

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: P920933

Luminaire Tested: DFN2DIP-TR4F0-040D090US935-RLLONL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P920933  
REPORT IS A COMBINATION OF REPORTS P901980 AND P898849  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-TR4F0-040D090US935-RLLONL  
Description: 4 foot, Triangle Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

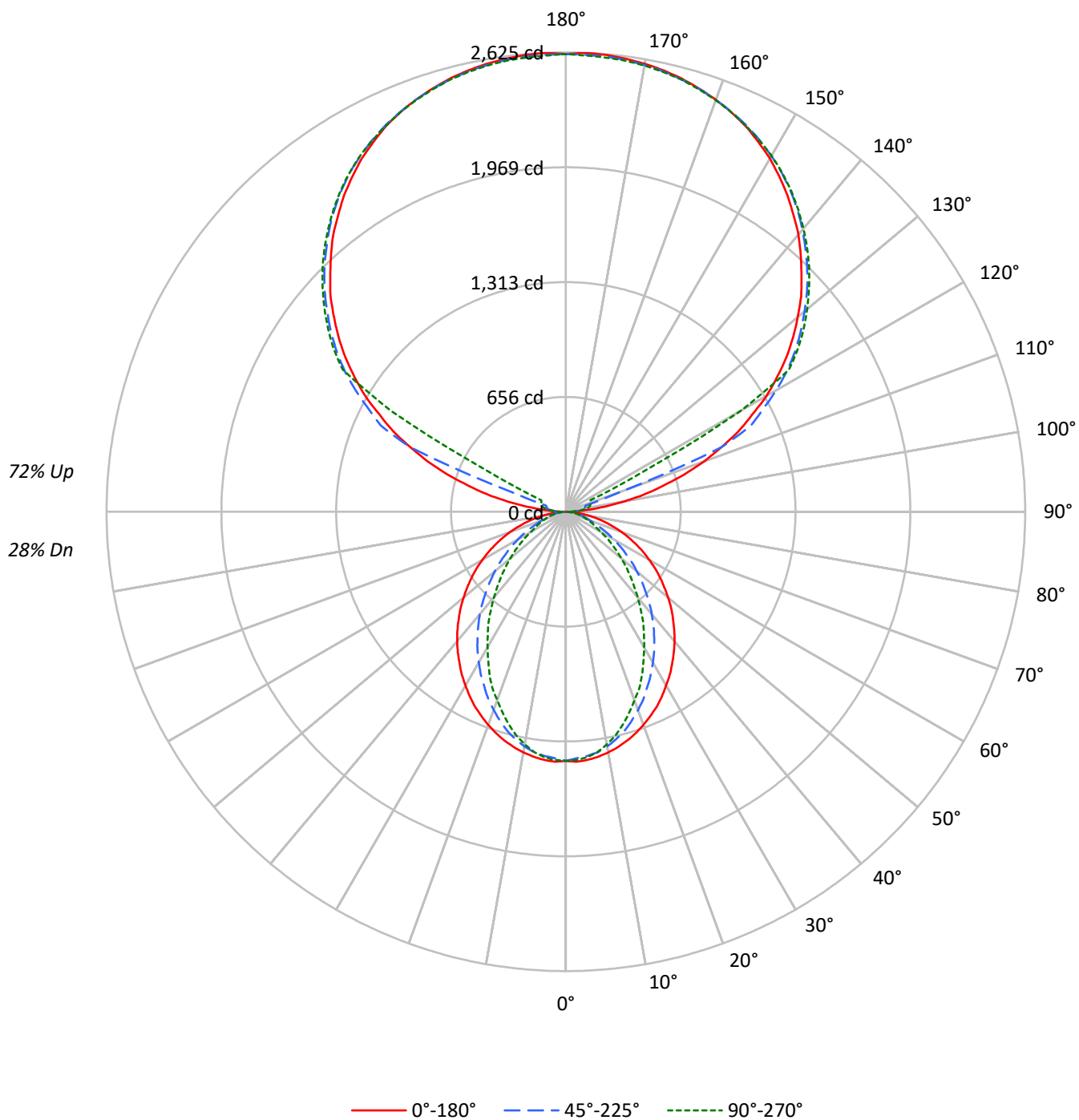
**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 10598.9 lumens  
Efficiency: N/A  
Efficacy: 106.4 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): 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   | 102 | 102 | 102 | 102 | 91 | 91 | 91 | 91 | 71 | 71 | 71 | 53 | 53 | 53 | 36 | 36 | 36 |
| 1   | 93  | 89  | 85  | 82  | 83 | 80 | 77 | 74 | 62 | 60 | 59 | 46 | 45 | 44 | 32 | 31 | 31 |
| 2   | 85  | 78  | 72  | 67  | 76 | 70 | 65 | 61 | 55 | 52 | 49 | 41 | 39 | 37 | 28 | 27 | 26 |
| 3   | 78  | 69  | 62  | 56  | 69 | 62 | 56 | 51 | 49 | 45 | 41 | 37 | 34 | 32 | 25 | 24 | 22 |
| 4   | 71  | 61  | 53  | 48  | 63 | 55 | 48 | 44 | 43 | 39 | 35 | 33 | 30 | 27 | 23 | 21 | 20 |
