

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: P910017

Luminaire Tested: DFN2DIP-TR4F0-040D080US840-RLLONL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P910017  
REPORT IS A COMBINATION OF REPORTS P901962 AND P898849  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-TR4F0-040D080US840-RLLONL  
Description: 4 foot, Triangle Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

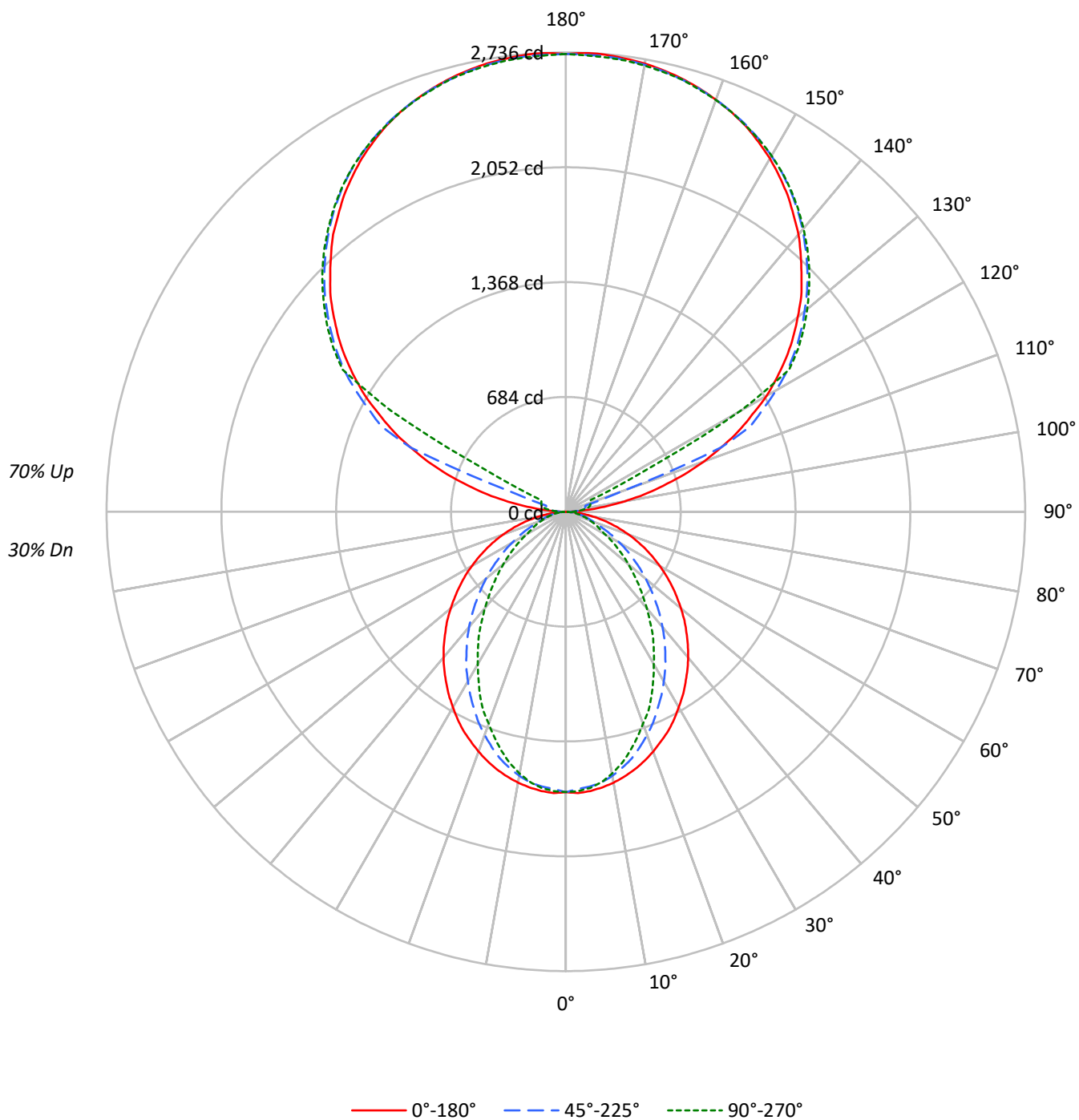
**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 11431.7 lumens  
Efficiency: N/A  
Efficacy: 125.5 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): 91.1  
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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### 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°  | 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: 1448 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 156.5   | 1.4       |
| 10°-20°   | 429.5   | 3.8       |
| 20°-30°   | 603.0   | 5.3       |
| 30°-40°   | 657.4   | 5.8       |
| 40°-50°   | 604.2   | 5.3       |
| 50°-60°   | 474.5   | 4.2       |
| 60°-70°   | 308.9   | 2.7       |
| 70°-80°   | 159.0   | 1.4       |
| 80°-90°   | 45.4    | 0.4       |
| 90°-100°  | 89.9    | 0.8       |
| 100°-110° | 335.1   | 2.9       |
| 110°-120° | 888.9   | 7.8       |
| 120°-130° | 1474.3  | 12.9      |
| 130°-140° | 1566.0  | 13.7      |
| 140°-150° | 1455.4  | 12.7      |
| 150°-160° | 1170.1  | 10.2      |
| 160°-170° | 754.0   | 6.6       |
| 170°-180° | 259.5   | 2.3       |
| 0°-30°    | 1189.0  | 10.4      |
| 0°-40°    | 1846.4  | 16.2      |
| 0°-60°    | 2925.1  | 25.6      |
| 0°-90°    | 3438.3  | 30.1      |
| 90°-120°  | 1314.0  | 11.5      |
| 90°-150°  | 5809.7  | 50.8      |
| 90°-180°  | 7993.0  | 69.9      |
| 0°-180°   | 11431.7 | 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    | 24    | 39   | 49    | 53   | 11   |
| 95°  | 128  | 63    | 77   | 87    | 85   | 152  |
| 105° | 600  | 659   | 120  | 142   | 150  | 641  |
| 115° | 1134 | 1168  | 1217 | 304   | 162  | 1117 |
| 125° | 1604 | 1630  | 1667 | 1681  | 1687 | 1430 |
| 135° | 1985 | 2016  | 2034 | 2054  | 2050 | 1533 |
| 145° | 2302 | 2300  | 2334 | 2348  | 2338 | 1440 |
| 155° | 2535 | 2518  | 2541 | 2553  | 2537 | 1168 |
| 165° | 2671 | 2660  | 2665 | 2679  | 2665 | 755  |
| 175° | 2732 | 2719  | 2723 | 2736  | 2717 | 260  |
| 180° | 2726 | 2726  | 2726 | 2726  | 2726 |      |

