

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: P916333

Luminaire Tested: DFN2DIP-HX4F0-040D070US930-RLLFLL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P916333  
REPORT IS A COMBINATION OF REPORTS P899354 AND P896188  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-HX4F0-040D070US930-RLLFLL  
Description: 4 foot, Hexagon Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

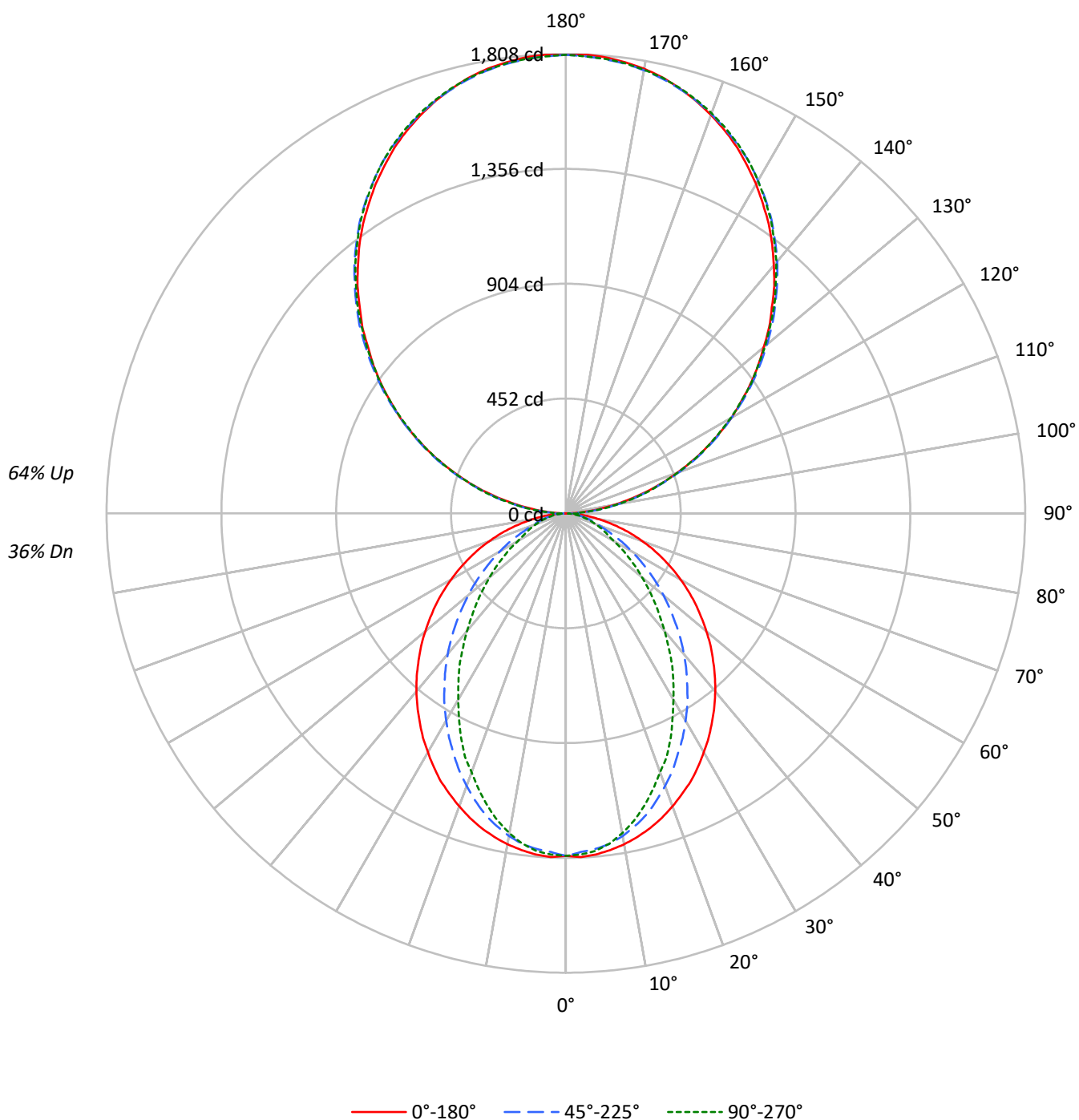
**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 7822.8 lumens  
Efficiency: N/A  
Efficacy: 107.5 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 0.99 / 1.16  
Luminous Opening: Rectangular w/ Sides (W: 3.54' x L: 4.09' x H: 0.1')  
CIE Type: Semi-Indirect  
  
