

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: P903414

Luminaire Tested: DFN2DIP-PN4F0-110D080US830-RLLFLL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P903414  
REPORT IS A COMBINATION OF REPORTS P899696 AND P896497  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-PN4F0-110D080US830-RLLFLL  
Description: 4 foot, Pentagon Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

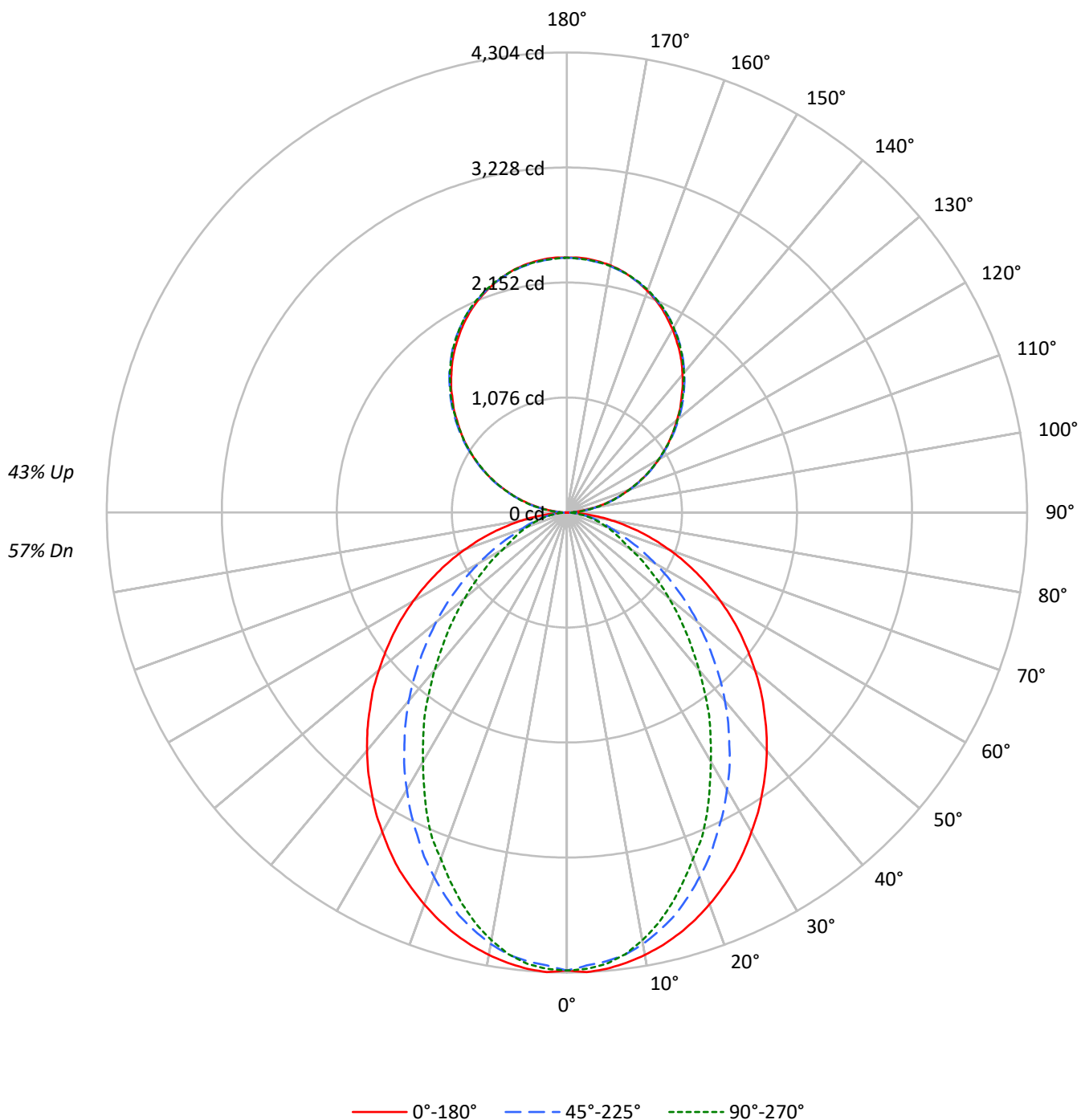
**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 15486.0 lumens  
Efficiency: N/A  
Efficacy: 89.9 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: General Diffuse  
  
