

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: P918651

Luminaire Tested: DFN2DIP-4P4F0-030D050US935-FLLONL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P918651  
REPORT IS A COMBINATION OF REPORTS P900623 AND P897523  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-4P4F0-030D050US935-FLLONL  
Description: 4 foot, 90deg - 4way Define Geo, with Direct Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

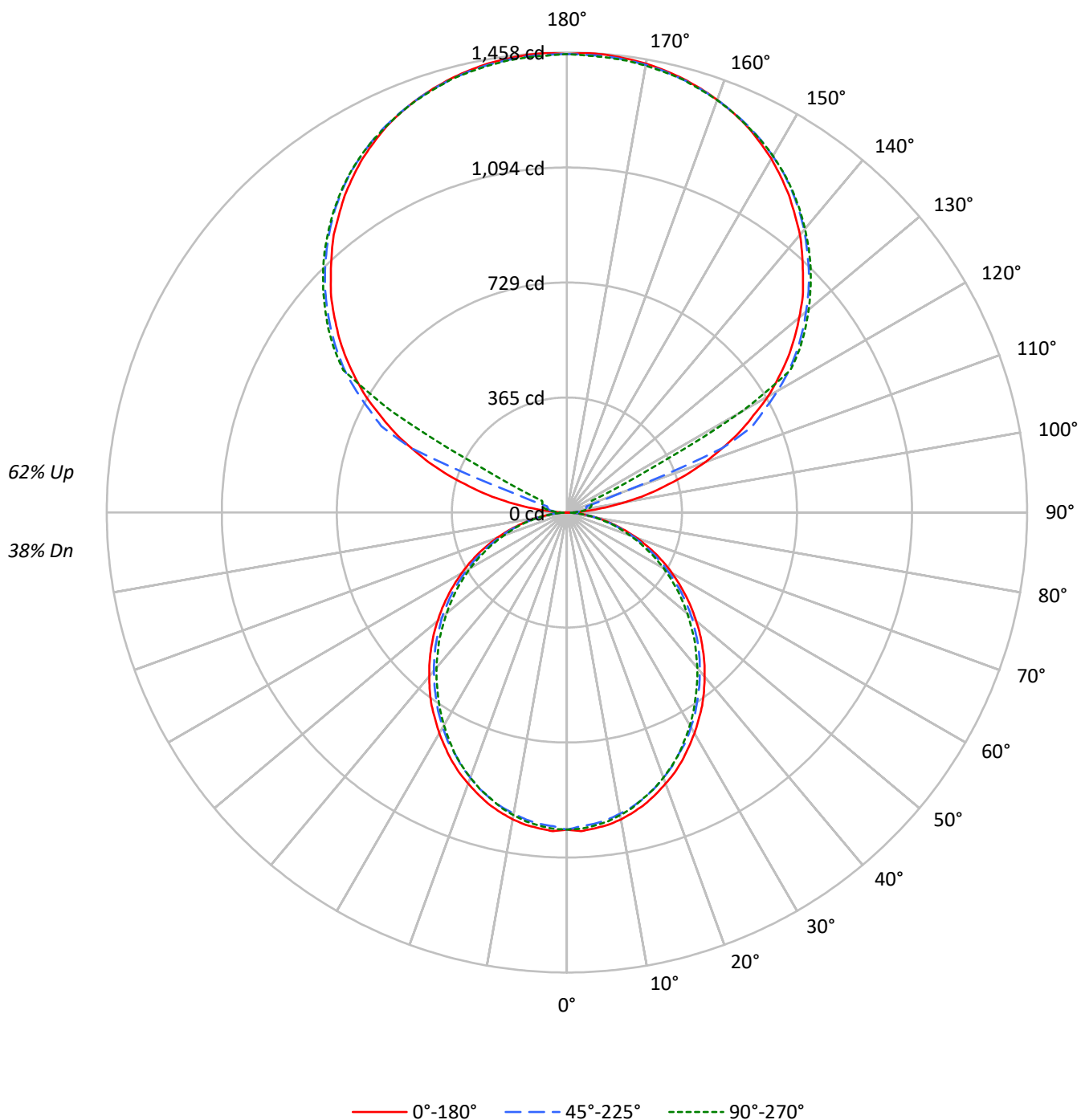
Lumens per Lamp: N/A  
Luminaire Lumens: 6819.1 lumens  
Efficiency: N/A  
Efficacy: 100.4 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 4.07' x L: 4.07' x H: 0.1')  
CIE Type: Semi-Indirect

