

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: P906167

Luminaire Tested: DFN2DIP-PN4F0-120D050US835-RLLONL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P906167  
REPORT IS A COMBINATION OF REPORTS P901164 AND P898053  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-PN4F0-120D050US835-RLLONL  
Description: 4 foot, Pentagon Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

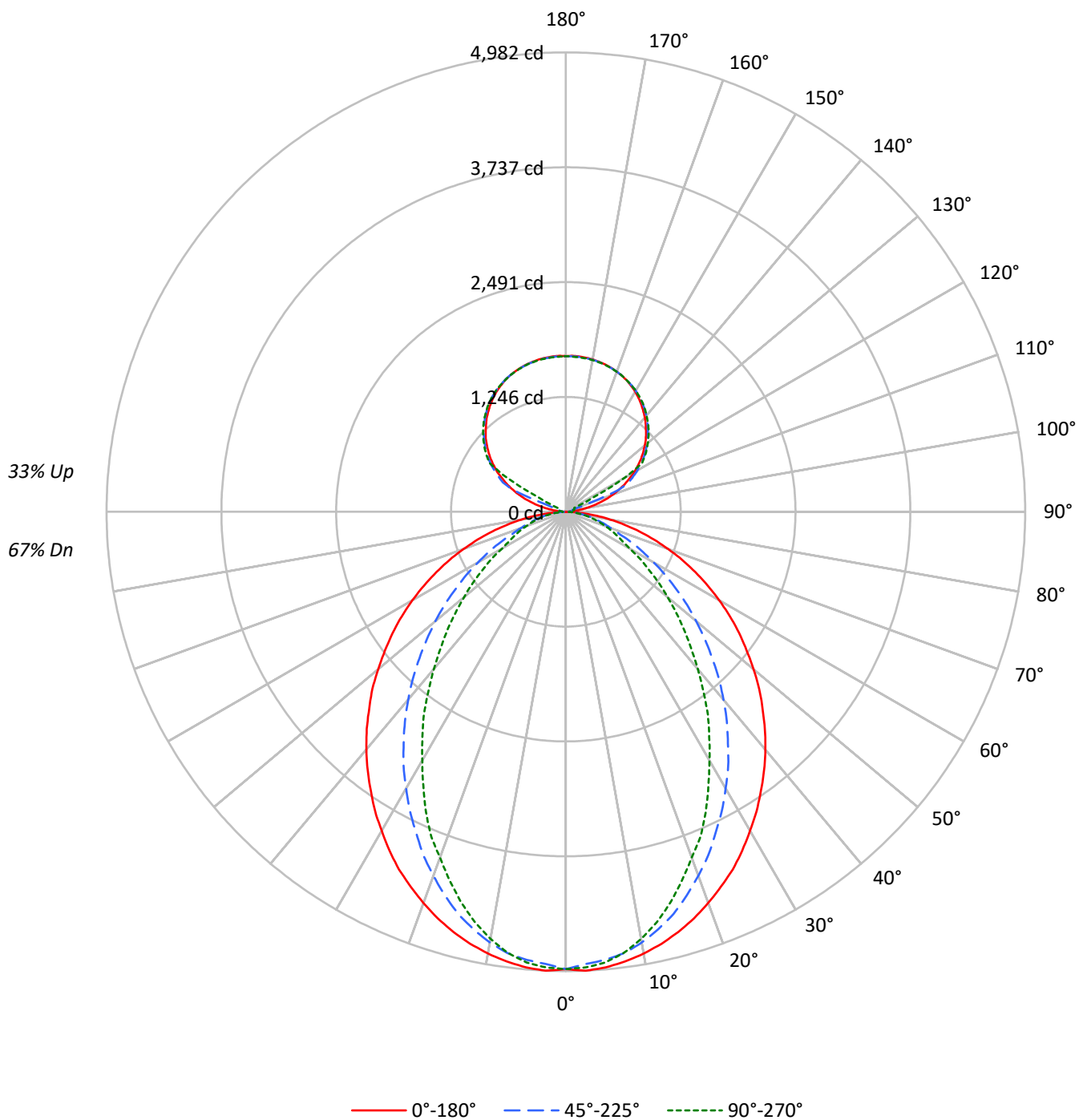
**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 15150.0 lumens  
Efficiency: N/A  
Efficacy: 92.4 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 0.99 / 1.16  
Luminous Opening: Rectangular w/ Sides (W: 3.74' x L: 3.94' x H: 0.1')  
CIE Type: Semi-Direct  
  
Input Watts (W): 163.9  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9781  
Total Harmonic Distortion (THDi): 0.075  
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   | 111 | 111 | 111 | 111 | 105 | 105 | 105 | 105 | 93 | 93 | 93 | 82 | 82 | 82 | 72 | 72 | 72 |
| 1   | 102 | 98  | 94  | 91  | 96  | 93  | 89  | 86  | 83 | 80 | 78 | 73 | 71 | 70 | 65 | 63 | 62 |
| 2   | 94  | 86  | 80  | 75  | 88  | 82  | 77  | 72  | 73 | 69 | 66 | 65 | 62 | 59 | 58 | 55 | 53 |
| 3   | 86  | 77  | 69  | 64  | 81  | 73  | 66  | 61  | 65 | 60 | 56 | 58 | 54 | 51 | 52 | 49 | 46 |
| 4   | 79  | 68  | 61  | 55  | 74  | 65  | 58  | 52  | 58 | 53 | 48 | 52 | 48 | 44 | 47 | 43 | 40 |
| 5   | 73  | 61  | 53  | 47  | 69  | 58  | 51  | 46  | 53 | 47 | 42 | 47 | 43 | 39 | 42 | 39 | 36 |
| 6   | 67  | 55  | 47  | 42  | 63  | 53  | 45  | 40  | 48 | 42 | 37 | 43 | 38 | 34 | 39 | 35 | 32 |
| 7   | 63  | 50  | 42  | 37  | 59  | 48  | 41  | 36  | 44 | 38 | 33 | 39 | 35 | 31 | 36 | 32 | 28 |
| 8   | 58  | 46  | 38  | 33  | 55  | 44  | 37  | 32  | 40 | 34 | 30 | 36 | 31 | 28 | 33 | 29 | 26 |
| 9   | 54  | 42  | 35  | 30  | 51  | 40  | 33  | 29  | 37 | 31 | 27 | 34 | 29 | 25 | 30 | 26 | 23 |
| 10  | 51  | 39  | 32  | 27  | 48  | 37  | 31  | 26  | 34 | 28 | 25 | 31 | 26 | 23 | 28 | 24 | 21 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 3620 | 3620 | 3620 |
| 5°  | 3626 | 3563 | 3586 |
| 10° | 3590 | 3494 | 3470 |
| 15° | 3541 | 3379 | 3290 |
| 20° | 3475 | 3220 | 3070 |
| 25° | 3408 | 3042 | 2856 |
| 30° | 3318 | 2860 | 2586 |
| 35° | 3230 | 2663 | 2348 |
