

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: P926399

Luminaire Tested: DFN2DIP-TR4F0-040D120US950-FLLONL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P926399  
REPORT IS A COMBINATION OF REPORTS P902033 AND P898849  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-TR4F0-040D120US950-FLLONL  
Description: 4 foot, Triangle Define Geo, with Direct Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

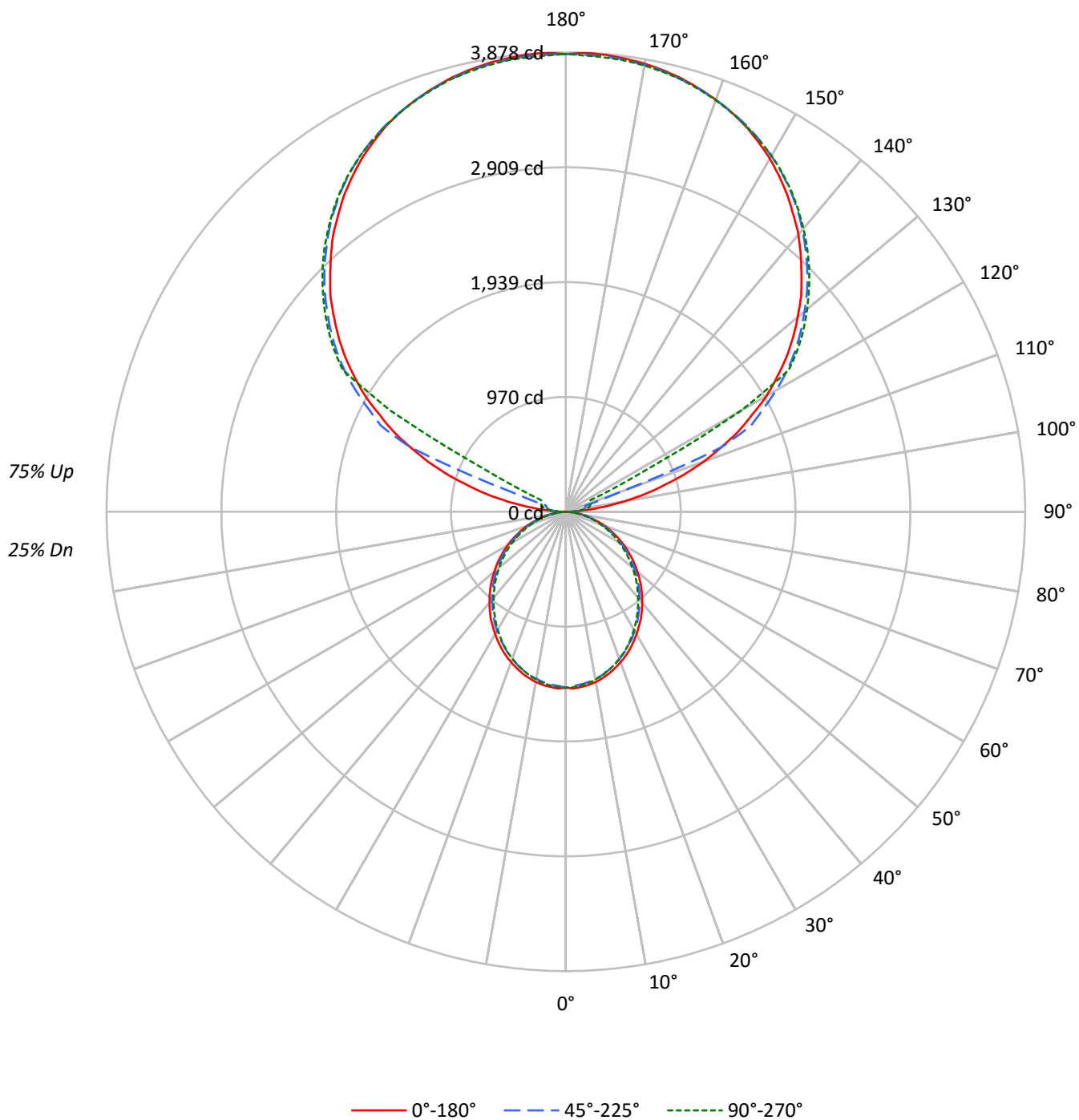
Lumens per Lamp: N/A  
Luminaire Lumens: 15111.3 lumens  
Efficiency: N/A  
Efficacy: 122.6 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 3.43' x L: 3.96' x H: 0.1')  
CIE Type: Semi-Indirect

