

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: P914917

Luminaire Tested: DFN2DIP-SQ4F0-070D160US927-FLLONL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P914917  
REPORT IS A COMBINATION OF REPORTS P901725 AND P898471  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-SQ4F0-070D160US927-FLLONL  
Description: 4 foot, Square Define Geo, with Direct Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

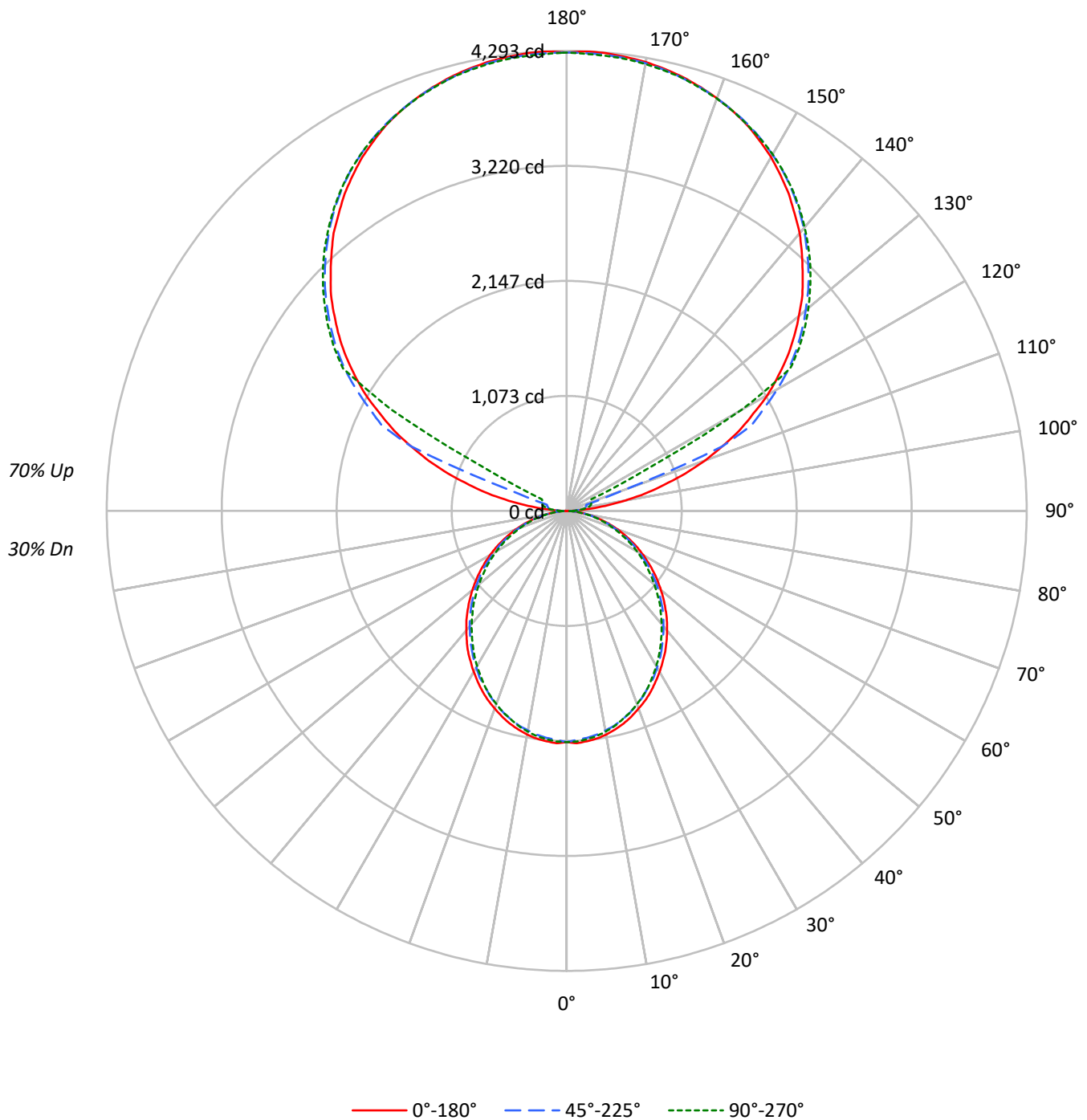
Lumens per Lamp: N/A  
Luminaire Lumens: 18038.0 lumens  
Efficiency: N/A  
Efficacy: 98.4 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 3.92' x L: 3.92' x H: 0.1')  
CIE Type: Semi-Indirect