Input Watts (W): 72.8  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9977  
Total Harmonic Distortion (THDi): 0.049  
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   | 104 | 104 | 104 | 104 | 94 | 94 | 94 | 94 | 75 | 75 | 75 | 58 | 58 | 58 | 43 | 43 | 43 |
| 1   | 95  | 91  | 87  | 84  | 86 | 82 | 79 | 76 | 66 | 64 | 62 | 52 | 50 | 49 | 38 | 37 | 37 |
| 2   | 87  | 80  | 74  | 69  | 78 | 72 | 67 | 63 | 59 | 55 | 52 | 46 | 44 | 42 | 34 | 33 | 31 |
| 3   | 79  | 70  | 63  | 58  | 71 | 64 | 58 | 53 | 52 | 48 | 44 | 41 | 38 | 36 | 31 | 29 | 27 |
| 4   | 73  | 62  | 55  | 49  | 65 | 57 | 50 | 45 | 46 | 42 | 38 | 37 | 33 | 31 | 27 | 25 | 24 |
| 5   | 67  | 56  | 48  | 42  | 60 | 51 | 44 | 39 | 42 | 37 | 33 | 33 | 29 | 27 | 25 | 23 | 21 |
| 6   | 61  | 50  | 42  | 37  | 55 | 46 | 39 | 34 | 37 | 32 | 29 | 30 | 26 | 24 | 23 | 20 | 18 |
| 7   | 57  | 45  | 37  | 32  | 51 | 41 | 35 | 30 | 34 | 29 | 25 | 27 | 24 | 21 | 21 | 18 | 17 |
| 8   | 53  | 41  | 33  | 28  | 48 | 38 | 31 | 26 | 31 | 26 | 23 | 25 | 21 | 19 | 19 | 17 | 15 |
| 9   | 49  | 37  | 30  | 25  | 44 | 34 | 28 | 24 | 28 | 24 | 20 | 23 | 19 | 17 | 18 | 15 | 14 |
| 10  | 46  | 34  | 27  | 23  | 42 | 31 | 25 | 21 | 26 | 21 | 18 | 21 | 18 | 15 | 16 | 14 | 12 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 1002 | 1002 | 1002 |
| 5°  | 1004 | 986  | 993  |
| 10° | 994  | 967  | 960  |
| 15° | 980  | 935  | 911  |
| 20° | 962  | 891  | 849  |
| 25° | 944  | 842  | 790  |
| 30° | 919  | 791  | 715  |
| 35° | 895  | 737  | 649  |
| 40° | 870  | 681  | 574  |
| 45° | 841  | 618  | 505  |
| 50° | 812  | 555  | 438  |
| 55° | 781  | 488  | 374  |
| 60° | 745  | 417  | 308  |
| 65° | 704  | 346  | 277  |
| 70° | 654  | 279  | 251  |
| 75° | 591  | 246  | 228  |
| 80° | 500  | 207  | 198  |
| 85° | 349  | 139  | 150  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 90°

