

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: P909095

Luminaire Tested: DFN2DIP-SQ3F0-040D100US840-RLLONL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P909095  
REPORT IS A COMBINATION OF REPORTS P901490 AND P898289  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-SQ3F0-040D100US840-RLLONL  
Description: 3 foot, Square Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

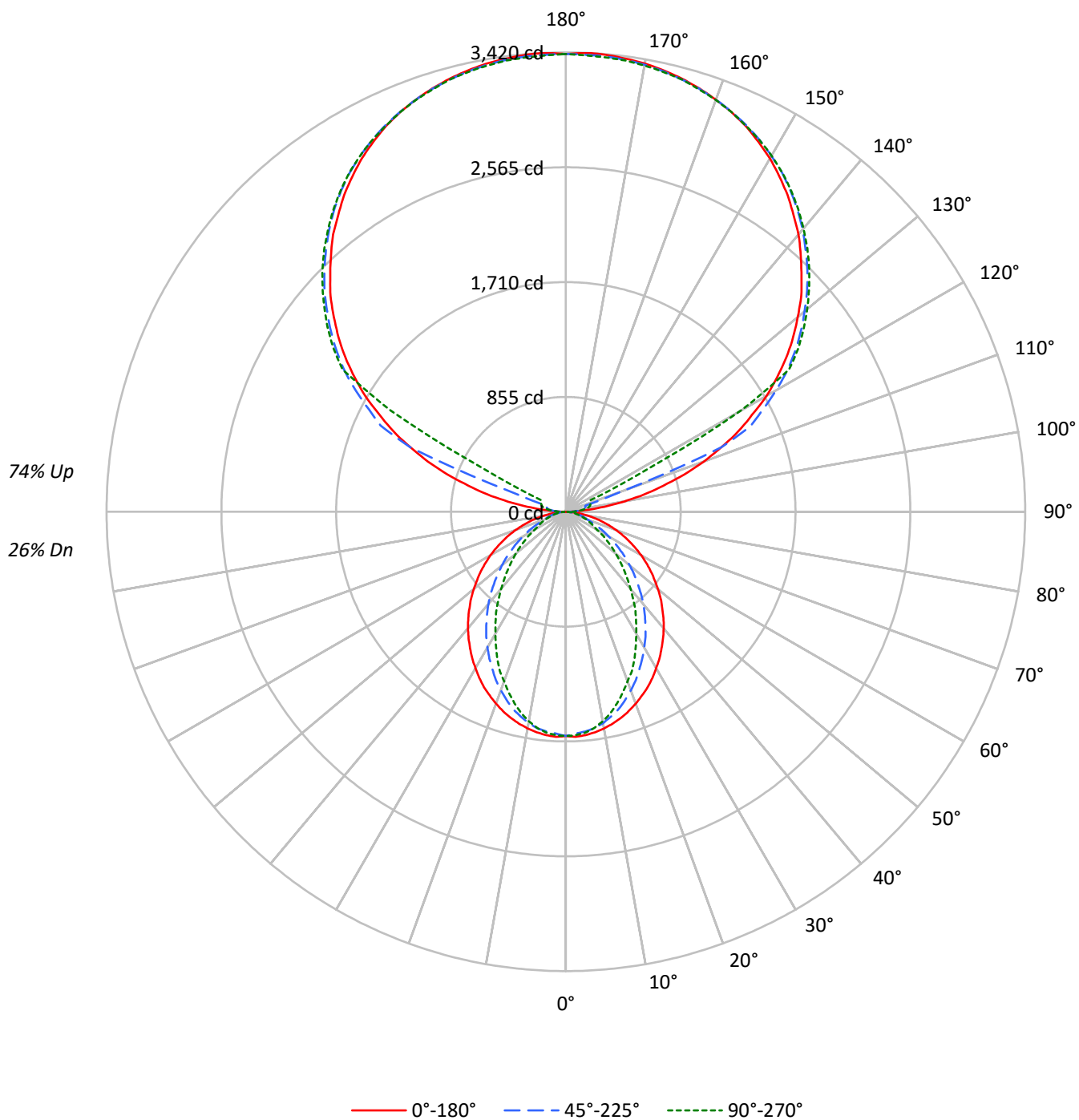
Lumens per Lamp: N/A  
Luminaire Lumens: 13431.2 lumens  
Efficiency: N/A  
Efficacy: 122.3 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 0.99 / 1.16  
Luminous Opening: Rectangular w/ Sides (W: 3.06' x L: 3.06' x H: 0.1')  
CIE Type: Semi-Indirect

