

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: P907290

Luminaire Tested: DFN2DIP-TR4F0-040D090US835-FLLFLL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P907290  
REPORT IS A COMBINATION OF REPORTS P900459 AND P897293  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-TR4F0-040D090US835-FLLFLL  
Description: 4 foot, Triangle Define Geo, with Direct Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

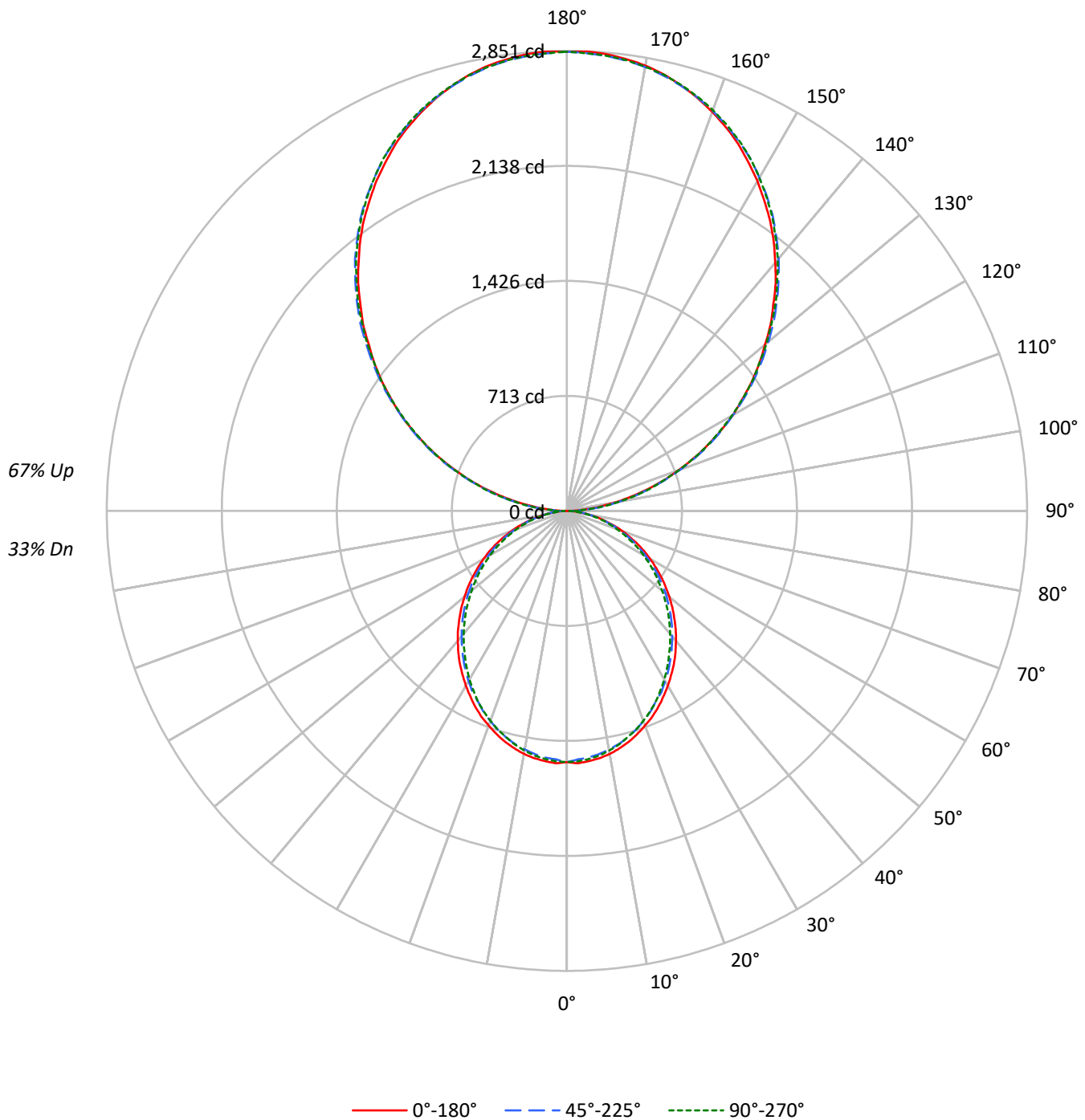
Lumens per Lamp: N/A  
Luminaire Lumens: 11925.0 lumens  
Efficiency: N/A  
Efficacy: 119.7 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 3.43' x L: 3.96' x H: 0.1')  
CIE Type: Semi-Indirect

