

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: P913601

Luminaire Tested: DFN2DIP-HX4F0-040D050US927-RLLFLL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P913601  
REPORT IS A COMBINATION OF REPORTS P899318 AND P896188  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-HX4F0-040D050US927-RLLFLL  
Description: 4 foot, Hexagon Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

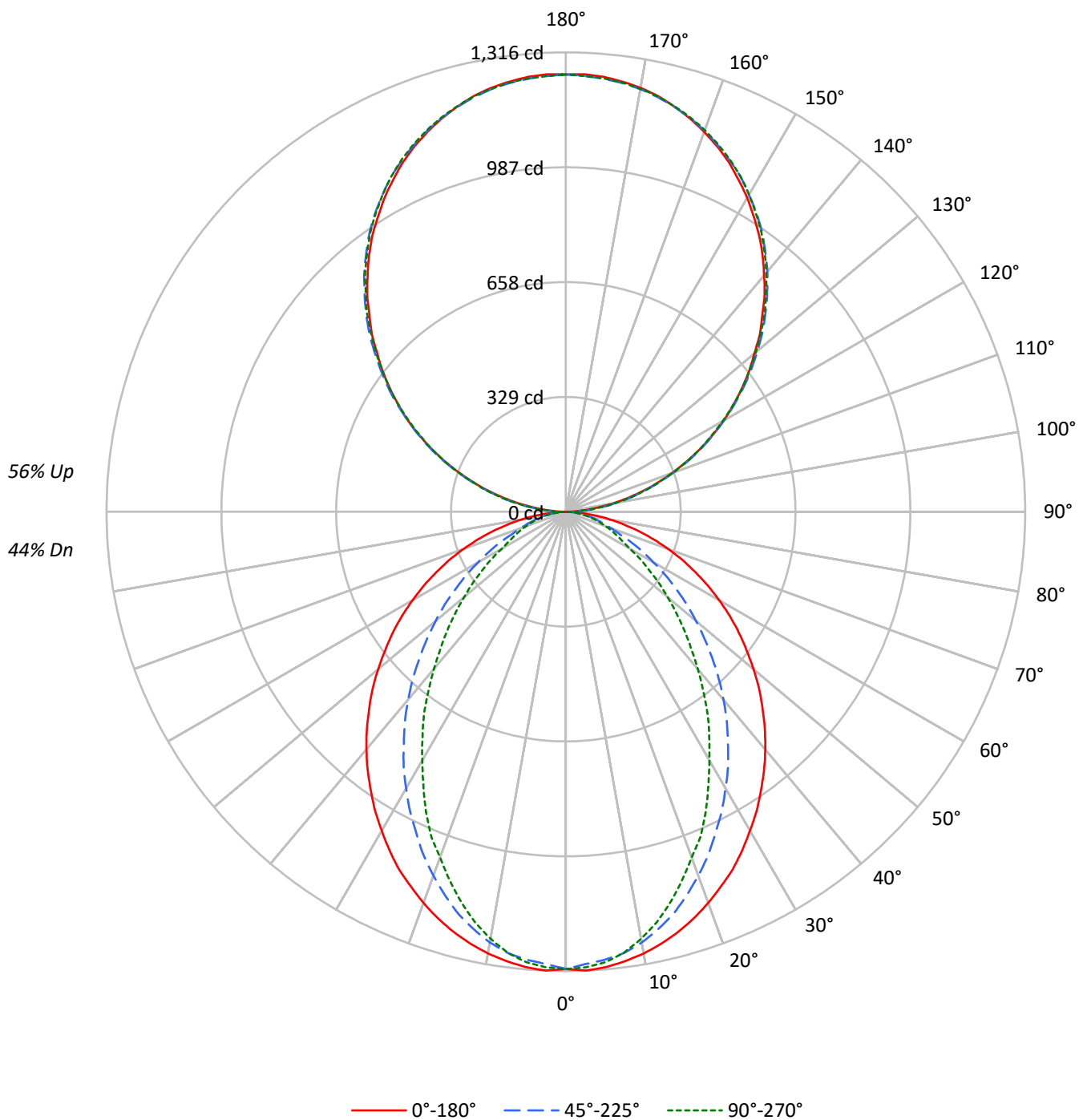
Lumens per Lamp: N/A  
Luminaire Lumens: 6198.8 lumens  
Efficiency: N/A  
Efficacy: 100.1 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 0.99 / 1.16  
Luminous Opening: Rectangular w/ Sides (W: 3.54' x L: 4.09' x H: 0.1')  
CIE Type: General Diffuse