Input Watts (W): 109.8  
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 | 0  |
| RCR |     |     |     |     |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 0   | 101 | 101 | 101 | 101 | 90 | 90 | 90 | 90 | 70 | 70 | 70 | 51 | 51 | 51 | 34 | 34 | 34 | 26 |
| 1   | 93  | 88  | 85  | 82  | 82 | 79 | 76 | 73 | 61 | 59 | 58 | 45 | 44 | 43 | 30 | 29 | 29 | 22 |
| 2   | 84  | 77  | 72  | 67  | 75 | 69 | 65 | 60 | 54 | 51 | 48 | 40 | 38 | 36 | 27 | 26 | 25 | 19 |
| 3   | 77  | 68  | 61  | 56  | 69 | 61 | 55 | 51 | 48 | 44 | 41 | 35 | 33 | 31 | 24 | 23 | 21 | 16 |
| 4   | 71  | 60  | 53  | 47  | 63 | 54 | 48 | 43 | 43 | 38 | 35 | 32 | 29 | 26 | 22 | 20 | 19 | 14 |
| 5   | 65  | 54  | 46  | 41  | 58 | 48 | 42 | 37 | 38 | 33 | 30 | 28 | 25 | 23 | 19 | 18 | 16 | 12 |
| 6   | 60  | 48  | 41  | 35  | 53 | 43 | 37 | 32 | 34 | 30 | 26 | 26 | 23 | 20 | 18 | 16 | 14 | 11 |
| 7   | 55  | 43  | 36  | 31  | 49 | 39 | 33 | 28 | 31 | 26 | 23 | 23 | 20 | 18 | 16 | 14 | 13 | 10 |
| 8   | 51  | 39  | 32  | 27  | 45 | 36 | 29 | 25 | 28 | 24 | 20 | 21 | 18 | 16 | 15 | 13 | 12 | 9  |
| 9   | 47  | 36  | 29  | 24  | 42 | 32 | 26 | 22 | 26 | 21 | 18 | 20 | 16 | 14 | 14 | 12 | 10 | 8  |
| 10  | 44  | 33  | 26  | 21  | 39 | 30 | 24 | 20 | 24 | 19 | 16 | 18 | 15 | 13 | 13 | 11 | 10 | 7  |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 1913 | 1913 | 1913 |
| 5°  | 1915 | 1881 | 1894 |
| 10° | 1895 | 1843 | 1832 |
| 15° | 1867 | 1781 | 1736 |
| 20° | 1832 | 1696 | 1618 |
| 25° | 1795 | 1600 | 1505 |
| 30° | 1746 | 1503 | 1362 |
| 35° | 1698 | 1398 | 1235 |
| 40° | 1650 | 1290 | 1091 |
| 45° | 1593 | 1170 | 960  |
| 50° | 1535 | 1049 | 832  |
| 55° | 1474 | 920  | 709  |
| 60° | 1402 | 785  | 583  |
| 65° | 1321 | 649  | 524  |
| 70° | 1222 | 521  | 473  |
| 75° | 1097 | 457  | 430  |
| 80° | 917  | 379  | 371  |
| 85° | 621  | 247  | 275  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 90°

