

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: P910024

Luminaire Tested: DFN2DIP-TR4F0-040D100US840-RLLFLL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P910024  
REPORT IS A COMBINATION OF REPORTS P900478 AND P897293  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-TR4F0-040D100US840-RLLFLL  
Description: 4 foot, Triangle Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

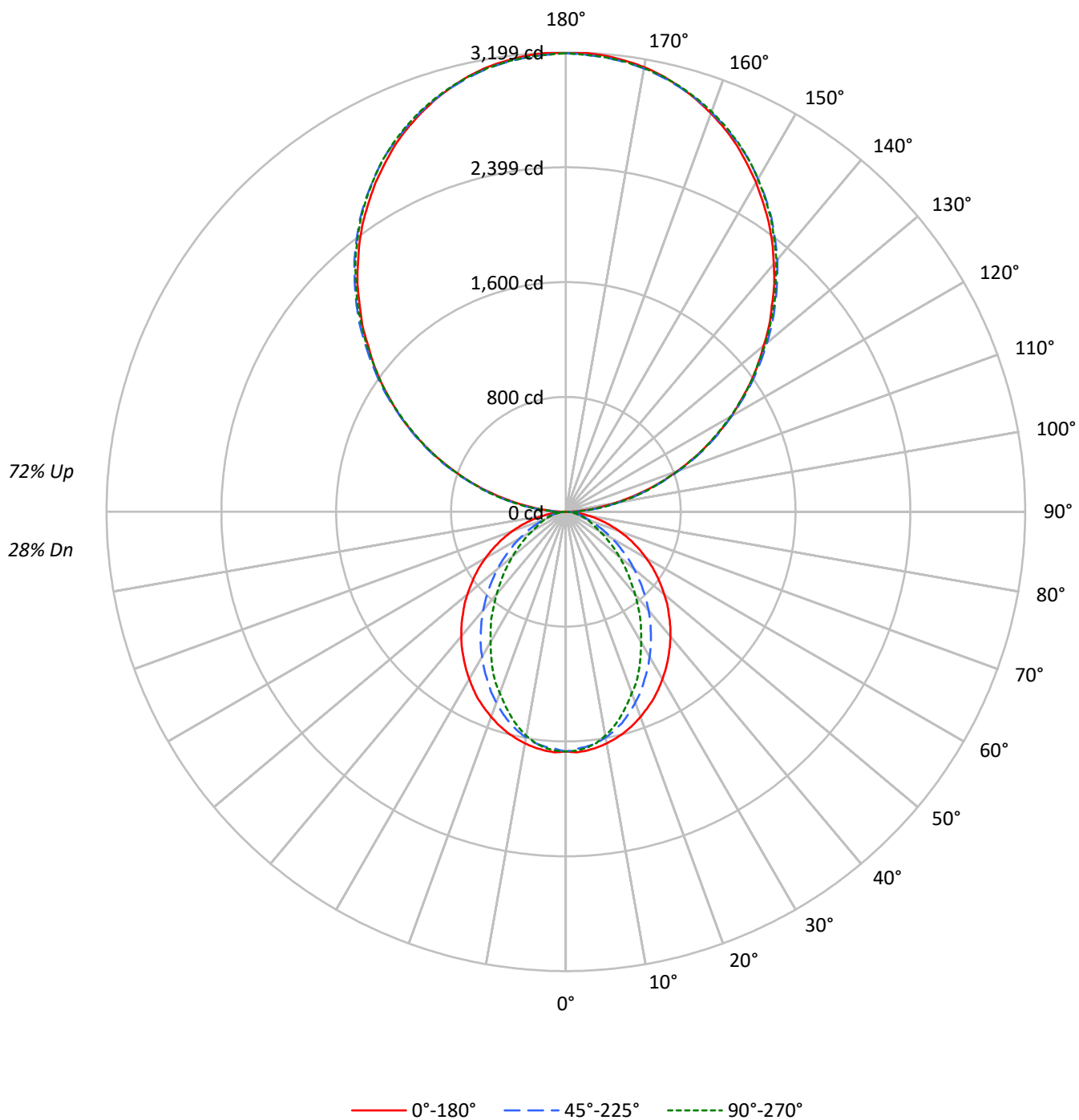
**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 12370.8 lumens  
Efficiency: N/A  
Efficacy: 114.2 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 0.99 / 1.16  
Luminous Opening: Rectangular w/ Sides (W: 3.43' x L: 3.96' x H: 0.1')  
CIE Type: Semi-Indirect  
  