Input Watts (W): 172.2  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.996  
Total Harmonic Distortion (THDi): 0.064  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT

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CATALOG NUMBER: DFN2DIP-PN4F0-110D080US830-RLLFLL

### Luminous Intensity Polar Plot



TEST NUMBER: P903414

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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   | 109 | 109 | 109 | 109 | 101 | 101 | 101 | 101 | 87 | 87 | 87 | 74 | 74 | 74 | 63 | 63 | 63 |
| 1   | 100 | 96  | 92  | 89  | 93  | 89  | 86  | 83  | 77 | 75 | 73 | 66 | 65 | 63 | 56 | 55 | 54 |
| 2   | 91  | 84  | 78  | 73  | 85  | 79  | 74  | 69  | 68 | 65 | 61 | 59 | 56 | 54 | 50 | 48 | 46 |
| 3   | 84  | 75  | 67  | 62  | 78  | 70  | 64  | 58  | 61 | 56 | 52 | 53 | 49 | 46 | 45 | 42 | 40 |
| 4   | 77  | 66  | 59  | 53  | 71  | 62  | 55  | 50  | 54 | 49 | 45 | 47 | 43 | 40 | 40 | 37 | 35 |
| 5   | 71  | 59  | 52  | 46  | 66  | 56  | 49  | 43  | 49 | 43 | 39 | 43 | 38 | 35 | 37 | 33 | 31 |
| 6   | 65  | 54  | 46  | 40  | 61  | 50  | 43  | 38  | 44 | 39 | 34 | 39 | 34 | 31 | 34 | 30 | 27 |
| 7   | 61  | 49  | 41  | 35  | 57  | 46  | 39  | 34  | 40 | 35 | 31 | 35 | 31 | 28 | 31 | 27 | 25 |
| 8   | 56  | 44  | 37  | 31  | 53  | 42  | 35  | 30  | 37 | 31 | 27 | 33 | 28 | 25 | 28 | 25 | 22 |
| 9   | 53  | 41  | 33  | 28  | 49  | 38  | 32  | 27  | 34 | 29 | 25 | 30 | 26 | 22 | 26 | 23 | 20 |
| 10  | 49  | 37  | 30  | 26  | 46  | 35  | 29  | 24  | 32 | 26 | 22 | 28 | 24 | 20 | 24 | 21 | 18 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 3128 | 3128 | 3128 |
| 5°  | 3133 | 3079 | 3099 |
| 10° | 3102 | 3019 | 2998 |
| 15° | 3059 | 2919 | 2843 |
| 20° | 3003 | 2782 | 2652 |
| 25° | 2945 | 2628 | 2468 |
| 30° | 2867 | 2471 | 2234 |
| 35° | 2791 | 2301 | 2028 |
| 40° | 2714 | 2125 | 1793 |
| 45° | 2624 | 1931 | 1579 |
| 50° | 2531 | 1734 | 1370 |
| 55° | 2433 | 1524 | 1170 |
| 60° | 2321 | 1304 | 963  |
| 65° | 2192 | 1080 | 868  |
| 70° | 2035 | 872  | 786  |
| 75° | 1838 | 769  | 717  |
| 80° | 1552 | 647  | 624  |
| 85° | 1081 | 434  | 472  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 2624 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 401.6   | 2.6       |
| 10°-20°   | 1102.5  | 7.1       |
| 20°-30°   | 1547.8  | 10.0      |
| 30°-40°   | 1687.2  | 10.9      |
| 40°-50°   | 1550.8  | 10.0      |
| 50°-60°   | 1217.9  | 7.9       |
| 60°-70°   | 792.7   | 5.1       |
| 70°-80°   | 408.1   | 2.6       |
| 80°-90°   | 110.9   | 0.7       |
| 90°-100°  | 147.6   | 1.0       |
| 100°-110° | 468.9   | 3.0       |
| 110°-120° | 802.4   | 5.2       |
| 120°-130° | 1055.3  | 6.8       |
| 130°-140° | 1184.5  | 7.6       |
| 140°-150° | 1161.5  | 7.5       |
| 150°-160° | 974.4   | 6.3       |
| 160°-170° | 646.2   | 4.2       |
