

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: P913200

Luminaire Tested: DFN2DIP-4P4F0-030D060US927-RLLFLL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P913200  
REPORT IS A COMBINATION OF REPORTS P899116 AND P895967  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-4P4F0-030D060US927-RLLFLL  
Description: 4 foot, 90deg - 4way Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

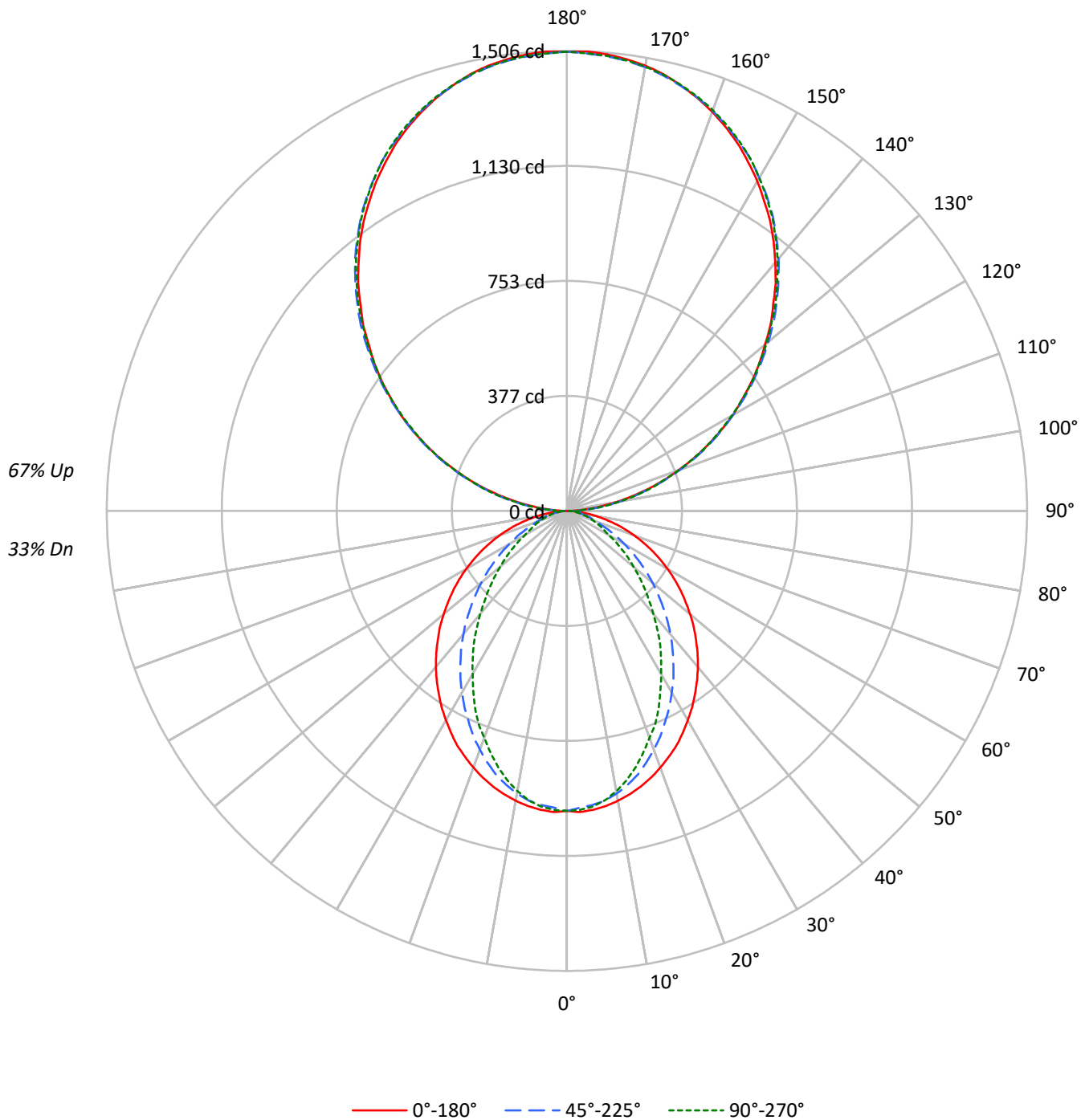
Lumens per Lamp: N/A  
Luminaire Lumens: 6226.6 lumens  
Efficiency: N/A  
Efficacy: 79.8 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 0.99 / 1.16  
Luminous Opening: Rectangular w/ Sides (W: 4.07' x L: 4.07' x H: 0.1')  
CIE Type: Semi-Indirect

