

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: P916163

Luminaire Tested: DFN2DIP-HX3F0-030D040US930-FLLONL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P916163  
REPORT IS A COMBINATION OF REPORTS P900735 AND P897645  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-HX3F0-030D040US930-FLLONL  
Description: 3 foot, Hexagon Define Geo, with Direct Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

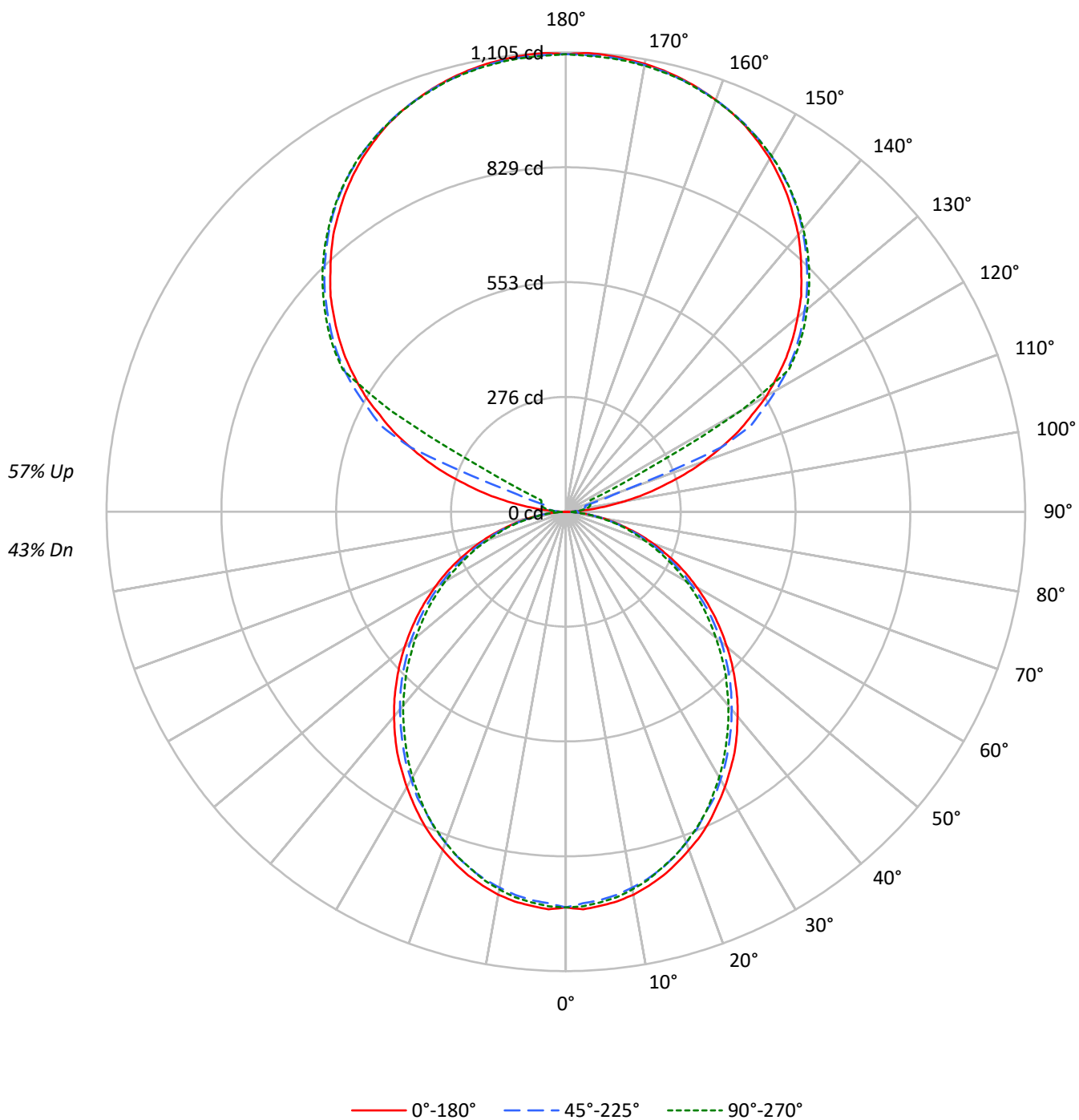
Lumens per Lamp: N/A  
Luminaire Lumens: 5650.0 lumens  
Efficiency: N/A  
Efficacy: 105.8 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 2.84' x L: 3.28' x H: 0.1')  
CIE Type: General Diffuse

Input Watts (W): 53.4  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.983  
Total Harmonic Distortion (THDi): 0.073  
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   | 105 | 105 | 105 | 105 | 96 | 96 | 96 | 96 | 79 | 79 | 79 | 64 | 64 | 64 | 50 | 50 | 50 |
| 1   | 96  | 92  | 88  | 85  | 88 | 84 | 81 | 78 | 70 | 67 | 65 | 56 | 55 | 53 | 44 | 43 | 42 |
| 2   | 88  | 80  | 74  | 69  | 80 | 74 | 68 | 64 | 61 | 57 | 54 | 49 | 47 | 44 | 39 | 37 | 35 |
| 3   | 80  | 71  | 63  | 58  | 73 | 65 | 58 | 53 | 54 | 49 | 45 | 44 | 40 | 38 | 34 | 32 | 30 |
| 4   | 73  | 62  | 55  | 49  | 66 | 57 | 50 | 45 | 48 | 43 | 39 | 39 | 35 | 32 | 31 | 28 | 26 |
| 5   | 67  | 56  | 48  | 42  | 61 | 51 | 44 | 39 | 43 | 37 | 33 | 35 | 31 | 28 | 28 | 25 | 23 |
| 6   | 62  | 50  | 42  | 36  | 56 | 46 | 39 | 34 | 38 | 33 | 29 | 31 | 27 | 24 | 25 | 22 | 20 |
| 7   | 57  | 45  | 37  | 32  | 52 | 41 | 34 | 29 | 35 | 29 | 25 | 29 | 25 | 22 | 23 | 20 | 18 |
| 8   | 53  | 41  | 33  | 28  | 48 | 38 | 31 | 26 | 32 | 26 | 23 | 26 | 22 | 19 | 21 | 18 | 16 |
| 9   | 49  | 37  | 30  | 25  | 45 | 34 | 28 | 23 | 29 | 24 | 20 | 24 | 20 | 17 | 19 | 16 | 14 |
| 10  | 46  | 34  | 27  | 22  | 42 | 31 | 25 | 21 | 27 | 22 | 18 | 22 | 18 | 16 | 18 | 15 | 13 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 1102 | 1102 | 1102 |
| 5°  | 1104 | 1086 | 1094 |
| 10° | 1094 | 1071 | 1078 |
| 15° | 1078 | 1053 | 1055 |
| 20° | 1055 | 1027 | 1030 |
| 25° | 1033 | 997  | 1002 |
| 30° | 1006 | 969  | 967  |
| 35° | 979  | 936  | 929  |
| 40° | 947  | 903  | 894  |
| 45° | 915  | 870  | 857  |
