

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: P920931

Luminaire Tested: DFN2DIP-TR4F0-040D090US935-FLLONL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P920931  
REPORT IS A COMBINATION OF REPORTS P901979 AND P898849  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-TR4F0-040D090US935-FLLONL  
Description: 4 foot, Triangle Define Geo, with Direct Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

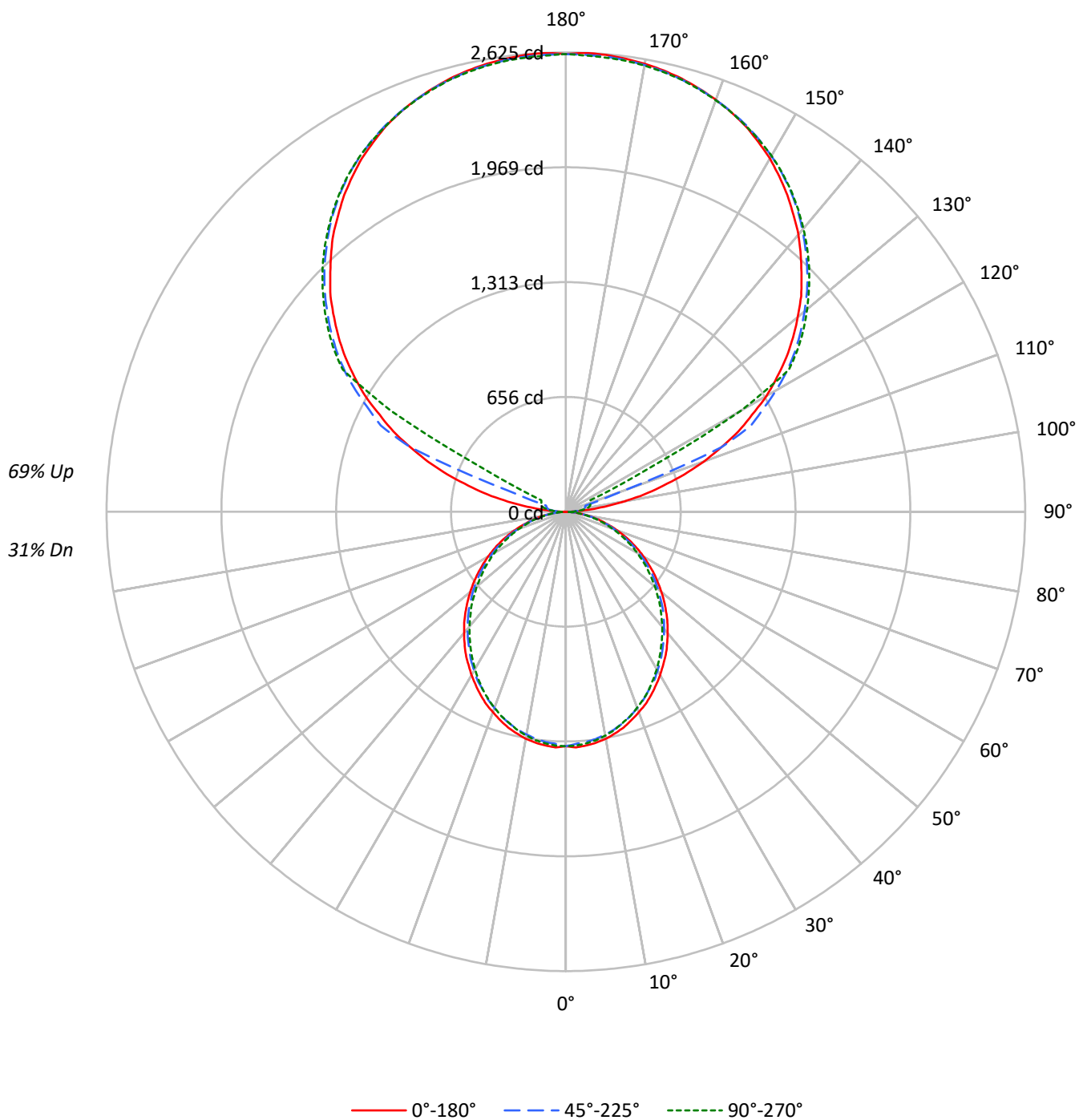
Lumens per Lamp: N/A  
Luminaire Lumens: 11081.0 lumens  
Efficiency: N/A  
Efficacy: 111.3 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 3.43' x L: 3.96' x H: 0.1')  
CIE Type: Semi-Indirect

