

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: P913133

Luminaire Tested: DFN2DIP-4P3F0-040D030US927-RLLONL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P913133  
REPORT IS A COMBINATION OF REPORTS P900564 AND P897473  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-4P3F0-040D030US927-RLLONL  
Description: 3 foot, 90deg - 4way Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

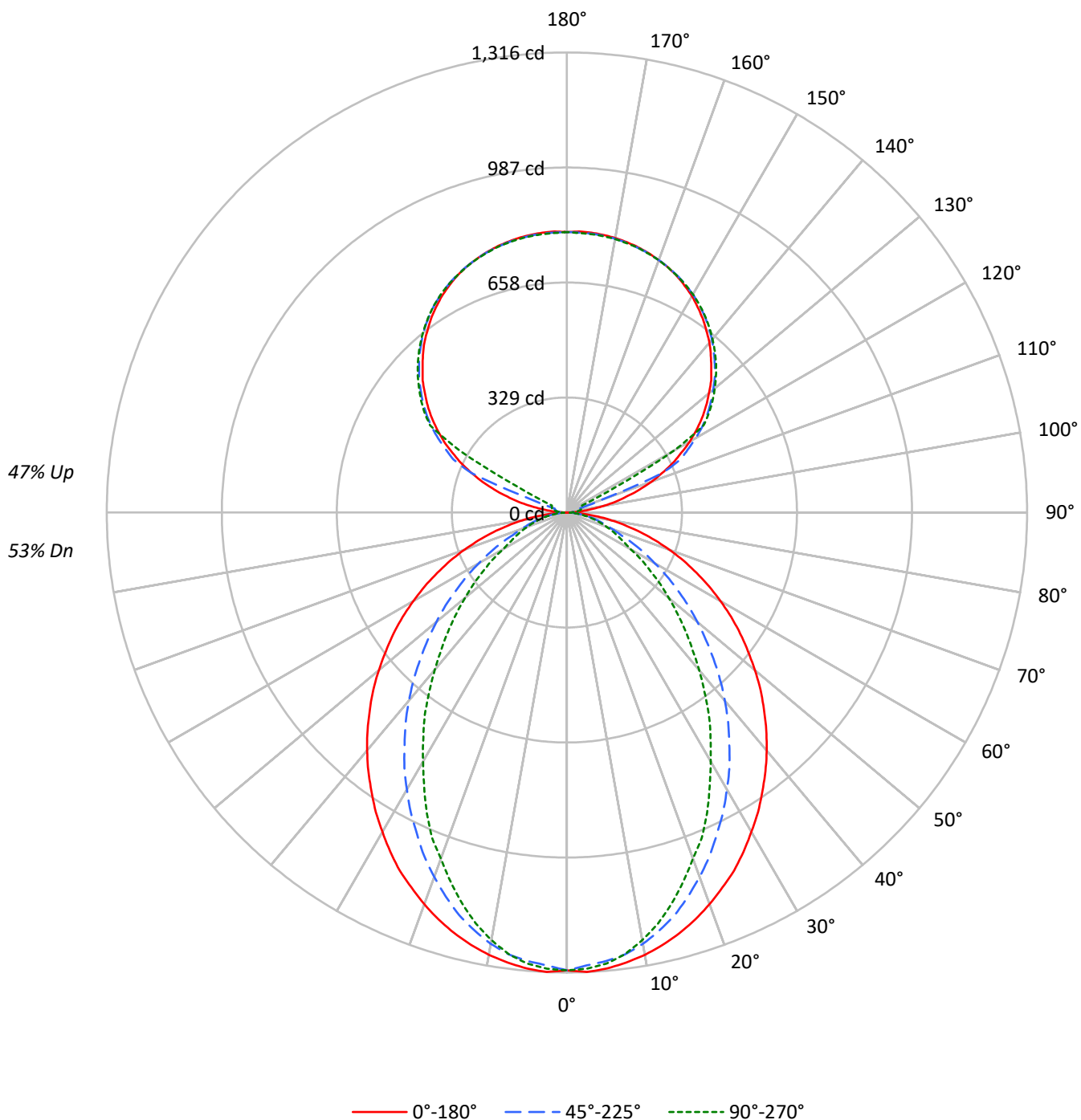
**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 5046.2 lumens  
Efficiency: N/A  
Efficacy: 84.2 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 0.99 / 1.16  
Luminous Opening: Rectangular w/ Sides (W: 3.07' x L: 3.07' x H: 0.1')  
CIE Type: General Diffuse  
  