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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°    | 1.9    | 23.6   | 39.4   | 49.4   | 53.2   |
| 92.5°  | 49.4   | 41.5   | 47.4   | 51.3   | 53.2   |
| 95°    | 128.2  | 63.0   | 76.9   | 86.9   | 84.8   |
| 97.5°  | 230.8  | 69.1   | 100.5  | 106.6  | 108.5  |
| 100°   | 349.3  | 79.0   | 112.5  | 128.2  | 132.1  |
| 102.5° | 479.4  | 475.5  | 116.4  | 137.9  | 144.1  |
| 105°   | 599.8  | 659.0  | 120.4  | 142.0  | 150.0  |
| 107.5° | 739.8  | 789.0  | 124.4  | 145.9  | 153.9  |
| 110°   | 874.1  | 915.3  | 345.4  | 148.0  | 155.8  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 1000.4 | 1035.7 | 1002.3 | 151.8  | 157.9  |
| 115°   | 1134.4 | 1167.9 | 1217.3 | 303.9  | 161.9  |
| 117.5° | 1250.8 | 1290.2 | 1323.9 | 1041.6 | 524.8  |
| 120°   | 1381.1 | 1410.6 | 1446.2 | 1469.9 | 1203.5 |
| 122.5° | 1491.4 | 1523.1 | 1562.7 | 1574.4 | 1576.5 |
| 125°   | 1603.9 | 1629.6 | 1667.1 | 1680.9 | 1686.8 |
| 127.5° | 1706.5 | 1734.1 | 1763.9 | 1783.5 | 1785.4 |
| 130°   | 1803.2 | 1834.8 | 1856.4 | 1878.2 | 1876.3 |
| 132.5° | 1901.9 | 1927.6 | 1949.2 | 1967.0 | 1965.1 |
| 135°   | 1984.8 | 2016.4 | 2034.0 | 2054.0 | 2049.9 |
| 137.5° | 2071.5 | 2095.2 | 2115.1 | 2134.8 | 2128.9 |
| 140°   | 2156.3 | 2172.2 | 2193.8 | 2211.6 | 2201.7 |
| 142.5° | 2227.6 | 2241.3 | 2266.8 | 2282.6 | 2272.7 |
| 145°   | 2302.5 | 2300.4 | 2333.9 | 2347.7 | 2337.8 |
| 147.5° | 2367.4 | 2361.6 | 2395.0 | 2404.9 | 2397.1 |
| 150°   | 2430.6 | 2416.8 | 2448.4 | 2460.1 | 2450.3 |
| 152.5° | 2483.9 | 2468.1 | 2497.6 | 2509.6 | 2495.8 |
| 155°   | 2535.2 | 2517.6 | 2541.2 | 2552.9 | 2537.3 |
| 157.5° | 2576.6 | 2560.9 | 2578.7 | 2592.5 | 2576.6 |
| 160°   | 2612.2 | 2600.3 | 2612.2 | 2623.9 | 2610.1 |
| 162.5° | 2643.6 | 2631.9 | 2641.7 | 2655.5 | 2637.8 |
| 165°   | 2671.3 | 2659.6 | 2665.4 | 2679.2 | 2665.4 |
| 167.5° | 2693.0 | 2681.1 | 2687.2 | 2701.0 | 2683.2 |
| 170°   | 2710.9 | 2698.9 | 2702.9 | 2716.7 | 2698.9 |
| 172.5° | 2722.6 | 2710.9 | 2714.8 | 2728.7 | 2710.9 |
| 175°   | 2732.4 | 2718.6 | 2722.6 | 2736.3 | 2716.7 |
| 177.5° | 2736.3 | 2722.6 | 2724.6 | 2738.5 | 2720.7 |
| 180°   | 2726.5 | 2726.5 | 2726.5 | 2726.5 | 2726.5 |