| 50° | 880  | 834  | 815  |
| 55° | 843  | 794  | 776  |
| 60° | 801  | 746  | 731  |
| 65° | 756  | 696  | 679  |
| 70° | 698  | 635  | 622  |
| 75° | 618  | 562  | 568  |
| 80° | 521  | 468  | 468  |
| 85° | 369  | 310  | 303  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 915 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 89.6   | 1.6       |
| 10°-20°   | 252.0  | 4.5       |
| 20°-30°   | 370.4  | 6.6       |
| 30°-40°   | 430.2  | 7.6       |
| 40°-50°   | 429.7  | 7.6       |
| 50°-60°   | 374.6  | 6.6       |
| 60°-70°   | 277.0  | 4.9       |
| 70°-80°   | 156.7  | 2.8       |
| 80°-90°   | 43.3   | 0.8       |
| 90°-100°  | 36.3   | 0.6       |
| 100°-110° | 135.3  | 2.4       |
| 110°-120° | 358.8  | 6.4       |
| 120°-130° | 595.1  | 10.5      |
| 130°-140° | 632.1  | 11.2      |
| 140°-150° | 587.5  | 10.4      |
| 150°-160° | 472.3  | 8.4       |
| 160°-170° | 304.4  | 5.4       |
| 170°-180° | 104.8  | 1.9       |
| 0°-30°    | 712.0  | 12.6      |
| 0°-40°    | 1142.2 | 20.2      |
| 0°-60°    | 1946.5 | 34.5      |
| 0°-90°    | 2423.4 | 42.9      |
| 90°-120°  | 530.4  | 9.4       |
| 90°-150°  | 2345.2 | 41.5      |
| 90°-180°  | 3227.0 | 57.1      |
| 0°-180°   | 5650.0 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 952  | 952   | 952  | 952   | 952  |      |
| 5°   | 952  | 948   | 938  | 945   | 944  | 90   |
| 15°  | 906  | 901   | 889  | 892   | 888  | 255  |
| 25°  | 820  | 813   | 797  | 799   | 797  | 377  |
| 35°  | 707  | 698   | 684  | 678   | 674  | 442  |
| 45°  | 576  | 569   | 556  | 545   | 542  | 444  |
| 55°  | 436  | 430   | 419  | 408   | 404  | 390  |
| 65°  | 294  | 288   | 279  | 271   | 266  | 290  |
| 75°  | 154  | 152   | 147  | 142   | 144  | 164  |
| 85°  | 38   | 37    | 36   | 33    | 32   | 42   |
| 90°  | 1    | 10    | 16   | 20    | 21   | 5    |
| 95°  | 52   | 25    | 31   | 35    | 34   | 61   |
| 105° | 242  | 266   | 49   | 57    | 60   | 259  |
| 115° | 458  | 471   | 491  | 123   | 65   | 451  |
| 125° | 647  | 658   | 673  | 679   | 681  | 577  |
| 135° | 801  | 814   | 821  | 829   | 828  | 619  |
| 145° | 929  | 929   | 942  | 948   | 944  | 581  |
| 155° | 1023 | 1016  | 1026 | 1030  | 1024 | 472  |
