

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: P926391

Luminaire Tested: DFN2DIP-TR4F0-040D100US950-FLLONL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P926391  
REPORT IS A COMBINATION OF REPORTS P901997 AND P898849  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-TR4F0-040D100US950-FLLONL  
Description: 4 foot, Triangle Define Geo, with Direct Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

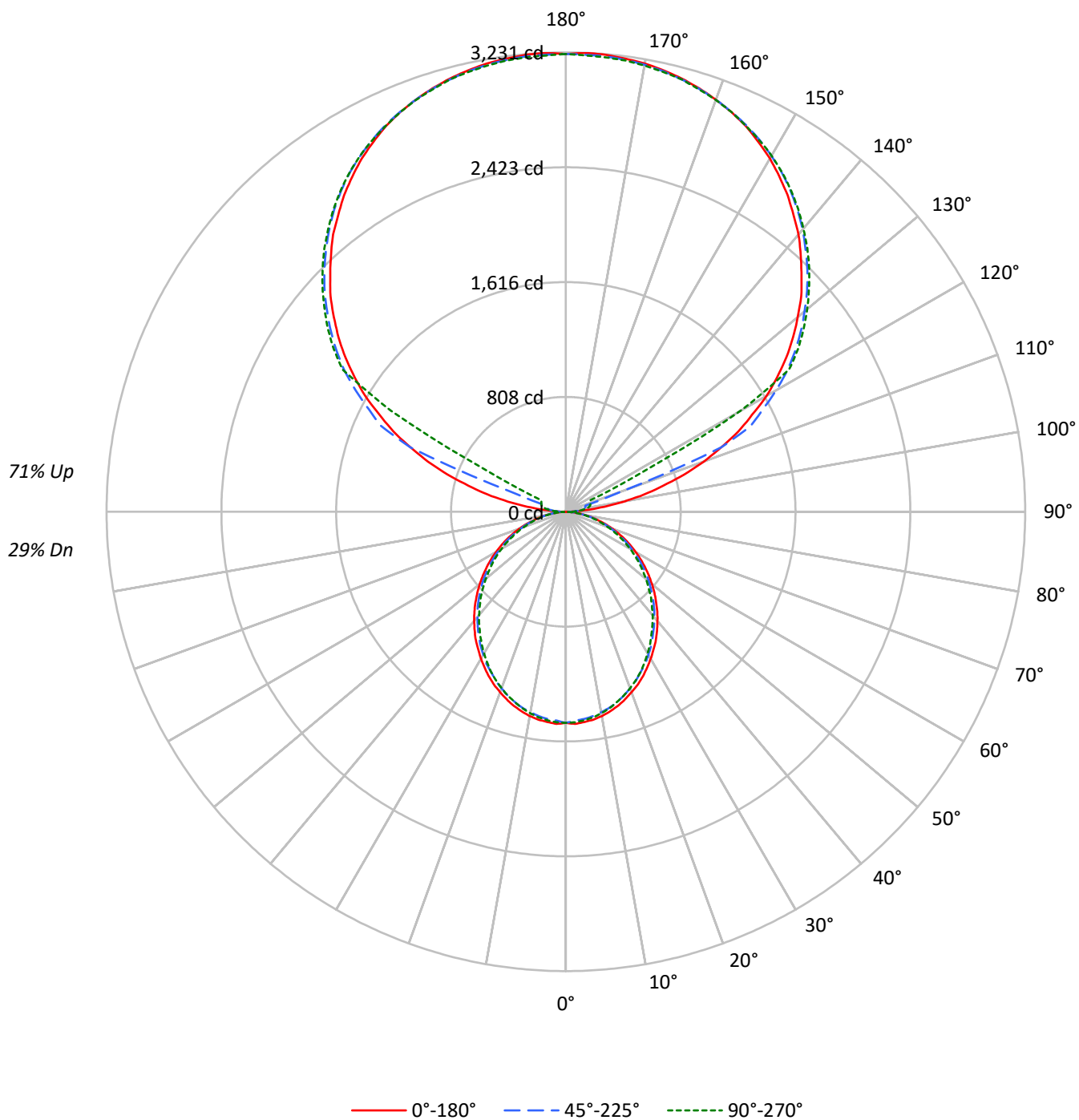
Lumens per Lamp: N/A  
Luminaire Lumens: 13222.5 lumens  
Efficiency: N/A  
Efficacy: 122.1 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 3.43' x L: 3.96' x H: 0.1')  
CIE Type: Semi-Indirect

Input Watts (W): 108.3  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9952  
Total Harmonic Distortion (THDi): 0.069  
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 | 53 | 53 | 53 | 36 | 36 | 36 |
| 1   | 93  | 89  | 85  | 82  | 83 | 80 | 77 | 74 | 62 | 60 | 58 | 47 | 45 | 44 | 32 | 31 | 31 |
| 2   | 85  | 77  | 72  | 67  | 76 | 70 | 65 | 60 | 55 | 51 | 48 | 41 | 39 | 37 | 28 | 27 | 26 |
| 3   | 77  | 68  | 61  | 55  | 69 | 61 | 55 | 50 | 48 | 44 | 41 | 36 | 33 | 31 | 25 | 23 | 22 |
| 4   | 71  | 60  | 53  | 47  | 63 | 54 | 48 | 43 | 43 | 38 | 34 | 32 | 29 | 27 | 22 | 21 | 19 |
| 5   | 65  | 53  | 46  | 40  | 58 | 48 | 41 | 36 | 38 | 33 | 30 | 29 | 26 | 23 | 20 | 18 | 16 |
| 6   | 59  | 48  | 40  | 34  | 53 | 43 | 36 | 31 | 34 | 29 | 26 | 26 | 23 | 20 | 18 | 16 | 14 |
| 7   | 55  | 43  | 35  | 30  | 49 | 39 | 32 | 27 | 31 | 26 | 23 | 24 | 20 | 18 | 17 | 14 | 13 |
| 8   | 51  | 39  | 31  | 26  | 45 | 35 | 29 | 24 | 28 | 23 | 20 | 22 | 18 | 16 | 15 | 13 | 11 |
| 9   | 47  | 35  | 28  | 23  | 42 | 32 | 26 | 21 | 26 | 21 | 18 | 20 | 16 | 14 | 14 | 12 | 10 |
| 10  | 44  | 32  | 25  | 21  | 39 | 29 | 23 | 19 | 24 | 19 | 16 | 18 | 15 | 13 | 13 | 11 | 9  |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 1180 | 1180 | 1180 |
| 5°  | 1181 | 1163 | 1171 |
| 10° | 1172 | 1147 | 1155 |
| 15° | 1155 | 1129 | 1130 |
| 20° | 1131 | 1102 | 1105 |
| 25° | 1108 | 1071 | 1075 |
| 30° | 1079 | 1042 | 1038 |
| 35° | 1052 | 1007 | 999  |
| 40° | 1018 | 972  | 961  |
| 45° | 984  | 938  | 923  |
| 50° | 947  | 901  | 878  |
| 55° | 909  | 859  | 837  |