Vertical Angle: 90°

Luminance: 2332 cd/sqm

TEST NUMBER: P909095

CATALOG NUMBER: DFN2DIP-SQ3F0-040D100US840-RLLONL

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 156.5   | 1.2       |
| 10°-20°   | 429.5   | 3.2       |
| 20°-30°   | 603.0   | 4.5       |
| 30°-40°   | 657.4   | 4.9       |
| 40°-50°   | 604.2   | 4.5       |
| 50°-60°   | 474.5   | 3.5       |
| 60°-70°   | 308.9   | 2.3       |
| 70°-80°   | 159.0   | 1.2       |
| 80°-90°   | 46.6    | 0.3       |
| 90°-100°  | 112.4   | 0.8       |
| 100°-110° | 418.9   | 3.1       |
| 110°-120° | 1111.1  | 8.3       |
| 120°-130° | 1842.9  | 13.7      |
| 130°-140° | 1957.5  | 14.6      |
| 140°-150° | 1819.3  | 13.5      |
| 150°-160° | 1462.7  | 10.9      |
| 160°-170° | 942.5   | 7.0       |
| 170°-180° | 324.4   | 2.4       |
| 0°-30°    | 1189.0  | 8.9       |
| 0°-40°    | 1846.4  | 13.7      |
| 0°-60°    | 2925.1  | 21.8      |
| 0°-90°    | 3439.5  | 25.6      |
| 90°-120°  | 1642.4  | 12.2      |
| 90°-150°  | 7262.1  | 54.1      |
| 90°-180°  | 9992.0  | 74.4      |
| 0°-180°   | 13431.2 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 1670 | 1670  | 1670 | 1670  | 1670 |      |
| 5°   | 1670 | 1662  | 1642 | 1656  | 1651 | 158  |
| 15°  | 1588 | 1571  | 1520 | 1491  | 1476 | 447  |
| 25°  | 1441 | 1393  | 1293 | 1231  | 1209 | 663  |
| 35°  | 1242 | 1165  | 1032 | 937   | 903  | 777  |
| 45°  | 1015 | 914   | 756  | 648   | 612  | 784  |
| 55°  | 772  | 654   | 491  | 400   | 372  | 690  |
| 65°  | 521  | 399   | 263  | 212   | 207  | 517  |
| 75°  | 278  | 172   | 121  | 110   | 109  | 294  |
| 85°  | 65   | 33    | 29   | 29    | 29   | 75   |
| 90°  | 2    | 30    | 49   | 62    | 66   | 12   |
| 95°  | 160  | 79    | 96   | 109   | 106  | 190  |
| 105° | 750  | 824   | 151  | 177   | 187  | 801  |
| 115° | 1418 | 1460  | 1522 | 380   | 202  | 1396 |
| 125° | 2005 | 2037  | 2084 | 2101  | 2108 | 1788 |
| 135° | 2481 | 2520  | 2542 | 2567  | 2562 | 1916 |
| 145° | 2878 | 2876  | 2917 | 2935  | 2922 | 1800 |
| 155° | 3169 | 3147  | 3176 | 3191  | 3172 | 1460 |
| 165° | 3339 | 3324  | 3332 | 3349  | 3332 | 943  |
| 175° | 3416 | 3398  | 3403 | 3420  | 3396 | 325  |
| 180° | 3408 | 3408  | 3408 | 3408  | 3408 |      |