Input Watts (W): 78  
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



TEST NUMBER: P913200

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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   | 103 | 103 | 103 | 103 | 93 | 93 | 93 | 93 | 74 | 74 | 74 | 56 | 56 | 56 | 40 | 40 | 40 |
| 1   | 94  | 90  | 86  | 83  | 85 | 81 | 78 | 75 | 65 | 63 | 61 | 50 | 48 | 47 | 36 | 35 | 34 |
| 2   | 86  | 79  | 73  | 68  | 77 | 71 | 67 | 62 | 57 | 54 | 51 | 44 | 42 | 40 | 32 | 31 | 29 |
| 3   | 79  | 70  | 63  | 57  | 71 | 63 | 57 | 52 | 51 | 46 | 43 | 39 | 36 | 34 | 29 | 27 | 25 |
| 4   | 72  | 62  | 54  | 49  | 65 | 56 | 50 | 45 | 45 | 41 | 37 | 35 | 32 | 29 | 26 | 24 | 22 |
| 5   | 66  | 55  | 47  | 42  | 59 | 50 | 43 | 38 | 40 | 36 | 32 | 32 | 28 | 26 | 23 | 21 | 19 |
| 6   | 61  | 49  | 42  | 36  | 55 | 45 | 38 | 33 | 36 | 32 | 28 | 29 | 25 | 23 | 21 | 19 | 17 |
| 7   | 56  | 45  | 37  | 32  | 51 | 41 | 34 | 29 | 33 | 28 | 25 | 26 | 23 | 20 | 19 | 17 | 15 |
| 8   | 52  | 40  | 33  | 28  | 47 | 37 | 30 | 26 | 30 | 25 | 22 | 24 | 20 | 18 | 18 | 16 | 14 |
| 9   | 49  | 37  | 30  | 25  | 44 | 34 | 27 | 23 | 28 | 23 | 20 | 22 | 19 | 16 | 17 | 14 | 13 |
| 10  | 45  | 34  | 27  | 22  | 41 | 31 | 25 | 21 | 25 | 21 | 18 | 20 | 17 | 15 | 15 | 13 | 11 |

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

|     | 0°  | 45° | 90° |
|-----|-----|-----|-----|
| 0°  | 637 | 637 | 637 |
| 5°  | 638 | 627 | 631 |
| 10° | 632 | 615 | 611 |
| 15° | 623 | 595 | 579 |
| 20° | 612 | 567 | 541 |
| 25° | 600 | 536 | 503 |
| 30° | 584 | 504 | 456 |
| 35° | 569 | 469 | 414 |
| 40° | 553 | 434 | 366 |
| 45° | 535 | 394 | 322 |
| 50° | 516 | 354 | 280 |
| 55° | 496 | 311 | 239 |
| 60° | 473 | 267 | 197 |
| 65° | 447 | 221 | 178 |
| 70° | 415 | 179 | 161 |
| 75° | 375 | 158 | 147 |
| 80° | 318 | 133 | 128 |
| 85° | 222 | 90  | 98  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 90°