| 40° | 3141 | 2460 | 2075 |
| 45° | 3037 | 2235 | 1828 |
| 50° | 2929 | 2007 | 1586 |
| 55° | 2817 | 1763 | 1354 |
| 60° | 2686 | 1509 | 1115 |
| 65° | 2537 | 1250 | 1004 |
| 70° | 2355 | 1009 | 910  |
| 75° | 2127 | 890  | 829  |
| 80° | 1797 | 748  | 721  |
| 85° | 1252 | 502  | 547  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 3037 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 464.8   | 3.1       |
| 10°-20°   | 1276.0  | 8.4       |
| 20°-30°   | 1791.5  | 11.8      |
| 30°-40°   | 1952.8  | 12.9      |
| 40°-50°   | 1794.9  | 11.8      |
| 50°-60°   | 1409.6  | 9.3       |
| 60°-70°   | 917.5   | 6.1       |
| 70°-80°   | 472.3   | 3.1       |
| 80°-90°   | 123.5   | 0.8       |
| 90°-100°  | 55.7    | 0.4       |
| 100°-110° | 207.4   | 1.4       |
| 110°-120° | 550.1   | 3.6       |
| 120°-130° | 912.4   | 6.0       |
| 130°-140° | 969.2   | 6.4       |
| 140°-150° | 900.8   | 5.9       |
| 150°-160° | 724.2   | 4.8       |
| 160°-170° | 466.6   | 3.1       |
| 170°-180° | 160.6   | 1.1       |
| 0°-30°    | 3532.3  | 23.3      |
| 0°-40°    | 5485.2  | 36.2      |
| 0°-60°    | 8689.6  | 57.4      |
| 0°-90°    | 10203.0 | 67.3      |
| 90°-120°  | 813.2   | 5.4       |
| 90°-150°  | 3595.6  | 23.7      |
| 90°-180°  | 4947.0  | 32.7      |
| 0°-180°   | 15150.0 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 4960 | 4960  | 4960 | 4960  | 4960 |      |
| 5°   | 4960 | 4937  | 4879 | 4919  | 4906 | 470  |
| 15°  | 4717 | 4668  | 4515 | 4430  | 4385 | 1329 |
| 25°  | 4282 | 4138  | 3842 | 3658  | 3590 | 1969 |
| 35°  | 3690 | 3460  | 3066 | 2783  | 2684 | 2309 |
| 45°  | 3016 | 2715  | 2244 | 1925  | 1818 | 2329 |
| 55°  | 2293 | 1943  | 1459 | 1190  | 1104 | 2049 |
| 65°  | 1549 | 1185  | 781  | 629   | 615  | 1535 |
| 75°  | 826  | 511   | 359  | 328   | 323  | 873  |
| 85°  | 193  | 99    | 85   | 85    | 85   | 221  |
| 90°  | 1    | 15    | 24   | 31    | 33   | 14   |
| 95°  | 79   | 39    | 48   | 54    | 52   | 94   |
| 105° | 371  | 408   | 74   | 88    | 93   | 397  |
| 115° | 702  | 723   | 753  | 188   | 100  | 691  |
| 125° | 993  | 1009  | 1032 | 1040  | 1044 | 885  |
| 135° | 1228 | 1248  | 1259 | 1271  | 1269 | 949  |
| 145° | 1425 | 1424  | 1444 | 1453  | 1447 | 891  |
| 155° | 1569 | 1558  | 1573 | 1580  | 1570 | 723  |