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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 | 5.90             | 6.59 | 7.02  | 7.70  | 9.23  | 1.88           | 2.57 | 2.99 | 3.67 | 5.20 |
|                 | 3H   | 7.57             | 8.19 | 8.69  | 9.30  | 10.85 | 3.05           | 3.67 | 4.18 | 4.79 | 6.34 |
|                 | 4H   | 8.17             | 8.76 | 9.30  | 9.87  | 11.43 | 3.50           | 4.08 | 4.63 | 5.20 | 6.75 |
|                 | 6H   | 8.58             | 9.12 | 9.73  | 10.24 | 11.81 | 3.81           | 4.35 | 4.96 | 5.47 | 7.04 |
|                 | 8H   | 8.71             | 9.22 | 9.85  | 10.35 | 11.91 | 3.90           | 4.41 | 5.05 | 5.55 | 7.10 |
|                 | 12H  | 8.76             | 9.25 | 9.91  | 10.38 | 11.96 | 3.94           | 4.43 | 5.09 | 5.55 | 7.13 |
| 4H              | 2H   | 5.90             | 6.49 | 7.04  | 7.60  | 9.16  | 2.45           | 3.04 | 3.59 | 4.16 | 5.71 |
|                 | 3H   | 7.72             | 8.21 | 8.87  | 9.35  | 10.91 | 3.79           | 4.28 | 4.94 | 5.42 | 6.99 |
|                 | 4H   | 8.41             | 8.85 | 9.56  | 9.98  | 11.57 | 4.34           | 4.78 | 5.48 | 5.91 | 7.50 |
|                 | 6H   | 8.91             | 9.30 | 10.07 | 10.45 | 12.03 | 4.75           | 5.13 | 5.90 | 6.29 | 7.86 |
|                 | 8H   | 9.09             | 9.44 | 10.24 | 10.59 | 12.18 | 4.87           | 5.23 | 6.03 | 6.38 | 7.97 |
|                 | 12H  | 9.17             | 9.50 | 10.34 | 10.66 | 12.25 | 4.93           | 5.26 | 6.10 | 6.42 | 8.01 |
| 8H              | 4H   | 8.36             | 8.72 | 9.52  | 9.87  | 11.46 | 4.60           | 4.96 | 5.76 | 6.11 | 7.70 |
|                 | 6H   | 8.92             | 9.22 | 10.10 | 10.41 | 12.00 | 5.12           | 5.41 | 6.29 | 6.60 | 8.19 |
|                 | 8H   | 9.14             | 9.40 | 10.32 | 10.56 | 12.17 | 5.31           | 5.57 | 6.49 | 6.73 | 8.34 |
|                 | 12H  | 9.27             | 9.50 | 10.46 | 10.66 | 12.31 | 5.42           | 5.65 | 6.61 | 6.81 | 8.46 |
| 12H             | 4H   | 8.31             | 8.63 | 9.48  | 9.79  | 11.39 | 4.60           | 4.93 | 5.77 | 6.08 | 7.68 |
|                 | 6H   | 8.90             | 9.16 | 10.08 | 10.32 | 11.93 | 5.17           | 5.43 | 6.35 | 6.59 | 8.20 |
|                 | 8H   | 9.11             | 9.34 | 10.30 | 10.50 | 12.15 | 5.37           | 5.60 | 6.56 | 6.76 | 8.41 |

END OF REPORT