| 60° | 865  | 808  | 790  |
| 65° | 817  | 756  | 735  |
| 70° | 757  | 693  | 676  |
| 75° | 673  | 617  | 621  |
| 80° | 571  | 520  | 516  |
| 85° | 414  | 353  | 342  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 90°

Vertical Angle: 90°

Luminance: 1709 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 139.8   | 1.1       |
| 10°-20°   | 393.2   | 3.0       |
| 20°-30°   | 577.9   | 4.4       |
| 30°-40°   | 671.2   | 5.1       |
| 40°-50°   | 670.3   | 5.1       |
| 50°-60°   | 584.5   | 4.4       |
| 60°-70°   | 432.1   | 3.3       |
| 70°-80°   | 244.5   | 1.8       |
| 80°-90°   | 70.2    | 0.5       |
| 90°-100°  | 106.2   | 0.8       |
| 100°-110° | 395.8   | 3.0       |
| 110°-120° | 1049.6  | 7.9       |
| 120°-130° | 1740.9  | 13.2      |
| 130°-140° | 1849.2  | 14.0      |
| 140°-150° | 1718.7  | 13.0      |
| 150°-160° | 1381.8  | 10.5      |
| 160°-170° | 890.4   | 6.7       |
| 170°-180° | 306.5   | 2.3       |
| 0°-30°    | 1110.8  | 8.4       |
| 0°-40°    | 1782.0  | 13.5      |
| 0°-60°    | 3036.8  | 23.0      |
| 0°-90°    | 3783.5  | 28.6      |
| 90°-120°  | 1551.6  | 11.7      |
| 90°-150°  | 6860.4  | 51.9      |
| 90°-180°  | 9439.0  | 71.4      |
| 0°-180°   | 13222.5 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 1485 | 1485  | 1485 | 1485  | 1485 |      |
| 5°   | 1485 | 1479  | 1463 | 1475  | 1472 | 141  |
| 15°  | 1413 | 1405  | 1386 | 1392  | 1385 | 398  |
| 25°  | 1279 | 1268  | 1244 | 1246  | 1244 | 589  |
| 35°  | 1104 | 1090  | 1067 | 1058  | 1051 | 689  |
| 45°  | 898  | 888   | 867  | 851   | 845  | 693  |
| 55°  | 680  | 671   | 654  | 637   | 630  | 608  |
| 65°  | 458  | 450   | 436  | 423   | 416  | 453  |
| 75°  | 240  | 237   | 230  | 221   | 224  | 256  |
| 85°  | 58   | 57    | 56   | 51    | 50   | 65   |
| 90°  | 2    | 28    | 46   | 58    | 63   | 12   |
| 95°  | 151  | 74    | 91   | 103   | 100  | 179  |
| 105° | 708  | 778   | 142  | 168   | 177  | 757  |
| 115° | 1340 | 1379  | 1438 | 359   | 191  | 1319 |
| 125° | 1894 | 1924  | 1969 | 1985  | 1992 | 1689 |
| 135° | 2344 | 2381  | 2402 | 2425  | 2421 | 1810 |
| 145° | 2719 | 2716  | 2756 | 2772  | 2761 | 1700 |
| 155° | 2994 | 2973  | 3001 | 3015  | 2996 | 1380 |
| 165° | 3154 | 3140  | 3147 | 3164  | 3147 | 891  |
