

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: P908628

Luminaire Tested: DFN2DIP-PN4F0-040D110US840-FLLFLL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P908628  
REPORT IS A COMBINATION OF REPORTS P899735 AND P896497  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-PN4F0-040D110US840-FLLFLL  
Description: 4 foot, Pentagon Define Geo, with Direct Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

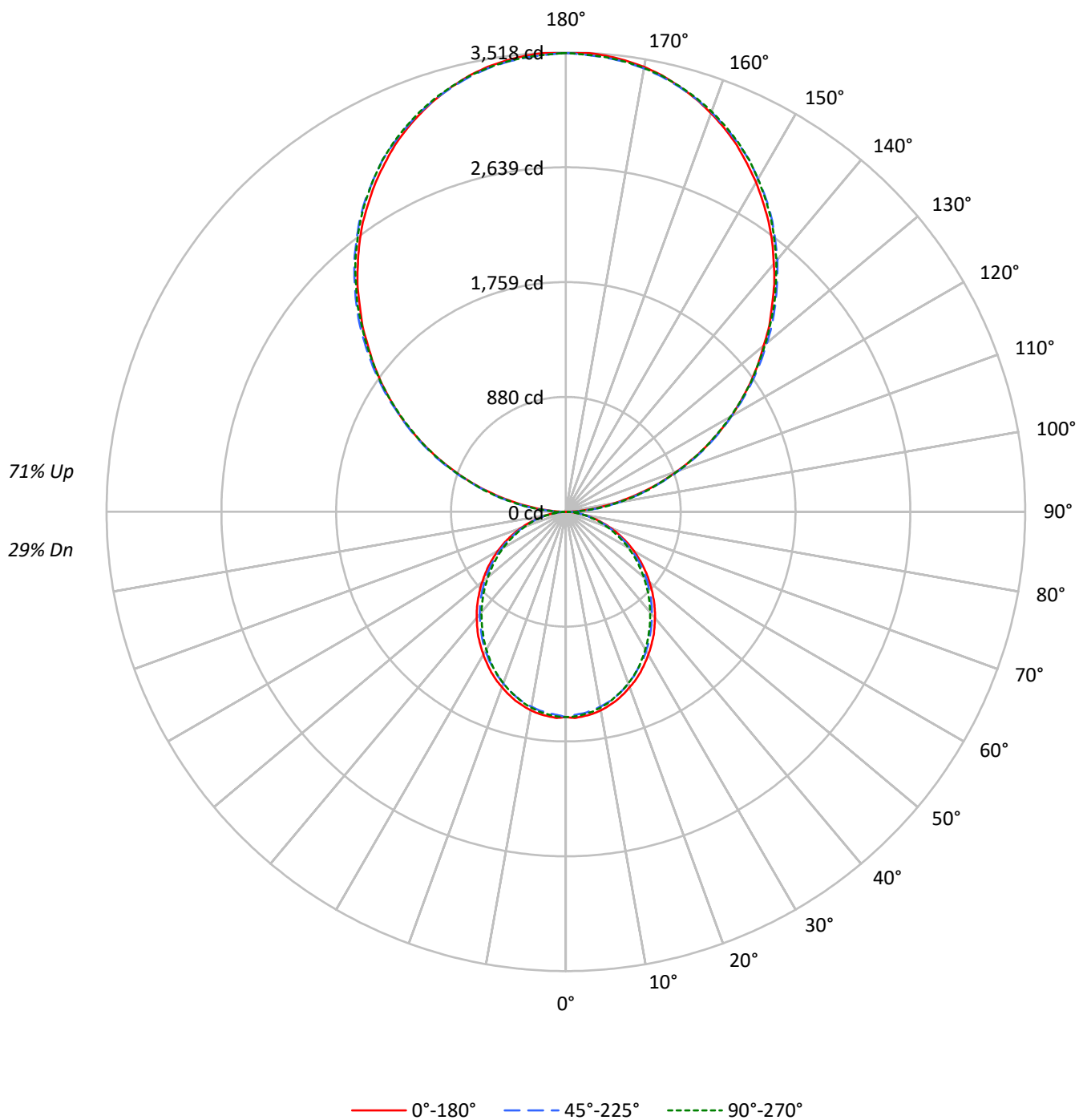
Lumens per Lamp: N/A  
Luminaire Lumens: 13830.1 lumens  
Efficiency: N/A  
Efficacy: 110.6 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 3.74' x L: 3.94' x H: 0.1')  
CIE Type: Semi-Indirect

