

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: P924691

Luminaire Tested: DFN2DIP-PN2F0-020D060US950-RLLONL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P924691  
REPORT IS A COMBINATION OF REPORTS P901022 AND P897905  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-PN2F0-020D060US950-RLLONL  
Description: 2 foot, Pentagon Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

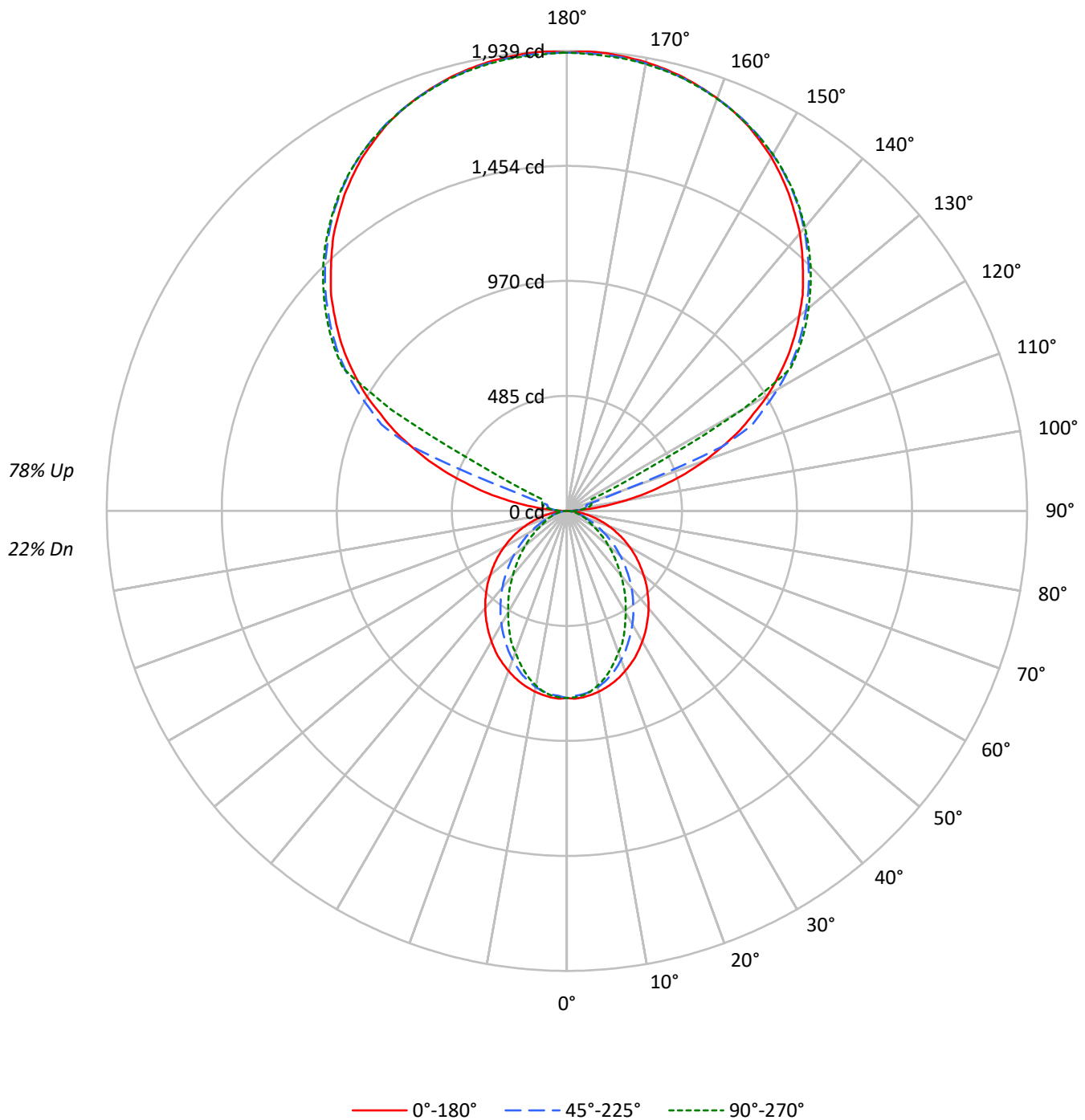
Lumens per Lamp: N/A  
Luminaire Lumens: 7288.5 lumens  
Efficiency: N/A  
Efficacy: 105.6 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 0.99 / 1.16  
Luminous Opening: Rectangular w/ Sides (W: 2.17' x L: 2.29' x H: 0.1')  
CIE Type: Semi-Indirect

Input Watts (W): 69  
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   | 101 | 101 | 101 | 101 | 89 | 89 | 89 | 89 | 68 | 68 | 68 | 49 | 49 | 49 | 31 | 31 | 31 |
| 1   | 92  | 88  | 84  | 81  | 81 | 78 | 75 | 72 | 60 | 58 | 56 | 43 | 42 | 41 | 27 | 27 | 26 |
| 2   | 84  | 77  | 71  | 66  | 74 | 68 | 64 | 60 | 52 | 49 | 47 | 38 | 36 | 34 | 24 | 23 | 22 |
| 3   | 76  | 68  | 61  | 55  | 68 | 60 | 55 | 50 | 46 | 43 | 39 | 34 | 31 | 29 | 22 | 20 | 19 |
| 4   | 70  | 60  | 52  | 47  | 62 | 53 | 47 | 42 | 41 | 37 | 34 | 30 | 27 | 25 | 20 | 18 | 17 |
| 5   | 64  | 53  | 46  | 40  | 57 | 48 | 41 | 36 | 37 | 32 | 29 | 27 | 24 | 22 | 18 | 16 | 15 |
| 6   | 59  | 48  | 40  | 35  | 52 | 43 | 36 | 31 | 33 | 29 | 25 | 24 | 21 | 19 | 16 | 14 | 13 |
| 7   | 54  | 43  | 35  | 30  | 48 | 38 | 32 | 27 | 30 | 25 | 22 | 22 | 19 | 17 | 15 | 13 | 12 |
| 8   | 50  | 39  | 32  | 27  | 45 | 35 | 29 | 24 | 27 | 23 | 20 | 20 | 17 | 15 | 14 | 12 | 10 |
| 9   | 47  | 35  | 28  | 23  | 42 | 32 | 26 | 21 | 25 | 20 | 17 | 19 | 16 | 13 | 12 | 11 | 9  |
| 10  | 44  | 32  | 25  | 21  | 39 | 29 | 23 | 19 | 23 | 19 | 16 | 17 | 14 | 12 | 12 | 10 | 9  |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 1708 | 1708 | 1708 |
| 5°  | 1708 | 1677 | 1689 |
| 10° | 1688 | 1641 | 1632 |
| 15° | 1662 | 1583 | 1545 |
| 20° | 1629 | 1505 | 1438 |
| 25° | 1595 | 1418 | 1336 |
| 30° | 1549 | 1329 | 1206 |
| 35° | 1505 | 1234 | 1093 |
| 40° | 1460 | 1136 | 963  |
| 45° | 1407 | 1028 | 846  |
| 50° | 1353 | 919  | 732  |