| 5   | 65  | 54  | 47  | 41  | 58 | 49 | 42 | 37 | 39 | 34 | 30 | 29 | 26 | 24 | 21 | 19 | 17 |
| 6   | 60  | 49  | 41  | 35  | 54 | 44 | 37 | 32 | 35 | 30 | 27 | 27 | 23 | 21 | 19 | 17 | 15 |
| 7   | 55  | 44  | 36  | 31  | 49 | 40 | 33 | 28 | 32 | 27 | 23 | 24 | 21 | 18 | 17 | 15 | 14 |
| 8   | 51  | 40  | 32  | 27  | 46 | 36 | 30 | 25 | 29 | 24 | 21 | 22 | 19 | 16 | 16 | 14 | 12 |
| 9   | 48  | 36  | 29  | 24  | 43 | 33 | 27 | 22 | 26 | 22 | 19 | 20 | 17 | 15 | 15 | 13 | 11 |
| 10  | 45  | 33  | 26  | 22  | 40 | 30 | 24 | 20 | 24 | 20 | 17 | 19 | 16 | 13 | 14 | 12 | 10 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 1131 | 1131 | 1131 |
| 5°  | 1133 | 1113 | 1120 |
| 10° | 1121 | 1091 | 1083 |
| 15° | 1106 | 1055 | 1027 |
| 20° | 1086 | 1005 | 958  |
| 25° | 1065 | 949  | 891  |
| 30° | 1037 | 892  | 807  |
| 35° | 1009 | 831  | 732  |
| 40° | 981  | 767  | 647  |
| 45° | 949  | 697  | 570  |
| 50° | 915  | 626  | 494  |
| 55° | 880  | 550  | 421  |
| 60° | 839  | 470  | 347  |
| 65° | 792  | 389  | 312  |
| 70° | 736  | 314  | 282  |
| 75° | 664  | 277  | 257  |
| 80° | 561  | 232  | 223  |
| 85° | 392  | 155  | 167  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 90°