Vertical Angle: 90°

Luminance: 1361 cd/sqm

TEST NUMBER: P916333

CATALOG NUMBER: DFN2DIP-HX4F0-040D070US930-RLFL

**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 126.3  | 1.6       |
| 10°-20°   | 346.8  | 4.4       |
| 20°-30°   | 486.9  | 6.2       |
| 30°-40°   | 530.7  | 6.8       |
| 40°-50°   | 487.8  | 6.2       |
| 50°-60°   | 383.1  | 4.9       |
| 60°-70°   | 249.3  | 3.2       |
| 70°-80°   | 128.4  | 1.6       |
| 80°-90°   | 37.9   | 0.5       |
| 90°-100°  | 111.7  | 1.4       |
| 100°-110° | 354.9  | 4.5       |
| 110°-120° | 607.3  | 7.8       |
| 120°-130° | 798.7  | 10.2      |
| 130°-140° | 896.5  | 11.5      |
| 140°-150° | 879.1  | 11.2      |
| 150°-160° | 737.5  | 9.4       |
| 160°-170° | 489.1  | 6.3       |
| 170°-180° | 170.9  | 2.2       |
| 0°-30°    | 960.0  | 12.3      |
| 0°-40°    | 1490.7 | 19.1      |
| 0°-60°    | 2361.5 | 30.2      |
| 0°-90°    | 2777.1 | 35.5      |
| 90°-120°  | 1073.9 | 13.7      |
| 90°-150°  | 3648.2 | 46.6      |
| 90°-180°  | 5046.0 | 64.5      |
| 0°-180°   | 7822.8 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 1348 | 1348  | 1348 | 1348  | 1348 |      |
| 5°   | 1348 | 1342  | 1326 | 1337  | 1333 | 128  |
| 15°  | 1282 | 1268  | 1227 | 1204  | 1192 | 361  |
| 25°  | 1164 | 1125  | 1044 | 994   | 976  | 535  |
| 35°  | 1003 | 940   | 833  | 756   | 729  | 628  |
| 45°  | 820  | 738   | 610  | 523   | 494  | 633  |
| 55°  | 623  | 528   | 396  | 323   | 300  | 557  |
| 65°  | 421  | 322   | 212  | 171   | 167  | 417  |
| 75°  | 224  | 139   | 98   | 89    | 88   | 237  |
| 85°  | 52   | 27    | 23   | 23    | 23   | 60   |
| 90°  | 2    | 20    | 53   | 50    | 52   | 8    |
| 95°  | 79   | 95    | 97   | 97    | 95   | 88   |
| 105° | 328  | 332   | 335  | 338   | 338  | 346  |
| 115° | 609  | 618   | 616  | 614   | 609  | 603  |
| 125° | 886  | 900   | 896  | 891   | 889  | 792  |
| 135° | 1147 | 1163  | 1167 | 1165  | 1161 | 886  |
| 145° | 1392 | 1403  | 1412 | 1413  | 1407 | 870  |
| 155° | 1592 | 1596  | 1601 | 1608  | 1604 | 733  |
| 165° | 1731 | 1730  | 1730 | 1741  | 1733 | 488  |
| 175° | 1802 | 1797  | 1794 | 1805  | 1796 | 171  |
| 180° | 1805 | 1805  | 1805 | 1805  | 1805 |      |