Input Watts (W): 108.3  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9952  
Total Harmonic Distortion (THDi): 0.069  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT

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CATALOG NUMBER: DFN2DIP-TR4F0-040D100US840-RLLFLL

### Luminous Intensity Polar Plot



TEST NUMBER: P910024

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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 | 91 | 91 | 91 | 91 | 71 | 71 | 71 | 53 | 53 | 53 | 36 | 36 | 36 |
| 1   | 93  | 89  | 85  | 82  | 83 | 80 | 77 | 74 | 62 | 60 | 59 | 47 | 45 | 44 | 32 | 31 | 31 |
| 2   | 85  | 78  | 72  | 67  | 76 | 70 | 65 | 61 | 55 | 52 | 49 | 41 | 39 | 37 | 28 | 27 | 26 |
| 3   | 78  | 69  | 62  | 56  | 69 | 62 | 56 | 51 | 49 | 45 | 41 | 37 | 34 | 32 | 25 | 24 | 23 |
| 4   | 71  | 61  | 53  | 48  | 63 | 55 | 48 | 44 | 43 | 39 | 35 | 33 | 30 | 27 | 23 | 21 | 20 |
| 5   | 65  | 54  | 47  | 41  | 58 | 49 | 42 | 37 | 39 | 34 | 31 | 29 | 26 | 24 | 21 | 19 | 17 |
| 6   | 60  | 49  | 41  | 35  | 54 | 44 | 37 | 32 | 35 | 30 | 27 | 27 | 23 | 21 | 19 | 17 | 15 |
| 7   | 55  | 44  | 36  | 31  | 50 | 40 | 33 | 28 | 32 | 27 | 23 | 24 | 21 | 19 | 17 | 15 | 14 |
| 8   | 51  | 40  | 32  | 27  | 46 | 36 | 30 | 25 | 29 | 24 | 21 | 22 | 19 | 16 | 16 | 14 | 12 |
| 9   | 48  | 36  | 29  | 24  | 43 | 33 | 27 | 22 | 26 | 22 | 19 | 20 | 17 | 15 | 15 | 13 | 11 |
| 10  | 45  | 33  | 26  | 22  | 40 | 30 | 24 | 20 | 24 | 20 | 17 | 19 | 16 | 13 | 14 | 12 | 10 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 1326 | 1326 | 1326 |
| 5°  | 1328 | 1305 | 1314 |
| 10° | 1315 | 1280 | 1271 |
| 15° | 1297 | 1237 | 1205 |
| 20° | 1273 | 1179 | 1124 |
| 25° | 1249 | 1114 | 1045 |
| 30° | 1216 | 1047 | 946  |
| 35° | 1184 | 975  | 859  |
| 40° | 1151 | 900  | 759  |
| 45° | 1113 | 817  | 668  |
| 50° | 1073 | 734  | 579  |
| 55° | 1032 | 645  | 494  |
| 60° | 984  | 551  | 407  |
| 65° | 930  | 456  | 366  |
| 70° | 863  | 368  | 331  |
| 75° | 779  | 324  | 301  |
| 80° | 659  | 272  | 261  |
| 85° | 459  | 182  | 196  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 90°