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

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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   | 103 | 103 | 103 | 103 | 93 | 93 | 93 | 93 | 74 | 74 | 74 | 57 | 57 | 57 | 41 | 41 | 41 |
| 1   | 94  | 90  | 86  | 83  | 85 | 81 | 78 | 75 | 65 | 63 | 61 | 50 | 48 | 47 | 36 | 35 | 34 |
| 2   | 86  | 78  | 72  | 67  | 77 | 71 | 66 | 62 | 57 | 53 | 50 | 44 | 41 | 39 | 32 | 30 | 29 |
| 3   | 78  | 69  | 62  | 56  | 70 | 62 | 56 | 51 | 50 | 46 | 42 | 39 | 36 | 33 | 28 | 26 | 25 |
| 4   | 71  | 61  | 53  | 47  | 64 | 55 | 49 | 43 | 44 | 40 | 36 | 34 | 31 | 28 | 25 | 23 | 21 |
| 5   | 65  | 54  | 46  | 40  | 59 | 49 | 42 | 37 | 40 | 35 | 31 | 31 | 27 | 25 | 23 | 20 | 18 |
| 6   | 60  | 48  | 41  | 35  | 54 | 44 | 37 | 32 | 36 | 31 | 27 | 28 | 24 | 21 | 20 | 18 | 16 |
| 7   | 56  | 44  | 36  | 30  | 50 | 40 | 33 | 28 | 32 | 27 | 23 | 25 | 22 | 19 | 19 | 16 | 14 |
| 8   | 51  | 39  | 32  | 27  | 46 | 36 | 29 | 25 | 29 | 24 | 21 | 23 | 19 | 17 | 17 | 15 | 13 |
| 9   | 48  | 36  | 29  | 24  | 43 | 33 | 26 | 22 | 27 | 22 | 18 | 21 | 18 | 15 | 16 | 13 | 12 |
| 10  | 45  | 33  | 26  | 21  | 40 | 30 | 24 | 20 | 25 | 20 | 17 | 19 | 16 | 14 | 15 | 12 | 11 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 1236 | 1236 | 1236 |
| 5°  | 1238 | 1219 | 1227 |
| 10° | 1228 | 1203 | 1211 |
| 15° | 1210 | 1183 | 1185 |
| 20° | 1186 | 1155 | 1158 |
| 25° | 1162 | 1123 | 1127 |
| 30° | 1131 | 1092 | 1088 |
| 35° | 1102 | 1056 | 1047 |
| 40° | 1067 | 1019 | 1008 |
| 45° | 1032 | 983  | 967  |
| 50° | 993  | 944  | 921  |
| 55° | 952  | 900  | 878  |
| 60° | 907  | 847  | 828  |
| 65° | 857  | 793  | 771  |
| 70° | 793  | 726  | 708  |
| 75° | 705  | 646  | 650  |
| 80° | 599  | 545  | 540  |
| 85° | 433  | 370  | 358  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 90°