Input Watts (W): 123.3  
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



TEST NUMBER: P926399

CATALOG NUMBER: DFN2DIP-TR4F0-040D120US950-FLONL

**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   | 101 | 101 | 101 | 101 | 90 | 90 | 90 | 90 | 69 | 69 | 69 | 51 | 51 | 51 | 33 | 33 | 33 |
| 1   | 92  | 88  | 84  | 81  | 82 | 79 | 75 | 73 | 61 | 59 | 57 | 44 | 43 | 42 | 29 | 29 | 28 |
| 2   | 84  | 77  | 71  | 66  | 74 | 69 | 64 | 59 | 53 | 50 | 47 | 39 | 37 | 35 | 26 | 25 | 24 |
| 3   | 76  | 67  | 60  | 55  | 68 | 60 | 54 | 50 | 47 | 43 | 39 | 34 | 32 | 30 | 23 | 21 | 20 |
| 4   | 70  | 60  | 52  | 46  | 62 | 53 | 47 | 42 | 42 | 37 | 33 | 31 | 28 | 25 | 20 | 19 | 17 |
| 5   | 64  | 53  | 45  | 39  | 57 | 47 | 41 | 36 | 37 | 32 | 29 | 27 | 24 | 22 | 18 | 16 | 15 |
| 6   | 59  | 47  | 40  | 34  | 52 | 42 | 36 | 31 | 33 | 28 | 25 | 25 | 21 | 19 | 17 | 15 | 13 |
| 7   | 54  | 43  | 35  | 30  | 48 | 38 | 32 | 27 | 30 | 25 | 22 | 22 | 19 | 17 | 15 | 13 | 12 |
| 8   | 50  | 38  | 31  | 26  | 45 | 35 | 28 | 24 | 27 | 23 | 19 | 20 | 17 | 15 | 14 | 12 | 10 |
| 9   | 47  | 35  | 28  | 23  | 41 | 31 | 25 | 21 | 25 | 20 | 17 | 19 | 15 | 13 | 13 | 11 | 9  |
| 10  | 43  | 32  | 25  | 20  | 39 | 29 | 23 | 19 | 23 | 18 | 15 | 17 | 14 | 12 | 12 | 10 | 8  |

**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: 2052 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 139.8   | 0.9       |
| 10°-20°   | 393.2   | 2.6       |
| 20°-30°   | 577.9   | 3.8       |
| 30°-40°   | 671.2   | 4.4       |
| 40°-50°   | 670.3   | 4.4       |
| 50°-60°   | 584.5   | 3.9       |
| 60°-70°   | 432.1   | 2.9       |
| 70°-80°   | 244.5   | 1.6       |
| 80°-90°   | 71.3    | 0.5       |
| 90°-100°  | 127.4   | 0.8       |
| 100°-110° | 474.9   | 3.1       |
| 110°-120° | 1259.5  | 8.3       |
| 120°-130° | 2089.1  | 13.8      |
| 130°-140° | 2219.1  | 14.7      |
| 140°-150° | 2062.4  | 13.6      |
| 150°-160° | 1658.1  | 11.0      |
| 160°-170° | 1068.4  | 7.1       |
| 170°-180° | 367.7   | 2.4       |
| 0°-30°    | 1110.8  | 7.4       |
| 0°-40°    | 1782.0  | 11.8      |
| 0°-60°    | 3036.8  | 20.1      |
| 0°-90°    | 3784.6  | 25.0      |
| 90°-120°  | 1861.9  | 12.3      |
| 90°-150°  | 8232.4  | 54.5      |
| 90°-180°  | 11327.0 | 75.0      |
| 0°-180°   | 15111.3 | 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°  | 3    | 34    | 56   | 70    | 75   | 14   |
| 95°  | 182  | 89    | 109  | 123   | 120  | 215  |
| 105° | 850  | 934   | 171  | 201   | 212  | 908  |
| 115° | 1607 | 1655  | 1725 | 430   | 229  | 1582 |
| 125° | 2273 | 2309  | 2362 | 2382  | 2390 | 2027 |
| 135° | 2812 | 2857  | 2882 | 2910  | 2905 | 2173 |
| 145° | 3263 | 3260  | 3307 | 3327  | 3313 | 2041 |
| 155° | 3592 | 3567  | 3601 | 3618  | 3595 | 1655 |
| 165° | 3785 | 3769  | 3777 | 3796  | 3777 | 1069 |
| 175° | 3872 | 3852  | 3858 | 3878  | 3850 | 368  |
| 180° | 3864 | 3864  | 3864 | 3864  | 3864 |      |