| 165° | 1653 | 1646  | 1650 | 1658  | 1650 | 467  |
| 175° | 1691 | 1682  | 1685 | 1694  | 1681 | 161  |
| 180° | 1687 | 1687  | 1687 | 1687  | 1687 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 4959.6 | 4959.6 | 4959.6 | 4959.6 | 4959.6 |
| 2.5°   | 4982.0 | 4959.6 | 4910.1 | 4955.3 | 4946.2 |
| 5°     | 4959.6 | 4937.2 | 4878.6 | 4919.1 | 4905.8 |
| 7.5°   | 4919.1 | 4892.4 | 4829.6 | 4847.2 | 4824.8 |
| 10°    | 4865.3 | 4833.9 | 4744.3 | 4730.5 | 4703.9 |
| 12.5°  | 4798.1 | 4757.7 | 4636.2 | 4609.6 | 4560.1 |
| 15°    | 4717.2 | 4667.7 | 4515.3 | 4430.0 | 4385.3 |
| 17.5°  | 4622.9 | 4551.0 | 4362.4 | 4263.9 | 4192.0 |
| 20°    | 4515.3 | 4425.3 | 4201.0 | 4089.1 | 3990.0 |
| 22.5°  | 4398.6 | 4295.3 | 4034.8 | 3882.4 | 3815.3 |
| 25°    | 4282.0 | 4138.1 | 3841.9 | 3658.1 | 3590.5 |
| 27.5°  | 4142.9 | 3990.0 | 3662.4 | 3451.5 | 3348.1 |
| 30°    | 3994.8 | 3823.9 | 3464.8 | 3236.2 | 3114.8 |
| 32.5°  | 3851.0 | 3644.3 | 3276.7 | 3007.2 | 2894.8 |
| 35°    | 3689.6 | 3460.5 | 3065.7 | 2782.9 | 2683.8 |
| 37.5°  | 3532.4 | 3285.3 | 2868.1 | 2558.1 | 2446.2 |
| 40°    | 3366.2 | 3097.2 | 2661.5 | 2342.9 | 2226.2 |
| 42.5°  | 3195.7 | 2908.6 | 2455.3 | 2122.9 | 2011.0 |
| 45°    | 3016.2 | 2715.3 | 2244.3 | 1925.3 | 1817.6 |
| 47.5°  | 2845.7 | 2527.2 | 2042.4 | 1723.4 | 1624.8 |
| 50°    | 2657.2 | 2338.6 | 1844.8 | 1534.8 | 1441.0 |
| 52.5°  | 2472.9 | 2136.2 | 1656.2 | 1360.0 | 1274.8 |
| 55°    | 2293.4 | 1943.4 | 1458.6 | 1189.5 | 1104.3 |
| 57.5°  | 2109.5 | 1750.5 | 1283.8 | 1032.4 | 960.5  |
| 60°    | 1921.0 | 1561.9 | 1099.5 | 871.0  | 799.1  |
| 62.5°  | 1737.2 | 1378.1 | 942.4  | 727.2  | 691.4  |
| 65°    | 1548.6 | 1184.8 | 781.0  | 628.6  | 614.8  |
| 67.5°  | 1369.1 | 1005.2 | 628.6  | 551.9  | 538.6  |
| 70°    | 1180.5 | 830.5  | 520.5  | 475.7  | 457.6  |
| 72.5°  | 1001.0 | 668.6  | 435.2  | 399.5  | 390.5  |
| 75°    | 825.7  | 511.4  | 359.1  | 327.6  | 323.3  |
| 77.5°  | 651.0  | 363.3  | 282.9  | 264.8  | 255.7  |
| 80°    | 489.1  | 260.5  | 215.2  | 197.6  | 197.6  |
| 82.5°  | 341.0  | 175.2  | 148.1  | 139.0  | 139.0  |
| 85°    | 192.9  | 98.6   | 85.2   | 85.2   | 85.2   |
| 87.5°  | 71.9   | 35.7   | 35.7   | 31.4   | 31.4   |
| 90°    | 1.2    | 14.6   | 24.4   | 30.6   | 32.9   |
