

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: P917647

Luminaire Tested: DFN2DIP-SQ4F0-070D160US930-RLLONL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P917647  
REPORT IS A COMBINATION OF REPORTS P901726 AND P898471  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-SQ4F0-070D160US930-RLLONL  
Description: 4 foot, Square Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

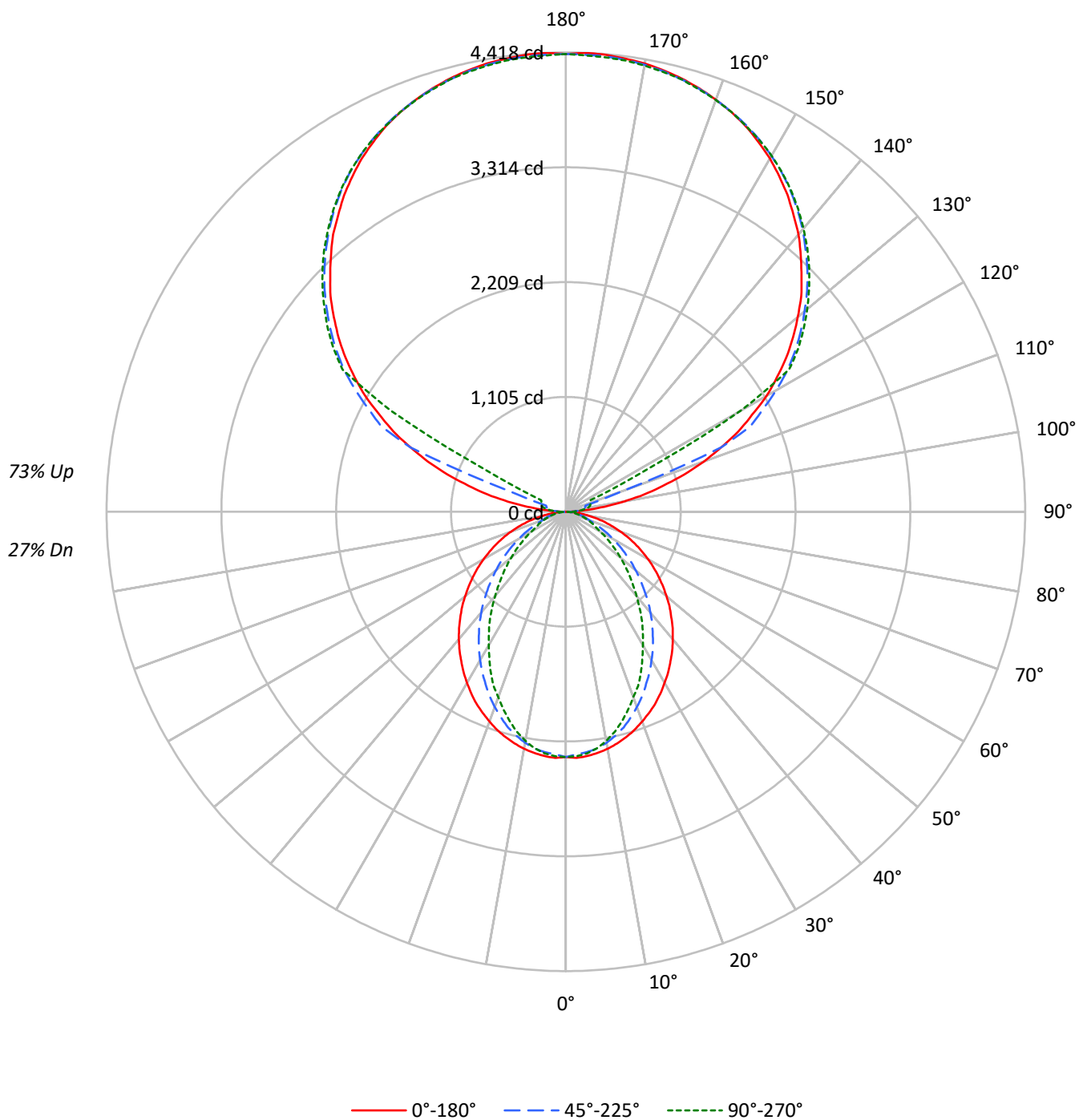
Lumens per Lamp: N/A  
Luminaire Lumens: 17765.3 lumens  
Efficiency: N/A  
Efficacy: 96.9 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 0.99 / 1.16  
Luminous Opening: Rectangular w/ Sides (W: 3.92' x L: 3.92' x H: 0.1')  
CIE Type: Semi-Indirect