| 170°-180° | 225.9   | 1.5       |
| 0°-30°    | 3051.9  | 19.7      |
| 0°-40°    | 4739.1  | 30.6      |
| 0°-60°    | 7507.8  | 48.5      |
| 0°-90°    | 8819.5  | 57.0      |
| 90°-120°  | 1418.8  | 9.2       |
| 90°-150°  | 4820.1  | 31.1      |
| 90°-180°  | 6666.0  | 43.0      |
| 0°-180°   | 15486.0 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 4285 | 4285  | 4285 | 4285  | 4285 |      |
| 5°   | 4285 | 4266  | 4215 | 4250  | 4239 | 406  |
| 15°  | 4076 | 4033  | 3901 | 3828  | 3789 | 1148 |
| 25°  | 3700 | 3575  | 3319 | 3161  | 3102 | 1701 |
| 35°  | 3188 | 2990  | 2649 | 2404  | 2319 | 1995 |
| 45°  | 2606 | 2346  | 1939 | 1663  | 1570 | 2013 |
| 55°  | 1981 | 1679  | 1260 | 1028  | 954  | 1771 |
| 65°  | 1338 | 1024  | 675  | 543   | 531  | 1326 |
| 75°  | 713  | 442   | 310  | 283   | 279  | 755  |
| 85°  | 167  | 85    | 74   | 74    | 74   | 191  |
| 90°  | 2    | 26    | 70   | 66    | 68   | 15   |
| 95°  | 105  | 125   | 129  | 129   | 125  | 117  |
| 105° | 433  | 439   | 443  | 446   | 446  | 457  |
| 115° | 805  | 817   | 813  | 811   | 805  | 796  |
| 125° | 1171 | 1189  | 1183 | 1177  | 1175 | 1047 |
| 135° | 1515 | 1537  | 1541 | 1539  | 1534 | 1171 |
| 145° | 1839 | 1853  | 1865 | 1867  | 1859 | 1149 |
| 155° | 2103 | 2109  | 2115 | 2125  | 2119 | 968  |
| 165° | 2288 | 2286  | 2286 | 2300  | 2290 | 645  |
| 175° | 2380 | 2375  | 2370 | 2385  | 2372 | 226  |
| 180° | 2385 | 2385  | 2385 | 2385  | 2385 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 4285.1 | 4285.1 | 4285.1 | 4285.1 | 4285.1 |
| 2.5°   | 4304.4 | 4285.1 | 4242.3 | 4281.4 | 4273.6 |
| 5°     | 4285.1 | 4265.8 | 4215.1 | 4250.1 | 4238.6 |
| 7.5°   | 4250.1 | 4227.0 | 4172.7 | 4188.0 | 4168.6 |
| 10°    | 4203.6 | 4176.4 | 4099.1 | 4087.1 | 4064.1 |
| 12.5°  | 4145.6 | 4110.6 | 4005.7 | 3982.6 | 3939.8 |
| 15°    | 4075.6 | 4032.9 | 3901.2 | 3827.6 | 3788.8 |
| 17.5°  | 3994.2 | 3932.1 | 3769.1 | 3683.9 | 3621.8 |
| 20°    | 3901.2 | 3823.4 | 3629.6 | 3532.9 | 3447.3 |
| 22.5°  | 3800.4 | 3711.1 | 3486.1 | 3354.4 | 3296.4 |
| 25°    | 3699.6 | 3575.3 | 3319.4 | 3160.6 | 3102.2 |
| 27.5°  | 3579.5 | 3447.3 | 3164.3 | 2982.0 | 2892.8 |
| 30°    | 3451.5 | 3303.8 | 2993.6 | 2796.1 | 2691.1 |
| 32.5°  | 3327.3 | 3148.7 | 2831.0 | 2598.2 | 2501.1 |
| 35°    | 3187.8 | 2989.8 | 2648.8 | 2404.4 | 2318.8 |
| 37.5°  | 3052.0 | 2838.5 | 2478.0 | 2210.2 | 2113.6 |
| 40°    | 2908.4 | 2676.0 | 2299.5 | 2024.2 | 1923.4 |
| 42.5°  | 2761.1 | 2513.0 | 2121.4 | 1834.2 | 1737.5 |
| 45°    | 2606.0 | 2346.0 | 1939.1 | 1663.4 | 1570.5 |
| 47.5°  | 2458.7 | 2183.5 | 1764.6 | 1488.9 | 1403.8 |
| 50°    | 2295.8 | 2020.5 | 1593.9 | 1326.1 | 1245.0 |
| 52.5°  | 2136.6 | 1845.7 | 1431.0 | 1175.1 | 1101.4 |
| 55°    | 1981.4 | 1679.0 | 1260.2 | 1027.7 | 954.1  |