| 55° | 1296 | 803  | 622  |
| 60° | 1230 | 683  | 510  |
| 65° | 1154 | 560  | 456  |
| 70° | 1061 | 446  | 409  |
| 75° | 945  | 386  | 367  |
| 80° | 777  | 314  | 311  |
| 85° | 507  | 194  | 220  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 90°

Vertical Angle: 90°

Luminance: 1775 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 73.9   | 1.0       |
| 10°-20°   | 202.9  | 2.8       |
| 20°-30°   | 284.8  | 3.9       |
| 30°-40°   | 310.5  | 4.3       |
| 40°-50°   | 285.4  | 3.9       |
| 50°-60°   | 224.1  | 3.1       |
| 60°-70°   | 145.9  | 2.0       |
| 70°-80°   | 75.1   | 1.0       |
| 80°-90°   | 22.6   | 0.3       |
| 90°-100°  | 63.7   | 0.9       |
| 100°-110° | 237.5  | 3.3       |
| 110°-120° | 629.8  | 8.6       |
| 120°-130° | 1044.5 | 14.3      |
| 130°-140° | 1109.5 | 15.2      |
| 140°-150° | 1031.2 | 14.1      |
| 150°-160° | 829.1  | 11.4      |
| 160°-170° | 534.2  | 7.3       |
| 170°-180° | 183.9  | 2.5       |
| 0°-30°    | 561.6  | 7.7       |
| 0°-40°    | 872.1  | 12.0      |
| 0°-60°    | 1381.7 | 19.0      |
| 0°-90°    | 1625.2 | 22.3      |
| 90°-120°  | 930.9  | 12.8      |
| 90°-150°  | 4116.2 | 56.5      |
| 90°-180°  | 5663.0 | 77.7      |
| 0°-180°   | 7288.5 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 789  | 789   | 789  | 789   | 789  |      |
| 5°   | 789  | 785   | 776  | 782   | 780  | 75   |
| 15°  | 750  | 742   | 718  | 704   | 697  | 211  |
| 25°  | 681  | 658   | 611  | 582   | 571  | 313  |
| 35°  | 587  | 550   | 488  | 442   | 427  | 367  |
| 45°  | 480  | 432   | 357  | 306   | 289  | 370  |
| 55°  | 365  | 309   | 232  | 189   | 176  | 326  |
| 65°  | 246  | 188   | 124  | 100   | 98   | 244  |
| 75°  | 131  | 81    | 57   | 52    | 51   | 139  |
| 85°  | 31   | 16    | 14   | 14    | 14   | 35   |
| 90°  | 1    | 17    | 28   | 35    | 38   | 7    |
| 95°  | 91   | 45    | 54   | 62    | 60   | 108  |
| 105° | 425  | 467   | 85   | 101   | 106  | 454  |
| 115° | 804  | 828   | 862  | 215   | 115  | 791  |
| 125° | 1136 | 1155  | 1181 | 1191  | 1195 | 1014 |
| 135° | 1406 | 1429  | 1441 | 1455  | 1452 | 1086 |
| 145° | 1631 | 1630  | 1654 | 1663  | 1656 | 1020 |
| 155° | 1796 | 1784  | 1800 | 1809  | 1798 | 828  |