Input Watts (W): 67.9  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.983  
Total Harmonic Distortion (THDi): 0.073  
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



TEST NUMBER: P918651

CATALOG NUMBER: DFN2DIP-4P4F0-030D050US935-FLONL

**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   | 104 | 104 | 104 | 104 | 94 | 94 | 94 | 94 | 76 | 76 | 76 | 60 | 60 | 60 | 45 | 45 | 45 |
| 1   | 95  | 91  | 87  | 83  | 86 | 82 | 79 | 76 | 67 | 65 | 63 | 53 | 51 | 50 | 39 | 39 | 38 |
| 2   | 86  | 79  | 73  | 68  | 78 | 72 | 67 | 63 | 59 | 55 | 52 | 46 | 44 | 42 | 35 | 33 | 32 |
| 3   | 79  | 70  | 62  | 57  | 71 | 63 | 57 | 52 | 52 | 47 | 44 | 41 | 38 | 35 | 31 | 29 | 27 |
| 4   | 72  | 62  | 54  | 48  | 65 | 56 | 49 | 44 | 46 | 41 | 37 | 36 | 33 | 30 | 27 | 25 | 23 |
| 5   | 66  | 55  | 47  | 41  | 60 | 50 | 43 | 38 | 41 | 36 | 32 | 33 | 29 | 26 | 25 | 22 | 20 |
| 6   | 61  | 49  | 41  | 35  | 55 | 45 | 38 | 33 | 37 | 32 | 28 | 29 | 26 | 23 | 22 | 20 | 18 |
| 7   | 56  | 44  | 36  | 31  | 51 | 40 | 34 | 29 | 33 | 28 | 24 | 27 | 23 | 20 | 20 | 18 | 16 |
| 8   | 52  | 40  | 32  | 27  | 47 | 37 | 30 | 25 | 30 | 25 | 22 | 24 | 21 | 18 | 19 | 16 | 14 |
| 9   | 48  | 36  | 29  | 24  | 44 | 33 | 27 | 23 | 28 | 23 | 19 | 22 | 19 | 16 | 17 | 15 | 13 |
| 10  | 45  | 33  | 26  | 22  | 41 | 31 | 24 | 20 | 26 | 21 | 17 | 21 | 17 | 14 | 16 | 13 | 12 |

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

|     | 0°  | 45° | 90° |
|-----|-----|-----|-----|
| 0°  | 652 | 652 | 652 |
| 5°  | 653 | 643 | 647 |
| 10° | 648 | 635 | 639 |
| 15° | 638 | 624 | 626 |
| 20° | 626 | 610 | 612 |
| 25° | 613 | 593 | 596 |
| 30° | 597 | 577 | 575 |
| 35° | 582 | 558 | 554 |
| 40° | 563 | 539 | 533 |
| 45° | 544 | 520 | 512 |
| 50° | 524 | 500 | 488 |
| 55° | 503 | 477 | 466 |
| 60° | 479 | 450 | 440 |
| 65° | 453 | 421 | 410 |
| 70° | 419 | 387 | 378 |
| 75° | 373 | 345 | 349 |
| 80° | 317 | 292 | 292 |
| 85° | 230 | 201 | 196 |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 90°