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

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 1655 | 1655 | 1655 |
| 5°  | 1658 | 1629 | 1640 |
| 10° | 1641 | 1597 | 1587 |
| 15° | 1619 | 1545 | 1505 |
| 20° | 1589 | 1473 | 1404 |
| 25° | 1558 | 1391 | 1306 |
| 30° | 1517 | 1308 | 1183 |
| 35° | 1477 | 1218 | 1074 |
| 40° | 1436 | 1125 | 949  |
| 45° | 1388 | 1022 | 837  |
| 50° | 1339 | 918  | 726  |
| 55° | 1287 | 807  | 620  |
| 60° | 1228 | 691  | 511  |
| 65° | 1159 | 572  | 460  |
| 70° | 1076 | 462  | 417  |
| 75° | 972  | 408  | 381  |
| 80° | 821  | 343  | 332  |
| 85° | 571  | 231  | 252  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 90°

Vertical Angle: 90°

Luminance: 2361 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 221.1   | 1.2       |
| 10°-20°   | 606.9   | 3.4       |
| 20°-30°   | 852.0   | 4.8       |
| 30°-40°   | 928.8   | 5.2       |
| 40°-50°   | 853.6   | 4.8       |
| 50°-60°   | 670.4   | 3.8       |
| 60°-70°   | 436.4   | 2.5       |
| 70°-80°   | 224.6   | 1.3       |
| 80°-90°   | 65.1    | 0.4       |
| 90°-100°  | 145.1   | 0.8       |
| 100°-110° | 541.2   | 3.0       |
| 110°-120° | 1435.3  | 8.1       |
| 120°-130° | 2380.5  | 13.4      |
| 130°-140° | 2528.6  | 14.2      |
| 140°-150° | 2350.1  | 13.2      |
| 150°-160° | 1889.4  | 10.6      |
| 160°-170° | 1217.5  | 6.9       |
| 170°-180° | 419.0   | 2.4       |
| 0°-30°    | 1679.9  | 9.5       |
| 0°-40°    | 2608.7  | 14.7      |
| 0°-60°    | 4132.7  | 23.3      |
| 0°-90°    | 4858.7  | 27.3      |
| 90°-120°  | 2121.6  | 11.9      |
| 90°-150°  | 9380.7  | 52.8      |
| 90°-180°  | 12907.0 | 72.7      |
| 0°-180°   | 17765.3 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 2359 | 2359  | 2359 | 2359  | 2359 |      |
| 5°   | 2359 | 2348  | 2320 | 2340  | 2333 | 224  |
| 15°  | 2244 | 2220  | 2147 | 2107  | 2086 | 632  |
| 25°  | 2036 | 1968  | 1827 | 1740  | 1708 | 937  |
| 35°  | 1755 | 1646  | 1458 | 1324  | 1276 | 1098 |
| 45°  | 1434 | 1291  | 1067 | 916   | 864  | 1108 |
| 55°  | 1091 | 924   | 694  | 566   | 525  | 975  |
| 65°  | 736  | 564   | 371  | 299   | 292  | 730  |
| 75°  | 393  | 243   | 171  | 156   | 154  | 415  |
| 85°  | 92   | 47    | 40   | 40    | 40   | 105  |
| 90°  | 3    | 38    | 64   | 80    | 86   | 16   |
| 95°  | 207  | 102   | 124  | 140   | 137  | 245  |