Input Watts (W): 183.4  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9967  
Total Harmonic Distortion (THDi): 0.063  
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 | 92 | 92 | 92 | 92 | 72 | 72 | 72 | 55 | 55 | 55 | 38 | 38 | 38 |
| 1   | 93  | 89  | 85  | 82  | 84 | 80 | 77 | 74 | 63 | 61 | 59 | 48 | 47 | 45 | 34 | 33 | 32 |
| 2   | 85  | 78  | 72  | 67  | 76 | 70 | 65 | 61 | 56 | 52 | 49 | 42 | 40 | 38 | 30 | 28 | 27 |
| 3   | 78  | 68  | 61  | 56  | 69 | 62 | 56 | 51 | 49 | 45 | 41 | 37 | 34 | 32 | 26 | 25 | 23 |
| 4   | 71  | 60  | 53  | 47  | 63 | 55 | 48 | 43 | 43 | 39 | 35 | 33 | 30 | 27 | 23 | 21 | 20 |
| 5   | 65  | 54  | 46  | 40  | 58 | 49 | 42 | 37 | 39 | 34 | 30 | 30 | 26 | 24 | 21 | 19 | 17 |
| 6   | 60  | 48  | 40  | 35  | 53 | 43 | 37 | 32 | 35 | 30 | 26 | 27 | 23 | 21 | 19 | 17 | 15 |
| 7   | 55  | 43  | 36  | 30  | 49 | 39 | 32 | 28 | 31 | 26 | 23 | 24 | 21 | 18 | 17 | 15 | 13 |
| 8   | 51  | 39  | 32  | 27  | 46 | 36 | 29 | 24 | 29 | 24 | 20 | 22 | 19 | 16 | 16 | 14 | 12 |
| 9   | 47  | 36  | 28  | 23  | 43 | 32 | 26 | 22 | 26 | 21 | 18 | 20 | 17 | 14 | 15 | 12 | 11 |
| 10  | 44  | 33  | 26  | 21  | 40 | 30 | 23 | 19 | 24 | 19 | 16 | 19 | 15 | 13 | 14 | 11 | 10 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 1514 | 1514 | 1514 |
| 5°  | 1516 | 1493 | 1503 |
| 10° | 1504 | 1473 | 1483 |
| 15° | 1482 | 1449 | 1452 |
| 20° | 1452 | 1416 | 1420 |
| 25° | 1422 | 1376 | 1383 |
| 30° | 1385 | 1339 | 1335 |
| 35° | 1350 | 1295 | 1285 |
| 40° | 1306 | 1251 | 1237 |
| 45° | 1263 | 1206 | 1189 |
| 50° | 1215 | 1160 | 1132 |
| 55° | 1166 | 1106 | 1080 |
| 60° | 1110 | 1041 | 1021 |
| 65° | 1049 | 975  | 950  |
| 70° | 971  | 894  | 875  |
| 75° | 863  | 798  | 806  |
| 80° | 733  | 675  | 673  |
| 85° | 530  | 462  | 452  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 90°

Vertical Angle: 90°

Luminance: 2292 cd/sqm

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CATALOG NUMBER: DFN2DIP-SQ4F0-070D160US927-FLLONL