Vertical Angle: 90°

Luminance: 2218 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 146.5   | 1.2       |
| 10°-20°   | 412.2   | 3.5       |
| 20°-30°   | 605.7   | 5.1       |
| 30°-40°   | 703.5   | 5.9       |
| 40°-50°   | 702.6   | 5.9       |
| 50°-60°   | 612.7   | 5.1       |
| 60°-70°   | 452.9   | 3.8       |
| 70°-80°   | 256.2   | 2.1       |
| 80°-90°   | 75.7    | 0.6       |
| 90°-100°  | 176.1   | 1.5       |
| 100°-110° | 559.6   | 4.7       |
| 110°-120° | 957.7   | 8.0       |
| 120°-130° | 1259.5  | 10.6      |
| 130°-140° | 1413.8  | 11.9      |
| 140°-150° | 1386.4  | 11.6      |
| 150°-160° | 1163.0  | 9.8       |
| 160°-170° | 771.2   | 6.5       |
| 170°-180° | 269.6   | 2.3       |
| 0°-30°    | 1164.4  | 9.8       |
| 0°-40°    | 1867.9  | 15.7      |
| 0°-60°    | 3183.2  | 26.7      |
| 0°-90°    | 3968.1  | 33.3      |
| 90°-120°  | 1693.5  | 14.2      |
| 90°-150°  | 5753.1  | 48.2      |
| 90°-180°  | 7957.0  | 66.7      |
| 0°-180°   | 11925.0 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 1556 | 1556  | 1556 | 1556  | 1556 |      |
| 5°   | 1556 | 1550  | 1534 | 1546  | 1543 | 148  |
| 15°  | 1482 | 1473  | 1453 | 1459  | 1452 | 417  |
| 25°  | 1341 | 1329  | 1304 | 1306  | 1304 | 617  |
| 35°  | 1157 | 1142  | 1118 | 1109  | 1102 | 722  |
| 45°  | 941  | 931   | 908  | 892   | 886  | 727  |
| 55°  | 712  | 703   | 686  | 668   | 660  | 637  |
| 65°  | 480  | 471   | 456  | 443   | 436  | 475  |
| 75°  | 251  | 248   | 241  | 232   | 235  | 268  |
| 85°  | 61   | 60    | 58   | 54    | 52   | 68   |
| 90°  | 3    | 31    | 84   | 79    | 82   | 12   |
| 95°  | 125  | 149   | 154  | 154   | 149  | 139  |
| 105° | 517  | 523   | 529  | 533   | 533  | 545  |
| 115° | 961  | 975   | 970  | 968   | 961  | 951  |
| 125° | 1398 | 1419  | 1412 | 1405  | 1402 | 1249 |
| 135° | 1808 | 1835  | 1840 | 1837  | 1830 | 1398 |
| 145° | 2195 | 2212  | 2226 | 2228  | 2219 | 1372 |
| 155° | 2510 | 2517  | 2525 | 2537  | 2529 | 1155 |
| 165° | 2730 | 2728  | 2728 | 2745  | 2733 | 770  |
| 175° | 2841 | 2834  | 2829 | 2846  | 2832 | 270  |
| 180° | 2846 | 2846  | 2846 | 2846  | 2846 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 1556.4 | 1556.4 | 1556.4 | 1556.4 | 1556.4 |
| 2.5°   | 1565.5 | 1558.0 | 1541.5 | 1556.4 | 1553.6 |
| 5°     | 1556.4 | 1550.5 | 1534.0 | 1545.9 | 1543.1 |
| 7.5°   | 1545.9 | 1537.0 | 1520.5 | 1532.6 | 1529.6 |
| 10°    | 1529.6 | 1519.1 | 1501.2 | 1513.1 | 1508.6 |
| 12.5°  | 1507.0 | 1498.1 | 1480.2 | 1487.7 | 1484.6 |
| 15°    | 1481.6 | 1472.7 | 1453.2 | 1459.2 | 1451.8 |
| 17.5°  | 1450.2 | 1441.3 | 1421.8 | 1429.2 | 1421.8 |
| 20°    | 1415.7 | 1406.8 | 1385.9 | 1390.3 | 1384.5 |
| 22.5°  | 1381.4 | 1367.9 | 1348.4 | 1348.4 | 1345.4 |
| 25°    | 1340.9 | 1329.0 | 1303.6 | 1306.5 | 1303.6 |
| 27.5°  | 1296.0 | 1285.5 | 1266.2 | 1261.7 | 1254.3 |
| 30°    | 1251.2 | 1239.2 | 1216.8 | 1212.3 | 1206.3 |
| 32.5°  | 1203.3 | 1194.4 | 1170.4 | 1161.4 | 1155.3 |
| 35°    | 1156.9 | 1142.0 | 1118.0 | 1109.0 | 1101.5 |
| 37.5°  | 1104.5 | 1091.0 | 1067.0 | 1056.6 | 1049.1 |
| 40°    | 1050.7 | 1038.6 | 1014.6 | 1001.3 | 995.3  |