| 105° | 968  | 1064  | 194  | 229   | 242  | 1035 |
| 115° | 1832 | 1886  | 1966 | 491   | 261  | 1803 |
| 125° | 2590 | 2631  | 2692 | 2714  | 2724 | 2310 |
| 135° | 3205 | 3256  | 3284 | 3316  | 3310 | 2476 |
| 145° | 3718 | 3714  | 3768 | 3791  | 3775 | 2325 |
| 155° | 4093 | 4065  | 4103 | 4122  | 4097 | 1886 |
| 165° | 4313 | 4294  | 4304 | 4326  | 4304 | 1219 |
| 175° | 4412 | 4390  | 4396 | 4418  | 4386 | 420  |
| 180° | 4402 | 4402  | 4402 | 4402  | 4402 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 2358.7 | 2358.7 | 2358.7 | 2358.7 | 2358.7 |
| 2.5°   | 2369.3 | 2358.7 | 2335.2 | 2356.7 | 2352.4 |
| 5°     | 2358.7 | 2348.1 | 2320.3 | 2339.5 | 2333.1 |
| 7.5°   | 2339.5 | 2326.8 | 2296.9 | 2305.3 | 2294.7 |
| 10°    | 2313.9 | 2299.0 | 2256.3 | 2249.8 | 2237.1 |
| 12.5°  | 2281.9 | 2262.7 | 2205.0 | 2192.3 | 2168.7 |
| 15°    | 2243.5 | 2219.9 | 2147.4 | 2106.9 | 2085.6 |
| 17.5°  | 2198.6 | 2164.5 | 2074.8 | 2027.8 | 1993.6 |
| 20°    | 2147.4 | 2104.6 | 1998.0 | 1944.7 | 1897.6 |
| 22.5°  | 2092.0 | 2042.8 | 1918.9 | 1846.4 | 1814.5 |
| 25°    | 2036.5 | 1968.0 | 1827.2 | 1739.8 | 1707.6 |
| 27.5°  | 1970.3 | 1897.6 | 1741.8 | 1641.5 | 1592.4 |
| 30°    | 1899.9 | 1818.6 | 1647.8 | 1539.1 | 1481.4 |
| 32.5°  | 1831.5 | 1733.2 | 1558.4 | 1430.2 | 1376.7 |
| 35°    | 1754.7 | 1645.8 | 1458.1 | 1323.6 | 1276.4 |
| 37.5°  | 1680.0 | 1562.4 | 1364.1 | 1216.6 | 1163.4 |
| 40°    | 1600.9 | 1473.0 | 1265.8 | 1114.3 | 1058.7 |
| 42.5°  | 1519.9 | 1383.3 | 1167.7 | 1009.6 | 956.4  |
| 45°    | 1434.5 | 1291.4 | 1067.4 | 915.7  | 864.5  |
| 47.5°  | 1353.4 | 1201.9 | 971.3  | 819.6  | 772.7  |
| 50°    | 1263.7 | 1112.2 | 877.3  | 729.9  | 685.3  |
| 52.5°  | 1176.1 | 1015.9 | 787.7  | 646.8  | 606.3  |
| 55°    | 1090.7 | 924.2  | 693.7  | 565.7  | 525.2  |
| 57.5°  | 1003.3 | 832.5  | 610.6  | 491.0  | 456.8  |
| 60°    | 913.6  | 742.8  | 522.9  | 414.3  | 380.0  |
| 62.5°  | 826.1  | 655.4  | 448.2  | 345.8  | 328.8  |
| 65°    | 736.5  | 563.5  | 371.4  | 299.0  | 292.4  |
| 67.5°  | 651.1  | 478.1  | 299.0  | 262.4  | 256.2  |
| 70°    | 561.4  | 394.9  | 247.5  | 226.2  | 217.6  |
| 72.5°  | 476.1  | 318.0  | 207.0  | 190.0  | 185.7  |
| 75°    | 392.7  | 243.2  | 170.7  | 155.8  | 153.8  |
| 77.5°  | 309.6  | 172.8  | 134.5  | 125.9  | 121.6  |