Vertical Angle: 90°

Luminance: 1136 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 92.1   | 1.5       |
| 10°-20°   | 252.7  | 4.1       |
| 20°-30°   | 354.8  | 5.7       |
| 30°-40°   | 386.8  | 6.2       |
| 40°-50°   | 355.5  | 5.7       |
| 50°-60°   | 279.2  | 4.5       |
| 60°-70°   | 181.7  | 2.9       |
| 70°-80°   | 93.5   | 1.5       |
| 80°-90°   | 28.2   | 0.5       |
| 90°-100°  | 93.0   | 1.5       |
| 100°-110° | 295.6  | 4.7       |
| 110°-120° | 505.8  | 8.1       |
| 120°-130° | 665.2  | 10.7      |
| 130°-140° | 746.6  | 12.0      |
| 140°-150° | 732.2  | 11.8      |
| 150°-160° | 614.2  | 9.9       |
| 160°-170° | 407.3  | 6.5       |
| 170°-180° | 142.4  | 2.3       |
| 0°-30°    | 699.6  | 11.2      |
| 0°-40°    | 1086.3 | 17.4      |
| 0°-60°    | 1720.9 | 27.6      |
| 0°-90°    | 2024.3 | 32.5      |
| 90°-120°  | 894.4  | 14.4      |
| 90°-150°  | 3038.4 | 48.8      |
| 90°-180°  | 4202.0 | 67.5      |
| 0°-180°   | 6226.6 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 982  | 982   | 982  | 982   | 982  |      |
| 5°   | 982  | 978   | 966  | 974   | 972  | 93   |
| 15°  | 934  | 924   | 894  | 877   | 868  | 263  |
| 25°  | 848  | 820   | 761  | 724   | 711  | 390  |
| 35°  | 731  | 685   | 607  | 551   | 532  | 457  |
| 45°  | 597  | 538   | 444  | 381   | 360  | 461  |
| 55°  | 454  | 385   | 289  | 236   | 219  | 406  |
| 65°  | 307  | 235   | 155  | 124   | 122  | 304  |
| 75°  | 164  | 101   | 71   | 65    | 64   | 173  |
| 85°  | 38   | 20    | 17   | 17    | 17   | 44   |
| 90°  | 1    | 16    | 44   | 42    | 43   | 6    |
| 95°  | 66   | 79    | 81   | 81    | 79   | 74   |
| 105° | 273  | 276   | 279  | 282   | 282  | 288  |
| 115° | 508  | 515   | 512  | 511   | 508  | 502  |
| 125° | 738  | 750   | 746  | 742   | 740  | 660  |
| 135° | 955  | 969   | 972  | 970   | 967  | 738  |
| 145° | 1159 | 1168  | 1176 | 1177  | 1172 | 724  |
| 155° | 1326 | 1329  | 1333 | 1340  | 1336 | 610  |
| 165° | 1442 | 1441  | 1441 | 1450  | 1443 | 407  |
| 175° | 1500 | 1497  | 1494 | 1503  | 1496 | 143  |
| 180° | 1503 | 1503  | 1503 | 1503  | 1503 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°    | 22.5° | 45°   | 67.5° | 90°   |
|--------|-------|-------|-------|-------|-------|
| 0°     | 982.2 | 982.2 | 982.2 | 982.2 | 982.2 |
| 2.5°   | 986.7 | 982.2 | 972.4 | 981.4 | 979.6 |
| 5°     | 982.2 | 977.8 | 966.2 | 974.2 | 971.5 |
| 7.5°   | 974.2 | 968.9 | 956.5 | 960.0 | 955.5 |
| 10°    | 963.5 | 957.4 | 939.6 | 936.8 | 931.6 |
| 12.5°  | 950.2 | 942.2 | 918.2 | 912.9 | 903.1 |
| 15°    | 934.2 | 924.4 | 894.2 | 877.3 | 868.5 |
| 17.5°  | 915.5 | 901.3 | 864.0 | 844.5 | 830.2 |
| 20°    | 894.2 | 876.4 | 831.9 | 809.8 | 790.2 |
| 22.5°  | 871.2 | 850.6 | 799.1 | 768.9 | 755.6 |
| 25°    | 848.0 | 819.5 | 760.9 | 724.4 | 711.1 |
| 27.5°  | 820.5 | 790.2 | 725.3 | 683.6 | 663.1 |
| 30°    | 791.2 | 757.3 | 686.2 | 641.0 | 616.9 |
| 32.5°  | 762.6 | 721.8 | 649.0 | 595.6 | 573.3 |
| 35°    | 730.7 | 685.3 | 607.1 | 551.1 | 531.6 |
| 37.5°  | 699.6 | 650.6 | 568.0 | 506.6 | 484.5 |