| 165° | 1893 | 1884  | 1888 | 1898  | 1888 | 535  |
| 175° | 1936 | 1926  | 1929 | 1939  | 1925 | 184  |
| 180° | 1932 | 1932  | 1932 | 1932  | 1932 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°    | 22.5° | 45°   | 67.5° | 90°   |
|--------|-------|-------|-------|-------|-------|
| 0°     | 788.6 | 788.6 | 788.6 | 788.6 | 788.6 |
| 2.5°   | 792.1 | 788.6 | 780.7 | 787.9 | 786.5 |
| 5°     | 788.6 | 785.0 | 775.7 | 782.2 | 780.0 |
| 7.5°   | 782.2 | 777.9 | 767.9 | 770.7 | 767.1 |
| 10°    | 773.6 | 768.5 | 754.3 | 752.1 | 747.9 |
| 12.5°  | 762.9 | 756.4 | 737.2 | 733.0 | 725.0 |
| 15°    | 750.0 | 742.1 | 717.9 | 704.3 | 697.3 |
| 17.5°  | 735.1 | 723.6 | 693.7 | 677.9 | 666.6 |
| 20°    | 717.9 | 703.6 | 668.0 | 650.2 | 634.4 |
| 22.5°  | 699.4 | 683.0 | 641.6 | 617.3 | 606.6 |
| 25°    | 680.9 | 658.0 | 610.8 | 581.7 | 570.9 |
| 27.5°  | 658.7 | 634.4 | 582.3 | 548.7 | 532.3 |
| 30°    | 635.2 | 608.0 | 550.9 | 514.6 | 495.2 |
| 32.5°  | 612.3 | 579.5 | 521.0 | 478.1 | 460.3 |
| 35°    | 586.6 | 550.3 | 487.5 | 442.5 | 426.7 |
| 37.5°  | 561.6 | 522.3 | 456.0 | 406.8 | 388.9 |
| 40°    | 535.2 | 492.5 | 423.2 | 372.5 | 353.9 |
| 42.5°  | 508.1 | 462.5 | 390.4 | 337.5 | 319.8 |
| 45°    | 479.6 | 431.7 | 356.9 | 306.1 | 289.0 |
| 47.5°  | 452.5 | 401.8 | 324.7 | 274.0 | 258.3 |
| 50°    | 422.5 | 371.9 | 293.4 | 244.0 | 229.2 |
| 52.5°  | 393.1 | 339.6 | 263.3 | 216.3 | 202.7 |
| 55°    | 364.6 | 309.0 | 231.9 | 189.2 | 175.5 |
| 57.5°  | 335.4 | 278.3 | 204.2 | 164.2 | 152.7 |
| 60°    | 305.5 | 248.3 | 174.9 | 138.5 | 127.1 |
| 62.5°  | 276.2 | 219.1 | 149.9 | 115.6 | 109.9 |
| 65°    | 246.2 | 188.4 | 124.2 | 100.0 | 97.8  |
| 67.5°  | 217.7 | 159.8 | 100.0 | 87.8  | 85.7  |
| 70°    | 187.7 | 132.0 | 82.7  | 75.7  | 72.8  |
| 72.5°  | 159.1 | 106.3 | 69.2  | 63.5  | 62.1  |
| 75°    | 131.3 | 81.3  | 57.0  | 52.1  | 51.4  |
| 77.5°  | 103.5 | 57.8  | 44.9  | 42.1  | 40.6  |
| 80°    | 77.8  | 41.4  | 34.2  | 31.4  | 31.4  |
| 82.5°  | 54.2  | 27.9  | 23.6  | 22.1  | 22.1  |
| 85°    | 30.6  | 15.6  | 13.5  | 13.5  | 13.5  |
| 87.5°  | 11.4  | 5.7   | 5.7   | 5.0   | 5.0   |
| 90°    | 1.3   | 16.8  | 27.9  | 35.0  | 37.7  |