Input Watts (W): 99.6  
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

TEST NUMBER: P920931

CATALOG NUMBER: DFN2DIP-TR4F0-040D090US935-FLLONL

### Luminous Intensity Polar Plot



TEST NUMBER: P920931

CATALOG NUMBER: DFN2DIP-TR4F0-040D090US935-FLLONL

**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   | 103 | 103 | 103 | 103 | 92 | 92 | 92 | 92 | 73 | 73 | 73 | 55 | 55 | 55 | 38 | 38 | 38 |
| 1   | 93  | 89  | 86  | 82  | 84 | 80 | 77 | 74 | 64 | 61 | 59 | 48 | 47 | 46 | 34 | 33 | 32 |
| 2   | 85  | 78  | 72  | 67  | 76 | 70 | 65 | 61 | 56 | 52 | 49 | 42 | 40 | 38 | 30 | 29 | 27 |
| 3   | 78  | 68  | 61  | 56  | 69 | 62 | 56 | 51 | 49 | 45 | 41 | 37 | 35 | 32 | 26 | 25 | 23 |
| 4   | 71  | 60  | 53  | 47  | 63 | 55 | 48 | 43 | 44 | 39 | 35 | 33 | 30 | 27 | 24 | 22 | 20 |
| 5   | 65  | 54  | 46  | 40  | 58 | 49 | 42 | 37 | 39 | 34 | 30 | 30 | 26 | 24 | 21 | 19 | 17 |
| 6   | 60  | 48  | 40  | 35  | 53 | 44 | 37 | 32 | 35 | 30 | 26 | 27 | 23 | 21 | 19 | 17 | 15 |
| 7   | 55  | 43  | 36  | 30  | 49 | 39 | 33 | 28 | 32 | 27 | 23 | 24 | 21 | 18 | 18 | 15 | 14 |
| 8   | 51  | 39  | 32  | 27  | 46 | 36 | 29 | 24 | 29 | 24 | 20 | 22 | 19 | 16 | 16 | 14 | 12 |
| 9   | 47  | 36  | 28  | 24  | 43 | 32 | 26 | 22 | 26 | 21 | 18 | 20 | 17 | 14 | 15 | 13 | 11 |
| 10  | 44  | 33  | 26  | 21  | 40 | 30 | 23 | 19 | 24 | 19 | 16 | 19 | 15 | 13 | 14 | 12 | 10 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 1065 | 1065 | 1065 |
| 5°  | 1066 | 1050 | 1057 |
| 10° | 1058 | 1036 | 1042 |
| 15° | 1042 | 1019 | 1020 |
| 20° | 1021 | 995  | 997  |
| 25° | 1000 | 966  | 971  |
| 30° | 974  | 940  | 937  |
| 35° | 949  | 909  | 901  |
| 40° | 919  | 878  | 868  |
| 45° | 888  | 846  | 833  |
| 50° | 855  | 813  | 793  |
| 55° | 820  | 775  | 756  |
| 60° | 781  | 729  | 713  |
| 65° | 738  | 682  | 664  |
| 70° | 683  | 625  | 610  |
| 75° | 607  | 557  | 560  |
| 80° | 516  | 469  | 466  |
| 85° | 373  | 318  | 308  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 90°