| 57.5°  | 1822.7 | 1512.4 | 1109.2 | 892.0  | 829.8  |
| 60°    | 1659.7 | 1349.5 | 950.0  | 752.5  | 690.4  |
| 62.5°  | 1500.9 | 1190.7 | 814.3  | 628.3  | 597.4  |
| 65°    | 1337.9 | 1023.6 | 674.8  | 543.1  | 531.1  |
| 67.5°  | 1182.9 | 868.6  | 543.1  | 476.8  | 465.3  |
| 70°    | 1019.9 | 717.6  | 449.7  | 411.0  | 395.4  |
| 72.5°  | 864.8  | 577.7  | 376.1  | 345.2  | 337.3  |
| 75°    | 713.4  | 441.9  | 310.2  | 283.0  | 279.4  |
| 77.5°  | 562.4  | 314.0  | 244.4  | 228.8  | 220.9  |
| 80°    | 422.5  | 225.1  | 186.0  | 170.8  | 170.8  |
| 82.5°  | 294.5  | 151.4  | 128.0  | 120.2  | 120.2  |
| 85°    | 166.6  | 85.2   | 73.6   | 73.6   | 73.6   |
| 87.5°  | 62.1   | 30.8   | 30.8   | 27.1   | 27.1   |
| 90°    | 2.2    | 25.9   | 70.5   | 66.2   | 68.3   |
| 92.5°  | 44.6   | 60.4   | 62.6   | 64.7   | 64.7   |
| 95°    | 105.0  | 125.1  | 128.7  | 128.7  | 125.1  |
| 97.5°  | 174.7  | 193.4  | 201.3  | 201.3  | 201.3  |
| 100°   | 255.2  | 271.7  | 277.5  | 277.5  | 275.3  |
| 102.5° | 340.1  | 352.3  | 360.1  | 362.3  | 360.1  |
| 105°   | 432.8  | 438.6  | 442.9  | 446.5  | 446.5  |
| 107.5° | 524.8  | 533.5  | 533.5  | 534.9  | 524.8  |
| 110°   | 614.0  | 625.5  | 625.5  | 625.5  | 619.7  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 710.3  | 722.6  | 720.4  | 714.6  | 710.3  |
| 115°   | 805.2  | 816.7  | 813.1  | 811.0  | 805.2  |
| 117.5° | 899.4  | 915.2  | 905.1  | 899.4  | 893.6  |
| 120°   | 994.3  | 1010.1 | 994.3  | 994.3  | 987.8  |
| 122.5° | 1080.5 | 1100.7 | 1090.6 | 1084.9 | 1080.5 |
| 125°   | 1171.1 | 1189.1 | 1183.4 | 1176.9 | 1174.8 |
| 127.5° | 1259.6 | 1281.9 | 1273.9 | 1265.4 | 1259.6 |
| 130°   | 1342.3 | 1368.1 | 1364.5 | 1360.3 | 1352.4 |
| 132.5° | 1435.0 | 1455.1 | 1456.6 | 1446.5 | 1440.8 |
| 135°   | 1514.8 | 1537.1 | 1541.4 | 1539.3 | 1533.5 |
| 137.5° | 1603.9 | 1621.9 | 1625.5 | 1624.1 | 1615.4 |
| 140°   | 1682.3 | 1700.3 | 1710.3 | 1710.3 | 1702.4 |
| 142.5° | 1762.8 | 1780.8 | 1786.6 | 1788.8 | 1780.8 |
| 145°   | 1839.1 | 1853.4 | 1864.9 | 1867.1 | 1859.2 |
| 147.5° | 1907.3 | 1925.3 | 1933.9 | 1937.6 | 1929.7 |
| 150°   | 1977.8 | 1990.0 | 1997.9 | 2004.4 | 1997.9 |
| 152.5° | 2040.3 | 2052.6 | 2062.7 | 2070.6 | 2062.7 |
| 155°   | 2102.9 | 2108.7 | 2115.2 | 2125.2 | 2118.7 |
| 157.5° | 2156.8 | 2161.2 | 2164.7 | 2179.1 | 2169.1 |
| 160°   | 2205.0 | 2209.3 | 2211.5 | 2223.6 | 2215.1 |
| 162.5° | 2249.6 | 2249.6 | 2251.7 | 2265.4 | 2255.3 |
| 165°   | 2287.6 | 2285.5 | 2285.5 | 2299.9 | 2289.8 |
| 167.5° | 2322.1 | 2315.7 | 2315.7 | 2330.1 | 2320.0 |
| 170°   | 2348.1 | 2342.3 | 2340.1 | 2354.6 | 2342.3 |
| 172.5° | 2366.1 | 2360.3 | 2358.1 | 2372.5 | 2360.3 |
| 175°   | 2380.4 | 2374.6 | 2370.3 | 2384.7 | 2372.5 |
| 177.5° | 2388.3 | 2382.6 | 2378.2 | 2390.5 | 2378.2 |
| 180°   | 2384.7 | 2384.7 | 2384.7 | 2384.7 | 2384.7 |