| 92.5°  | 35.0  | 29.4  | 33.5  | 36.3  | 37.7  |
| 95°    | 90.8  | 44.6  | 54.5  | 61.6  | 60.1  |
| 97.5°  | 163.5 | 48.9  | 71.2  | 75.6  | 76.9  |
| 100°   | 247.5 | 55.9  | 79.7  | 90.8  | 93.6  |
| 102.5° | 339.6 | 337.0 | 82.5  | 97.8  | 102.1 |
| 105°   | 424.9 | 466.9 | 85.3  | 100.6 | 106.3 |
| 107.5° | 524.2 | 559.0 | 88.1  | 103.4 | 109.0 |
| 110°   | 619.3 | 648.5 | 244.7 | 104.9 | 110.4 |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 708.7  | 733.8  | 710.1  | 107.5  | 111.9  |
| 115°   | 803.7  | 827.5  | 862.5  | 215.3  | 114.7  |
| 117.5° | 886.2  | 914.1  | 938.0  | 738.0  | 371.8  |
| 120°   | 978.5  | 999.4  | 1024.7 | 1041.4 | 852.7  |
| 122.5° | 1056.7 | 1079.1 | 1107.1 | 1115.4 | 1116.9 |
| 125°   | 1136.4 | 1154.6 | 1181.1 | 1191.0 | 1195.1 |
| 127.5° | 1209.1 | 1228.7 | 1249.7 | 1263.7 | 1265.0 |
| 130°   | 1277.6 | 1300.0 | 1315.3 | 1330.7 | 1329.4 |
| 132.5° | 1347.5 | 1365.7 | 1381.0 | 1393.6 | 1392.3 |
| 135°   | 1406.3 | 1428.7 | 1441.1 | 1455.2 | 1452.4 |
| 137.5° | 1467.6 | 1484.4 | 1498.5 | 1512.5 | 1508.4 |
| 140°   | 1527.7 | 1539.1 | 1554.4 | 1566.9 | 1560.0 |
| 142.5° | 1578.2 | 1588.0 | 1606.2 | 1617.2 | 1610.3 |
| 145°   | 1631.3 | 1629.8 | 1653.6 | 1663.4 | 1656.4 |
| 147.5° | 1677.3 | 1673.1 | 1696.9 | 1703.8 | 1698.4 |
| 150°   | 1722.2 | 1712.3 | 1734.8 | 1743.1 | 1736.1 |
| 152.5° | 1759.8 | 1748.7 | 1769.6 | 1778.1 | 1768.2 |
| 155°   | 1796.2 | 1783.7 | 1800.5 | 1808.8 | 1797.6 |
| 157.5° | 1825.6 | 1814.4 | 1827.0 | 1836.8 | 1825.6 |
| 160°   | 1850.8 | 1842.3 | 1850.8 | 1859.1 | 1849.3 |
| 162.5° | 1873.0 | 1864.7 | 1871.7 | 1881.5 | 1868.9 |
| 165°   | 1892.6 | 1884.3 | 1888.4 | 1898.3 | 1888.4 |
| 167.5° | 1908.0 | 1899.6 | 1903.9 | 1913.7 | 1901.0 |
| 170°   | 1920.7 | 1912.2 | 1915.1 | 1924.8 | 1912.2 |
| 172.5° | 1929.0 | 1920.7 | 1923.5 | 1933.3 | 1920.7 |
| 175°   | 1936.0 | 1926.1 | 1929.0 | 1938.7 | 1924.8 |
| 177.5° | 1938.7 | 1929.0 | 1930.4 | 1940.2 | 1927.7 |
| 180°   | 1931.8 | 1931.8 | 1931.8 | 1931.8 | 1931.8 |

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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 | 5.46             | 6.11 | 6.63 | 7.26  | 8.88  | 1.43           | 2.08 | 2.60 | 3.23 | 4.85 |