Input Watts (W): 61.9  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9977  
Total Harmonic Distortion (THDi): 0.049  
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



TEST NUMBER: P913601

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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   | 106 | 106 | 106 | 106 | 97 | 97 | 97 | 97 | 80 | 80 | 80 | 64 | 64 | 64 | 50 | 50 | 50 |
| 1   | 97  | 93  | 89  | 86  | 88 | 85 | 82 | 79 | 70 | 68 | 66 | 57 | 56 | 54 | 45 | 44 | 43 |
| 2   | 88  | 81  | 75  | 71  | 81 | 75 | 70 | 65 | 62 | 59 | 55 | 51 | 48 | 46 | 40 | 38 | 37 |
| 3   | 81  | 72  | 65  | 59  | 74 | 66 | 60 | 55 | 55 | 51 | 47 | 45 | 42 | 39 | 36 | 34 | 32 |
| 4   | 74  | 64  | 56  | 50  | 68 | 59 | 52 | 47 | 49 | 44 | 40 | 41 | 37 | 34 | 32 | 30 | 28 |
| 5   | 68  | 57  | 49  | 43  | 62 | 53 | 46 | 41 | 44 | 39 | 35 | 37 | 33 | 30 | 29 | 27 | 25 |
| 6   | 63  | 51  | 43  | 38  | 57 | 47 | 41 | 35 | 40 | 35 | 31 | 33 | 29 | 26 | 27 | 24 | 22 |
| 7   | 58  | 46  | 39  | 33  | 53 | 43 | 36 | 31 | 36 | 31 | 27 | 30 | 26 | 23 | 25 | 22 | 20 |
| 8   | 54  | 42  | 35  | 30  | 50 | 39 | 32 | 28 | 33 | 28 | 24 | 28 | 24 | 21 | 23 | 20 | 18 |
| 9   | 50  | 39  | 31  | 26  | 46 | 36 | 29 | 25 | 31 | 25 | 22 | 26 | 22 | 19 | 21 | 18 | 16 |
| 10  | 47  | 35  | 28  | 24  | 43 | 33 | 27 | 22 | 28 | 23 | 20 | 24 | 20 | 17 | 19 | 17 | 15 |

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

|     | 0°  | 45° | 90° |
|-----|-----|-----|-----|
| 0°  | 974 | 974 | 974 |
| 5°  | 975 | 958 | 965 |
| 10° | 966 | 940 | 933 |
| 15° | 953 | 909 | 885 |
| 20° | 935 | 866 | 825 |
| 25° | 917 | 818 | 768 |
| 30° | 893 | 769 | 695 |
| 35° | 870 | 716 | 631 |
| 40° | 845 | 661 | 557 |
| 45° | 818 | 601 | 491 |
| 50° | 789 | 540 | 426 |
| 55° | 759 | 474 | 363 |
| 60° | 724 | 406 | 299 |
| 65° | 684 | 336 | 269 |
| 70° | 635 | 271 | 244 |
| 75° | 574 | 239 | 222 |
| 80° | 485 | 201 | 193 |
| 85° | 339 | 135 | 145 |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 90°