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 203.1   | 1.1       |
| 10°-20°   | 571.4   | 3.2       |
| 20°-30°   | 839.7   | 4.7       |
| 30°-40°   | 975.3   | 5.4       |
| 40°-50°   | 974.1   | 5.4       |
| 50°-60°   | 849.4   | 4.7       |
| 60°-70°   | 627.9   | 3.5       |
| 70°-80°   | 355.2   | 2.0       |
| 80°-90°   | 101.3   | 0.6       |
| 90°-100°  | 141.0   | 0.8       |
| 100°-110° | 525.8   | 2.9       |
| 110°-120° | 1394.6  | 7.7       |
| 120°-130° | 2313.0  | 12.8      |
| 130°-140° | 2456.9  | 13.6      |
| 140°-150° | 2283.4  | 12.7      |
| 150°-160° | 1835.8  | 10.2      |
| 160°-170° | 1182.9  | 6.6       |
| 170°-180° | 407.2   | 2.3       |
| 0°-30°    | 1614.2  | 8.9       |
| 0°-40°    | 2589.5  | 14.4      |
| 0°-60°    | 4412.9  | 24.5      |
| 0°-90°    | 5497.4  | 30.5      |
| 90°-120°  | 2061.4  | 11.4      |
| 90°-150°  | 9114.7  | 50.5      |
| 90°-180°  | 12541.0 | 69.5      |
| 0°-180°   | 18038.0 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 2158 | 2158  | 2158 | 2158  | 2158 |      |
| 5°   | 2158 | 2150  | 2127 | 2143  | 2139 | 205  |
| 15°  | 2054 | 2042  | 2015 | 2023  | 2013 | 578  |
| 25°  | 1859 | 1842  | 1807 | 1811  | 1807 | 855  |
| 35°  | 1604 | 1583  | 1550 | 1537  | 1527 | 1002 |
| 45°  | 1305 | 1291  | 1259 | 1237  | 1228 | 1007 |
| 55°  | 988  | 975   | 950  | 925   | 915  | 883  |
| 65°  | 666  | 654   | 633  | 614   | 604  | 659  |
| 75°  | 348  | 344   | 334  | 322   | 326  | 372  |
| 85°  | 85   | 83    | 81   | 75    | 73   | 95   |
| 90°  | 3    | 37    | 62   | 78    | 83   | 17   |
| 95°  | 201  | 99    | 121  | 136   | 133  | 238  |
| 105° | 941  | 1034  | 189  | 223   | 235  | 1005 |
| 115° | 1780 | 1832  | 1910 | 477   | 254  | 1752 |
| 125° | 2516 | 2557  | 2616 | 2637  | 2646 | 2244 |
| 135° | 3114 | 3164  | 3191 | 3222  | 3216 | 2405 |
| 145° | 3612 | 3609  | 3662 | 3683  | 3668 | 2259 |
| 155° | 3977 | 3950  | 3987 | 4005  | 3981 | 1833 |
| 165° | 4191 | 4172  | 4182 | 4203  | 4182 | 1184 |
| 175° | 4287 | 4265  | 4271 | 4293  | 4262 | 408  |
| 180° | 4278 | 4278  | 4278 | 4278  | 4278 |      |