| 165° | 1078 | 1074  | 1076 | 1082  | 1076 | 305  |
| 175° | 1103 | 1097  | 1099 | 1105  | 1097 | 105  |
| 180° | 1101 | 1101  | 1101 | 1101  | 1101 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°    | 22.5° | 45°   | 67.5° | 90°   |
|--------|-------|-------|-------|-------|-------|
| 0°     | 951.7 | 951.7 | 951.7 | 951.7 | 951.7 |
| 2.5°   | 957.2 | 952.7 | 942.6 | 951.7 | 950.0 |
| 5°     | 951.7 | 948.1 | 938.0 | 945.3 | 943.5 |
| 7.5°   | 945.3 | 939.9 | 929.8 | 937.2 | 935.3 |
| 10°    | 935.3 | 928.9 | 917.9 | 925.2 | 922.5 |
| 12.5°  | 921.5 | 916.1 | 905.1 | 909.6 | 907.8 |
| 15°    | 906.0 | 900.6 | 888.6 | 892.3 | 887.7 |
| 17.5°  | 886.7 | 881.3 | 869.4 | 873.9 | 869.4 |
| 20°    | 865.7 | 860.2 | 847.4 | 850.1 | 846.5 |
| 22.5°  | 844.7 | 836.5 | 824.5 | 824.5 | 822.6 |
| 25°    | 819.9 | 812.7 | 797.1 | 798.9 | 797.1 |
| 27.5°  | 792.5 | 786.0 | 774.2 | 771.5 | 767.0 |
| 30°    | 765.1 | 757.7 | 744.0 | 741.3 | 737.6 |
| 32.5°  | 735.8 | 730.3 | 715.7 | 710.1 | 706.5 |
| 35°    | 707.4 | 698.3 | 683.6 | 678.1 | 673.5 |
| 37.5°  | 675.4 | 667.2 | 652.5 | 646.0 | 641.5 |
| 40°    | 642.5 | 635.1 | 620.4 | 612.3 | 608.6 |
| 42.5°  | 610.4 | 603.1 | 588.5 | 579.3 | 573.8 |
| 45°    | 575.7 | 569.2 | 555.5 | 545.4 | 541.8 |
| 47.5°  | 541.8 | 535.4 | 520.7 | 510.6 | 505.2 |
| 50°    | 506.1 | 501.5 | 488.7 | 475.9 | 471.3 |
| 52.5°  | 471.3 | 464.9 | 453.1 | 443.0 | 436.5 |
| 55°    | 435.7 | 430.2 | 419.1 | 408.2 | 403.7 |
| 57.5°  | 399.9 | 395.3 | 383.4 | 372.4 | 368.8 |
| 60°    | 364.2 | 360.6 | 347.8 | 337.7 | 335.0 |
| 62.5°  | 329.5 | 323.0 | 313.9 | 304.8 | 301.1 |
| 65°    | 293.8 | 288.3 | 279.2 | 270.9 | 266.4 |
| 67.5°  | 257.2 | 252.6 | 244.3 | 238.0 | 234.3 |
| 70°    | 223.3 | 219.6 | 211.4 | 205.0 | 201.4 |
| 72.5°  | 188.6 | 184.8 | 180.3 | 173.9 | 171.2 |
| 75°    | 153.7 | 152.0 | 147.3 | 141.9 | 143.7 |
| 77.5°  | 122.6 | 119.0 | 117.1 | 114.4 | 111.7 |
| 80°    | 91.6  | 90.6  | 88.7  | 86.0  | 84.2  |
| 82.5°  | 62.2  | 62.2  | 61.4  | 57.6  | 57.6  |
| 85°    | 37.5  | 36.6  | 35.7  | 32.9  | 32.0  |
| 87.5°  | 16.5  | 14.7  | 12.8  | 10.1  | 9.1   |
| 90°    | 0.7   | 9.5   | 15.9  | 20.0  | 21.4  |
| 92.5°  | 20.0  | 16.7  | 19.1  | 20.7  | 21.4  |