Vertical Angle: 90°

Luminance: 1388 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 133.4   | 1.3       |
| 10°-20°   | 366.2   | 3.5       |
| 20°-30°   | 514.2   | 4.9       |
| 30°-40°   | 560.5   | 5.3       |
| 40°-50°   | 515.1   | 4.9       |
| 50°-60°   | 404.5   | 3.8       |
| 60°-70°   | 263.3   | 2.5       |
| 70°-80°   | 135.6   | 1.3       |
| 80°-90°   | 39.2    | 0.4       |
| 90°-100°  | 86.2    | 0.8       |
| 100°-110° | 321.5   | 3.0       |
| 110°-120° | 852.6   | 8.0       |
| 120°-130° | 1414.1  | 13.3      |
| 130°-140° | 1502.1  | 14.2      |
| 140°-150° | 1396.0  | 13.2      |
| 150°-160° | 1122.4  | 10.6      |
| 160°-170° | 723.2   | 6.8       |
| 170°-180° | 248.9   | 2.3       |
| 0°-30°    | 1013.8  | 9.6       |
| 0°-40°    | 1574.2  | 14.9      |
| 0°-60°    | 2493.9  | 23.5      |
| 0°-90°    | 2932.0  | 27.7      |
| 90°-120°  | 1260.3  | 11.9      |
| 90°-150°  | 5572.4  | 52.6      |
| 90°-180°  | 7667.0  | 72.3      |
| 0°-180°   | 10598.9 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 1423 | 1423  | 1423 | 1423  | 1423 |      |
| 5°   | 1423 | 1417  | 1400 | 1412  | 1408 | 135  |
| 15°  | 1354 | 1340  | 1296 | 1271  | 1259 | 382  |
| 25°  | 1229 | 1188  | 1103 | 1050  | 1030 | 565  |
| 35°  | 1059 | 993   | 880  | 799   | 770  | 663  |
| 45°  | 866  | 779   | 644  | 553   | 522  | 668  |
| 55°  | 658  | 558   | 419  | 341   | 317  | 588  |
| 65°  | 444  | 340   | 224  | 180   | 176  | 441  |
| 75°  | 237  | 147   | 103  | 94    | 93   | 251  |
| 85°  | 55   | 28    | 24   | 24    | 24   | 64   |
| 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 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 1423.4 | 1423.4 | 1423.4 | 1423.4 | 1423.4 |
| 2.5°   | 1429.9 | 1423.4 | 1409.2 | 1422.2 | 1419.5 |
| 5°     | 1423.4 | 1416.9 | 1400.2 | 1411.8 | 1408.0 |
| 7.5°   | 1411.8 | 1404.1 | 1386.1 | 1391.1 | 1384.7 |
| 10°    | 1396.4 | 1387.3 | 1361.6 | 1357.6 | 1350.0 |
| 12.5°  | 1377.1 | 1365.5 | 1330.6 | 1322.9 | 1308.7 |
| 15°    | 1353.8 | 1339.6 | 1295.9 | 1271.4 | 1258.6 |
| 17.5°  | 1326.8 | 1306.1 | 1252.0 | 1223.7 | 1203.1 |
| 20°    | 1295.9 | 1270.1 | 1205.7 | 1173.5 | 1145.1 |
| 22.5°  | 1262.4 | 1232.8 | 1158.0 | 1114.2 | 1095.0 |
| 25°    | 1228.9 | 1187.7 | 1102.6 | 1049.9 | 1030.4 |
| 27.5°  | 1189.0 | 1145.1 | 1051.1 | 990.6  | 960.9  |
| 30°    | 1146.5 | 1097.4 | 994.4  | 928.8  | 894.0  |
| 32.5°  | 1105.3 | 1045.9 | 940.4  | 863.1  | 830.8  |
| 35°    | 1058.9 | 993.2  | 879.9  | 798.7  | 770.2  |
| 37.5°  | 1013.8 | 942.9  | 823.1  | 734.2  | 702.1  |
| 40°    | 966.1  | 888.9  | 763.9  | 672.4  | 638.9  |
| 42.5°  | 917.1  | 834.7  | 704.6  | 609.2  | 577.1  |
| 45°    | 865.6  | 779.3  | 644.1  | 552.6  | 521.7  |
| 47.5°  | 816.7  | 725.3  | 586.2  | 494.6  | 466.3  |
| 50°    | 762.6  | 671.1  | 529.4  | 440.5  | 413.5  |
| 52.5°  | 709.7  | 613.1  | 475.4  | 390.3  | 365.8  |
| 55°    | 658.2  | 557.8  | 418.6  | 341.4  | 316.9  |
| 57.5°  | 605.5  | 502.4  | 368.4  | 296.3  | 275.7  |
| 60°    | 551.3  | 448.2  | 315.6  | 249.9  | 229.4  |
| 62.5°  | 498.6  | 395.5  | 270.4  | 208.7  | 198.5  |
| 65°    | 444.4  | 340.0  | 224.1  | 180.4  | 176.4  |
| 67.5°  | 393.0  | 288.5  | 180.4  | 158.4  | 154.5  |
| 70°    | 338.8  | 238.3  | 149.4  | 136.6  | 131.3  |
| 72.5°  | 287.3  | 191.9  | 124.9  | 114.7  | 112.1  |
| 75°    | 236.9  | 146.8  | 103.1  | 94.0   | 92.8   |
| 77.5°  | 186.8  | 104.3  | 81.2   | 76.0   | 73.4   |
| 80°    | 140.3  | 74.7   | 61.7   | 56.7   | 56.7   |
| 82.5°  | 97.9   | 50.3   | 42.5   | 39.9   | 39.9   |
| 85°    | 55.4   | 28.3   | 24.5   | 24.5   | 24.5   |
| 87.5°  | 20.7   | 10.2   | 10.2   | 9.0    | 9.0    |
| 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  |