| 175° | 3226 | 3210  | 3215 | 3231  | 3208 | 307  |
| 180° | 3220 | 3220  | 3220 | 3220  | 3220 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 1484.8 | 1484.8 | 1484.8 | 1484.8 | 1484.8 |
| 2.5°   | 1493.5 | 1486.3 | 1470.6 | 1484.8 | 1482.1 |
| 5°     | 1484.8 | 1479.2 | 1463.4 | 1474.8 | 1472.1 |
| 7.5°   | 1474.8 | 1466.3 | 1450.6 | 1462.1 | 1459.2 |
| 10°    | 1459.2 | 1449.2 | 1432.1 | 1443.5 | 1439.2 |
| 12.5°  | 1437.7 | 1429.2 | 1412.1 | 1419.3 | 1416.3 |
| 15°    | 1413.4 | 1405.0 | 1386.4 | 1392.1 | 1385.0 |
| 17.5°  | 1383.5 | 1375.0 | 1356.4 | 1363.5 | 1356.4 |
| 20°    | 1350.6 | 1342.1 | 1322.1 | 1326.3 | 1320.8 |
| 22.5°  | 1317.9 | 1305.0 | 1286.4 | 1286.4 | 1283.5 |
| 25°    | 1279.2 | 1267.9 | 1243.6 | 1246.4 | 1243.6 |
| 27.5°  | 1236.4 | 1226.4 | 1208.0 | 1203.7 | 1196.6 |
| 30°    | 1193.6 | 1182.2 | 1160.8 | 1156.5 | 1150.8 |
| 32.5°  | 1147.9 | 1139.5 | 1116.6 | 1108.0 | 1102.2 |
| 35°    | 1103.7 | 1089.5 | 1066.6 | 1058.0 | 1050.8 |
| 37.5°  | 1053.7 | 1040.8 | 1017.9 | 1008.0 | 1000.8 |
| 40°    | 1002.4 | 990.8  | 967.9  | 955.2  | 949.5  |
| 42.5°  | 952.4  | 940.8  | 918.1  | 903.7  | 895.2  |
| 45°    | 898.1  | 888.2  | 866.6  | 851.1  | 845.2  |
| 47.5°  | 845.2  | 835.2  | 812.4  | 796.7  | 788.2  |
| 50°    | 789.5  | 782.4  | 762.4  | 742.4  | 735.2  |
| 52.5°  | 735.2  | 725.3  | 706.8  | 691.1  | 681.1  |
| 55°    | 679.7  | 671.0  | 654.0  | 636.8  | 629.7  |
| 57.5°  | 623.9  | 616.9  | 598.2  | 581.1  | 575.4  |
| 60°    | 568.2  | 562.6  | 542.6  | 526.9  | 522.6  |
| 62.5°  | 514.0  | 504.0  | 489.8  | 475.5  | 469.7  |
| 65°    | 458.4  | 449.7  | 435.5  | 422.6  | 415.6  |
| 67.5°  | 401.3  | 394.0  | 381.3  | 371.3  | 365.6  |
| 70°    | 348.4  | 342.7  | 329.8  | 319.8  | 314.2  |
| 72.5°  | 294.2  | 288.4  | 281.3  | 271.3  | 267.0  |
| 75°    | 239.8  | 237.1  | 229.8  | 221.3  | 224.2  |
| 77.5°  | 191.3  | 185.6  | 182.7  | 178.4  | 174.2  |
| 80°    | 142.8  | 141.3  | 138.4  | 134.2  | 131.4  |
| 82.5°  | 97.1   | 97.1   | 95.8   | 90.0   | 90.0   |
| 85°    | 58.5   | 57.1   | 55.7   | 51.3   | 50.0   |
| 87.5°  | 25.8   | 22.9   | 20.0   | 15.7   | 14.2   |
| 90°    | 2.2    | 28.0   | 46.5   | 58.4   | 62.8   |