| 40°    | 666.7 | 613.4 | 527.1 | 464.0 | 440.9 |
| 42.5°  | 632.9 | 576.1 | 486.2 | 420.4 | 398.2 |
| 45°    | 597.4 | 537.7 | 444.5 | 381.3 | 360.0 |
| 47.5°  | 563.6 | 500.5 | 404.5 | 341.3 | 321.8 |
| 50°    | 526.2 | 463.1 | 365.4 | 304.0 | 285.3 |
| 52.5°  | 489.7 | 423.1 | 328.0 | 269.3 | 252.5 |
| 55°    | 454.2 | 384.8 | 288.8 | 235.6 | 218.7 |
| 57.5°  | 417.8 | 346.7 | 254.3 | 204.5 | 190.2 |
| 60°    | 380.4 | 309.3 | 217.8 | 172.5 | 158.3 |
| 62.5°  | 344.0 | 272.9 | 186.6 | 144.0 | 137.0 |
| 65°    | 306.7 | 234.6 | 154.6 | 124.5 | 121.8 |
| 67.5°  | 271.2 | 199.1 | 124.5 | 109.3 | 106.6 |
| 70°    | 233.8 | 164.5 | 103.1 | 94.2  | 90.6  |
| 72.5°  | 198.2 | 132.4 | 86.2  | 79.1  | 77.3  |
| 75°    | 163.5 | 101.3 | 71.1  | 64.9  | 64.0  |
| 77.5°  | 128.9 | 71.9  | 56.0  | 52.4  | 50.6  |
| 80°    | 96.9  | 51.6  | 42.6  | 39.1  | 39.1  |
| 82.5°  | 67.5  | 34.7  | 29.3  | 27.6  | 27.6  |
| 85°    | 38.2  | 19.5  | 16.9  | 16.9  | 16.9  |
| 87.5°  | 14.3  | 7.1   | 7.1   | 6.3   | 6.3   |
| 90°    | 1.3   | 16.3  | 44.4  | 41.7  | 43.0  |
| 92.5°  | 28.1  | 38.1  | 39.5  | 40.8  | 40.8  |
| 95°    | 66.1  | 78.8  | 81.1  | 81.1  | 78.8  |
| 97.5°  | 110.1 | 121.9 | 126.9 | 126.9 | 126.9 |
| 100°   | 160.9 | 171.3 | 174.9 | 174.9 | 173.6 |
| 102.5° | 214.4 | 222.0 | 227.0 | 228.4 | 227.0 |
| 105°   | 272.8 | 276.5 | 279.2 | 281.5 | 281.5 |
| 107.5° | 330.8 | 336.3 | 336.3 | 337.2 | 330.8 |
| 110°   | 387.1 | 394.3 | 394.3 | 394.3 | 390.6 |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 447.7  | 455.4  | 454.1  | 450.4  | 447.7  |
| 115°   | 507.6  | 514.8  | 512.5  | 511.2  | 507.6  |
| 117.5° | 567.0  | 576.9  | 570.5  | 567.0  | 563.3  |
| 120°   | 626.8  | 636.8  | 626.8  | 626.8  | 622.7  |
| 122.5° | 681.1  | 693.8  | 687.5  | 683.9  | 681.1  |
| 125°   | 738.2  | 749.6  | 745.9  | 741.9  | 740.5  |
| 127.5° | 794.0  | 808.0  | 803.0  | 797.6  | 794.0  |
| 130°   | 846.1  | 862.4  | 860.2  | 857.5  | 852.5  |
| 132.5° | 904.6  | 917.3  | 918.1  | 911.8  | 908.2  |
| 135°   | 954.9  | 968.9  | 971.6  | 970.3  | 966.6  |
| 137.5° | 1011.1 | 1022.4 | 1024.7 | 1023.7 | 1018.3 |
| 140°   | 1060.5 | 1071.8 | 1078.2 | 1078.2 | 1073.2 |
| 142.5° | 1111.2 | 1122.5 | 1126.2 | 1127.5 | 1122.5 |
| 145°   | 1159.3 | 1168.3 | 1175.6 | 1176.9 | 1172.0 |
| 147.5° | 1202.3 | 1213.6 | 1219.1 | 1221.3 | 1216.3 |
| 150°   | 1246.7 | 1254.4 | 1259.4 | 1263.4 | 1259.4 |
| 152.5° | 1286.1 | 1293.9 | 1300.2 | 1305.2 | 1300.2 |
| 155°   | 1325.6 | 1329.2 | 1333.2 | 1339.7 | 1335.5 |
| 157.5° | 1359.5 | 1362.3 | 1364.5 | 1373.6 | 1367.3 |
| 160°   | 1390.0 | 1392.7 | 1394.0 | 1401.7 | 1396.3 |
| 162.5° | 1418.0 | 1418.0 | 1419.4 | 1428.0 | 1421.6 |
| 165°   | 1442.0 | 1440.7 | 1440.7 | 1449.8 | 1443.4 |
| 167.5° | 1463.8 | 1459.8 | 1459.8 | 1468.8 | 1462.4 |
| 170°   | 1480.1 | 1476.5 | 1475.1 | 1484.2 | 1476.5 |
| 172.5° | 1491.4 | 1487.8 | 1486.4 | 1495.5 | 1487.8 |
| 175°   | 1500.5 | 1496.9 | 1494.1 | 1503.2 | 1495.5 |
| 177.5° | 1505.5 | 1501.9 | 1499.1 | 1506.8 | 1499.1 |
| 180°   | 1503.2 | 1503.2 | 1503.2 | 1503.2 | 1503.2 |