Vertical Angle: 90°

Luminance: 748 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 94.6   | 1.4       |
| 10°-20°   | 266.2  | 3.9       |
| 20°-30°   | 391.1  | 5.7       |
| 30°-40°   | 454.3  | 6.7       |
| 40°-50°   | 453.7  | 6.7       |
| 50°-60°   | 395.6  | 5.8       |
| 60°-70°   | 292.5  | 4.3       |
| 70°-80°   | 165.5  | 2.4       |
| 80°-90°   | 46.2   | 0.7       |
| 90°-100°  | 47.9   | 0.7       |
| 100°-110° | 178.6  | 2.6       |
| 110°-120° | 473.7  | 6.9       |
| 120°-130° | 785.6  | 11.5      |
| 130°-140° | 834.5  | 12.2      |
| 140°-150° | 775.6  | 11.4      |
| 150°-160° | 623.5  | 9.1       |
| 160°-170° | 401.8  | 5.9       |
| 170°-180° | 138.3  | 2.0       |
| 0°-30°    | 751.9  | 11.0      |
| 0°-40°    | 1206.2 | 17.7      |
| 0°-60°    | 2055.6 | 30.1      |
| 0°-90°    | 2559.7 | 37.5      |
| 90°-120°  | 700.2  | 10.3      |
| 90°-150°  | 3095.8 | 45.4      |
| 90°-180°  | 4259.0 | 62.5      |
| 0°-180°   | 6819.1 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 1005 | 1005  | 1005 | 1005  | 1005 |      |
| 5°   | 1005 | 1001  | 991  | 998   | 996  | 95   |
| 15°  | 957  | 951   | 938  | 942   | 938  | 269  |
| 25°  | 866  | 858   | 842  | 844   | 842  | 398  |
| 35°  | 747  | 737   | 722  | 716   | 711  | 467  |
| 45°  | 608  | 601   | 587  | 576   | 572  | 469  |
| 55°  | 460  | 454   | 443  | 431   | 426  | 411  |
| 65°  | 310  | 304   | 295  | 286   | 281  | 307  |
| 75°  | 162  | 160   | 156  | 150   | 152  | 173  |
| 85°  | 40   | 39    | 38   | 35    | 34   | 44   |
| 90°  | 1    | 13    | 21   | 26    | 28   | 6    |
| 95°  | 68   | 34    | 41   | 46    | 45   | 81   |
| 105° | 320  | 351   | 64   | 76    | 80   | 342  |
| 115° | 604  | 622   | 649  | 162   | 86   | 595  |
| 125° | 855  | 868   | 888  | 896   | 899  | 762  |
| 135° | 1058 | 1074  | 1084 | 1094  | 1092 | 817  |
| 145° | 1227 | 1226  | 1244 | 1251  | 1246 | 767  |
| 155° | 1351 | 1342  | 1354 | 1360  | 1352 | 622  |
| 165° | 1423 | 1417  | 1420 | 1428  | 1420 | 402  |
| 175° | 1456 | 1449  | 1451 | 1458  | 1448 | 139  |
| 180° | 1453 | 1453  | 1453 | 1453  | 1453 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 1005.0 | 1005.0 | 1005.0 | 1005.0 | 1005.0 |
| 2.5°   | 1010.9 | 1006.1 | 995.4  | 1005.0 | 1003.2 |
| 5°     | 1005.0 | 1001.3 | 990.6  | 998.3  | 996.4  |
| 7.5°   | 998.3  | 992.6  | 981.9  | 989.7  | 987.7  |
| 10°    | 987.7  | 980.9  | 969.4  | 977.1  | 974.2  |
| 12.5°  | 973.2  | 967.4  | 955.9  | 960.6  | 958.7  |
| 15°    | 956.7  | 951.1  | 938.4  | 942.3  | 937.5  |
| 17.5°  | 936.4  | 930.7  | 918.1  | 922.9  | 918.1  |
| 20°    | 914.2  | 908.4  | 894.9  | 897.8  | 894.0  |
| 22.5°  | 892.1  | 883.4  | 870.7  | 870.7  | 868.7  |
| 25°    | 865.9  | 858.2  | 841.8  | 843.7  | 841.8  |
| 27.5°  | 836.9  | 830.1  | 817.6  | 814.8  | 809.9  |
| 30°    | 808.0  | 800.2  | 785.7  | 782.8  | 778.9  |
| 32.5°  | 777.1  | 771.3  | 755.8  | 749.9  | 746.1  |
| 35°    | 747.1  | 737.4  | 721.9  | 716.1  | 711.3  |
| 37.5°  | 713.3  | 704.6  | 689.1  | 682.3  | 677.4  |
| 40°    | 678.5  | 670.7  | 655.2  | 646.6  | 642.7  |
| 42.5°  | 644.6  | 636.9  | 621.5  | 611.7  | 606.0  |
