 | 1072.4 | 1027.9 | 1004.8 | 987.8  |
| 20°    | 1063.9 | 1042.7 | 989.9  | 963.6  | 940.2  |
| 22.5°  | 1036.5 | 1012.1 | 950.7  | 914.8  | 899.0  |
| 25°    | 1009.0 | 975.1  | 905.3  | 862.0  | 846.0  |
| 27.5°  | 976.2  | 940.2  | 863.0  | 813.3  | 788.9  |
| 30°    | 941.3  | 901.1  | 816.4  | 762.6  | 734.0  |
| 32.5°  | 907.4  | 858.8  | 772.1  | 708.6  | 682.1  |
| 35°    | 869.4  | 815.4  | 722.4  | 655.7  | 632.4  |
| 37.5°  | 832.4  | 774.1  | 675.8  | 602.8  | 576.5  |
| 40°    | 793.2  | 729.8  | 627.2  | 552.0  | 524.6  |
| 42.5°  | 753.0  | 685.4  | 578.5  | 500.2  | 473.8  |
| 45°    | 710.8  | 639.8  | 528.9  | 453.6  | 428.3  |
| 47.5°  | 670.5  | 595.5  | 481.3  | 406.0  | 382.9  |
| 50°    | 626.1  | 551.0  | 434.7  | 361.7  | 339.5  |
| 52.5°  | 582.7  | 503.4  | 390.3  | 320.5  | 300.4  |
| 55°    | 540.4  | 457.9  | 343.7  | 280.3  | 260.2  |
| 57.5°  | 497.1  | 412.5  | 302.6  | 243.3  | 226.3  |
| 60°    | 452.6  | 368.1  | 259.1  | 205.2  | 188.3  |
| 62.5°  | 409.3  | 324.7  | 222.1  | 171.4  | 163.0  |
| 65°    | 364.9  | 279.2  | 184.0  | 148.1  | 144.9  |
| 67.5°  | 322.6  | 236.9  | 148.1  | 130.1  | 126.9  |
| 70°    | 278.1  | 195.7  | 122.6  | 112.1  | 107.8  |
| 72.5°  | 235.8  | 157.5  | 102.5  | 94.2   | 92.0   |
| 75°    | 194.5  | 120.6  | 84.6   | 77.2   | 76.2   |
| 77.5°  | 153.4  | 85.6   | 66.6   | 62.4   | 60.2   |
| 80°    | 115.3  | 61.4   | 50.7   | 46.6   | 46.6   |
| 82.5°  | 80.3   | 41.3   | 34.9   | 32.8   | 32.8   |
| 85°    | 45.4   | 23.2   | 20.1   | 20.1   | 20.1   |
| 87.5°  | 17.0   | 8.4    | 8.4    | 7.4    | 7.4    |
| 90°    | 1.3    | 16.6   | 27.5   | 34.6   | 37.2   |
| 92.5°  | 34.6   | 29.0   | 33.1   | 35.9   | 37.2   |
| 95°    | 89.7   | 44.1   | 53.8   | 60.9   | 59.4   |
| 97.5°  | 161.6  | 48.4   | 70.3   | 74.6   | 76.0   |
| 100°   | 244.5  | 55.2   | 78.7   | 89.7   | 92.5   |
| 102.5° | 335.5  | 332.9  | 81.5   | 96.6   | 100.9  |
| 105°   | 419.8  | 461.3  | 84.3   | 99.3   | 105.0  |
| 107.5° | 517.9  | 552.3  | 87.1   | 102.2  | 107.7  |
| 110°   | 611.9  | 640.7  | 241.8  | 103.7  | 109.1  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 700.2  | 725.0  | 701.5  | 106.2  | 110.6  |
| 115°   | 794.1  | 817.6  | 852.2  | 212.7  | 113.3  |
| 117.5° | 875.5  | 903.1  | 926.7  | 729.2  | 367.3  |
| 120°   | 966.8  | 987.4  | 1012.4 | 1028.9 | 842.4  |
| 122.5° | 1044.0 | 1066.1 | 1093.8 | 1102.0 | 1103.5 |
| 125°   | 1122.8 | 1140.8 | 1167.0 | 1176.7 | 1180.7 |
| 127.5° | 1194.6 | 1213.9 | 1234.7 | 1248.5 | 1249.8 |
| 130°   | 1262.3 | 1284.4 | 1299.5 | 1314.8 | 1313.4 |
| 132.5° | 1331.3 | 1349.3 | 1364.4 | 1376.9 | 1375.5 |
| 135°   | 1389.4 | 1411.6 | 1423.8 | 1437.8 | 1434.9 |
| 137.5° | 1450.0 | 1466.6 | 1480.5 | 1494.3 | 1490.3 |
| 140°   | 1509.4 | 1520.6 | 1535.7 | 1548.1 | 1541.2 |
| 142.5° | 1559.2 | 1569.0 | 1586.9 | 1597.8 | 1590.9 |
| 145°   | 1611.7 | 1610.2 | 1633.7 | 1643.4 | 1636.5 |
| 147.5° | 1657.2 | 1653.0 | 1676.5 | 1683.4 | 1678.0 |
| 150°   | 1701.5 | 1691.8 | 1713.9 | 1722.1 | 1715.2 |