Vertical Angle: 90°

Luminance: 1388 cd/sqm

TEST NUMBER: P920931

CATALOG NUMBER: DFN2DIP-TR4F0-040D090US935-FLLONL

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 126.1   | 1.1       |
| 10°-20°   | 354.9   | 3.2       |
| 20°-30°   | 521.5   | 4.7       |
| 30°-40°   | 605.7   | 5.5       |
| 40°-50°   | 605.0   | 5.5       |
| 50°-60°   | 527.5   | 4.8       |
| 60°-70°   | 389.9   | 3.5       |
| 70°-80°   | 220.6   | 2.0       |
| 80°-90°   | 62.8    | 0.6       |
| 90°-100°  | 86.2    | 0.8       |
| 100°-110° | 321.5   | 2.9       |
| 110°-120° | 852.6   | 7.7       |
| 120°-130° | 1414.1  | 12.8      |
| 130°-140° | 1502.1  | 13.6      |
| 140°-150° | 1396.0  | 12.6      |
| 150°-160° | 1122.4  | 10.1      |
| 160°-170° | 723.2   | 6.5       |
| 170°-180° | 248.9   | 2.2       |
| 0°-30°    | 1002.5  | 9.0       |
| 0°-40°    | 1608.3  | 14.5      |
| 0°-60°    | 2740.7  | 24.7      |
| 0°-90°    | 3414.1  | 30.8      |
| 90°-120°  | 1260.3  | 11.4      |
| 90°-150°  | 5572.4  | 50.3      |
| 90°-180°  | 7667.0  | 69.2      |
| 0°-180°   | 11081.0 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 1340 | 1340  | 1340 | 1340  | 1340 |      |
| 5°   | 1340 | 1335  | 1321 | 1331  | 1329 | 127  |
| 15°  | 1276 | 1268  | 1251 | 1256  | 1250 | 359  |
| 25°  | 1154 | 1144  | 1122 | 1125  | 1122 | 531  |
| 35°  | 996  | 983   | 963  | 955   | 948  | 622  |
| 45°  | 810  | 802   | 782  | 768   | 763  | 626  |
| 55°  | 614  | 606   | 590  | 575   | 568  | 548  |
| 65°  | 414  | 406   | 393  | 381   | 375  | 409  |
| 75°  | 216  | 214   | 207  | 200   | 202  | 231  |
| 85°  | 53   | 52    | 50   | 46    | 45   | 59   |
| 90°  | 2    | 23    | 38   | 47    | 51   | 10   |
| 95°  | 123  | 60    | 74   | 83    | 81   | 146  |
| 105° | 575  | 632   | 116  | 136   | 144  | 615  |
| 115° | 1088 | 1120  | 1168 | 291   | 155  | 1071 |
| 125° | 1538 | 1563  | 1599 | 1612  | 1618 | 1372 |
| 135° | 1904 | 1934  | 1951 | 1970  | 1966 | 1471 |
| 145° | 2208 | 2206  | 2239 | 2252  | 2242 | 1381 |
| 155° | 2432 | 2415  | 2437 | 2449  | 2434 | 1121 |
| 165° | 2562 | 2551  | 2557 | 2570  | 2557 | 724  |
| 175° | 2621 | 2608  | 2611 | 2625  | 2606 | 249  |
| 180° | 2615 | 2615  | 2615 | 2615  | 2615 |      |