| 92.5°  | 30.6   | 25.7   | 29.3   | 31.8   | 32.9   |
| 95°    | 79.3   | 39.0   | 47.6   | 53.8   | 52.5   |
| 97.5°  | 142.8  | 42.8   | 62.2   | 66.0   | 67.1   |
| 100°   | 216.2  | 48.9   | 69.6   | 79.3   | 81.8   |
| 102.5° | 296.7  | 294.3  | 72.1   | 85.4   | 89.2   |
| 105°   | 371.2  | 407.9  | 74.5   | 87.9   | 92.8   |
| 107.5° | 457.9  | 488.3  | 77.0   | 90.3   | 95.3   |
| 110°   | 541.0  | 566.5  | 213.7  | 91.6   | 96.4   |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 619.1  | 641.0  | 620.3  | 94.0   | 97.7   |
| 115°   | 702.1  | 722.8  | 753.4  | 188.1  | 100.2  |
| 117.5° | 774.1  | 798.5  | 819.4  | 644.6  | 324.8  |
| 120°   | 854.7  | 873.0  | 895.0  | 909.7  | 744.8  |
| 122.5° | 923.0  | 942.6  | 967.1  | 974.4  | 975.7  |
| 125°   | 992.6  | 1008.6 | 1031.8 | 1040.3 | 1044.0 |
| 127.5° | 1056.1 | 1073.2 | 1091.7 | 1103.8 | 1105.0 |
| 130°   | 1116.0 | 1135.6 | 1148.9 | 1162.4 | 1161.3 |
| 132.5° | 1177.1 | 1193.0 | 1206.3 | 1217.4 | 1216.2 |
| 135°   | 1228.4 | 1248.0 | 1258.8 | 1271.2 | 1268.7 |
| 137.5° | 1282.0 | 1296.7 | 1309.0 | 1321.2 | 1317.6 |
| 140°   | 1334.5 | 1344.4 | 1357.7 | 1368.7 | 1362.7 |
| 142.5° | 1378.6 | 1387.2 | 1403.0 | 1412.7 | 1406.6 |
| 145°   | 1425.0 | 1423.7 | 1444.4 | 1453.0 | 1446.9 |
| 147.5° | 1465.2 | 1461.5 | 1482.3 | 1488.4 | 1483.6 |
| 150°   | 1504.3 | 1495.8 | 1515.3 | 1522.6 | 1516.5 |
| 152.5° | 1537.2 | 1527.5 | 1545.8 | 1553.2 | 1544.6 |
| 155°   | 1569.0 | 1558.1 | 1572.7 | 1580.0 | 1570.3 |
| 157.5° | 1594.6 | 1584.9 | 1595.9 | 1604.5 | 1594.6 |
| 160°   | 1616.7 | 1609.3 | 1616.7 | 1623.9 | 1615.4 |
| 162.5° | 1636.1 | 1628.9 | 1634.9 | 1643.5 | 1632.5 |
| 165°   | 1653.2 | 1646.0 | 1649.6 | 1658.1 | 1649.6 |
| 167.5° | 1666.7 | 1659.3 | 1663.1 | 1671.6 | 1660.6 |
| 170°   | 1677.7 | 1670.3 | 1672.8 | 1681.3 | 1670.3 |
| 172.5° | 1685.0 | 1677.7 | 1680.2 | 1688.7 | 1677.7 |
| 175°   | 1691.1 | 1682.5 | 1685.0 | 1693.5 | 1681.3 |
| 177.5° | 1693.5 | 1685.0 | 1686.3 | 1694.8 | 1683.8 |
| 180°   | 1687.4 | 1687.4 | 1687.4 | 1687.4 | 1687.4 |

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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 | 13.11            | 14.10 | 13.91 | 14.92 | 15.92 | 9.07           | 10.07 | 9.87  | 10.89 | 11.89 |