| 152.5° | 1738.7 | 1727.7 | 1748.3 | 1756.7 | 1747.0 |
| 155°   | 1774.6 | 1762.3 | 1778.9 | 1787.1 | 1776.0 |
| 157.5° | 1803.6 | 1792.6 | 1805.1 | 1814.8 | 1803.6 |
| 160°   | 1828.5 | 1820.1 | 1828.5 | 1836.7 | 1827.1 |
| 162.5° | 1850.5 | 1842.3 | 1849.2 | 1858.9 | 1846.4 |
| 165°   | 1869.9 | 1861.7 | 1865.8 | 1875.5 | 1865.8 |
| 167.5° | 1885.1 | 1876.8 | 1881.0 | 1890.7 | 1878.2 |
| 170°   | 1897.6 | 1889.2 | 1892.1 | 1901.7 | 1889.2 |
| 172.5° | 1905.8 | 1897.6 | 1900.4 | 1910.1 | 1897.6 |
| 175°   | 1912.7 | 1903.0 | 1905.8 | 1915.4 | 1901.7 |
| 177.5° | 1915.4 | 1905.8 | 1907.2 | 1916.9 | 1904.5 |
| 180°   | 1908.6 | 1908.6 | 1908.6 | 1908.6 | 1908.6 |

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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 | 5.89             | 6.58 | 7.00  | 7.69  | 9.22  | 1.85           | 2.54 | 2.97 | 3.65 | 5.18 |
|                 | 3H   | 7.55             | 8.17 | 8.67  | 9.28  | 10.83 | 3.02           | 3.64 | 4.14 | 4.75 | 6.30 |
|                 | 4H   | 8.15             | 8.73 | 9.28  | 9.85  | 11.40 | 3.46           | 4.05 | 4.59 | 5.16 | 6.72 |
|                 | 6H   | 8.56             | 9.10 | 9.70  | 10.22 | 11.78 | 3.77           | 4.31 | 4.91 | 5.43 | 6.99 |
|                 | 8H   | 8.68             | 9.19 | 9.83  | 10.33 | 11.88 | 3.85           | 4.36 | 5.00 | 5.50 | 7.06 |
|                 | 12H  | 8.74             | 9.22 | 9.88  | 10.35 | 11.93 | 3.89           | 4.37 | 5.04 | 5.50 | 7.08 |
| 4H              | 2H   | 5.89             | 6.47 | 7.03  | 7.59  | 9.14  | 2.42           | 3.01 | 3.57 | 4.13 | 5.68 |
|                 | 3H   | 7.70             | 8.19 | 8.84  | 9.33  | 10.89 | 3.75           | 4.24 | 4.90 | 5.38 | 6.95 |
|                 | 4H   | 8.38             | 8.83 | 9.53  | 9.96  | 11.55 | 4.29           | 4.74 | 5.44 | 5.87 | 7.46 |
|                 | 6H   | 8.88             | 9.27 | 10.04 | 10.42 | 12.00 | 4.70           | 5.08 | 5.85 | 6.23 | 7.81 |
|                 | 8H   | 9.05             | 9.41 | 10.21 | 10.56 | 12.15 | 4.82           | 5.18 | 5.97 | 6.32 | 7.92 |
|                 | 12H  | 9.14             | 9.46 | 10.31 | 10.62 | 12.22 | 4.87           | 5.20 | 6.04 | 6.36 | 7.95 |
| 8H              | 4H   | 8.34             | 8.69 | 9.49  | 9.84  | 11.43 | 4.56           | 4.92 | 5.71 | 6.06 | 7.65 |
|                 | 6H   | 8.89             | 9.19 | 10.07 | 10.38 | 11.97 | 5.06           | 5.36 | 6.24 | 6.55 | 8.14 |
|                 | 8H   | 9.11             | 9.36 | 10.29 | 10.53 | 12.14 | 5.25           | 5.51 | 6.43 | 6.67 | 8.28 |
|                 | 12H  | 9.23             | 9.46 | 10.42 | 10.62 | 12.27 | 5.36           | 5.58 | 6.54 | 6.75 | 8.39 |
| 12H             | 4H   | 8.28             | 8.61 | 9.45  | 9.76  | 11.36 | 4.56           | 4.88 | 5.73 | 6.04 | 7.63 |
|                 | 6H   | 8.87             | 9.12 | 10.05 | 10.29 | 11.90 | 5.11           | 5.37 | 6.29 | 6.53 | 8.14 |
|                 | 8H   | 9.08             | 9.30 | 10.26 | 10.47 | 12.11 | 5.31           | 5.54 | 6.49 | 6.70 | 8.34 |

END OF REPORT