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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°    | 2.7    | 33.5   | 55.8   | 70.0   | 75.4   |
| 92.5°  | 70.0   | 58.8   | 67.1   | 72.7   | 75.4   |
| 95°    | 181.5  | 89.3   | 108.9  | 123.2  | 120.2  |
| 97.5°  | 327.0  | 98.0   | 142.4  | 151.0  | 153.7  |
| 100°   | 494.9  | 111.9  | 159.3  | 181.5  | 187.3  |
| 102.5° | 679.2  | 673.9  | 164.9  | 195.6  | 204.2  |
| 105°   | 849.8  | 933.9  | 170.7  | 201.2  | 212.5  |
| 107.5° | 1048.4 | 1118.1 | 176.3  | 206.8  | 218.1  |
| 110°   | 1238.6 | 1297.1 | 489.3  | 209.8  | 220.8  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 1417.5 | 1467.6 | 1420.2 | 215.1  | 223.7  |
| 115°   | 1607.4 | 1654.9 | 1724.9 | 430.5  | 229.4  |
| 117.5° | 1772.4 | 1828.2 | 1876.0 | 1475.9 | 743.6  |
| 120°   | 1957.0 | 1998.8 | 2049.3 | 2082.9 | 1705.4 |
| 122.5° | 2113.4 | 2158.2 | 2214.3 | 2230.9 | 2233.9 |
| 125°   | 2272.7 | 2309.3 | 2362.4 | 2381.9 | 2390.2 |
| 127.5° | 2418.1 | 2457.3 | 2499.5 | 2527.3 | 2530.0 |
| 130°   | 2555.2 | 2600.0 | 2630.6 | 2661.5 | 2658.8 |
| 132.5° | 2695.0 | 2731.5 | 2762.0 | 2787.3 | 2784.6 |
| 135°   | 2812.5 | 2857.3 | 2882.2 | 2910.5 | 2904.8 |
| 137.5° | 2935.4 | 2968.8 | 2997.1 | 3024.9 | 3016.6 |
| 140°   | 3055.6 | 3078.1 | 3108.6 | 3133.9 | 3120.0 |
| 142.5° | 3156.4 | 3176.1 | 3212.2 | 3234.4 | 3220.5 |
| 145°   | 3262.7 | 3259.7 | 3307.1 | 3326.8 | 3312.8 |
| 147.5° | 3354.6 | 3346.3 | 3393.9 | 3407.8 | 3396.8 |
| 150°   | 3444.2 | 3424.7 | 3469.5 | 3486.1 | 3472.2 |
| 152.5° | 3519.6 | 3497.4 | 3539.2 | 3556.1 | 3536.6 |
| 155°   | 3592.3 | 3567.4 | 3601.0 | 3617.6 | 3595.3 |
| 157.5° | 3651.1 | 3628.8 | 3654.1 | 3673.7 | 3651.1 |
| 160°   | 3701.5 | 3684.6 | 3701.5 | 3718.1 | 3698.6 |
| 162.5° | 3746.1 | 3729.5 | 3743.4 | 3763.0 | 3737.8 |
| 165°   | 3785.2 | 3768.6 | 3776.9 | 3796.5 | 3776.9 |
| 167.5° | 3816.1 | 3799.1 | 3807.8 | 3827.4 | 3802.2 |
| 170°   | 3841.3 | 3824.4 | 3830.0 | 3849.6 | 3824.4 |
| 172.5° | 3857.9 | 3841.3 | 3847.0 | 3866.6 | 3841.3 |
| 175°   | 3871.8 | 3852.3 | 3857.9 | 3877.5 | 3849.6 |
| 177.5° | 3877.5 | 3857.9 | 3860.9 | 3880.5 | 3855.3 |
| 180°   | 3863.6 | 3863.6 | 3863.6 | 3863.6 | 3863.6 |