| 95°    | 51.7  | 25.4  | 31.0  | 35.1  | 34.2  |
| 97.5°  | 93.2  | 27.9  | 40.6  | 43.0  | 43.8  |
| 100°   | 141.0 | 31.9  | 45.4  | 51.7  | 53.3  |
| 102.5° | 193.5 | 192.0 | 47.0  | 55.7  | 58.1  |
| 105°   | 242.1 | 266.0 | 48.6  | 57.3  | 60.5  |
| 107.5° | 298.6 | 318.5 | 50.2  | 58.9  | 62.1  |
| 110°   | 352.9 | 369.5 | 139.4 | 59.8  | 62.9  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 403.8  | 418.1  | 404.6  | 61.3   | 63.8   |
| 115°   | 457.9  | 471.4  | 491.4  | 122.6  | 65.4   |
| 117.5° | 504.9  | 520.8  | 534.4  | 420.4  | 211.8  |
| 120°   | 557.5  | 569.4  | 583.8  | 593.4  | 485.8  |
| 122.5° | 602.0  | 614.8  | 630.8  | 635.5  | 636.3  |
| 125°   | 647.4  | 657.9  | 672.9  | 678.6  | 680.9  |
| 127.5° | 688.8  | 700.0  | 712.0  | 720.0  | 720.7  |
| 130°   | 727.9  | 740.7  | 749.3  | 758.1  | 757.4  |
| 132.5° | 767.7  | 778.1  | 786.8  | 794.0  | 793.3  |
| 135°   | 801.2  | 814.0  | 821.1  | 829.1  | 827.5  |
| 137.5° | 836.2  | 845.7  | 853.8  | 861.7  | 859.3  |
| 140°   | 870.4  | 876.9  | 885.6  | 892.8  | 888.8  |
| 142.5° | 899.2  | 904.7  | 915.1  | 921.4  | 917.5  |
| 145°   | 929.4  | 928.6  | 942.1  | 947.7  | 943.7  |
| 147.5° | 955.6  | 953.2  | 966.8  | 970.8  | 967.7  |
| 150°   | 981.1  | 975.6  | 988.4  | 993.1  | 989.1  |
| 152.5° | 1002.7 | 996.3  | 1008.2 | 1013.0 | 1007.5 |
| 155°   | 1023.4 | 1016.3 | 1025.8 | 1030.5 | 1024.2 |
| 157.5° | 1040.1 | 1033.7 | 1041.0 | 1046.5 | 1040.1 |
| 160°   | 1054.4 | 1049.6 | 1054.4 | 1059.2 | 1053.6 |
| 162.5° | 1067.1 | 1062.4 | 1066.4 | 1072.0 | 1064.8 |
| 165°   | 1078.3 | 1073.6 | 1075.9 | 1081.5 | 1075.9 |
| 167.5° | 1087.1 | 1082.2 | 1084.8 | 1090.3 | 1083.1 |
| 170°   | 1094.3 | 1089.5 | 1091.0 | 1096.7 | 1089.5 |
| 172.5° | 1099.0 | 1094.3 | 1095.9 | 1101.5 | 1094.3 |
| 175°   | 1102.9 | 1097.4 | 1099.0 | 1104.6 | 1096.7 |
| 177.5° | 1104.6 | 1099.0 | 1099.8 | 1105.5 | 1098.3 |
| 180°   | 1100.7 | 1100.7 | 1100.7 | 1100.7 | 1100.7 |

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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 | 6.87             | 7.67  | 7.89  | 8.70  | 10.07 | 6.44           | 7.24  | 7.46  | 8.27  | 9.64  |
|                 | 3H   | 8.52             | 9.24  | 9.55  | 10.27 | 11.66 | 8.05           | 8.77  | 9.08  | 9.80  | 11.19 |