Input Watts (W): 125  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9968  
Total Harmonic Distortion (THDi): 0.064  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT

TEST NUMBER: P908628

CATALOG NUMBER: DFN2DIP-PN4F0-040D110US840-FLLFLL

### Luminous Intensity Polar Plot



TEST NUMBER: P908628

CATALOG NUMBER: DFN2DIP-PN4F0-040D110US840-FLLFLL

**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 | 92 | 92 | 92 | 92 | 72 | 72 | 72 | 54 | 54 | 54 | 37 | 37 | 37 |
| 1   | 93  | 89  | 85  | 82  | 83 | 80 | 77 | 74 | 63 | 61 | 59 | 47 | 46 | 44 | 32 | 32 | 31 |
| 2   | 85  | 78  | 72  | 67  | 76 | 70 | 65 | 60 | 55 | 51 | 48 | 41 | 39 | 37 | 29 | 27 | 26 |
| 3   | 77  | 68  | 61  | 55  | 69 | 61 | 55 | 50 | 48 | 44 | 41 | 36 | 34 | 31 | 25 | 24 | 22 |
| 4   | 71  | 60  | 53  | 47  | 63 | 54 | 48 | 43 | 43 | 38 | 35 | 32 | 29 | 27 | 23 | 21 | 19 |
| 5   | 65  | 53  | 46  | 40  | 58 | 48 | 41 | 36 | 38 | 33 | 30 | 29 | 26 | 23 | 20 | 18 | 17 |
| 6   | 59  | 48  | 40  | 34  | 53 | 43 | 36 | 31 | 34 | 29 | 26 | 26 | 23 | 20 | 18 | 16 | 15 |
| 7   | 55  | 43  | 35  | 30  | 49 | 39 | 32 | 27 | 31 | 26 | 23 | 24 | 20 | 18 | 17 | 15 | 13 |
| 8   | 51  | 39  | 31  | 26  | 45 | 35 | 29 | 24 | 28 | 23 | 20 | 22 | 18 | 16 | 15 | 13 | 12 |
| 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°  | 1147 | 1147 | 1147 |
| 5°  | 1149 | 1131 | 1139 |
| 10° | 1140 | 1116 | 1124 |
| 15° | 1123 | 1098 | 1100 |
| 20° | 1100 | 1073 | 1076 |
| 25° | 1078 | 1042 | 1047 |
| 30° | 1050 | 1014 | 1011 |
| 35° | 1023 | 981  | 973  |
| 40° | 990  | 947  | 937  |
| 45° | 957  | 913  | 900  |
| 50° | 921  | 878  | 857  |
| 55° | 884  | 837  | 817  |
| 60° | 841  | 788  | 772  |
| 65° | 795  | 738  | 719  |
| 70° | 736  | 677  | 661  |
| 75° | 654  | 603  | 609  |
| 80° | 556  | 509  | 508  |
| 85° | 402  | 348  | 339  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 90°