Input Watts (W): 59.9  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9789  
Total Harmonic Distortion (THDi): 0.074  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT

TEST NUMBER: P913133

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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   | 108 | 108 | 108 | 108 | 100 | 100 | 100 | 100 | 85 | 85 | 85 | 72 | 72 | 72 | 59 | 59 | 59 |
| 1   | 99  | 95  | 91  | 88  | 92  | 88  | 85  | 82  | 76 | 73 | 71 | 64 | 62 | 61 | 53 | 52 | 51 |
| 2   | 91  | 83  | 78  | 73  | 84  | 78  | 73  | 68  | 67 | 63 | 60 | 57 | 54 | 52 | 47 | 45 | 44 |
| 3   | 83  | 74  | 67  | 61  | 77  | 69  | 63  | 58  | 59 | 55 | 51 | 51 | 47 | 44 | 42 | 40 | 38 |
| 4   | 76  | 66  | 58  | 52  | 70  | 61  | 55  | 49  | 53 | 48 | 44 | 45 | 42 | 38 | 38 | 35 | 33 |
| 5   | 70  | 59  | 51  | 45  | 65  | 55  | 48  | 43  | 48 | 42 | 38 | 41 | 37 | 34 | 35 | 32 | 29 |
| 6   | 65  | 53  | 45  | 39  | 60  | 50  | 43  | 37  | 43 | 38 | 34 | 37 | 33 | 30 | 32 | 28 | 26 |
| 7   | 60  | 48  | 40  | 35  | 56  | 45  | 38  | 33  | 39 | 34 | 30 | 34 | 30 | 26 | 29 | 26 | 23 |
| 8   | 56  | 44  | 36  | 31  | 52  | 41  | 34  | 29  | 36 | 31 | 27 | 31 | 27 | 24 | 27 | 24 | 21 |
| 9   | 52  | 40  | 33  | 28  | 48  | 38  | 31  | 26  | 33 | 28 | 24 | 29 | 25 | 22 | 25 | 22 | 19 |
| 10  | 49  | 37  | 30  | 25  | 45  | 35  | 28  | 24  | 31 | 25 | 22 | 27 | 23 | 20 | 23 | 20 | 17 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 1492 | 1492 | 1492 |
| 5°  | 1494 | 1468 | 1478 |
| 10° | 1478 | 1438 | 1429 |
| 15° | 1457 | 1390 | 1354 |
| 20° | 1429 | 1323 | 1263 |
| 25° | 1400 | 1249 | 1174 |
| 30° | 1363 | 1173 | 1062 |
| 35° | 1325 | 1091 | 964  |
| 40° | 1287 | 1007 | 851  |
| 45° | 1243 | 913  | 749  |
| 50° | 1197 | 819  | 649  |
| 55° | 1150 | 718  | 554  |
| 60° | 1094 | 613  | 455  |
| 65° | 1031 | 506  | 409  |
| 70° | 953  | 406  | 369  |
| 75° | 856  | 356  | 335  |
| 80° | 715  | 296  | 289  |
| 85° | 485  | 193  | 214  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°  
Vertical Angle: 45°  
Luminance: 1243 cd/sqm