Vertical Angle: 90°

Luminance: 945 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 122.7  | 2.0       |
| 10°-20°   | 336.9  | 5.4       |
| 20°-30°   | 473.1  | 7.6       |
| 30°-40°   | 515.7  | 8.3       |
| 40°-50°   | 473.9  | 7.6       |
| 50°-60°   | 372.2  | 6.0       |
| 60°-70°   | 242.3  | 3.9       |
| 70°-80°   | 124.7  | 2.0       |
| 80°-90°   | 35.4   | 0.6       |
| 90°-100°  | 77.5   | 1.3       |
| 100°-110° | 246.3  | 4.0       |
| 110°-120° | 421.5  | 6.8       |
| 120°-130° | 554.3  | 8.9       |
| 130°-140° | 622.2  | 10.0      |
| 140°-150° | 610.1  | 9.8       |
| 150°-160° | 511.8  | 8.3       |
| 160°-170° | 339.4  | 5.5       |
| 170°-180° | 118.6  | 1.9       |
| 0°-30°    | 932.7  | 15.0      |
| 0°-40°    | 1448.4 | 23.4      |
| 0°-60°    | 2294.6 | 37.0      |
| 0°-90°    | 2696.9 | 43.5      |
| 90°-120°  | 745.3  | 12.0      |
| 90°-150°  | 2532.0 | 40.8      |
| 90°-180°  | 3502.0 | 56.5      |
| 0°-180°   | 6198.8 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 1310 | 1310  | 1310 | 1310  | 1310 |      |
| 5°   | 1310 | 1304  | 1288 | 1299  | 1296 | 124  |
| 15°  | 1246 | 1233  | 1192 | 1170  | 1158 | 351  |
| 25°  | 1131 | 1093  | 1014 | 966   | 948  | 520  |
| 35°  | 974  | 914   | 810  | 735   | 709  | 610  |
| 45°  | 796  | 717   | 593  | 508   | 480  | 615  |
| 55°  | 606  | 513   | 385  | 314   | 292  | 541  |
| 65°  | 409  | 313   | 206  | 166   | 162  | 405  |
| 75°  | 218  | 135   | 95   | 86    | 85   | 231  |
| 85°  | 51   | 26    | 22   | 22    | 22   | 58   |
| 90°  | 1    | 14    | 37   | 35    | 36   | 6    |
| 95°  | 55   | 66    | 68   | 68    | 66   | 61   |
| 105° | 227  | 230   | 233  | 234   | 234  | 240  |
| 115° | 423  | 429   | 427  | 426   | 423  | 418  |
| 125° | 615  | 625   | 622  | 618   | 617  | 550  |
| 135° | 796  | 807   | 810  | 809   | 806  | 615  |
| 145° | 966  | 974   | 980  | 981   | 977  | 604  |
| 155° | 1105 | 1108  | 1111 | 1116  | 1113 | 508  |
| 165° | 1202 | 1201  | 1201 | 1208  | 1203 | 339  |
| 175° | 1250 | 1247  | 1245 | 1253  | 1246 | 119  |
| 180° | 1253 | 1253  | 1253 | 1253  | 1253 |      |