Vertical Angle: 90°

Luminance: 2750 cd/sqm

TEST NUMBER: P908628

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 147.9   | 1.1       |
| 10°-20°   | 416.2   | 3.0       |
| 20°-30°   | 611.7   | 4.4       |
| 30°-40°   | 710.5   | 5.1       |
| 40°-50°   | 709.6   | 5.1       |
| 50°-60°   | 618.7   | 4.5       |
| 60°-70°   | 457.4   | 3.3       |
| 70°-80°   | 258.8   | 1.9       |
| 80°-90°   | 78.3    | 0.6       |
| 90°-100°  | 217.4   | 1.6       |
| 100°-110° | 690.8   | 5.0       |
| 110°-120° | 1182.1  | 8.5       |
| 120°-130° | 1554.6  | 11.2      |
| 130°-140° | 1745.0  | 12.6      |
| 140°-150° | 1711.2  | 12.4      |
| 150°-160° | 1435.4  | 10.4      |
| 160°-170° | 951.9   | 6.9       |
| 170°-180° | 332.7   | 2.4       |
| 0°-30°    | 1175.9  | 8.5       |
| 0°-40°    | 1886.3  | 13.6      |
| 0°-60°    | 3214.6  | 23.2      |
| 0°-90°    | 4009.0  | 29.0      |
| 90°-120°  | 2090.2  | 15.1      |
| 90°-150°  | 7101.0  | 51.3      |
| 90°-180°  | 9821.0  | 71.0      |
| 0°-180°   | 13830.1 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 1572 | 1572  | 1572 | 1572  | 1572 |      |
| 5°   | 1572 | 1566  | 1549 | 1561  | 1558 | 149  |
| 15°  | 1496 | 1487  | 1468 | 1474  | 1466 | 421  |
| 25°  | 1354 | 1342  | 1316 | 1319  | 1316 | 623  |
| 35°  | 1168 | 1153  | 1129 | 1120  | 1112 | 730  |
| 45°  | 951  | 940   | 917  | 901   | 895  | 734  |
| 55°  | 720  | 710   | 692  | 674   | 667  | 643  |
| 65°  | 485  | 476   | 461  | 447   | 440  | 480  |
| 75°  | 254  | 251   | 243  | 234   | 237  | 271  |
| 85°  | 62   | 60    | 59   | 54    | 53   | 69   |
| 90°  | 3    | 38    | 104  | 98    | 101  | 14   |
| 95°  | 155  | 184   | 190  | 190   | 184  | 172  |
| 105° | 638  | 646   | 652  | 658   | 658  | 673  |
| 115° | 1186 | 1203  | 1198 | 1195  | 1186 | 1173 |
| 125° | 1725 | 1752  | 1743 | 1734  | 1731 | 1542 |
| 135° | 2232 | 2264  | 2271 | 2268  | 2259 | 1725 |
| 145° | 2709 | 2730  | 2747 | 2751  | 2739 | 1693 |
| 155° | 3098 | 3106  | 3116 | 3131  | 3121 | 1426 |
| 165° | 3370 | 3367  | 3367 | 3388  | 3373 | 951  |
| 175° | 3507 | 3498  | 3492 | 3513  | 3495 | 333  |
| 180° | 3513 | 3513  | 3513 | 3513  | 3513 |      |

TEST NUMBER: P908628

CATALOG NUMBER: DFN2DIP-PN4F0-040D110US840-FLLFLL

**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 1571.8 | 1571.8 | 1571.8 | 1571.8 | 1571.8 |
| 2.5°   | 1580.9 | 1573.4 | 1556.7 | 1571.8 | 1568.9 |
| 5°     | 1571.8 | 1565.8 | 1549.1 | 1561.2 | 1558.3 |
| 7.5°   | 1561.2 | 1552.2 | 1535.5 | 1547.7 | 1544.7 |
| 10°    | 1544.7 | 1534.1 | 1516.0 | 1528.0 | 1523.5 |
| 12.5°  | 1521.9 | 1512.9 | 1494.8 | 1502.4 | 1499.2 |
| 15°    | 1496.2 | 1487.2 | 1467.5 | 1473.6 | 1466.1 |
| 17.5°  | 1464.5 | 1455.5 | 1435.8 | 1443.3 | 1435.8 |
| 20°    | 1429.7 | 1420.7 | 1399.6 | 1404.0 | 1398.2 |
| 22.5°  | 1395.0 | 1381.4 | 1361.7 | 1361.7 | 1358.7 |
| 25°    | 1354.1 | 1342.1 | 1316.5 | 1319.4 | 1316.5 |
| 27.5°  | 1308.8 | 1298.2 | 1278.7 | 1274.1 | 1266.7 |
| 30°    | 1263.5 | 1251.4 | 1228.8 | 1224.3 | 1218.2 |
| 32.5°  | 1215.2 | 1206.2 | 1181.9 | 1172.9 | 1166.7 |
| 35°    | 1168.3 | 1153.3 | 1129.0 | 1119.9 | 1112.4 |
| 37.5°  | 1115.4 | 1101.8 | 1077.5 | 1067.0 | 1059.4 |
| 40°    | 1061.1 | 1048.8 | 1024.6 | 1011.2 | 1005.1 |
| 42.5°  | 1008.1 | 995.9  | 971.9  | 956.6  | 947.7  |
| 45°    | 950.7  | 940.2  | 917.4  | 900.9  | 894.7  |
| 47.5°  | 894.7  | 884.1  | 860.0  | 843.3  | 834.4  |
| 50°    | 835.8  | 828.2  | 807.1  | 785.9  | 778.3  |
| 52.5°  | 778.3  | 767.8  | 748.2  | 731.5  | 720.9  |
| 55°    | 719.5  | 710.3  | 692.3  | 674.1  | 666.6  |
| 57.5°  | 660.5  | 653.0  | 633.2  | 615.1  | 609.0  |
| 60°    | 601.5  | 595.5  | 574.4  | 557.7  | 553.2  |
| 62.5°  | 544.1  | 533.5  | 518.5  | 503.3  | 497.3  |
| 65°    | 485.2  | 476.1  | 461.0  | 447.4  | 439.9  |
| 67.5°  | 424.7  | 417.1  | 403.6  | 393.0  | 387.0  |
| 70°    | 368.8  | 362.7  | 349.1  | 338.5  | 332.5  |
| 72.5°  | 311.4  | 305.3  | 297.8  | 287.2  | 282.7  |
| 75°    | 253.9  | 251.0  | 243.3  | 234.3  | 237.3  |
| 77.5°  | 202.5  | 196.4  | 193.4  | 188.8  | 184.4  |
| 80°    | 151.2  | 149.6  | 146.5  | 142.1  | 139.1  |
| 82.5°  | 102.8  | 102.8  | 101.4  | 95.2   | 95.2   |
| 85°    | 61.9   | 60.5   | 59.0   | 54.3   | 52.9   |
| 87.5°  | 27.3   | 24.2   | 21.2   | 16.7   | 15.0   |
| 90°    | 3.1    | 38.2   | 103.8  | 97.5   | 100.6  |
| 92.5°  | 65.6   | 89.0   | 92.1   | 95.3   | 95.3   |
| 95°    | 154.6  | 184.3  | 189.6  | 189.6  | 184.3  |
| 97.5°  | 257.4  | 284.9  | 296.6  | 296.6  | 296.6  |
| 100°   | 376.0  | 400.3  | 408.8  | 408.8  | 405.7  |
| 102.5° | 501.0  | 519.0  | 530.7  | 533.8  | 530.7  |
| 105°   | 637.6  | 646.1  | 652.5  | 657.7  | 657.7  |
| 107.5° | 773.2  | 785.9  | 785.9  | 788.0  | 773.2  |
| 110°   | 904.5  | 921.5  | 921.5  | 921.5  | 913.0  |