TEST NUMBER: P913133

CATALOG NUMBER: DFN2DIP-4P3F0-040D030US927-RLLONL

**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 122.7  | 2.4       |
| 10°-20°   | 336.9  | 6.7       |
| 20°-30°   | 473.1  | 9.4       |
| 30°-40°   | 515.7  | 10.2      |
| 40°-50°   | 473.9  | 9.4       |
| 50°-60°   | 372.2  | 7.4       |
| 60°-70°   | 242.3  | 4.8       |
| 70°-80°   | 124.7  | 2.5       |
| 80°-90°   | 33.3   | 0.7       |
| 90°-100°  | 26.5   | 0.5       |
| 100°-110° | 98.6   | 2.0       |
| 110°-120° | 261.5  | 5.2       |
| 120°-130° | 433.7  | 8.6       |
| 130°-140° | 460.7  | 9.1       |
| 140°-150° | 428.1  | 8.5       |
| 150°-160° | 344.2  | 6.8       |
| 160°-170° | 221.8  | 4.4       |
| 170°-180° | 76.3   | 1.5       |
| 0°-30°    | 932.7  | 18.5      |
| 0°-40°    | 1448.4 | 28.7      |
| 0°-60°    | 2294.6 | 45.5      |
| 0°-90°    | 2694.8 | 53.4      |
| 90°-120°  | 386.5  | 7.7       |
| 90°-150°  | 1709.0 | 33.9      |
| 90°-180°  | 2351.0 | 46.6      |
| 0°-180°   | 5046.2 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 1310 | 1310  | 1310 | 1310  | 1310 |      |
| 5°   | 1310 | 1304  | 1288 | 1299  | 1296 | 124  |
| 15°  | 1246 | 1233  | 1192 | 1170  | 1158 | 351  |
| 25°  | 1131 | 1093  | 1014 | 966   | 948  | 520  |
| 35°  | 974  | 914   | 810  | 735   | 709  | 610  |
| 45°  | 796  | 717   | 593  | 508   | 480  | 615  |
| 55°  | 606  | 513   | 385  | 314   | 292  | 541  |
| 65°  | 409  | 313   | 206  | 166   | 162  | 405  |
| 75°  | 218  | 135   | 95   | 86    | 85   | 231  |
| 85°  | 51   | 26    | 22   | 22    | 22   | 58   |
| 90°  | 1    | 7     | 12   | 15    | 16   | 5    |
| 95°  | 38   | 18    | 23   | 26    | 25   | 45   |
| 105° | 176  | 194   | 35   | 42    | 44   | 188  |
| 115° | 334  | 344   | 358  | 89    | 48   | 329  |
| 125° | 472  | 479   | 490  | 494   | 496  | 421  |
| 135° | 584  | 593   | 598  | 604   | 603  | 451  |
| 145° | 677  | 677   | 687  | 691   | 688  | 424  |
| 155° | 746  | 741   | 748  | 751   | 746  | 344  |
| 165° | 786  | 782   | 784  | 788   | 784  | 222  |
| 175° | 804  | 800   | 801  | 805   | 799  | 76   |
| 180° | 802  | 802   | 802  | 802   | 802  |      |