| 42.5°  | 998.3  | 986.2  | 962.4  | 947.3  | 938.4  |
| 45°    | 941.4  | 931.0  | 908.4  | 892.1  | 886.0  |
| 47.5°  | 886.0  | 875.5  | 851.6  | 835.1  | 826.2  |
| 50°    | 827.6  | 820.1  | 799.2  | 778.2  | 770.7  |
| 52.5°  | 770.7  | 760.3  | 740.9  | 724.4  | 713.9  |
| 55°    | 712.5  | 703.4  | 685.5  | 667.5  | 660.1  |
| 57.5°  | 654.0  | 646.6  | 627.0  | 609.1  | 603.1  |
| 60°    | 595.6  | 589.7  | 568.8  | 552.3  | 547.8  |
| 62.5°  | 538.8  | 528.3  | 513.4  | 498.4  | 492.4  |
| 65°    | 480.5  | 471.4  | 456.5  | 443.0  | 435.6  |
| 67.5°  | 420.6  | 413.0  | 399.7  | 389.2  | 383.2  |
| 70°    | 365.2  | 359.2  | 345.7  | 335.2  | 329.3  |
| 72.5°  | 308.4  | 302.3  | 294.9  | 284.4  | 279.9  |
| 75°    | 251.4  | 248.5  | 240.9  | 232.0  | 235.0  |
| 77.5°  | 200.5  | 194.5  | 191.5  | 187.0  | 182.6  |
| 80°    | 149.7  | 148.1  | 145.1  | 140.7  | 137.7  |
| 82.5°  | 101.8  | 101.8  | 100.4  | 94.3   | 94.3   |
| 85°    | 61.3   | 59.9   | 58.4   | 53.8   | 52.4   |
| 87.5°  | 27.0   | 24.0   | 21.0   | 16.5   | 14.9   |
| 90°    | 2.6    | 30.9   | 84.1   | 78.9   | 81.5   |
| 92.5°  | 53.2   | 72.1   | 74.7   | 77.2   | 77.2   |
| 95°    | 125.3  | 149.3  | 153.6  | 153.6  | 149.3  |
| 97.5°  | 208.5  | 230.8  | 240.3  | 240.3  | 240.3  |
| 100°   | 304.6  | 324.4  | 331.2  | 331.2  | 328.7  |
| 102.5° | 405.9  | 420.5  | 429.9  | 432.5  | 429.9  |
| 105°   | 516.6  | 523.4  | 528.6  | 532.9  | 532.9  |
| 107.5° | 626.4  | 636.7  | 636.7  | 638.4  | 626.4  |
| 110°   | 732.8  | 746.6  | 746.6  | 746.6  | 739.7  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 847.8  | 862.4  | 859.8  | 853.0  | 847.8  |
| 115°   | 961.1  | 974.8  | 970.5  | 968.0  | 961.1  |
| 117.5° | 1073.5 | 1092.4 | 1080.4 | 1073.5 | 1066.6 |
| 120°   | 1186.8 | 1205.6 | 1186.8 | 1186.8 | 1179.0 |
| 122.5° | 1289.7 | 1313.8 | 1301.8 | 1294.9 | 1289.7 |
| 125°   | 1397.9 | 1419.3 | 1412.5 | 1404.7 | 1402.2 |
| 127.5° | 1503.4 | 1530.0 | 1520.6 | 1510.3 | 1503.4 |
| 130°   | 1602.1 | 1633.0 | 1628.7 | 1623.5 | 1614.1 |
| 132.5° | 1712.8 | 1736.8 | 1738.5 | 1726.5 | 1719.7 |
| 135°   | 1808.0 | 1834.6 | 1839.8 | 1837.2 | 1830.4 |
| 137.5° | 1914.4 | 1935.9 | 1940.2 | 1938.5 | 1928.2 |
| 140°   | 2008.0 | 2029.4 | 2041.4 | 2041.4 | 2032.0 |
| 142.5° | 2104.1 | 2125.5 | 2132.4 | 2135.0 | 2125.5 |
| 145°   | 2195.1 | 2212.2 | 2225.9 | 2228.5 | 2219.1 |
| 147.5° | 2276.6 | 2298.0 | 2308.3 | 2312.6 | 2303.2 |
| 150°   | 2360.7 | 2375.3 | 2384.7 | 2392.4 | 2384.7 |
| 152.5° | 2435.3 | 2449.9 | 2461.9 | 2471.4 | 2461.9 |
| 155°   | 2510.0 | 2516.8 | 2524.6 | 2536.6 | 2528.9 |
| 157.5° | 2574.3 | 2579.5 | 2583.8 | 2600.9 | 2588.9 |
| 160°   | 2631.8 | 2637.0 | 2639.6 | 2654.1 | 2643.8 |
| 162.5° | 2685.0 | 2685.0 | 2687.6 | 2703.9 | 2691.9 |
| 165°   | 2730.5 | 2727.9 | 2727.9 | 2745.1 | 2733.1 |
| 167.5° | 2771.7 | 2764.0 | 2764.0 | 2781.1 | 2769.1 |
| 170°   | 2802.6 | 2795.7 | 2793.2 | 2810.3 | 2795.7 |
| 172.5° | 2824.0 | 2817.2 | 2814.6 | 2831.8 | 2817.2 |
| 175°   | 2841.2 | 2834.3 | 2829.2 | 2846.4 | 2831.8 |
| 177.5° | 2850.6 | 2843.8 | 2838.6 | 2853.2 | 2838.6 |
| 180°   | 2846.4 | 2846.4 | 2846.4 | 2846.4 | 2846.4 |