| 45°    | 608.0  | 601.1  | 586.6  | 576.0  | 572.1  |
| 47.5°  | 572.1  | 565.4  | 549.9  | 539.2  | 533.5  |
| 50°    | 534.4  | 529.6  | 516.1  | 502.6  | 497.7  |
| 52.5°  | 497.7  | 490.9  | 478.5  | 467.8  | 461.0  |
| 55°    | 460.1  | 454.3  | 442.6  | 431.1  | 426.3  |
| 57.5°  | 422.3  | 417.5  | 404.9  | 393.3  | 389.4  |
| 60°    | 384.6  | 380.8  | 367.3  | 356.6  | 353.8  |
| 62.5°  | 347.9  | 341.1  | 331.5  | 321.8  | 318.0  |
| 65°    | 310.3  | 304.4  | 294.8  | 286.1  | 281.3  |
| 67.5°  | 271.6  | 266.7  | 258.0  | 251.3  | 247.5  |
| 70°    | 235.8  | 232.0  | 223.3  | 216.5  | 212.7  |
| 72.5°  | 199.1  | 195.2  | 190.4  | 183.7  | 180.8  |
| 75°    | 162.3  | 160.5  | 155.6  | 149.8  | 151.8  |
| 77.5°  | 129.5  | 125.6  | 123.6  | 120.8  | 118.0  |
| 80°    | 96.7   | 95.7   | 93.7   | 90.8   | 88.9   |
| 82.5°  | 65.7   | 65.7   | 64.8   | 60.9   | 60.9   |
| 85°    | 39.6   | 38.7   | 37.7   | 34.8   | 33.8   |
| 87.5°  | 17.4   | 15.5   | 13.5   | 10.7   | 9.6    |
| 90°    | 1.0    | 12.6   | 21.0   | 26.3   | 28.3   |
| 92.5°  | 26.3   | 22.1   | 25.2   | 27.4   | 28.3   |
| 95°    | 68.3   | 33.6   | 41.0   | 46.3   | 45.2   |
| 97.5°  | 123.0  | 36.9   | 53.6   | 56.8   | 57.8   |
| 100°   | 186.1  | 42.1   | 59.9   | 68.3   | 70.4   |
| 102.5° | 255.5  | 253.4  | 62.1   | 73.5   | 76.8   |
| 105°   | 319.6  | 351.2  | 64.1   | 75.7   | 79.9   |
| 107.5° | 394.3  | 420.4  | 66.3   | 77.7   | 82.1   |
| 110°   | 465.8  | 487.8  | 184.0  | 78.9   | 83.0   |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 533.0  | 551.9  | 534.1  | 80.9   | 84.1   |
| 115°   | 604.5  | 622.3  | 648.7  | 162.0  | 86.3   |
| 117.5° | 666.5  | 687.5  | 705.5  | 555.0  | 279.7  |
| 120°   | 735.9  | 751.7  | 770.6  | 783.2  | 641.3  |
| 122.5° | 794.7  | 811.6  | 832.7  | 839.0  | 840.1  |
| 125°   | 854.6  | 868.4  | 888.4  | 895.7  | 898.9  |
| 127.5° | 909.3  | 924.0  | 940.0  | 950.4  | 951.4  |
| 130°   | 960.9  | 977.7  | 989.2  | 1000.8 | 999.9  |
| 132.5° | 1013.5 | 1027.2 | 1038.6 | 1048.2 | 1047.1 |
| 135°   | 1057.6 | 1074.5 | 1083.8 | 1094.5 | 1092.3 |
| 137.5° | 1103.8 | 1116.5 | 1127.0 | 1137.6 | 1134.5 |
| 140°   | 1149.0 | 1157.5 | 1169.0 | 1178.4 | 1173.3 |
| 142.5° | 1187.0 | 1194.4 | 1208.0 | 1216.3 | 1211.1 |
| 145°   | 1226.9 | 1225.8 | 1243.6 | 1251.0 | 1245.8 |
| 147.5° | 1261.5 | 1258.3 | 1276.3 | 1281.5 | 1277.4 |
| 150°   | 1295.2 | 1287.9 | 1304.7 | 1311.0 | 1305.7 |
| 152.5° | 1323.5 | 1315.2 | 1330.9 | 1337.3 | 1329.9 |
| 155°   | 1350.9 | 1341.5 | 1354.1 | 1360.4 | 1352.0 |
| 157.5° | 1372.9 | 1364.6 | 1374.1 | 1381.5 | 1372.9 |
| 160°   | 1392.0 | 1385.6 | 1392.0 | 1398.2 | 1390.9 |
| 162.5° | 1408.7 | 1402.5 | 1407.6 | 1415.0 | 1405.6 |
| 165°   | 1423.4 | 1417.2 | 1420.3 | 1427.6 | 1420.3 |
| 167.5° | 1435.0 | 1428.7 | 1431.9 | 1439.2 | 1429.8 |
| 170°   | 1444.5 | 1438.1 | 1440.3 | 1447.6 | 1438.1 |
| 172.5° | 1450.8 | 1444.5 | 1446.6 | 1454.0 | 1444.5 |
| 175°   | 1456.0 | 1448.6 | 1450.8 | 1458.1 | 1447.6 |
| 177.5° | 1458.1 | 1450.8 | 1451.9 | 1459.2 | 1449.7 |
| 180°   | 1452.8 | 1452.8 | 1452.8 | 1452.8 | 1452.8 |