| 80°    | 232.6  | 123.8  | 102.4  | 94.0   | 94.0   |
| 82.5°  | 162.2  | 83.3   | 70.4   | 66.1   | 66.1   |
| 85°    | 91.7   | 46.9   | 40.5   | 40.5   | 40.5   |
| 87.5°  | 34.2   | 17.0   | 17.0   | 14.9   | 14.9   |
| 90°    | 3.0    | 38.2   | 63.5   | 79.8   | 85.9   |
| 92.5°  | 79.8   | 66.9   | 76.4   | 82.8   | 85.9   |
| 95°    | 206.9  | 101.7  | 124.1  | 140.3  | 137.0  |
| 97.5°  | 372.6  | 111.6  | 162.2  | 172.1  | 175.1  |
| 100°   | 564.0  | 127.5  | 181.6  | 206.9  | 213.4  |
| 102.5° | 774.0  | 767.9  | 188.0  | 222.8  | 232.6  |
| 105°   | 968.4  | 1064.1 | 194.4  | 229.3  | 242.1  |
| 107.5° | 1194.6 | 1274.1 | 200.9  | 235.7  | 248.5  |
| 110°   | 1411.4 | 1478.0 | 557.6  | 239.0  | 251.5  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 1615.3 | 1672.4 | 1618.3 | 245.2  | 254.9  |
| 115°   | 1831.6 | 1885.7 | 1965.5 | 490.6  | 261.4  |
| 117.5° | 2019.7 | 2083.2 | 2137.7 | 1681.9 | 847.3  |
| 120°   | 2230.0 | 2277.6 | 2335.1 | 2373.3 | 1943.3 |
| 122.5° | 2408.1 | 2459.2 | 2523.1 | 2542.0 | 2545.4 |
| 125°   | 2589.7 | 2631.3 | 2691.9 | 2714.2 | 2723.7 |
| 127.5° | 2755.4 | 2800.1 | 2848.1 | 2879.9 | 2882.9 |
| 130°   | 2911.7 | 2962.7 | 2997.5 | 3032.7 | 3029.6 |
| 132.5° | 3070.9 | 3112.5 | 3147.3 | 3176.1 | 3173.1 |
| 135°   | 3204.8 | 3255.9 | 3284.3 | 3316.4 | 3309.9 |
| 137.5° | 3344.8 | 3383.0 | 3415.1 | 3446.9 | 3437.5 |
| 140°   | 3481.7 | 3507.4 | 3542.2 | 3571.0 | 3555.1 |
| 142.5° | 3596.7 | 3619.0 | 3660.3 | 3685.6 | 3669.7 |
| 145°   | 3717.8 | 3714.3 | 3768.5 | 3790.7 | 3774.9 |
| 147.5° | 3822.5 | 3813.1 | 3867.2 | 3883.1 | 3870.5 |
| 150°   | 3924.7 | 3902.3 | 3953.5 | 3972.4 | 3956.5 |
| 152.5° | 4010.5 | 3985.2 | 4032.9 | 4052.2 | 4029.9 |
| 155°   | 4093.4 | 4065.0 | 4103.2 | 4122.1 | 4096.8 |
| 157.5° | 4160.4 | 4135.0 | 4163.7 | 4186.1 | 4160.4 |
| 160°   | 4217.9 | 4198.5 | 4217.9 | 4236.8 | 4214.4 |
| 162.5° | 4268.6 | 4249.7 | 4265.5 | 4287.8 | 4259.1 |
| 165°   | 4313.2 | 4294.3 | 4303.7 | 4326.1 | 4303.7 |
| 167.5° | 4348.4 | 4329.1 | 4338.9 | 4361.2 | 4332.5 |
| 170°   | 4377.1 | 4357.9 | 4364.2 | 4386.5 | 4357.9 |
| 172.5° | 4396.0 | 4377.1 | 4383.5 | 4405.9 | 4377.1 |
| 175°   | 4411.9 | 4389.6 | 4396.0 | 4418.3 | 4386.5 |
| 177.5° | 4418.3 | 4396.0 | 4399.4 | 4421.8 | 4393.0 |
| 180°   | 4402.4 | 4402.4 | 4402.4 | 4402.4 | 4402.4 |