TEST NUMBER: P913601

CATALOG NUMBER: DFN2DIP-HX4F0-040D050US927-RLFL

**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 1309.6 | 1309.6 | 1309.6 | 1309.6 | 1309.6 |
| 2.5°   | 1315.6 | 1309.6 | 1296.6 | 1308.5 | 1306.1 |
| 5°     | 1309.6 | 1303.7 | 1288.2 | 1298.9 | 1295.5 |
| 7.5°   | 1298.9 | 1291.9 | 1275.3 | 1279.9 | 1274.1 |
| 10°    | 1284.8 | 1276.4 | 1252.8 | 1249.1 | 1242.1 |
| 12.5°  | 1267.0 | 1256.3 | 1224.2 | 1217.2 | 1204.1 |
| 15°    | 1245.6 | 1232.6 | 1192.3 | 1169.8 | 1158.0 |
| 17.5°  | 1220.8 | 1201.7 | 1151.9 | 1125.9 | 1106.9 |
| 20°    | 1192.3 | 1168.5 | 1109.3 | 1079.7 | 1053.6 |
| 22.5°  | 1161.5 | 1134.2 | 1065.4 | 1025.2 | 1007.5 |
| 25°    | 1130.7 | 1092.7 | 1014.5 | 966.0  | 948.1  |
| 27.5°  | 1094.0 | 1053.6 | 967.1  | 911.4  | 884.1  |
| 30°    | 1054.9 | 1009.7 | 914.9  | 854.5  | 822.5  |
| 32.5°  | 1016.9 | 962.3  | 865.2  | 794.1  | 764.4  |
| 35°    | 974.3  | 913.8  | 809.5  | 734.8  | 708.7  |
| 37.5°  | 932.8  | 867.5  | 757.3  | 675.5  | 645.9  |
| 40°    | 888.9  | 817.8  | 702.8  | 618.7  | 587.9  |
| 42.5°  | 843.8  | 768.0  | 648.3  | 560.5  | 531.0  |
| 45°    | 796.5  | 717.0  | 592.6  | 508.4  | 480.0  |
| 47.5°  | 751.5  | 667.3  | 539.3  | 455.1  | 429.0  |
| 50°    | 701.6  | 617.5  | 487.1  | 405.3  | 380.5  |
| 52.5°  | 653.0  | 564.1  | 437.4  | 359.1  | 336.6  |
| 55°    | 605.6  | 513.2  | 385.2  | 314.1  | 291.6  |
| 57.5°  | 557.1  | 462.2  | 339.0  | 272.6  | 253.7  |
| 60°    | 507.2  | 412.4  | 290.3  | 230.0  | 211.0  |
| 62.5°  | 458.8  | 363.9  | 248.8  | 192.0  | 182.6  |
| 65°    | 408.9  | 312.8  | 206.2  | 166.0  | 162.3  |
| 67.5°  | 361.6  | 265.5  | 166.0  | 145.8  | 142.2  |
| 70°    | 311.7  | 219.3  | 137.4  | 125.6  | 120.8  |
| 72.5°  | 264.4  | 176.6  | 114.9  | 105.5  | 103.1  |
| 75°    | 218.0  | 135.1  | 94.8   | 86.5   | 85.4   |
| 77.5°  | 171.9  | 95.9   | 74.7   | 69.9   | 67.5   |
| 80°    | 129.1  | 68.8   | 56.8   | 52.2   | 52.2   |
| 82.5°  | 90.1   | 46.3   | 39.1   | 36.7   | 36.7   |
| 85°    | 50.9   | 26.1   | 22.5   | 22.5   | 22.5   |
| 87.5°  | 19.0   | 9.4    | 9.4    | 8.3    | 8.3    |
| 90°    | 1.1    | 13.6   | 37.0   | 34.8   | 35.9   |
| 92.5°  | 23.4   | 31.7   | 32.9   | 34.0   | 34.0   |
| 95°    | 55.1   | 65.8   | 67.6   | 67.6   | 65.8   |
| 97.5°  | 91.7   | 101.6  | 105.8  | 105.8  | 105.8  |
| 100°   | 134.0  | 142.8  | 145.8  | 145.8  | 144.7  |
| 102.5° | 178.6  | 185.1  | 189.2  | 190.4  | 189.2  |
| 105°   | 227.4  | 230.4  | 232.7  | 234.5  | 234.5  |
| 107.5° | 275.7  | 280.2  | 280.2  | 281.0  | 275.7  |
| 110°   | 322.5  | 328.6  | 328.6  | 328.6  | 325.5  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 373.1  | 379.5  | 378.4  | 375.4  | 373.1  |
| 115°   | 422.9  | 429.0  | 427.1  | 426.0  | 422.9  |
| 117.5° | 472.5  | 480.8  | 475.5  | 472.5  | 469.4  |
| 120°   | 522.3  | 530.6  | 522.3  | 522.3  | 518.9  |
| 122.5° | 567.6  | 578.2  | 572.9  | 569.9  | 567.6  |
| 125°   | 615.2  | 624.6  | 621.6  | 618.2  | 617.1  |
| 127.5° | 661.6  | 673.4  | 669.2  | 664.6  | 661.6  |
| 130°   | 705.1  | 718.7  | 716.8  | 714.5  | 710.3  |
| 132.5° | 753.8  | 764.4  | 765.2  | 759.9  | 756.8  |
| 135°   | 795.7  | 807.4  | 809.7  | 808.6  | 805.6  |
| 137.5° | 842.6  | 852.0  | 853.9  | 853.1  | 848.6  |
| 140°   | 883.7  | 893.2  | 898.4  | 898.4  | 894.3  |
| 142.5° | 926.0  | 935.5  | 938.5  | 939.6  | 935.5  |
| 145°   | 966.1  | 973.6  | 979.6  | 980.8  | 976.6  |
| 147.5° | 1002.0 | 1011.4 | 1015.9 | 1017.8 | 1013.6 |
| 150°   | 1038.9 | 1045.4 | 1049.5 | 1052.9 | 1049.5 |
| 152.5° | 1071.8 | 1078.2 | 1083.5 | 1087.7 | 1083.5 |
| 155°   | 1104.6 | 1107.6 | 1111.0 | 1116.3 | 1112.9 |
| 157.5° | 1133.0 | 1135.2 | 1137.1 | 1144.7 | 1139.4 |
| 160°   | 1158.2 | 1160.5 | 1161.7 | 1168.1 | 1163.6 |
| 162.5° | 1181.7 | 1181.7 | 1182.8 | 1190.0 | 1184.7 |
| 165°   | 1201.7 | 1200.6 | 1200.6 | 1208.2 | 1202.8 |
| 167.5° | 1219.8 | 1216.4 | 1216.4 | 1224.0 | 1218.7 |
| 170°   | 1233.4 | 1230.4 | 1229.3 | 1236.8 | 1230.4 |
| 172.5° | 1242.9 | 1239.8 | 1238.7 | 1246.3 | 1239.8 |
| 175°   | 1250.5 | 1247.4 | 1245.2 | 1252.7 | 1246.3 |
| 177.5° | 1254.6 | 1251.6 | 1249.3 | 1255.7 | 1249.3 |
| 180°   | 1252.7 | 1252.7 | 1252.7 | 1252.7 | 1252.7 |