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CATALOG NUMBER: DFN2DIP-PN4F0-040D110US840-FLLFLL

**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 1046.4 | 1064.4 | 1061.3 | 1052.8 | 1046.4 |
| 115°   | 1186.3 | 1203.2 | 1197.9 | 1194.8 | 1186.3 |
| 117.5° | 1325.0 | 1348.3 | 1333.4 | 1325.0 | 1316.6 |
| 120°   | 1464.8 | 1488.1 | 1464.8 | 1464.8 | 1455.3 |
| 122.5° | 1592.0 | 1621.5 | 1606.7 | 1598.2 | 1592.0 |
| 125°   | 1725.4 | 1751.8 | 1743.3 | 1733.8 | 1730.6 |
| 127.5° | 1855.6 | 1888.4 | 1876.8 | 1864.1 | 1855.6 |
| 130°   | 1977.4 | 2015.6 | 2010.2 | 2003.9 | 1992.3 |
| 132.5° | 2114.1 | 2143.7 | 2145.9 | 2131.0 | 2122.5 |
| 135°   | 2231.6 | 2264.4 | 2270.8 | 2267.7 | 2259.2 |
| 137.5° | 2363.0 | 2389.4 | 2394.7 | 2392.6 | 2380.0 |
| 140°   | 2478.4 | 2504.9 | 2519.7 | 2519.7 | 2508.1 |
| 142.5° | 2597.1 | 2623.5 | 2632.0 | 2635.1 | 2623.5 |
| 145°   | 2709.3 | 2730.5 | 2747.4 | 2750.6 | 2739.0 |
| 147.5° | 2810.0 | 2836.4 | 2849.1 | 2854.4 | 2842.8 |
| 150°   | 2913.8 | 2931.7 | 2943.4 | 2952.9 | 2943.4 |
| 152.5° | 3005.9 | 3023.8 | 3038.7 | 3050.4 | 3038.7 |
| 155°   | 3098.1 | 3106.4 | 3116.0 | 3130.9 | 3121.3 |
| 157.5° | 3177.4 | 3183.8 | 3189.1 | 3210.3 | 3195.4 |
| 160°   | 3248.4 | 3254.8 | 3257.9 | 3276.0 | 3263.3 |
| 162.5° | 3314.1 | 3314.1 | 3317.3 | 3337.4 | 3322.6 |
| 165°   | 3370.2 | 3367.0 | 3367.0 | 3388.2 | 3373.4 |
| 167.5° | 3421.0 | 3411.5 | 3411.5 | 3432.7 | 3417.9 |
| 170°   | 3459.2 | 3450.7 | 3447.6 | 3468.7 | 3450.7 |
| 172.5° | 3485.7 | 3477.2 | 3474.0 | 3495.2 | 3477.2 |
| 175°   | 3506.9 | 3498.4 | 3492.0 | 3513.2 | 3495.2 |
| 177.5° | 3518.5 | 3510.0 | 3503.6 | 3521.7 | 3503.6 |
| 180°   | 3513.2 | 3513.2 | 3513.2 | 3513.2 | 3513.2 |