TEST NUMBER: P917647

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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 | 6.30             | 6.97 | 7.44  | 8.10  | 9.66  | 2.26           | 2.94 | 3.40 | 4.06 | 5.62 |
|                 | 3H   | 7.97             | 8.57 | 9.11  | 9.70  | 11.28 | 3.44           | 4.04 | 4.58 | 5.17 | 6.75 |
|                 | 4H   | 8.57             | 9.15 | 9.73  | 10.28 | 11.86 | 3.88           | 4.45 | 5.03 | 5.58 | 7.17 |
|                 | 6H   | 8.99             | 9.52 | 10.15 | 10.65 | 12.25 | 4.20           | 4.72 | 5.35 | 5.85 | 7.45 |
|                 | 8H   | 9.12             | 9.62 | 10.28 | 10.76 | 12.35 | 4.28           | 4.78 | 5.44 | 5.93 | 7.52 |
|                 | 12H  | 9.17             | 9.65 | 10.34 | 10.79 | 12.40 | 4.32           | 4.79 | 5.49 | 5.94 | 7.55 |
| 4H              | 2H   | 6.30             | 6.87 | 7.46  | 8.00  | 9.59  | 2.84           | 3.41 | 4.00 | 4.54 | 6.13 |
|                 | 3H   | 8.12             | 8.59 | 9.28  | 9.75  | 11.35 | 4.18           | 4.65 | 5.34 | 5.81 | 7.41 |
|                 | 4H   | 8.81             | 9.25 | 9.97  | 10.39 | 12.01 | 4.72           | 5.16 | 5.88 | 6.30 | 7.92 |
|                 | 6H   | 9.32             | 9.69 | 10.49 | 10.86 | 12.47 | 5.13           | 5.50 | 6.30 | 6.67 | 8.28 |
|                 | 8H   | 9.49             | 9.84 | 10.66 | 11.00 | 12.63 | 5.26           | 5.61 | 6.43 | 6.77 | 8.39 |
|                 | 12H  | 9.58             | 9.90 | 10.77 | 11.07 | 12.70 | 5.31           | 5.63 | 6.50 | 6.80 | 8.43 |
| 8H              | 4H   | 8.76             | 9.11 | 9.93  | 10.27 | 11.90 | 4.99           | 5.34 | 6.16 | 6.50 | 8.12 |
|                 | 6H   | 9.33             | 9.62 | 10.52 | 10.82 | 12.44 | 5.50           | 5.79 | 6.69 | 6.99 | 8.61 |
|                 | 8H   | 9.55             | 9.80 | 10.74 | 10.98 | 12.62 | 5.69           | 5.95 | 6.89 | 7.13 | 8.77 |
|                 | 12H  | 9.68             | 9.90 | 10.88 | 11.08 | 12.75 | 5.81           | 6.03 | 7.01 | 7.21 | 8.88 |
| 12H             | 4H   | 8.71             | 9.03 | 9.89  | 10.20 | 11.82 | 4.99           | 5.30 | 6.17 | 6.48 | 8.10 |
|                 | 6H   | 9.30             | 9.56 | 10.50 | 10.74 | 12.37 | 5.55           | 5.80 | 6.75 | 6.98 | 8.62 |
|                 | 8H   | 9.52             | 9.74 | 10.72 | 10.92 | 12.59 | 5.76           | 5.98 | 6.96 | 7.16 | 8.83 |

END OF REPORT