Vertical Angle: 90°

Luminance: 2490 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 156.5   | 1.3       |
| 10°-20°   | 429.5   | 3.5       |
| 20°-30°   | 603.0   | 4.9       |
| 30°-40°   | 657.4   | 5.3       |
| 40°-50°   | 604.2   | 4.9       |
| 50°-60°   | 474.5   | 3.8       |
| 60°-70°   | 308.9   | 2.5       |
| 70°-80°   | 159.0   | 1.3       |
| 80°-90°   | 49.7    | 0.4       |
| 90°-100°  | 197.6   | 1.6       |
| 100°-110° | 627.9   | 5.1       |
| 110°-120° | 1074.6  | 8.7       |
| 120°-130° | 1413.3  | 11.4      |
| 130°-140° | 1586.4  | 12.8      |
| 140°-150° | 1555.6  | 12.6      |
| 150°-160° | 1304.9  | 10.5      |
| 160°-170° | 865.4   | 7.0       |
| 170°-180° | 302.5   | 2.4       |
| 0°-30°    | 1189.0  | 9.6       |
| 0°-40°    | 1846.4  | 14.9      |
| 0°-60°    | 2925.1  | 23.6      |
| 0°-90°    | 3442.6  | 27.8      |
| 90°-120°  | 1900.2  | 15.4      |
| 90°-150°  | 6455.4  | 52.2      |
| 90°-180°  | 8928.0  | 72.2      |
| 0°-180°   | 12370.8 | 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°  | 3    | 35    | 94   | 89    | 92   | 12   |
| 95°  | 141  | 168   | 172  | 172   | 168  | 156  |
| 105° | 580  | 587   | 593  | 598   | 598  | 612  |
| 115° | 1078 | 1094  | 1089 | 1086  | 1078 | 1067 |
| 125° | 1568 | 1593  | 1585 | 1576  | 1573 | 1402 |
| 135° | 2029 | 2059  | 2064 | 2062  | 2054 | 1568 |
| 145° | 2463 | 2482  | 2498 | 2500  | 2490 | 1539 |
| 155° | 2816 | 2824  | 2833 | 2846  | 2838 | 1296 |
| 165° | 3064 | 3061  | 3061 | 3080  | 3067 | 864  |
| 175° | 3188 | 3180  | 3175 | 3194  | 3177 | 303  |
| 180° | 3194 | 3194  | 3194 | 3194  | 3194 |      |

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**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°    | 2.9    | 34.6   | 94.3   | 88.6   | 91.5   |
| 92.5°  | 59.7   | 80.9   | 83.8   | 86.6   | 86.6   |
| 95°    | 140.6  | 167.5  | 172.4  | 172.4  | 167.5  |
| 97.5°  | 234.0  | 259.0  | 269.6  | 269.6  | 269.6  |
| 100°   | 341.8  | 364.0  | 371.6  | 371.6  | 368.8  |
| 102.5° | 455.4  | 471.8  | 482.4  | 485.2  | 482.4  |
| 105°   | 579.7  | 587.3  | 593.1  | 597.9  | 597.9  |
| 107.5° | 702.9  | 714.5  | 714.5  | 716.4  | 702.9  |
| 110°   | 822.3  | 837.7  | 837.7  | 837.7  | 830.0  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 951.3  | 967.7  | 964.8  | 957.0  | 951.3  |
| 115°   | 1078.4 | 1093.8 | 1089.0 | 1086.1 | 1078.4 |
| 117.5° | 1204.6 | 1225.8 | 1212.2 | 1204.6 | 1196.8 |
| 120°   | 1331.6 | 1352.8 | 1331.6 | 1331.6 | 1323.0 |
| 122.5° | 1447.1 | 1474.1 | 1460.7 | 1453.0 | 1447.1 |
| 125°   | 1568.5 | 1592.6 | 1584.9 | 1576.2 | 1573.4 |
| 127.5° | 1687.0 | 1716.8 | 1706.2 | 1694.7 | 1687.0 |
| 130°   | 1797.7 | 1832.3 | 1827.6 | 1821.7 | 1811.2 |
| 132.5° | 1921.9 | 1948.8 | 1950.8 | 1937.3 | 1929.6 |
| 135°   | 2028.7 | 2058.6 | 2064.4 | 2061.5 | 2053.8 |
| 137.5° | 2148.2 | 2172.2 | 2177.1 | 2175.1 | 2163.5 |
| 140°   | 2253.1 | 2277.1 | 2290.7 | 2290.7 | 2280.1 |
| 142.5° | 2361.0 | 2385.0 | 2392.7 | 2395.6 | 2385.0 |
| 145°   | 2463.0 | 2482.2 | 2497.7 | 2500.5 | 2489.9 |
| 147.5° | 2554.5 | 2578.6 | 2590.1 | 2595.0 | 2584.3 |
| 150°   | 2648.9 | 2665.2 | 2675.8 | 2684.4 | 2675.8 |
| 152.5° | 2732.6 | 2749.0 | 2762.5 | 2773.1 | 2762.5 |
| 155°   | 2816.4 | 2824.1 | 2832.8 | 2846.2 | 2837.5 |
| 157.5° | 2888.6 | 2894.4 | 2899.2 | 2918.4 | 2905.0 |
| 160°   | 2953.1 | 2958.9 | 2961.7 | 2978.1 | 2966.6 |
| 162.5° | 3012.8 | 3012.8 | 3015.7 | 3033.9 | 3020.5 |
| 165°   | 3063.8 | 3060.9 | 3060.9 | 3080.2 | 3066.8 |
| 167.5° | 3110.1 | 3101.4 | 3101.4 | 3120.7 | 3107.2 |
| 170°   | 3144.7 | 3137.0 | 3134.1 | 3153.4 | 3137.0 |
| 172.5° | 3168.8 | 3161.1 | 3158.2 | 3177.4 | 3161.1 |
| 175°   | 3188.0 | 3180.4 | 3174.6 | 3193.8 | 3177.4 |
| 177.5° | 3198.6 | 3191.0 | 3185.1 | 3201.5 | 3185.1 |
| 180°   | 3193.8 | 3193.8 | 3193.8 | 3193.8 | 3193.8 |