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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 | 4.90             | 5.57 | 6.04  | 6.71  | 8.30  | 4.47           | 5.14 | 5.61 | 6.28  | 7.86  |
|                 | 3H   | 6.54             | 7.15 | 7.70  | 8.29  | 9.89  | 6.07           | 6.68 | 7.23 | 7.82  | 9.42  |
|                 | 4H   | 7.12             | 7.70 | 8.28  | 8.84  | 10.45 | 6.65           | 7.22 | 7.81 | 8.37  | 9.97  |
|                 | 6H   | 7.51             | 8.04 | 8.68  | 9.19  | 10.80 | 7.04           | 7.57 | 8.21 | 8.71  | 10.33 |
|                 | 8H   | 7.61             | 8.11 | 8.78  | 9.27  | 10.89 | 7.14           | 7.64 | 8.31 | 8.80  | 10.41 |
|                 | 12H  | 7.65             | 8.13 | 8.83  | 9.28  | 10.92 | 7.17           | 7.65 | 8.35 | 8.80  | 10.44 |
| 4H              | 2H   | 5.34             | 5.91 | 6.51  | 7.05  | 8.66  | 4.99           | 5.57 | 6.16 | 6.71  | 8.32  |
|                 | 3H   | 7.19             | 7.66 | 8.36  | 8.83  | 10.45 | 6.79           | 7.27 | 7.97 | 8.44  | 10.06 |
|                 | 4H   | 7.89             | 8.33 | 9.07  | 9.49  | 11.13 | 7.49           | 7.93 | 8.66 | 9.08  | 10.72 |
|                 | 6H   | 8.40             | 8.77 | 9.58  | 9.95  | 11.58 | 7.99           | 8.36 | 9.17 | 9.54  | 11.17 |
|                 | 8H   | 8.54             | 8.89 | 9.72  | 10.06 | 11.71 | 8.13           | 8.48 | 9.31 | 9.65  | 11.30 |
|                 | 12H  | 8.61             | 8.92 | 9.80  | 10.11 | 11.76 | 8.18           | 8.50 | 9.38 | 9.68  | 11.33 |
| 8H              | 4H   | 8.07             | 8.43 | 9.25  | 9.60  | 11.24 | 7.71           | 8.07 | 8.89 | 9.24  | 10.88 |
|                 | 6H   | 8.70             | 8.99 | 9.90  | 10.20 | 11.84 | 8.33           | 8.62 | 9.53 | 9.84  | 11.48 |
|                 | 8H   | 8.92             | 9.17 | 10.12 | 10.36 | 12.02 | 8.55           | 8.80 | 9.75 | 9.99  | 11.65 |
|                 | 12H  | 9.04             | 9.26 | 10.25 | 10.45 | 12.14 | 8.65           | 8.88 | 9.86 | 10.06 | 11.76 |
| 12H             | 4H   | 8.05             | 8.37 | 9.25  | 9.55  | 11.20 | 7.70           | 8.02 | 8.89 | 9.20  | 10.85 |
|                 | 6H   | 8.73             | 8.98 | 9.93  | 10.17 | 11.83 | 8.37           | 8.63 | 9.58 | 9.82  | 11.48 |
|                 | 8H   | 8.96             | 9.18 | 10.17 | 10.37 | 12.06 | 8.60           | 8.82 | 9.81 | 10.01 | 11.71 |

END OF REPORT