| 92.5°  | 58.4   | 48.9   | 55.9   | 60.6   | 62.8   |
| 95°    | 151.3  | 74.4   | 90.7   | 102.7  | 100.2  |
| 97.5°  | 272.5  | 81.6   | 118.7  | 125.8  | 128.1  |
| 100°   | 412.5  | 93.2   | 132.8  | 151.3  | 156.1  |
| 102.5° | 566.0  | 561.6  | 137.5  | 162.9  | 170.1  |
| 105°   | 708.2  | 778.2  | 142.2  | 167.6  | 177.1  |
| 107.5° | 873.7  | 931.8  | 146.9  | 172.4  | 181.7  |
| 110°   | 1032.1 | 1080.9 | 407.7  | 174.9  | 183.9  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 1181.2 | 1223.0 | 1183.5 | 179.3  | 186.5  |
| 115°   | 1339.5 | 1379.1 | 1437.5 | 358.8  | 191.2  |
| 117.5° | 1477.0 | 1523.5 | 1563.3 | 1230.0 | 619.7  |
| 120°   | 1630.9 | 1665.7 | 1707.8 | 1735.7 | 1421.2 |
| 122.5° | 1761.2 | 1798.5 | 1845.2 | 1859.1 | 1861.5 |
| 125°   | 1894.0 | 1924.4 | 1968.7 | 1985.0 | 1991.9 |
| 127.5° | 2015.1 | 2047.8 | 2082.9 | 2106.1 | 2108.3 |
| 130°   | 2129.3 | 2166.7 | 2192.2 | 2217.9 | 2215.7 |
| 132.5° | 2245.8 | 2276.2 | 2301.7 | 2322.7 | 2320.5 |
| 135°   | 2343.8 | 2381.1 | 2401.9 | 2425.4 | 2420.7 |
| 137.5° | 2446.2 | 2474.1 | 2497.6 | 2520.8 | 2513.9 |
| 140°   | 2546.2 | 2565.1 | 2590.5 | 2611.6 | 2599.9 |
| 142.5° | 2630.4 | 2646.7 | 2676.8 | 2695.3 | 2683.8 |
| 145°   | 2718.9 | 2716.4 | 2756.0 | 2772.3 | 2760.7 |
| 147.5° | 2795.5 | 2788.6 | 2828.1 | 2839.8 | 2830.7 |
| 150°   | 2870.2 | 2853.9 | 2891.3 | 2905.1 | 2893.5 |
| 152.5° | 2933.0 | 2914.5 | 2949.4 | 2963.4 | 2947.1 |
| 155°   | 2993.7 | 2972.9 | 3000.8 | 3014.6 | 2996.1 |
| 157.5° | 3042.6 | 3024.1 | 3045.1 | 3061.4 | 3042.6 |
| 160°   | 3084.7 | 3070.5 | 3084.7 | 3098.5 | 3082.2 |
| 162.5° | 3121.7 | 3107.8 | 3119.5 | 3135.8 | 3114.8 |
| 165°   | 3154.3 | 3140.5 | 3147.4 | 3163.8 | 3147.4 |
| 167.5° | 3180.1 | 3165.9 | 3173.2 | 3189.5 | 3168.4 |
| 170°   | 3201.1 | 3187.0 | 3191.7 | 3208.0 | 3187.0 |
| 172.5° | 3214.9 | 3201.1 | 3205.8 | 3222.1 | 3201.1 |
| 175°   | 3226.5 | 3210.2 | 3214.9 | 3231.3 | 3208.0 |
| 177.5° | 3231.3 | 3214.9 | 3217.5 | 3233.8 | 3212.7 |
| 180°   | 3219.7 | 3219.7 | 3219.7 | 3219.7 | 3219.7 |

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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 | 5.43             | 6.13 | 6.56  | 7.25  | 8.79  | 5.00           | 5.70 | 6.12  | 6.81  | 8.36  |