|                 | 3H   | 7.11             | 7.68 | 8.28 | 8.84  | 10.48 | 2.59           | 3.17 | 3.77 | 4.33 | 5.96 |
|                 | 4H   | 7.69             | 8.24 | 8.88 | 9.40  | 11.04 | 3.02           | 3.57 | 4.20 | 4.73 | 6.37 |
|                 | 6H   | 8.09             | 8.59 | 9.28 | 9.75  | 11.40 | 3.32           | 3.82 | 4.51 | 4.98 | 6.63 |
|                 | 8H   | 8.20             | 8.68 | 9.39 | 9.86  | 11.50 | 3.39           | 3.87 | 4.59 | 5.05 | 6.69 |
|                 | 12H  | 8.25             | 8.70 | 9.44 | 9.87  | 11.53 | 3.42           | 3.88 | 4.62 | 5.05 | 6.71 |
| 4H              | 2H   | 5.46             | 6.00 | 6.65 | 7.16  | 8.80  | 2.00           | 2.54 | 3.19 | 3.70 | 5.34 |
|                 | 3H   | 7.24             | 7.70 | 8.44 | 8.88  | 10.53 | 3.31           | 3.77 | 4.50 | 4.95 | 6.60 |
|                 | 4H   | 7.91             | 8.33 | 9.11 | 9.50  | 11.17 | 3.84           | 4.26 | 5.03 | 5.43 | 7.10 |
|                 | 6H   | 8.40             | 8.76 | 9.60 | 9.95  | 11.61 | 4.23           | 4.58 | 5.42 | 5.78 | 7.44 |
|                 | 8H   | 8.56             | 8.89 | 9.76 | 10.08 | 11.75 | 4.34           | 4.68 | 5.54 | 5.86 | 7.54 |
|                 | 12H  | 8.63             | 8.94 | 9.85 | 10.13 | 11.81 | 4.39           | 4.69 | 5.60 | 5.89 | 7.57 |
| 8H              | 4H   | 7.86             | 8.20 | 9.06 | 9.38  | 11.06 | 4.09           | 4.42 | 5.29 | 5.61 | 7.28 |
|                 | 6H   | 8.40             | 8.68 | 9.62 | 9.90  | 11.57 | 4.58           | 4.85 | 5.79 | 6.08 | 7.75 |
|                 | 8H   | 8.60             | 8.84 | 9.82 | 10.05 | 11.74 | 4.75           | 4.99 | 5.97 | 6.20 | 7.89 |
|                 | 12H  | 8.72             | 8.93 | 9.94 | 10.13 | 11.85 | 4.85           | 5.06 | 6.07 | 6.26 | 7.98 |
| 12H             | 4H   | 7.80             | 8.11 | 9.02 | 9.30  | 10.98 | 4.08           | 4.39 | 5.29 | 5.58 | 7.26 |
|                 | 6H   | 8.37             | 8.61 | 9.59 | 9.82  | 11.51 | 4.62           | 4.86 | 5.84 | 6.06 | 7.76 |
|                 | 8H   | 8.57             | 8.78 | 9.80 | 9.98  | 11.71 | 4.81           | 5.02 | 6.03 | 6.22 | 7.94 |

END OF REPORT