TEST NUMBER: P920931

CATALOG NUMBER: DFN2DIP-TR4F0-040D090US935-FLLONL

**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 1340.1 | 1340.1 | 1340.1 | 1340.1 | 1340.1 |
| 2.5°   | 1347.9 | 1341.4 | 1327.2 | 1340.1 | 1337.6 |
| 5°     | 1340.1 | 1335.0 | 1320.8 | 1331.0 | 1328.6 |
| 7.5°   | 1331.0 | 1323.4 | 1309.1 | 1319.6 | 1317.0 |
| 10°    | 1317.0 | 1307.9 | 1292.5 | 1302.8 | 1298.9 |
| 12.5°  | 1297.5 | 1289.9 | 1274.4 | 1280.9 | 1278.2 |
| 15°    | 1275.7 | 1268.0 | 1251.2 | 1256.4 | 1250.0 |
| 17.5°  | 1248.6 | 1241.0 | 1224.2 | 1230.5 | 1224.2 |
| 20°    | 1218.9 | 1211.3 | 1193.3 | 1197.0 | 1192.1 |
| 22.5°  | 1189.4 | 1177.8 | 1161.0 | 1161.0 | 1158.4 |
| 25°    | 1154.5 | 1144.3 | 1122.4 | 1124.9 | 1122.4 |
| 27.5°  | 1115.9 | 1106.8 | 1090.2 | 1086.3 | 1079.9 |
| 30°    | 1077.3 | 1066.9 | 1047.7 | 1043.8 | 1038.6 |
| 32.5°  | 1036.0 | 1028.4 | 1007.7 | 1000.0 | 994.7  |
| 35°    | 996.1  | 983.3  | 962.6  | 954.8  | 948.4  |
| 37.5°  | 951.0  | 939.3  | 918.7  | 909.7  | 903.3  |
| 40°    | 904.7  | 894.2  | 873.6  | 862.1  | 857.0  |
| 42.5°  | 859.5  | 849.1  | 828.6  | 815.6  | 808.0  |
| 45°    | 810.5  | 801.6  | 782.1  | 768.1  | 762.8  |
| 47.5°  | 762.8  | 753.8  | 733.2  | 719.0  | 711.4  |
| 50°    | 712.6  | 706.1  | 688.1  | 670.0  | 663.6  |
| 52.5°  | 663.6  | 654.6  | 637.9  | 623.7  | 614.7  |
| 55°    | 613.5  | 605.6  | 590.2  | 574.7  | 568.3  |
| 57.5°  | 563.1  | 556.7  | 539.8  | 524.4  | 519.3  |
| 60°    | 512.8  | 507.7  | 489.7  | 475.5  | 471.7  |
| 62.5°  | 463.9  | 454.9  | 442.0  | 429.1  | 424.0  |
| 65°    | 413.7  | 405.9  | 393.0  | 381.4  | 375.1  |
| 67.5°  | 362.1  | 355.6  | 344.1  | 335.1  | 329.9  |
| 70°    | 314.4  | 309.3  | 297.6  | 288.6  | 283.5  |
| 72.5°  | 265.5  | 260.3  | 253.9  | 244.9  | 241.0  |
| 75°    | 216.5  | 214.0  | 207.4  | 199.8  | 202.3  |
| 77.5°  | 172.6  | 167.5  | 164.9  | 161.0  | 157.2  |
| 80°    | 128.9  | 127.5  | 124.9  | 121.1  | 118.6  |
| 82.5°  | 87.6   | 87.6   | 86.4   | 81.2   | 81.2   |
| 85°    | 52.8   | 51.6   | 50.3   | 46.3   | 45.1   |
| 87.5°  | 23.2   | 20.7   | 18.1   | 14.2   | 12.8   |
| 90°    | 1.8    | 22.7   | 37.7   | 47.4   | 51.0   |
| 92.5°  | 47.4   | 39.8   | 45.4   | 49.2   | 51.0   |
| 95°    | 123.0  | 60.4   | 73.7   | 83.3   | 81.4   |
| 97.5°  | 221.4  | 66.3   | 96.4   | 102.2  | 104.0  |
| 100°   | 335.0  | 75.8   | 107.9  | 123.0  | 126.7  |
| 102.5° | 459.8  | 456.2  | 111.7  | 132.3  | 138.2  |
| 105°   | 575.2  | 632.1  | 115.5  | 136.2  | 143.8  |
| 107.5° | 709.6  | 756.8  | 119.3  | 140.0  | 147.7  |
| 110°   | 838.4  | 878.0  | 331.2  | 142.0  | 149.5  |

TEST NUMBER: P920931

CATALOG NUMBER: DFN2DIP-TR4F0-040D090US935-FLLONL

**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 959.5  | 993.4  | 961.3  | 145.6  | 151.4  |
| 115°   | 1088.0 | 1120.2 | 1167.6 | 291.4  | 155.2  |
| 117.5° | 1199.7 | 1237.5 | 1269.8 | 999.1  | 503.3  |
| 120°   | 1324.6 | 1353.0 | 1387.2 | 1409.8 | 1154.3 |
| 122.5° | 1430.5 | 1460.9 | 1498.8 | 1510.0 | 1512.1 |
| 125°   | 1538.3 | 1563.1 | 1599.0 | 1612.3 | 1617.9 |
| 127.5° | 1636.8 | 1663.3 | 1691.9 | 1710.7 | 1712.5 |
| 130°   | 1729.6 | 1760.0 | 1780.6 | 1801.5 | 1799.7 |
| 132.5° | 1824.2 | 1848.9 | 1869.6 | 1886.7 | 1884.9 |
| 135°   | 1903.8 | 1934.1 | 1950.9 | 1970.0 | 1966.3 |
| 137.5° | 1986.9 | 2009.6 | 2028.7 | 2047.5 | 2041.9 |
| 140°   | 2068.2 | 2083.5 | 2104.2 | 2121.2 | 2111.9 |
| 142.5° | 2136.6 | 2149.8 | 2174.3 | 2189.3 | 2180.0 |
| 145°   | 2208.5 | 2206.4 | 2238.6 | 2251.9 | 2242.4 |
| 147.5° | 2270.7 | 2265.1 | 2297.2 | 2306.7 | 2299.2 |
| 150°   | 2331.4 | 2318.2 | 2348.5 | 2359.7 | 2350.3 |
| 152.5° | 2382.4 | 2367.3 | 2395.6 | 2407.1 | 2393.8 |
| 155°   | 2431.6 | 2414.8 | 2437.4 | 2448.7 | 2433.6 |
| 157.5° | 2471.4 | 2456.3 | 2473.4 | 2486.6 | 2471.4 |
| 160°   | 2505.5 | 2494.1 | 2505.5 | 2516.8 | 2503.5 |
| 162.5° | 2535.6 | 2524.4 | 2533.8 | 2547.1 | 2530.0 |
| 165°   | 2562.2 | 2550.9 | 2556.6 | 2569.8 | 2556.6 |
| 167.5° | 2583.1 | 2571.6 | 2577.4 | 2590.7 | 2573.6 |
| 170°   | 2600.1 | 2588.7 | 2592.5 | 2605.7 | 2588.7 |
| 172.5° | 2611.4 | 2600.1 | 2603.9 | 2617.2 | 2600.1 |
| 175°   | 2620.8 | 2607.5 | 2611.4 | 2624.6 | 2605.7 |
| 177.5° | 2624.6 | 2611.4 | 2613.4 | 2626.6 | 2609.6 |
| 180°   | 2615.2 | 2615.2 | 2615.2 | 2615.2 | 2615.2 |