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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 | 6.42             | 7.20  | 7.43  | 8.22  | 9.58  | 2.39           | 3.17 | 3.41 | 4.19 | 5.55 |
|                 | 3H   | 8.09             | 8.79  | 9.12  | 9.82  | 11.20 | 3.58           | 4.27 | 4.60 | 5.30 | 6.69 |
|                 | 4H   | 8.70             | 9.36  | 9.74  | 10.39 | 11.78 | 4.02           | 4.68 | 5.06 | 5.72 | 7.11 |
|                 | 6H   | 9.12             | 9.72  | 10.17 | 10.76 | 12.17 | 4.34           | 4.95 | 5.39 | 5.99 | 7.39 |
|                 | 8H   | 9.24             | 9.82  | 10.30 | 10.87 | 12.27 | 4.43           | 5.01 | 5.49 | 6.07 | 7.46 |
|                 | 12H  | 9.30             | 9.85  | 10.36 | 10.90 | 12.32 | 4.48           | 5.03 | 5.54 | 6.07 | 7.50 |
| 4H              | 2H   | 6.43             | 7.09  | 7.47  | 8.12  | 9.51  | 2.98           | 3.64 | 4.02 | 4.67 | 6.06 |
|                 | 3H   | 8.25             | 8.80  | 9.31  | 9.86  | 11.27 | 4.33           | 4.87 | 5.38 | 5.94 | 7.34 |
|                 | 4H   | 8.95             | 9.45  | 10.01 | 10.50 | 11.93 | 4.87           | 5.38 | 5.93 | 6.43 | 7.86 |
|                 | 6H   | 9.46             | 9.89  | 10.53 | 10.97 | 12.39 | 5.29           | 5.72 | 6.36 | 6.80 | 8.22 |
|                 | 8H   | 9.63             | 10.04 | 10.70 | 11.10 | 12.54 | 5.42           | 5.82 | 6.49 | 6.89 | 8.33 |
|                 | 12H  | 9.73             | 10.09 | 10.81 | 11.17 | 12.61 | 5.48           | 5.85 | 6.57 | 6.93 | 8.37 |
| 8H              | 4H   | 8.91             | 9.31  | 9.98  | 10.38 | 11.82 | 5.15           | 5.55 | 6.22 | 6.62 | 8.06 |
|                 | 6H   | 9.47             | 9.81  | 10.57 | 10.92 | 12.35 | 5.67           | 6.00 | 6.76 | 7.11 | 8.55 |
|                 | 8H   | 9.69             | 9.98  | 10.79 | 11.08 | 12.53 | 5.86           | 6.15 | 6.96 | 7.25 | 8.70 |
|                 | 12H  | 9.83             | 10.09 | 10.93 | 11.17 | 12.67 | 5.98           | 6.24 | 7.08 | 7.32 | 8.82 |
| 12H             | 4H   | 8.86             | 9.22  | 9.95  | 10.31 | 11.75 | 5.15           | 5.52 | 6.24 | 6.60 | 8.04 |
|                 | 6H   | 9.45             | 9.74  | 10.55 | 10.84 | 12.29 | 5.72           | 6.01 | 6.82 | 7.10 | 8.56 |
|                 | 8H   | 9.67             | 9.93  | 10.77 | 11.01 | 12.51 | 5.93           | 6.18 | 7.03 | 7.27 | 8.77 |

END OF REPORT