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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 | 6.22             | 6.95  | 7.30  | 8.03  | 9.52  | 5.78           | 6.51  | 6.87  | 7.60  | 9.09  |
|                 | 3H   | 7.87             | 8.52  | 8.96  | 9.61  | 11.12 | 7.39           | 8.05  | 8.49  | 9.14  | 10.65 |
|                 | 4H   | 8.45             | 9.07  | 9.56  | 10.16 | 11.68 | 7.97           | 8.59  | 9.08  | 9.69  | 11.21 |
|                 | 6H   | 8.84             | 9.41  | 9.96  | 10.51 | 12.04 | 8.36           | 8.94  | 9.48  | 10.04 | 11.56 |
|                 | 8H   | 8.94             | 9.48  | 10.06 | 10.60 | 12.12 | 8.47           | 9.01  | 9.59  | 10.12 | 11.64 |
|                 | 12H  | 8.98             | 9.50  | 10.11 | 10.61 | 12.15 | 8.50           | 9.02  | 9.63  | 10.13 | 11.67 |
| 4H              | 2H   | 6.66             | 7.28  | 7.78  | 8.38  | 9.89  | 6.32           | 6.94  | 7.43  | 8.03  | 9.55  |
|                 | 3H   | 8.52             | 9.03  | 9.64  | 10.16 | 11.68 | 8.12           | 8.64  | 9.24  | 9.76  | 11.29 |
|                 | 4H   | 9.22             | 9.70  | 10.35 | 10.81 | 12.36 | 8.82           | 9.29  | 9.94  | 10.41 | 11.95 |
|                 | 6H   | 9.73             | 10.14 | 10.86 | 11.27 | 12.81 | 9.32           | 9.73  | 10.45 | 10.87 | 12.40 |
|                 | 8H   | 9.88             | 10.26 | 11.01 | 11.39 | 12.94 | 9.47           | 9.85  | 10.60 | 10.97 | 12.53 |
|                 | 12H  | 9.94             | 10.29 | 11.09 | 11.43 | 12.99 | 9.52           | 9.87  | 10.67 | 11.01 | 12.57 |
| 8H              | 4H   | 9.41             | 9.79  | 10.54 | 10.92 | 12.47 | 9.05           | 9.43  | 10.18 | 10.56 | 12.11 |
|                 | 6H   | 10.03            | 10.35 | 11.19 | 11.52 | 13.07 | 9.67           | 9.99  | 10.83 | 11.16 | 12.71 |
|                 | 8H   | 10.25            | 10.53 | 11.41 | 11.68 | 13.25 | 9.89           | 10.16 | 11.04 | 11.31 | 12.88 |
|                 | 12H  | 10.38            | 10.62 | 11.54 | 11.77 | 13.38 | 10.00          | 10.24 | 11.16 | 11.38 | 12.99 |
| 12H             | 4H   | 9.39             | 9.73  | 10.54 | 10.87 | 12.43 | 9.04           | 9.38  | 10.19 | 10.52 | 12.08 |
|                 | 6H   | 10.06            | 10.34 | 11.22 | 11.49 | 13.06 | 9.71           | 9.99  | 10.87 | 11.14 | 12.71 |
|                 | 8H   | 10.30            | 10.54 | 11.46 | 11.69 | 13.30 | 9.94           | 10.18 | 11.11 | 11.33 | 12.94 |

END OF REPORT