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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 | 11.74            | 12.63 | 12.64 | 13.55 | 14.72 | 7.71           | 8.60  | 8.61  | 9.51  | 10.68 |
|                 | 3H   | 13.43            | 14.22 | 14.34 | 15.15 | 16.34 | 8.90           | 9.70  | 9.81  | 10.62 | 11.82 |
|                 | 4H   | 14.04            | 14.79 | 14.97 | 15.72 | 16.93 | 9.35           | 10.11 | 10.28 | 11.04 | 12.24 |
|                 | 6H   | 14.47            | 15.16 | 15.41 | 16.10 | 17.31 | 9.68           | 10.37 | 10.62 | 11.31 | 12.53 |
|                 | 8H   | 14.60            | 15.25 | 15.54 | 16.21 | 17.42 | 9.77           | 10.43 | 10.72 | 11.38 | 12.60 |
|                 | 12H  | 14.66            | 15.29 | 15.61 | 16.23 | 17.48 | 9.82           | 10.44 | 10.77 | 11.39 | 12.63 |
| 4H              | 2H   | 11.77            | 12.52 | 12.70 | 13.45 | 14.66 | 8.31           | 9.06  | 9.24  | 9.99  | 11.20 |
|                 | 3H   | 13.60            | 14.23 | 14.55 | 15.19 | 16.41 | 9.67           | 10.29 | 10.61 | 11.25 | 12.47 |
|                 | 4H   | 14.30            | 14.87 | 15.26 | 15.83 | 17.07 | 10.22          | 10.79 | 11.17 | 11.74 | 12.99 |
|                 | 6H   | 14.82            | 15.31 | 15.79 | 16.29 | 17.54 | 10.64          | 11.13 | 11.61 | 12.11 | 13.36 |
|                 | 8H   | 15.00            | 15.46 | 15.97 | 16.43 | 17.69 | 10.77          | 11.23 | 11.74 | 12.20 | 13.46 |
|                 | 12H  | 15.10            | 15.51 | 16.09 | 16.50 | 17.77 | 10.84          | 11.25 | 11.83 | 12.24 | 13.51 |
| 8H              | 4H   | 14.27            | 14.73 | 15.24 | 15.70 | 16.96 | 10.50          | 10.96 | 11.47 | 11.94 | 13.19 |
|                 | 6H   | 14.84            | 15.22 | 15.84 | 16.24 | 17.49 | 11.03          | 11.40 | 12.02 | 12.42 | 13.68 |
|                 | 8H   | 15.06            | 15.40 | 16.07 | 16.40 | 17.68 | 11.22          | 11.55 | 12.22 | 12.56 | 13.83 |
|                 | 12H  | 15.21            | 15.50 | 16.21 | 16.50 | 17.82 | 11.34          | 11.63 | 12.35 | 12.63 | 13.95 |
| 12H             | 4H   | 14.23            | 14.64 | 15.22 | 15.63 | 16.89 | 10.51          | 10.92 | 11.50 | 11.91 | 13.18 |
|                 | 6H   | 14.82            | 15.15 | 15.82 | 16.16 | 17.43 | 11.08          | 11.41 | 12.08 | 12.41 | 13.69 |
|                 | 8H   | 15.05            | 15.34 | 16.05 | 16.34 | 17.66 | 11.29          | 11.58 | 12.30 | 12.58 | 13.90 |

END OF REPORT