|                 | 3H   | 7.08             | 7.71 | 8.21  | 8.83  | 10.39 | 6.61           | 7.23 | 7.74  | 8.36  | 9.92  |
|                 | 4H   | 7.66             | 8.25 | 8.80  | 9.38  | 10.95 | 7.19           | 7.78 | 8.33  | 8.91  | 10.47 |
|                 | 6H   | 8.05             | 8.60 | 9.20  | 9.72  | 11.30 | 7.58           | 8.12 | 8.72  | 9.25  | 10.83 |
|                 | 8H   | 8.15             | 8.67 | 9.30  | 9.81  | 11.39 | 7.68           | 8.20 | 8.83  | 9.34  | 10.91 |
|                 | 12H  | 8.19             | 8.69 | 9.35  | 9.82  | 11.42 | 7.71           | 8.21 | 8.87  | 9.34  | 10.94 |
| 4H              | 2H   | 5.88             | 6.47 | 7.02  | 7.59  | 9.16  | 5.53           | 6.12 | 6.68  | 7.25  | 8.82  |
|                 | 3H   | 7.73             | 8.22 | 8.88  | 9.37  | 10.95 | 7.33           | 7.83 | 8.49  | 8.98  | 10.56 |
|                 | 4H   | 8.43             | 8.89 | 9.59  | 10.03 | 11.63 | 8.03           | 8.48 | 9.18  | 9.62  | 11.22 |
|                 | 6H   | 8.94             | 9.33 | 10.10 | 10.49 | 12.08 | 8.53           | 8.92 | 9.69  | 10.08 | 11.67 |
|                 | 8H   | 9.08             | 9.45 | 10.24 | 10.60 | 12.21 | 8.67           | 9.04 | 9.83  | 10.19 | 11.80 |
|                 | 12H  | 9.15             | 9.48 | 10.33 | 10.64 | 12.26 | 8.73           | 9.06 | 9.90  | 10.22 | 11.83 |
| 8H              | 4H   | 8.62             | 8.98 | 9.78  | 10.13 | 11.74 | 8.26           | 8.62 | 9.42  | 9.77  | 11.38 |
|                 | 6H   | 9.24             | 9.54 | 10.42 | 10.74 | 12.34 | 8.88           | 9.18 | 10.06 | 10.37 | 11.98 |
|                 | 8H   | 9.46             | 9.72 | 10.65 | 10.90 | 12.52 | 9.09           | 9.35 | 10.28 | 10.53 | 12.15 |
|                 | 12H  | 9.58             | 9.81 | 10.77 | 10.98 | 12.64 | 9.20           | 9.43 | 10.39 | 10.60 | 12.26 |
| 12H             | 4H   | 8.59             | 8.93 | 9.77  | 10.09 | 11.70 | 8.24           | 8.57 | 9.42  | 9.74  | 11.35 |
|                 | 6H   | 9.27             | 9.53 | 10.46 | 10.71 | 12.33 | 8.92           | 9.18 | 10.10 | 10.35 | 11.98 |
|                 | 8H   | 9.50             | 9.73 | 10.69 | 10.90 | 12.56 | 9.15           | 9.38 | 10.34 | 10.55 | 12.20 |

END OF REPORT