|                 | 4H   | 9.10             | 9.78  | 10.14 | 10.82 | 12.21 | 8.63           | 9.31  | 9.67  | 10.35 | 11.74 |
|                 | 6H   | 9.49             | 10.12 | 10.54 | 11.16 | 12.57 | 9.02           | 9.65  | 10.07 | 10.69 | 12.10 |
|                 | 8H   | 9.59             | 10.19 | 10.64 | 11.24 | 12.65 | 9.12           | 9.72  | 10.17 | 10.77 | 12.18 |
|                 | 12H  | 9.63             | 10.20 | 10.69 | 11.25 | 12.68 | 9.16           | 9.73  | 10.22 | 10.78 | 12.21 |
| 4H              | 2H   | 7.32             | 8.00  | 8.37  | 9.04  | 10.44 | 6.98           | 7.66  | 8.03  | 8.70  | 10.09 |
|                 | 3H   | 9.18             | 9.74  | 10.23 | 10.81 | 12.22 | 8.79           | 9.35  | 9.84  | 10.42 | 11.83 |
|                 | 4H   | 9.88             | 10.40 | 10.94 | 11.46 | 12.89 | 9.48           | 10.00 | 10.54 | 11.06 | 12.49 |
|                 | 6H   | 10.39            | 10.83 | 11.45 | 11.91 | 13.34 | 9.98           | 10.43 | 11.05 | 11.51 | 12.93 |
|                 | 8H   | 10.53            | 10.95 | 11.60 | 12.02 | 13.46 | 10.12          | 10.54 | 11.19 | 11.61 | 13.05 |
|                 | 12H  | 10.60            | 10.97 | 11.68 | 12.06 | 13.51 | 10.18          | 10.56 | 11.27 | 11.64 | 13.09 |
| 8H              | 4H   | 10.07            | 10.49 | 11.14 | 11.56 | 13.00 | 9.71           | 10.13 | 10.78 | 11.20 | 12.64 |
|                 | 6H   | 10.69            | 11.03 | 11.78 | 12.15 | 13.59 | 10.33          | 10.68 | 11.42 | 11.79 | 13.23 |
|                 | 8H   | 10.90            | 11.21 | 12.00 | 12.30 | 13.76 | 10.54          | 10.84 | 11.64 | 11.94 | 13.40 |
|                 | 12H  | 11.03            | 11.29 | 12.13 | 12.39 | 13.88 | 10.65          | 10.91 | 11.75 | 12.01 | 13.50 |
| 12H             | 4H   | 10.05            | 10.43 | 11.14 | 11.51 | 12.96 | 9.70           | 10.08 | 10.79 | 11.17 | 12.61 |
|                 | 6H   | 10.72            | 11.02 | 11.82 | 12.12 | 13.58 | 10.37          | 10.67 | 11.47 | 11.77 | 13.23 |
|                 | 8H   | 10.95            | 11.22 | 12.05 | 12.31 | 13.81 | 10.60          | 10.86 | 11.70 | 11.96 | 13.45 |

END OF REPORT