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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 | 3.70             | 4.41 | 4.80 | 5.50 | 7.00  | 0.00           | 0.37 | 0.76 | 1.46 | 2.96 |
|                 | 3H   | 5.37             | 6.00 | 6.48 | 7.11 | 8.63  | 0.84           | 1.47 | 1.95 | 2.57 | 4.09 |
|                 | 4H   | 5.98             | 6.58 | 7.10 | 7.68 | 9.21  | 1.29           | 1.88 | 2.40 | 2.99 | 4.51 |
|                 | 6H   | 6.40             | 6.95 | 7.53 | 8.05 | 9.59  | 1.60           | 2.15 | 2.73 | 3.26 | 4.79 |
|                 | 8H   | 6.52             | 7.05 | 7.65 | 8.17 | 9.70  | 1.69           | 2.21 | 2.82 | 3.33 | 4.86 |
|                 | 12H  | 6.59             | 7.08 | 7.72 | 8.20 | 9.75  | 1.73           | 2.23 | 2.86 | 3.34 | 4.89 |
| 4H              | 2H   | 3.70             | 4.30 | 4.83 | 5.40 | 6.93  | 0.24           | 0.84 | 1.37 | 1.94 | 3.47 |
|                 | 3H   | 5.53             | 6.02 | 6.66 | 7.15 | 8.69  | 1.58           | 2.08 | 2.71 | 3.21 | 4.75 |
|                 | 4H   | 6.22             | 6.67 | 7.35 | 7.79 | 9.35  | 2.13           | 2.58 | 3.26 | 3.70 | 5.26 |
|                 | 6H   | 6.73             | 7.12 | 7.87 | 8.26 | 9.81  | 2.54           | 2.93 | 3.68 | 4.07 | 5.62 |
|                 | 8H   | 6.91             | 7.27 | 8.05 | 8.41 | 9.97  | 2.67           | 3.03 | 3.81 | 4.17 | 5.73 |
|                 | 12H  | 7.00             | 7.33 | 8.16 | 8.48 | 10.05 | 2.73           | 3.06 | 3.89 | 4.21 | 5.78 |
| 8H              | 4H   | 6.18             | 6.54 | 7.32 | 7.67 | 9.24  | 2.40           | 2.77 | 3.54 | 3.90 | 5.47 |
|                 | 6H   | 6.74             | 7.05 | 7.90 | 8.22 | 9.78  | 2.92           | 3.22 | 4.08 | 4.39 | 5.96 |
|                 | 8H   | 6.96             | 7.23 | 8.13 | 8.38 | 9.96  | 3.11           | 3.37 | 4.28 | 4.53 | 6.11 |
|                 | 12H  | 7.10             | 7.33 | 8.27 | 8.48 | 10.10 | 3.23           | 3.46 | 4.40 | 4.61 | 6.23 |
| 12H             | 4H   | 6.12             | 6.45 | 7.28 | 7.60 | 9.17  | 2.40           | 2.73 | 3.56 | 3.88 | 5.45 |
|                 | 6H   | 6.72             | 6.98 | 7.89 | 8.14 | 9.72  | 2.97           | 3.23 | 4.13 | 4.39 | 5.97 |
|                 | 8H   | 6.94             | 7.17 | 8.11 | 8.32 | 9.94  | 3.18           | 3.41 | 4.35 | 4.56 | 6.18 |

END OF REPORT