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**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 |

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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 | 5.01             | 5.68 | 6.14 | 6.80 | 8.36  | 0.98           | 1.66 | 2.11 | 2.78 | 4.34 |
|                 | 3H   | 6.67             | 7.28 | 7.81 | 8.40 | 9.98  | 2.16           | 2.76 | 3.30 | 3.89 | 5.47 |
|                 | 4H   | 7.27             | 7.85 | 8.42 | 8.98 | 10.56 | 2.60           | 3.17 | 3.75 | 4.30 | 5.88 |
|                 | 6H   | 7.69             | 8.21 | 8.84 | 9.34 | 10.94 | 2.91           | 3.44 | 4.07 | 4.57 | 6.17 |
|                 | 8H   | 7.81             | 8.31 | 8.97 | 9.46 | 11.04 | 3.00           | 3.50 | 4.16 | 4.65 | 6.23 |
|                 | 12H  | 7.86             | 8.34 | 9.03 | 9.48 | 11.09 | 3.04           | 3.52 | 4.20 | 4.66 | 6.26 |
| 4H              | 2H   | 5.00             | 5.58 | 6.16 | 6.71 | 8.29  | 1.55           | 2.13 | 2.71 | 3.26 | 4.84 |
|                 | 3H   | 6.82             | 7.30 | 7.98 | 8.45 | 10.05 | 2.89           | 3.37 | 4.05 | 4.52 | 6.12 |
|                 | 4H   | 7.51             | 7.94 | 8.67 | 9.09 | 10.70 | 3.43           | 3.87 | 4.60 | 5.02 | 6.63 |
|                 | 6H   | 8.01             | 8.39 | 9.18 | 9.55 | 11.16 | 3.85           | 4.22 | 5.02 | 5.39 | 6.99 |
|                 | 8H   | 8.18             | 8.53 | 9.35 | 9.69 | 11.31 | 3.97           | 4.32 | 5.14 | 5.48 | 7.10 |
|                 | 12H  | 8.27             | 8.59 | 9.46 | 9.76 | 11.38 | 4.03           | 4.35 | 5.22 | 5.52 | 7.14 |
| 8H              | 4H   | 7.46             | 7.81 | 8.63 | 8.97 | 10.59 | 3.70           | 4.05 | 4.87 | 5.21 | 6.83 |
|                 | 6H   | 8.02             | 8.31 | 9.21 | 9.51 | 11.13 | 4.22           | 4.51 | 5.40 | 5.71 | 7.32 |
|                 | 8H   | 8.24             | 8.49 | 9.43 | 9.67 | 11.30 | 4.41           | 4.66 | 5.60 | 5.84 | 7.47 |
|                 | 12H  | 8.37             | 8.59 | 9.57 | 9.77 | 11.44 | 4.52           | 4.74 | 5.72 | 5.92 | 7.59 |
| 12H             | 4H   | 7.41             | 7.72 | 8.59 | 8.89 | 10.52 | 3.70           | 4.02 | 4.89 | 5.19 | 6.81 |
|                 | 6H   | 8.00             | 8.25 | 9.19 | 9.43 | 11.06 | 4.27           | 4.52 | 5.46 | 5.70 | 7.33 |
|                 | 8H   | 8.21             | 8.43 | 9.41 | 9.61 | 11.28 | 4.47           | 4.69 | 5.67 | 5.87 | 7.54 |

END OF REPORT