TEST NUMBER: P916333

CATALOG NUMBER: DFN2DIP-HX4F0-040D070US930-RLFL

**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 1347.9 | 1347.9 | 1347.9 | 1347.9 | 1347.9 |
| 2.5°   | 1354.0 | 1347.9 | 1334.4 | 1346.7 | 1344.2 |
| 5°     | 1347.9 | 1341.7 | 1325.8 | 1336.8 | 1333.3 |
| 7.5°   | 1336.8 | 1329.6 | 1312.5 | 1317.3 | 1311.2 |
| 10°    | 1322.3 | 1313.7 | 1289.3 | 1285.6 | 1278.4 |
| 12.5°  | 1304.0 | 1293.0 | 1260.0 | 1252.7 | 1239.3 |
| 15°    | 1282.0 | 1268.5 | 1227.1 | 1204.0 | 1191.8 |
| 17.5°  | 1256.4 | 1236.8 | 1185.5 | 1158.8 | 1139.2 |
| 20°    | 1227.1 | 1202.6 | 1141.7 | 1111.3 | 1084.3 |
| 22.5°  | 1195.4 | 1167.3 | 1096.5 | 1055.1 | 1036.9 |
| 25°    | 1163.7 | 1124.6 | 1044.1 | 994.2  | 975.7  |
| 27.5°  | 1125.9 | 1084.3 | 995.3  | 938.0  | 909.9  |
| 30°    | 1085.7 | 1039.2 | 941.6  | 879.5  | 846.5  |
| 32.5°  | 1046.6 | 990.4  | 890.5  | 817.3  | 786.7  |
| 35°    | 1002.7 | 940.4  | 833.2  | 756.3  | 729.4  |
| 37.5°  | 960.0  | 892.8  | 779.4  | 695.2  | 664.8  |
| 40°    | 914.8  | 841.7  | 723.3  | 636.7  | 605.0  |
| 42.5°  | 868.5  | 790.4  | 667.2  | 576.9  | 546.5  |
| 45°    | 819.7  | 737.9  | 609.9  | 523.3  | 494.0  |
| 47.5°  | 773.4  | 686.8  | 555.1  | 468.4  | 441.6  |
| 50°    | 722.1  | 635.5  | 501.3  | 417.1  | 391.6  |
| 52.5°  | 672.1  | 580.6  | 450.1  | 369.6  | 346.4  |
| 55°    | 623.3  | 528.2  | 396.4  | 323.3  | 300.1  |
| 57.5°  | 573.3  | 475.7  | 348.9  | 280.5  | 261.1  |
| 60°    | 522.0  | 424.4  | 298.8  | 236.7  | 217.2  |
| 62.5°  | 472.1  | 374.5  | 256.1  | 197.6  | 187.9  |
| 65°    | 420.9  | 322.0  | 212.2  | 170.8  | 167.1  |
| 67.5°  | 372.1  | 273.2  | 170.8  | 150.0  | 146.3  |
| 70°    | 320.8  | 225.7  | 141.5  | 129.3  | 124.3  |
| 72.5°  | 272.1  | 181.7  | 118.3  | 108.6  | 106.2  |
| 75°    | 224.4  | 139.0  | 97.6   | 89.0   | 87.9   |
| 77.5°  | 176.9  | 98.7   | 76.9   | 72.0   | 69.5   |
| 80°    | 132.9  | 70.8   | 58.5   | 53.7   | 53.7   |
| 82.5°  | 92.7   | 47.6   | 40.3   | 37.7   | 37.7   |
| 85°    | 52.4   | 26.8   | 23.2   | 23.2   | 23.2   |
| 87.5°  | 19.6   | 9.7    | 9.7    | 8.6    | 8.6    |
| 90°    | 1.6    | 19.6   | 53.3   | 50.1   | 51.7   |
| 92.5°  | 33.8   | 45.7   | 47.4   | 49.0   | 49.0   |
| 95°    | 79.4   | 94.7   | 97.4   | 97.4   | 94.7   |
| 97.5°  | 132.2  | 146.3  | 152.4  | 152.4  | 152.4  |
| 100°   | 193.1  | 205.7  | 210.0  | 210.0  | 208.4  |
| 102.5° | 257.4  | 266.6  | 272.6  | 274.3  | 272.6  |
| 105°   | 327.6  | 331.9  | 335.2  | 337.9  | 337.9  |
| 107.5° | 397.2  | 403.7  | 403.7  | 404.9  | 397.2  |
| 110°   | 464.7  | 473.4  | 473.4  | 473.4  | 469.0  |

TEST NUMBER: P916333

CATALOG NUMBER: DFN2DIP-HX4F0-040D070US930-RLLFLL

**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 537.6  | 546.9  | 545.3  | 540.9  | 537.6  |
| 115°   | 609.4  | 618.2  | 615.5  | 613.8  | 609.4  |
| 117.5° | 680.7  | 692.7  | 685.1  | 680.7  | 676.4  |
| 120°   | 752.5  | 764.5  | 752.5  | 752.5  | 747.6  |
| 122.5° | 817.8  | 833.1  | 825.5  | 821.1  | 817.8  |
| 125°   | 886.4  | 900.0  | 895.7  | 890.8  | 889.2  |
| 127.5° | 953.3  | 970.2  | 964.3  | 957.7  | 953.3  |
| 130°   | 1015.9 | 1035.5 | 1032.8 | 1029.6 | 1023.5 |
| 132.5° | 1086.1 | 1101.4 | 1102.4 | 1094.9 | 1090.5 |
| 135°   | 1146.6 | 1163.3 | 1166.7 | 1165.0 | 1160.7 |
| 137.5° | 1214.0 | 1227.6 | 1230.3 | 1229.2 | 1222.7 |
| 140°   | 1273.3 | 1286.9 | 1294.5 | 1294.5 | 1288.6 |
| 142.5° | 1334.2 | 1347.9 | 1352.2 | 1353.8 | 1347.9 |
| 145°   | 1392.0 | 1402.8 | 1411.5 | 1413.2 | 1407.2 |
| 147.5° | 1443.6 | 1457.3 | 1463.8 | 1466.5 | 1460.5 |
| 150°   | 1497.0 | 1506.2 | 1512.2 | 1517.1 | 1512.2 |
| 152.5° | 1544.3 | 1553.6 | 1561.1 | 1567.2 | 1561.1 |
| 155°   | 1591.6 | 1595.9 | 1600.9 | 1608.5 | 1603.6 |
| 157.5° | 1632.5 | 1635.7 | 1638.4 | 1649.3 | 1641.7 |
| 160°   | 1668.9 | 1672.2 | 1673.8 | 1683.0 | 1676.5 |
| 162.5° | 1702.7 | 1702.7 | 1704.3 | 1714.6 | 1707.0 |
| 165°   | 1731.4 | 1729.8 | 1729.8 | 1740.7 | 1733.1 |
| 167.5° | 1757.6 | 1752.7 | 1752.7 | 1763.6 | 1756.0 |
| 170°   | 1777.2 | 1772.9 | 1771.2 | 1782.1 | 1772.9 |
| 172.5° | 1790.8 | 1786.4 | 1784.8 | 1795.7 | 1786.4 |
| 175°   | 1801.6 | 1797.3 | 1794.1 | 1804.9 | 1795.7 |
| 177.5° | 1807.7 | 1803.3 | 1800.0 | 1809.3 | 1800.0 |
| 180°   | 1804.9 | 1804.9 | 1804.9 | 1804.9 | 1804.9 |