TEST NUMBER: P913133

CATALOG NUMBER: DFN2DIP-4P3F0-040D030US927-RLONL

**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 1309.6 | 1309.6 | 1309.6 | 1309.6 | 1309.6 |
| 2.5°   | 1315.6 | 1309.6 | 1296.6 | 1308.5 | 1306.1 |
| 5°     | 1309.6 | 1303.7 | 1288.2 | 1298.9 | 1295.5 |
| 7.5°   | 1298.9 | 1291.9 | 1275.3 | 1279.9 | 1274.1 |
| 10°    | 1284.8 | 1276.4 | 1252.8 | 1249.1 | 1242.1 |
| 12.5°  | 1267.0 | 1256.3 | 1224.2 | 1217.2 | 1204.1 |
| 15°    | 1245.6 | 1232.6 | 1192.3 | 1169.8 | 1158.0 |
| 17.5°  | 1220.8 | 1201.7 | 1151.9 | 1125.9 | 1106.9 |
| 20°    | 1192.3 | 1168.5 | 1109.3 | 1079.7 | 1053.6 |
| 22.5°  | 1161.5 | 1134.2 | 1065.4 | 1025.2 | 1007.5 |
| 25°    | 1130.7 | 1092.7 | 1014.5 | 966.0  | 948.1  |
| 27.5°  | 1094.0 | 1053.6 | 967.1  | 911.4  | 884.1  |
| 30°    | 1054.9 | 1009.7 | 914.9  | 854.5  | 822.5  |
| 32.5°  | 1016.9 | 962.3  | 865.2  | 794.1  | 764.4  |
| 35°    | 974.3  | 913.8  | 809.5  | 734.8  | 708.7  |
| 37.5°  | 932.8  | 867.5  | 757.3  | 675.5  | 645.9  |
| 40°    | 888.9  | 817.8  | 702.8  | 618.7  | 587.9  |
| 42.5°  | 843.8  | 768.0  | 648.3  | 560.5  | 531.0  |
| 45°    | 796.5  | 717.0  | 592.6  | 508.4  | 480.0  |
| 47.5°  | 751.5  | 667.3  | 539.3  | 455.1  | 429.0  |
| 50°    | 701.6  | 617.5  | 487.1  | 405.3  | 380.5  |
| 52.5°  | 653.0  | 564.1  | 437.4  | 359.1  | 336.6  |
| 55°    | 605.6  | 513.2  | 385.2  | 314.1  | 291.6  |
| 57.5°  | 557.1  | 462.2  | 339.0  | 272.6  | 253.7  |
| 60°    | 507.2  | 412.4  | 290.3  | 230.0  | 211.0  |
| 62.5°  | 458.8  | 363.9  | 248.8  | 192.0  | 182.6  |
| 65°    | 408.9  | 312.8  | 206.2  | 166.0  | 162.3  |
| 67.5°  | 361.6  | 265.5  | 166.0  | 145.8  | 142.2  |
| 70°    | 311.7  | 219.3  | 137.4  | 125.6  | 120.8  |
| 72.5°  | 264.4  | 176.6  | 114.9  | 105.5  | 103.1  |
| 75°    | 218.0  | 135.1  | 94.8   | 86.5   | 85.4   |
| 77.5°  | 171.9  | 95.9   | 74.7   | 69.9   | 67.5   |
| 80°    | 129.1  | 68.8   | 56.8   | 52.2   | 52.2   |
| 82.5°  | 90.1   | 46.3   | 39.1   | 36.7   | 36.7   |
| 85°    | 50.9   | 26.1   | 22.5   | 22.5   | 22.5   |
| 87.5°  | 19.0   | 9.4    | 9.4    | 8.3    | 8.3    |
| 90°    | 0.6    | 7.0    | 11.6   | 14.6   | 15.6   |
| 92.5°  | 14.6   | 12.2   | 13.9   | 15.1   | 15.6   |
| 95°    | 37.7   | 18.5   | 22.6   | 25.6   | 25.0   |
| 97.5°  | 67.9   | 20.4   | 29.5   | 31.4   | 31.9   |
| 100°   | 102.7  | 23.2   | 33.1   | 37.7   | 38.9   |
| 102.5° | 141.0  | 139.9  | 34.2   | 40.6   | 42.4   |
| 105°   | 176.4  | 193.8  | 35.4   | 41.7   | 44.1   |
| 107.5° | 217.6  | 232.1  | 36.6   | 42.9   | 45.3   |
| 110°   | 257.1  | 269.3  | 101.6  | 43.6   | 45.9   |



TEST NUMBER: P913133

CATALOG NUMBER: DFN2DIP-4P3F0-040D030US927-RLLONL

**CANDELA DISTRIBUTION (continued):**

|        | 0°    | 22.5° | 45°   | 67.5° | 90°   |
|--------|-------|-------|-------|-------|-------|
| 112.5° | 294.3 | 304.7 | 294.8 | 44.7  | 46.4  |
| 115°   | 333.7 | 343.6 | 358.1 | 89.4  | 47.6  |
| 117.5° | 368.0 | 379.5 | 389.4 | 306.4 | 154.4 |
| 120°   | 406.2 | 414.9 | 425.4 | 432.4 | 354.0 |
| 122.5° | 438.7 | 448.1 | 459.7 | 463.1 | 463.7 |
| 125°   | 471.8 | 479.3 | 490.4 | 494.5 | 496.2 |
| 127.5° | 502.0 | 510.1 | 518.9 | 524.7 | 525.2 |
| 130°   | 530.4 | 539.8 | 546.1 | 552.5 | 552.0 |
| 132.5° | 559.4 | 567.0 | 573.4 | 578.6 | 578.1 |
| 135°   | 583.8 | 593.2 | 598.3 | 604.2 | 603.0 |
| 137.5° | 609.3 | 616.3 | 622.2 | 628.0 | 626.2 |
| 140°   | 634.3 | 639.0 | 645.3 | 650.5 | 647.7 |
| 142.5° | 655.3 | 659.3 | 666.9 | 671.5 | 668.6 |
| 145°   | 677.3 | 676.7 | 686.6 | 690.6 | 687.7 |
| 147.5° | 696.4 | 694.7 | 704.6 | 707.4 | 705.1 |
| 150°   | 715.0 | 711.0 | 720.3 | 723.7 | 720.8 |
| 152.5° | 730.6 | 726.0 | 734.7 | 738.2 | 734.2 |
| 155°   | 745.8 | 740.6 | 747.5 | 751.0 | 746.4 |
| 157.5° | 758.0 | 753.4 | 758.6 | 762.6 | 758.0 |
| 160°   | 768.4 | 764.9 | 768.4 | 771.9 | 767.8 |
| 162.5° | 777.7 | 774.2 | 777.1 | 781.2 | 775.9 |
| 165°   | 785.8 | 782.4 | 784.1 | 788.1 | 784.1 |
| 167.5° | 792.2 | 788.7 | 790.4 | 794.6 | 789.3 |
| 170°   | 797.4 | 793.9 | 795.1 | 799.2 | 793.9 |
| 172.5° | 800.9 | 797.4 | 798.6 | 802.6 | 797.4 |
| 175°   | 803.7 | 799.7 | 800.9 | 804.9 | 799.2 |
| 177.5° | 804.9 | 800.9 | 801.5 | 805.6 | 800.3 |
| 180°   | 802.1 | 802.1 | 802.1 | 802.1 | 802.1 |