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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 | 5.58             | 6.26 | 6.71  | 7.38  | 8.94  | 1.55           | 2.23 | 2.68 | 3.35 | 4.91 |
|                 | 3H   | 7.25             | 7.85 | 8.38  | 8.98  | 10.55 | 2.73           | 3.34 | 3.87 | 4.46 | 6.04 |
|                 | 4H   | 7.85             | 8.42 | 8.99  | 9.55  | 11.13 | 3.18           | 3.75 | 4.32 | 4.88 | 6.46 |
|                 | 6H   | 8.26             | 8.79 | 9.42  | 9.92  | 11.51 | 3.49           | 4.02 | 4.65 | 5.15 | 6.74 |
|                 | 8H   | 8.38             | 8.88 | 9.54  | 10.03 | 11.61 | 3.58           | 4.08 | 4.73 | 5.22 | 6.81 |
|                 | 12H  | 8.44             | 8.91 | 9.60  | 10.05 | 11.66 | 3.61           | 4.09 | 4.78 | 5.23 | 6.84 |
| 4H              | 2H   | 5.58             | 6.15 | 6.74  | 7.28  | 8.86  | 2.13           | 2.70 | 3.29 | 3.83 | 5.41 |
|                 | 3H   | 7.39             | 7.87 | 8.55  | 9.03  | 10.62 | 3.47           | 3.94 | 4.63 | 5.10 | 6.69 |
|                 | 4H   | 8.08             | 8.52 | 9.24  | 9.66  | 11.27 | 4.01           | 4.45 | 5.17 | 5.59 | 7.20 |
|                 | 6H   | 8.59             | 8.96 | 9.75  | 10.13 | 11.73 | 4.42           | 4.80 | 5.59 | 5.96 | 7.56 |
|                 | 8H   | 8.76             | 9.11 | 9.93  | 10.27 | 11.88 | 4.55           | 4.90 | 5.72 | 6.06 | 7.67 |
|                 | 12H  | 8.85             | 9.16 | 10.03 | 10.33 | 11.96 | 4.61           | 4.93 | 5.79 | 6.09 | 7.72 |
| 8H              | 4H   | 8.04             | 8.39 | 9.20  | 9.55  | 11.16 | 4.28           | 4.63 | 5.45 | 5.79 | 7.40 |
|                 | 6H   | 8.60             | 8.89 | 9.78  | 10.09 | 11.70 | 4.79           | 5.08 | 5.98 | 6.28 | 7.90 |
|                 | 8H   | 8.81             | 9.06 | 10.01 | 10.24 | 11.88 | 4.98           | 5.24 | 6.18 | 6.41 | 8.05 |
|                 | 12H  | 8.94             | 9.17 | 10.14 | 10.34 | 12.01 | 5.10           | 5.32 | 6.29 | 6.49 | 8.16 |
| 12H             | 4H   | 7.98             | 8.30 | 9.16  | 9.47  | 11.09 | 4.28           | 4.59 | 5.46 | 5.76 | 7.38 |
|                 | 6H   | 8.57             | 8.82 | 9.76  | 10.00 | 11.64 | 4.84           | 5.09 | 6.03 | 6.27 | 7.91 |
|                 | 8H   | 8.79             | 9.01 | 9.98  | 10.18 | 11.85 | 5.05           | 5.27 | 6.24 | 6.44 | 8.11 |

END OF REPORT