TEST NUMBER: P920931

CATALOG NUMBER: DFN2DIP-TR4F0-040D090US935-FLLONL

**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 | 5.38             | 6.09 | 6.49  | 7.19  | 8.72  | 4.95           | 5.66 | 6.05  | 6.76  | 8.28  |
|                 | 3H   | 7.03             | 7.67 | 8.14  | 8.78  | 10.31 | 6.56           | 7.19 | 7.67  | 8.30  | 9.84  |
|                 | 4H   | 7.61             | 8.21 | 8.73  | 9.33  | 10.87 | 7.14           | 7.74 | 8.26  | 8.85  | 10.40 |
|                 | 6H   | 8.00             | 8.56 | 9.13  | 9.67  | 11.23 | 7.53           | 8.08 | 8.66  | 9.20  | 10.75 |
|                 | 8H   | 8.10             | 8.63 | 9.24  | 9.76  | 11.31 | 7.63           | 8.16 | 8.76  | 9.29  | 10.83 |
|                 | 12H  | 8.14             | 8.65 | 9.28  | 9.77  | 11.34 | 7.66           | 8.17 | 8.80  | 9.29  | 10.86 |
| 4H              | 2H   | 5.82             | 6.43 | 6.96  | 7.54  | 9.08  | 5.48           | 6.08 | 6.61  | 7.20  | 8.74  |
|                 | 3H   | 7.68             | 8.18 | 8.81  | 9.32  | 10.87 | 7.28           | 7.79 | 8.42  | 8.93  | 10.48 |
|                 | 4H   | 8.38             | 8.85 | 9.52  | 9.97  | 11.55 | 7.98           | 8.44 | 9.12  | 9.57  | 11.14 |
|                 | 6H   | 8.89             | 9.29 | 10.04 | 10.44 | 12.00 | 8.48           | 8.88 | 9.63  | 10.03 | 11.59 |
|                 | 8H   | 9.04             | 9.41 | 10.18 | 10.55 | 12.13 | 8.62           | 9.00 | 9.77  | 10.14 | 11.72 |
|                 | 12H  | 9.10             | 9.44 | 10.26 | 10.59 | 12.18 | 8.68           | 9.02 | 9.84  | 10.17 | 11.76 |
| 8H              | 4H   | 8.57             | 8.94 | 9.71  | 10.08 | 11.66 | 8.21           | 8.58 | 9.35  | 9.72  | 11.30 |
|                 | 6H   | 9.19             | 9.50 | 10.36 | 10.68 | 12.26 | 8.83           | 9.14 | 10.00 | 10.32 | 11.90 |
|                 | 8H   | 9.41             | 9.68 | 10.58 | 10.84 | 12.44 | 9.04           | 9.31 | 10.22 | 10.47 | 12.07 |
|                 | 12H  | 9.54             | 9.77 | 10.71 | 10.93 | 12.57 | 9.15           | 9.39 | 10.33 | 10.55 | 12.18 |
| 12H             | 4H   | 8.55             | 8.88 | 9.71  | 10.04 | 11.62 | 8.19           | 8.53 | 9.36  | 9.68  | 11.27 |
|                 | 6H   | 9.22             | 9.49 | 10.39 | 10.65 | 12.25 | 8.87           | 9.14 | 10.04 | 10.30 | 11.90 |
|                 | 8H   | 9.46             | 9.69 | 10.63 | 10.85 | 12.48 | 9.10           | 9.33 | 10.28 | 10.49 | 12.13 |

END OF REPORT