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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 | 8.82             | 9.68  | 9.75  | 10.62 | 11.85 | 4.78           | 5.64 | 5.71 | 6.58 | 7.81  |
|                 | 3H   | 10.49            | 11.26 | 11.44 | 12.22 | 13.47 | 5.96           | 6.73 | 6.91 | 7.69 | 8.93  |
|                 | 4H   | 11.10            | 11.83 | 12.06 | 12.79 | 14.04 | 6.41           | 7.14 | 7.37 | 8.10 | 9.35  |
|                 | 6H   | 11.52            | 12.19 | 12.49 | 13.15 | 14.42 | 6.73           | 7.39 | 7.70 | 8.36 | 9.63  |
|                 | 8H   | 11.64            | 12.28 | 12.62 | 13.26 | 14.53 | 6.81           | 7.45 | 7.79 | 8.43 | 9.70  |
|                 | 12H  | 11.71            | 12.31 | 12.69 | 13.29 | 14.58 | 6.86           | 7.46 | 7.84 | 8.44 | 9.73  |
| 4H              | 2H   | 8.84             | 9.56  | 9.80  | 10.52 | 11.78 | 5.37           | 6.10 | 6.34 | 7.06 | 8.32  |
|                 | 3H   | 10.66            | 11.27 | 11.64 | 12.26 | 13.53 | 6.72           | 7.32 | 7.70 | 8.31 | 9.58  |
|                 | 4H   | 11.35            | 11.90 | 12.34 | 12.89 | 14.18 | 7.26           | 7.81 | 8.25 | 8.80 | 10.09 |
|                 | 6H   | 11.87            | 12.34 | 12.86 | 13.35 | 14.64 | 7.68           | 8.15 | 8.67 | 9.16 | 10.45 |
|                 | 8H   | 12.04            | 12.48 | 13.04 | 13.48 | 14.79 | 7.80           | 8.25 | 8.80 | 9.25 | 10.55 |
|                 | 12H  | 12.13            | 12.53 | 13.15 | 13.55 | 14.86 | 7.87           | 8.26 | 8.88 | 9.28 | 10.59 |
| 8H              | 4H   | 11.32            | 11.76 | 12.32 | 12.76 | 14.07 | 7.54           | 7.98 | 8.54 | 8.99 | 10.29 |
|                 | 6H   | 11.88            | 12.25 | 12.91 | 13.29 | 14.60 | 8.05           | 8.42 | 9.08 | 9.46 | 10.77 |
|                 | 8H   | 12.10            | 12.42 | 13.13 | 13.45 | 14.77 | 8.24           | 8.56 | 9.27 | 9.59 | 10.92 |
|                 | 12H  | 12.23            | 12.52 | 13.27 | 13.54 | 14.91 | 8.36           | 8.64 | 9.39 | 9.66 | 11.03 |
| 12H             | 4H   | 11.28            | 11.67 | 12.29 | 12.69 | 14.00 | 7.55           | 7.95 | 8.56 | 8.96 | 10.28 |
|                 | 6H   | 11.86            | 12.18 | 12.89 | 13.21 | 14.53 | 8.10           | 8.42 | 9.13 | 9.45 | 10.78 |
|                 | 8H   | 12.08            | 12.36 | 13.11 | 13.38 | 14.75 | 8.31           | 8.59 | 9.34 | 9.61 | 10.98 |

END OF REPORT