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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 | 4.53             | 5.29 | 5.59 | 6.35  | 7.79  | 4.08           | 4.84 | 5.14 | 5.90 | 7.34  |
|                 | 3H   | 6.19             | 6.87 | 7.25 | 7.94  | 9.39  | 5.70           | 6.38 | 6.76 | 7.45 | 8.90  |
|                 | 4H   | 6.77             | 7.42 | 7.85 | 8.49  | 9.95  | 6.28           | 6.93 | 7.36 | 8.00 | 9.46  |
|                 | 6H   | 7.17             | 7.77 | 8.26 | 8.84  | 10.32 | 6.67           | 7.27 | 7.76 | 8.34 | 9.82  |
|                 | 8H   | 7.28             | 7.84 | 8.37 | 8.93  | 10.40 | 6.78           | 7.34 | 7.87 | 8.43 | 9.90  |
|                 | 12H  | 7.32             | 7.86 | 8.42 | 8.95  | 10.44 | 6.82           | 7.35 | 7.91 | 8.44 | 9.93  |
| 4H              | 2H   | 4.98             | 5.62 | 6.06 | 6.70  | 8.16  | 4.62           | 5.27 | 5.71 | 6.34 | 7.80  |
|                 | 3H   | 6.84             | 7.38 | 7.93 | 8.48  | 9.96  | 6.43           | 6.97 | 7.53 | 8.07 | 9.55  |
|                 | 4H   | 7.56             | 8.05 | 8.65 | 9.14  | 10.64 | 7.13           | 7.63 | 8.23 | 8.72 | 10.21 |
|                 | 6H   | 8.07             | 8.50 | 9.18 | 9.61  | 11.10 | 7.64           | 8.06 | 8.74 | 9.18 | 10.67 |
|                 | 8H   | 8.22             | 8.62 | 9.33 | 9.72  | 11.23 | 7.78           | 8.18 | 8.89 | 9.28 | 10.79 |
|                 | 12H  | 8.29             | 8.65 | 9.41 | 9.77  | 11.28 | 7.84           | 8.20 | 8.97 | 9.32 | 10.83 |
| 8H              | 4H   | 7.75             | 8.14 | 8.85 | 9.25  | 10.75 | 7.37           | 7.77 | 8.47 | 8.87 | 10.38 |
|                 | 6H   | 8.38             | 8.71 | 9.51 | 9.85  | 11.36 | 8.00           | 8.32 | 9.12 | 9.47 | 10.97 |
|                 | 8H   | 8.60             | 8.89 | 9.74 | 10.02 | 11.54 | 8.21           | 8.50 | 9.34 | 9.62 | 11.15 |
|                 | 12H  | 8.73             | 8.99 | 9.87 | 10.11 | 11.67 | 8.32           | 8.57 | 9.46 | 9.70 | 11.26 |
| 12H             | 4H   | 7.73             | 8.09 | 8.85 | 9.20  | 10.71 | 7.36           | 7.72 | 8.48 | 8.83 | 10.35 |
|                 | 6H   | 8.41             | 8.70 | 9.54 | 9.82  | 11.35 | 8.04           | 8.32 | 9.17 | 9.45 | 10.97 |
|                 | 8H   | 8.65             | 8.90 | 9.79 | 10.03 | 11.59 | 8.27           | 8.52 | 9.41 | 9.65 | 11.21 |

END OF REPORT