TEST NUMBER: P909095

CATALOG NUMBER: DFN2DIP-SQ3F0-040D100US840-RLLONL

**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 1669.5 | 1669.5 | 1669.5 | 1669.5 | 1669.5 |
| 2.5°   | 1677.1 | 1669.5 | 1652.8 | 1668.1 | 1665.0 |
| 5°     | 1669.5 | 1661.9 | 1642.2 | 1655.9 | 1651.4 |
| 7.5°   | 1655.9 | 1646.9 | 1625.8 | 1631.6 | 1624.2 |
| 10°    | 1637.8 | 1627.2 | 1597.0 | 1592.4 | 1583.5 |
| 12.5°  | 1615.2 | 1601.5 | 1560.6 | 1551.7 | 1535.0 |
| 15°    | 1587.9 | 1571.2 | 1519.9 | 1491.3 | 1476.2 |
| 17.5°  | 1556.2 | 1532.0 | 1468.4 | 1435.3 | 1411.1 |
| 20°    | 1519.9 | 1489.7 | 1414.1 | 1376.4 | 1343.1 |
| 22.5°  | 1480.7 | 1445.9 | 1358.2 | 1306.9 | 1284.3 |
| 25°    | 1441.4 | 1393.0 | 1293.2 | 1231.4 | 1208.6 |
| 27.5°  | 1394.6 | 1343.1 | 1232.8 | 1161.9 | 1127.0 |
| 30°    | 1344.7 | 1287.2 | 1166.3 | 1089.3 | 1048.5 |
| 32.5°  | 1296.4 | 1226.8 | 1103.0 | 1012.3 | 974.4  |
| 35°    | 1242.0 | 1164.9 | 1032.0 | 936.8  | 903.4  |
| 37.5°  | 1189.1 | 1105.9 | 965.4  | 861.1  | 823.4  |
| 40°    | 1133.2 | 1042.6 | 896.0  | 788.7  | 749.4  |
| 42.5°  | 1075.7 | 979.1  | 826.5  | 714.6  | 676.9  |
| 45°    | 1015.3 | 914.0  | 755.5  | 648.1  | 611.9  |
| 47.5°  | 958.0  | 850.7  | 687.5  | 580.2  | 546.9  |
| 50°    | 894.4  | 787.2  | 621.0  | 516.6  | 485.0  |
| 52.5°  | 832.4  | 719.1  | 557.5  | 457.8  | 429.1  |
| 55°    | 772.0  | 654.2  | 491.0  | 400.4  | 371.7  |
| 57.5°  | 710.1  | 589.3  | 432.1  | 347.5  | 323.4  |
| 60°    | 646.6  | 525.7  | 370.1  | 293.2  | 269.0  |
| 62.5°  | 584.8  | 463.9  | 317.2  | 244.8  | 232.8  |
| 65°    | 521.3  | 398.8  | 262.9  | 211.6  | 206.9  |
| 67.5°  | 460.9  | 338.4  | 211.6  | 185.8  | 181.3  |
| 70°    | 397.4  | 279.5  | 175.2  | 160.2  | 154.0  |
| 72.5°  | 337.0  | 225.1  | 146.5  | 134.5  | 131.5  |
| 75°    | 277.9  | 172.2  | 120.9  | 110.3  | 108.9  |
| 77.5°  | 219.1  | 122.3  | 95.2   | 89.2   | 86.0   |
| 80°    | 164.6  | 87.7   | 72.4   | 66.6   | 66.6   |
| 82.5°  | 114.8  | 59.0   | 49.9   | 46.8   | 46.8   |
| 85°    | 64.9   | 33.2   | 28.7   | 28.7   | 28.7   |
| 87.5°  | 24.2   | 12.0   | 12.0   | 10.6   | 10.6   |
| 90°    | 2.3    | 29.6   | 49.2   | 61.8   | 66.4   |
| 92.5°  | 61.8   | 51.8   | 59.2   | 64.1   | 66.4   |
| 95°    | 160.2  | 78.8   | 96.0   | 108.7  | 106.0  |
| 97.5°  | 288.4  | 86.3   | 125.6  | 133.2  | 135.6  |
| 100°   | 436.7  | 98.7   | 140.6  | 160.2  | 165.2  |
| 102.5° | 599.2  | 594.5  | 145.5  | 172.5  | 180.1  |
| 105°   | 749.7  | 823.7  | 150.6  | 177.4  | 187.4  |
| 107.5° | 924.8  | 986.3  | 155.5  | 182.5  | 192.4  |
| 110°   | 1092.6 | 1144.2 | 431.6  | 185.1  | 194.7  |

TEST NUMBER: P909095

CATALOG NUMBER: DFN2DIP-SQ3F0-040D100US840-RLLONL

**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 1250.4 | 1294.6 | 1252.8 | 189.8  | 197.4  |
| 115°   | 1418.0 | 1459.9 | 1521.7 | 379.8  | 202.4  |
| 117.5° | 1563.5 | 1612.8 | 1654.9 | 1302.0 | 656.0  |
| 120°   | 1726.4 | 1763.2 | 1807.8 | 1837.3 | 1504.4 |
| 122.5° | 1864.3 | 1903.8 | 1953.3 | 1967.9 | 1970.6 |
| 125°   | 2004.9 | 2037.1 | 2084.0 | 2101.2 | 2108.5 |
| 127.5° | 2133.1 | 2167.7 | 2204.8 | 2229.5 | 2231.8 |
| 130°   | 2254.0 | 2293.6 | 2320.6 | 2347.7 | 2345.4 |
| 132.5° | 2377.3 | 2409.5 | 2436.5 | 2458.7 | 2456.4 |
| 135°   | 2481.0 | 2520.5 | 2542.5 | 2567.4 | 2562.4 |
| 137.5° | 2589.4 | 2619.0 | 2643.8 | 2668.5 | 2661.1 |
| 140°   | 2695.3 | 2715.3 | 2742.2 | 2764.5 | 2752.2 |
| 142.5° | 2784.4 | 2801.7 | 2833.6 | 2853.2 | 2841.0 |
| 145°   | 2878.1 | 2875.5 | 2917.4 | 2934.7 | 2922.3 |
| 147.5° | 2959.2 | 2951.9 | 2993.7 | 3006.1 | 2996.5 |
| 150°   | 3038.3 | 3021.0 | 3060.6 | 3075.2 | 3062.9 |
| 152.5° | 3104.7 | 3085.1 | 3122.1 | 3136.9 | 3119.7 |
| 155°   | 3169.0 | 3146.9 | 3176.5 | 3191.2 | 3171.6 |
| 157.5° | 3220.8 | 3201.2 | 3223.4 | 3240.7 | 3220.8 |
| 160°   | 3265.3 | 3250.4 | 3265.3 | 3279.9 | 3262.7 |
| 162.5° | 3304.5 | 3289.8 | 3302.2 | 3319.4 | 3297.2 |
| 165°   | 3339.0 | 3324.4 | 3331.7 | 3349.0 | 3331.7 |
| 167.5° | 3366.3 | 3351.3 | 3359.0 | 3376.3 | 3354.0 |
| 170°   | 3388.5 | 3373.7 | 3378.6 | 3395.9 | 3373.7 |
| 172.5° | 3403.1 | 3388.5 | 3393.6 | 3410.8 | 3388.5 |
| 175°   | 3415.5 | 3398.2 | 3403.1 | 3420.5 | 3395.9 |
| 177.5° | 3420.5 | 3403.1 | 3405.9 | 3423.1 | 3400.8 |
| 180°   | 3408.2 | 3408.2 | 3408.2 | 3408.2 | 3408.2 |