TEST NUMBER: P908628

CATALOG NUMBER: DFN2DIP-PN4F0-040D110US840-FLLFLL

**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 | 5.40             | 6.10 | 6.52  | 7.21  | 8.75  | 4.96           | 5.66 | 6.08  | 6.77  | 8.31  |
|                 | 3H   | 7.05             | 7.68 | 8.18  | 8.80  | 10.36 | 6.57           | 7.19 | 7.69  | 8.31  | 9.87  |
|                 | 4H   | 7.63             | 8.23 | 8.77  | 9.35  | 10.91 | 7.14           | 7.74 | 8.28  | 8.86  | 10.43 |
|                 | 6H   | 8.03             | 8.57 | 9.17  | 9.70  | 11.27 | 7.53           | 8.08 | 8.68  | 9.21  | 10.78 |
|                 | 8H   | 8.13             | 8.65 | 9.27  | 9.79  | 11.36 | 7.63           | 8.15 | 8.78  | 9.29  | 10.86 |
|                 | 12H  | 8.17             | 8.67 | 9.32  | 9.80  | 11.39 | 7.67           | 8.16 | 8.82  | 9.30  | 10.89 |
| 4H              | 2H   | 5.84             | 6.44 | 6.99  | 7.56  | 9.12  | 5.49           | 6.08 | 6.63  | 7.21  | 8.77  |
|                 | 3H   | 7.69             | 8.19 | 8.84  | 9.34  | 10.92 | 7.29           | 7.79 | 8.44  | 8.94  | 10.51 |
|                 | 4H   | 8.40             | 8.86 | 9.56  | 10.00 | 11.59 | 7.99           | 8.44 | 9.14  | 9.58  | 11.18 |
|                 | 6H   | 8.91             | 9.30 | 10.07 | 10.46 | 12.05 | 8.49           | 8.88 | 9.65  | 10.04 | 11.63 |
|                 | 8H   | 9.06             | 9.43 | 10.22 | 10.58 | 12.18 | 8.63           | 9.00 | 9.79  | 10.15 | 11.75 |
|                 | 12H  | 9.13             | 9.46 | 10.30 | 10.62 | 12.23 | 8.69           | 9.02 | 9.86  | 10.18 | 11.79 |
| 8H              | 4H   | 8.59             | 8.95 | 9.75  | 10.10 | 11.71 | 8.22           | 8.58 | 9.37  | 9.73  | 11.34 |
|                 | 6H   | 9.22             | 9.52 | 10.39 | 10.71 | 12.31 | 8.84           | 9.14 | 10.02 | 10.33 | 11.93 |
|                 | 8H   | 9.44             | 9.70 | 10.62 | 10.87 | 12.49 | 9.05           | 9.32 | 10.24 | 10.49 | 12.11 |
|                 | 12H  | 9.56             | 9.79 | 10.75 | 10.96 | 12.62 | 9.16           | 9.39 | 10.35 | 10.56 | 12.21 |
| 12H             | 4H   | 8.57             | 8.90 | 9.74  | 10.06 | 11.67 | 8.20           | 8.54 | 9.38  | 9.70  | 11.31 |
|                 | 6H   | 9.24             | 9.51 | 10.43 | 10.68 | 12.30 | 8.88           | 9.14 | 10.06 | 10.31 | 11.93 |
|                 | 8H   | 9.48             | 9.71 | 10.67 | 10.88 | 12.53 | 9.11           | 9.34 | 10.30 | 10.51 | 12.16 |

END OF REPORT