TEST NUMBER: P916333

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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 | 5.63             | 6.35 | 6.70  | 7.42  | 8.89  | 1.60           | 2.32 | 2.68 | 3.40 | 4.86 |
|                 | 3H   | 7.30             | 7.94 | 8.38  | 9.03  | 10.51 | 2.78           | 3.43 | 3.87 | 4.51 | 6.00 |
|                 | 4H   | 7.90             | 8.51 | 9.00  | 9.60  | 11.09 | 3.23           | 3.84 | 4.33 | 4.93 | 6.42 |
|                 | 6H   | 8.32             | 8.88 | 9.42  | 9.97  | 11.47 | 3.54           | 4.11 | 4.65 | 5.20 | 6.70 |
|                 | 8H   | 8.44             | 8.98 | 9.55  | 10.08 | 11.58 | 3.63           | 4.17 | 4.74 | 5.27 | 6.77 |
|                 | 12H  | 8.50             | 9.01 | 9.61  | 10.11 | 11.63 | 3.67           | 4.18 | 4.79 | 5.28 | 6.80 |
| 4H              | 2H   | 5.63             | 6.25 | 6.74  | 7.33  | 8.82  | 2.18           | 2.80 | 3.29 | 3.88 | 5.37 |
|                 | 3H   | 7.45             | 7.96 | 8.56  | 9.07  | 10.58 | 3.52           | 4.03 | 4.63 | 5.15 | 6.65 |
|                 | 4H   | 8.14             | 8.61 | 9.26  | 9.71  | 11.24 | 4.07           | 4.54 | 5.18 | 5.64 | 7.16 |
|                 | 6H   | 8.65             | 9.05 | 9.77  | 10.18 | 11.69 | 4.48           | 4.89 | 5.61 | 6.01 | 7.53 |
|                 | 8H   | 8.83             | 9.20 | 9.95  | 10.32 | 11.85 | 4.61           | 4.99 | 5.73 | 6.10 | 7.64 |
|                 | 12H  | 8.92             | 9.26 | 10.05 | 10.38 | 11.92 | 4.67           | 5.01 | 5.81 | 6.14 | 7.68 |
| 8H              | 4H   | 8.10             | 8.48 | 9.22  | 9.59  | 11.12 | 4.34           | 4.72 | 5.46 | 5.83 | 7.37 |
|                 | 6H   | 8.66             | 8.97 | 9.81  | 10.13 | 11.66 | 4.86           | 5.17 | 6.00 | 6.33 | 7.86 |
|                 | 8H   | 8.88             | 9.15 | 10.03 | 10.29 | 11.84 | 5.05           | 5.32 | 6.20 | 6.46 | 8.01 |
|                 | 12H  | 9.02             | 9.25 | 10.17 | 10.39 | 11.97 | 5.17           | 5.40 | 6.32 | 6.54 | 8.12 |
| 12H             | 4H   | 8.05             | 8.39 | 9.19  | 9.52  | 11.05 | 4.34           | 4.68 | 5.48 | 5.81 | 7.35 |
|                 | 6H   | 8.64             | 8.91 | 9.79  | 10.05 | 11.60 | 4.91           | 5.18 | 6.06 | 6.32 | 7.87 |
|                 | 8H   | 8.86             | 9.09 | 10.01 | 10.23 | 11.81 | 5.12           | 5.35 | 6.27 | 6.49 | 8.07 |

END OF REPORT