TEST NUMBER: P909095

CATALOG NUMBER: DFN2DIP-SQ3F0-040D100US840-RLONL

**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 | 6.49             | 7.16  | 7.64  | 8.29  | 9.87  | 2.45           | 3.12 | 3.60 | 4.25 | 5.83 |
|                 | 3H   | 8.15             | 8.75  | 9.31  | 9.89  | 11.48 | 3.62           | 4.22 | 4.78 | 5.36 | 6.95 |
|                 | 4H   | 8.75             | 9.31  | 9.91  | 10.45 | 12.06 | 4.06           | 4.62 | 5.22 | 5.76 | 7.37 |
|                 | 6H   | 9.16             | 9.68  | 10.33 | 10.82 | 12.43 | 4.37           | 4.88 | 5.54 | 6.03 | 7.64 |
|                 | 8H   | 9.28             | 9.77  | 10.45 | 10.93 | 12.54 | 4.45           | 4.94 | 5.62 | 6.10 | 7.71 |
|                 | 12H  | 9.33             | 9.80  | 10.51 | 10.95 | 12.58 | 4.48           | 4.95 | 5.66 | 6.10 | 7.73 |
| 4H              | 2H   | 6.49             | 7.05  | 7.66  | 8.19  | 9.80  | 3.02           | 3.59 | 4.19 | 4.73 | 6.33 |
|                 | 3H   | 8.30             | 8.77  | 9.47  | 9.93  | 11.55 | 4.35           | 4.82 | 5.53 | 5.99 | 7.60 |
|                 | 4H   | 8.98             | 9.41  | 10.15 | 10.56 | 12.20 | 4.89           | 5.32 | 6.06 | 6.47 | 8.11 |
|                 | 6H   | 9.48             | 9.85  | 10.66 | 11.03 | 12.65 | 5.29           | 5.66 | 6.47 | 6.84 | 8.46 |
|                 | 8H   | 9.65             | 9.99  | 10.83 | 11.16 | 12.80 | 5.41           | 5.76 | 6.59 | 6.93 | 8.57 |
|                 | 12H  | 9.73             | 10.05 | 10.93 | 11.22 | 12.87 | 5.47           | 5.78 | 6.66 | 6.96 | 8.60 |
| 8H              | 4H   | 8.93             | 9.28  | 10.11 | 10.44 | 12.09 | 5.15           | 5.50 | 6.33 | 6.67 | 8.31 |
|                 | 6H   | 9.49             | 9.77  | 10.69 | 10.98 | 12.62 | 5.66           | 5.94 | 6.86 | 7.15 | 8.79 |
|                 | 8H   | 9.70             | 9.95  | 10.90 | 11.13 | 12.79 | 5.84           | 6.09 | 7.05 | 7.28 | 8.94 |
|                 | 12H  | 9.83             | 10.04 | 11.03 | 11.23 | 12.92 | 5.95           | 6.17 | 7.16 | 7.35 | 9.04 |
| 12H             | 4H   | 8.88             | 9.19  | 10.07 | 10.37 | 12.01 | 5.15           | 5.46 | 6.35 | 6.64 | 8.29 |
|                 | 6H   | 9.46             | 9.71  | 10.66 | 10.90 | 12.55 | 5.70           | 5.95 | 6.91 | 7.14 | 8.80 |
|                 | 8H   | 9.67             | 9.89  | 10.88 | 11.07 | 12.76 | 5.90           | 6.12 | 7.11 | 7.31 | 8.99 |

END OF REPORT