TEST NUMBER: P914917

CATALOG NUMBER: DFN2DIP-SQ4F0-070D160US927-FLLONL

**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 2157.7 | 2157.7 | 2157.7 | 2157.7 | 2157.7 |
| 2.5°   | 2170.3 | 2159.9 | 2137.0 | 2157.7 | 2153.7 |
| 5°     | 2157.7 | 2149.6 | 2126.7 | 2143.2 | 2139.2 |
| 7.5°   | 2143.2 | 2130.8 | 2107.9 | 2124.7 | 2120.5 |
| 10°    | 2120.5 | 2105.9 | 2081.1 | 2097.6 | 2091.4 |
| 12.5°  | 2089.2 | 2076.9 | 2052.1 | 2062.4 | 2058.2 |
| 15°    | 2054.0 | 2041.7 | 2014.6 | 2023.0 | 2012.6 |
| 17.5°  | 2010.4 | 1998.1 | 1971.0 | 1981.4 | 1971.0 |
| 20°    | 1962.6 | 1950.4 | 1921.3 | 1927.5 | 1919.3 |
| 22.5°  | 1915.1 | 1896.4 | 1869.3 | 1869.3 | 1865.1 |
| 25°    | 1859.0 | 1842.5 | 1807.3 | 1811.2 | 1807.3 |
| 27.5°  | 1796.7 | 1782.2 | 1755.3 | 1749.1 | 1738.8 |
| 30°    | 1734.6 | 1717.8 | 1686.9 | 1680.7 | 1672.3 |
| 32.5°  | 1668.1 | 1655.8 | 1622.5 | 1610.0 | 1601.6 |
| 35°    | 1603.8 | 1583.2 | 1549.9 | 1537.4 | 1527.0 |
| 37.5°  | 1531.2 | 1512.5 | 1479.2 | 1464.7 | 1454.4 |
| 40°    | 1456.6 | 1439.9 | 1406.6 | 1388.1 | 1379.7 |
| 42.5°  | 1383.9 | 1367.2 | 1334.2 | 1313.3 | 1300.9 |
| 45°    | 1305.1 | 1290.6 | 1259.3 | 1236.7 | 1228.3 |
| 47.5°  | 1228.3 | 1213.8 | 1180.5 | 1157.6 | 1145.3 |
| 50°    | 1147.3 | 1136.9 | 1107.9 | 1078.9 | 1068.5 |
| 52.5°  | 1068.5 | 1054.0 | 1027.1 | 1004.2 | 989.7  |
| 55°    | 987.7  | 975.2  | 950.3  | 925.4  | 915.0  |
| 57.5°  | 906.7  | 896.4  | 869.3  | 844.4  | 836.1  |
| 60°    | 825.7  | 817.5  | 788.5  | 765.6  | 759.5  |
| 62.5°  | 746.9  | 732.4  | 711.7  | 691.0  | 682.6  |
| 65°    | 666.1  | 653.5  | 632.9  | 614.2  | 603.8  |
| 67.5°  | 583.1  | 572.6  | 554.1  | 539.6  | 531.2  |
| 70°    | 506.3  | 498.0  | 479.2  | 464.7  | 456.5  |
| 72.5°  | 427.5  | 419.1  | 408.8  | 394.3  | 388.1  |
| 75°    | 348.5  | 344.5  | 333.9  | 321.6  | 325.8  |
| 77.5°  | 278.1  | 269.7  | 265.5  | 259.3  | 253.2  |
| 80°    | 207.6  | 205.4  | 201.2  | 195.0  | 190.8  |
| 82.5°  | 141.1  | 141.1  | 139.1  | 130.8  | 130.8  |
| 85°    | 85.0   | 83.0   | 81.0   | 74.6   | 72.6   |
| 87.5°  | 37.4   | 33.3   | 29.1   | 22.9   | 20.7   |
| 90°    | 2.9    | 37.2   | 61.7   | 77.6   | 83.4   |
| 92.5°  | 77.6   | 65.0   | 74.2   | 80.5   | 83.4   |
| 95°    | 201.1  | 98.9   | 120.6  | 136.3  | 133.1  |
| 97.5°  | 362.0  | 108.4  | 157.6  | 167.2  | 170.2  |
| 100°   | 548.0  | 123.9  | 176.4  | 201.1  | 207.3  |
| 102.5° | 752.0  | 746.2  | 182.7  | 216.5  | 226.0  |
| 105°   | 941.0  | 1034.0 | 188.9  | 222.8  | 235.2  |
| 107.5° | 1160.7 | 1237.9 | 195.2  | 229.0  | 241.5  |
| 110°   | 1371.3 | 1436.1 | 541.8  | 232.3  | 244.4  |

TEST NUMBER: P914917

CATALOG NUMBER: DFN2DIP-SQ4F0-070D160US927-FLLONL

**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 1569.5 | 1625.0 | 1572.4 | 238.2  | 247.7  |
| 115°   | 1779.7 | 1832.2 | 1909.8 | 476.7  | 254.0  |
| 117.5° | 1962.4 | 2024.1 | 2077.1 | 1634.2 | 823.3  |
| 120°   | 2166.8 | 2213.0 | 2268.9 | 2306.0 | 1888.2 |
| 122.5° | 2339.9 | 2389.5 | 2451.6 | 2469.9 | 2473.3 |
| 125°   | 2516.3 | 2556.7 | 2615.5 | 2637.3 | 2646.4 |
| 127.5° | 2677.3 | 2720.7 | 2767.3 | 2798.2 | 2801.2 |
| 130°   | 2829.1 | 2878.7 | 2912.5 | 2946.7 | 2943.7 |
| 132.5° | 2983.8 | 3024.2 | 3058.1 | 3086.0 | 3083.1 |
| 135°   | 3113.9 | 3163.6 | 3191.1 | 3222.4 | 3216.1 |
| 137.5° | 3249.9 | 3287.1 | 3318.3 | 3349.2 | 3340.0 |
| 140°   | 3383.0 | 3408.0 | 3441.8 | 3469.8 | 3454.3 |
| 142.5° | 3494.7 | 3516.4 | 3556.5 | 3581.1 | 3565.7 |
| 145°   | 3612.3 | 3609.0 | 3661.6 | 3683.2 | 3667.9 |
| 147.5° | 3714.1 | 3705.0 | 3757.6 | 3773.0 | 3760.8 |
| 150°   | 3813.4 | 3791.7 | 3841.4 | 3859.7 | 3844.3 |
| 152.5° | 3896.8 | 3872.2 | 3918.5 | 3937.3 | 3915.6 |
| 155°   | 3977.3 | 3949.7 | 3986.9 | 4005.3 | 3980.6 |
| 157.5° | 4042.4 | 4017.8 | 4045.7 | 4067.4 | 4042.4 |
| 160°   | 4098.3 | 4079.5 | 4098.3 | 4116.6 | 4094.9 |
| 162.5° | 4147.5 | 4129.2 | 4144.5 | 4166.2 | 4138.4 |
| 165°   | 4190.9 | 4172.5 | 4181.7 | 4203.4 | 4181.7 |
| 167.5° | 4225.1 | 4206.3 | 4215.9 | 4237.5 | 4209.7 |
| 170°   | 4253.0 | 4234.3 | 4240.5 | 4262.2 | 4234.3 |
| 172.5° | 4271.4 | 4253.0 | 4259.2 | 4280.9 | 4253.0 |
| 175°   | 4286.8 | 4265.1 | 4271.4 | 4293.1 | 4262.2 |
| 177.5° | 4293.1 | 4271.4 | 4274.7 | 4296.4 | 4268.4 |
| 180°   | 4277.6 | 4277.6 | 4277.6 | 4277.6 | 4277.6 |