|                 | 3H   | 14.80            | 15.69 | 15.61 | 16.52 | 17.55 | 10.28          | 11.17 | 11.09 | 11.99 | 13.02 |
|                 | 4H   | 15.42            | 16.26 | 16.25 | 17.09 | 18.14 | 10.73          | 11.57 | 11.56 | 12.41 | 13.45 |
|                 | 6H   | 15.85            | 16.62 | 16.69 | 17.47 | 18.52 | 11.06          | 11.84 | 11.91 | 12.68 | 13.74 |
|                 | 8H   | 15.98            | 16.72 | 16.84 | 17.58 | 18.64 | 11.16          | 11.89 | 12.01 | 12.75 | 13.81 |
|                 | 12H  | 16.05            | 16.75 | 16.91 | 17.61 | 18.69 | 11.21          | 11.91 | 12.06 | 12.76 | 13.84 |
| 4H              | 2H   | 13.15            | 13.99 | 13.98 | 14.82 | 15.86 | 9.69           | 10.53 | 10.53 | 11.36 | 12.41 |
|                 | 3H   | 14.99            | 15.69 | 15.84 | 16.56 | 17.62 | 11.06          | 11.75 | 11.90 | 12.62 | 13.68 |
|                 | 4H   | 15.69            | 16.33 | 16.55 | 17.19 | 18.28 | 11.61          | 12.24 | 12.47 | 13.11 | 14.20 |
|                 | 6H   | 16.22            | 16.77 | 17.10 | 17.66 | 18.75 | 12.04          | 12.59 | 12.92 | 13.48 | 14.57 |
|                 | 8H   | 16.40            | 16.91 | 17.28 | 17.80 | 18.90 | 12.17          | 12.68 | 13.05 | 13.57 | 14.67 |
|                 | 12H  | 16.51            | 16.96 | 17.40 | 17.87 | 18.98 | 12.25          | 12.70 | 13.14 | 13.61 | 14.72 |
| 8H              | 4H   | 15.67            | 16.18 | 16.55 | 17.07 | 18.17 | 11.91          | 12.42 | 12.78 | 13.30 | 14.40 |
|                 | 6H   | 16.25            | 16.67 | 17.15 | 17.60 | 18.70 | 12.43          | 12.85 | 13.34 | 13.78 | 14.88 |
|                 | 8H   | 16.47            | 16.84 | 17.38 | 17.76 | 18.88 | 12.62          | 13.00 | 13.54 | 13.92 | 15.04 |
|                 | 12H  | 16.62            | 16.95 | 17.53 | 17.86 | 19.03 | 12.75          | 13.08 | 13.67 | 13.99 | 15.16 |
| 12H             | 4H   | 15.63            | 16.09 | 16.53 | 17.00 | 18.10 | 11.92          | 12.38 | 12.81 | 13.28 | 14.39 |
|                 | 6H   | 16.23            | 16.60 | 17.14 | 17.52 | 18.64 | 12.48          | 12.86 | 13.40 | 13.78 | 14.89 |
|                 | 8H   | 16.46            | 16.78 | 17.37 | 17.70 | 18.87 | 12.70          | 13.03 | 13.62 | 13.94 | 15.11 |

END OF REPORT