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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 | 6.58             | 7.29  | 7.69  | 8.39  | 9.92  | 6.13           | 6.84  | 7.24  | 7.95  | 9.47  |
|                 | 3H   | 8.23             | 8.87  | 9.35  | 9.98  | 11.52 | 7.74           | 8.37  | 8.86  | 9.49  | 11.03 |
|                 | 4H   | 8.81             | 9.42  | 9.94  | 10.53 | 12.08 | 8.32           | 8.92  | 9.45  | 10.04 | 11.58 |
|                 | 6H   | 9.21             | 9.76  | 10.34 | 10.88 | 12.44 | 8.71           | 9.26  | 9.84  | 10.38 | 11.94 |
|                 | 8H   | 9.31             | 9.84  | 10.45 | 10.97 | 12.52 | 8.81           | 9.34  | 9.95  | 10.47 | 12.02 |
|                 | 12H  | 9.36             | 9.86  | 10.50 | 10.98 | 12.56 | 8.85           | 9.35  | 9.99  | 10.47 | 12.05 |
| 4H              | 2H   | 7.02             | 7.62  | 8.15  | 8.74  | 10.28 | 6.66           | 7.27  | 7.80  | 8.38  | 9.93  |
|                 | 3H   | 8.88             | 9.38  | 10.02 | 10.52 | 12.08 | 8.47           | 8.97  | 9.61  | 10.11 | 11.67 |
|                 | 4H   | 9.59             | 10.05 | 10.73 | 11.18 | 12.76 | 9.16           | 9.63  | 10.31 | 10.75 | 12.33 |
|                 | 6H   | 10.10            | 10.49 | 11.25 | 11.65 | 13.22 | 9.67           | 10.06 | 10.82 | 11.21 | 12.78 |
|                 | 8H   | 10.25            | 10.62 | 11.40 | 11.76 | 13.35 | 9.81           | 10.18 | 10.96 | 11.32 | 12.91 |
|                 | 12H  | 10.31            | 10.65 | 11.48 | 11.81 | 13.40 | 9.86           | 10.20 | 11.03 | 11.36 | 12.95 |
| 8H              | 4H   | 9.77             | 10.14 | 10.92 | 11.29 | 12.87 | 9.40           | 9.77  | 10.54 | 10.91 | 12.50 |
|                 | 6H   | 10.40            | 10.71 | 11.57 | 11.89 | 13.48 | 10.02          | 10.32 | 11.19 | 11.51 | 13.09 |
|                 | 8H   | 10.62            | 10.89 | 11.80 | 12.05 | 13.66 | 10.23          | 10.50 | 11.41 | 11.66 | 13.27 |
|                 | 12H  | 10.75            | 10.99 | 11.93 | 12.15 | 13.78 | 10.34          | 10.57 | 11.52 | 11.74 | 13.37 |
| 12H             | 4H   | 9.75             | 10.09 | 10.92 | 11.24 | 12.83 | 9.38           | 9.72  | 10.55 | 10.87 | 12.46 |
|                 | 6H   | 10.43            | 10.70 | 11.61 | 11.86 | 13.47 | 10.06          | 10.33 | 11.23 | 11.49 | 13.09 |
|                 | 8H   | 10.67            | 10.90 | 11.85 | 12.06 | 13.70 | 10.29          | 10.52 | 11.47 | 11.68 | 13.32 |

END OF REPORT