

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: P920644

Luminaire Tested: DFN2DIP-TR2F0-020D060US935-FLLFLL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P920644  
REPORT IS A COMBINATION OF REPORTS P900261 AND P897145  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-TR2F0-020D060US935-FLLFLL  
Description: 2 foot, Triangle Define Geo, with Direct Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

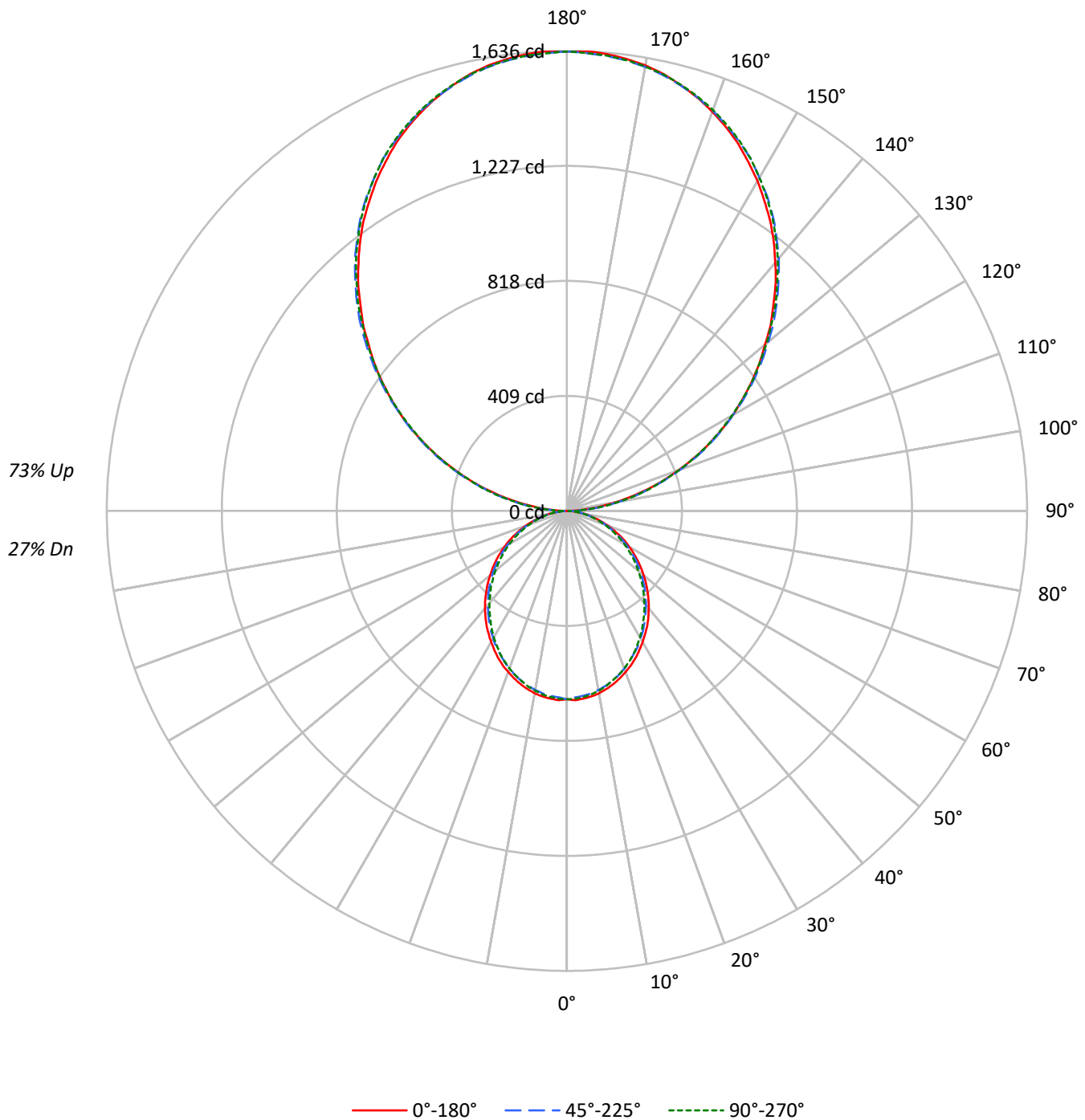
Lumens per Lamp: N/A  
Luminaire Lumens: 6276.7 lumens  
Efficiency: N/A  
Efficacy: 98.7 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 2.04' x L: 2.36' x H: 0.1')  
CIE Type: Semi-Indirect

Input Watts (W): 63.6  
Input Voltage (V): 120  
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

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### Luminous Intensity Polar Plot



TEST NUMBER: P920644

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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 | 52 | 52 | 52 | 35 | 35 | 35 |
| 1   | 93  | 88  | 85  | 81  | 83 | 79 | 76 | 73 | 62 | 60 | 58 | 46 | 44 | 43 | 31 | 30 | 30 |
| 2   | 84  | 77  | 71  | 66  | 75 | 69 | 64 | 60 | 54 | 51 | 48 | 40 | 38 | 36 | 27 | 26 | 25 |
| 3   | 77  | 68  | 61  | 55  | 68 | 61 | 55 | 50 | 48 | 44 | 40 | 35 | 33 | 30 | 24 | 23 | 21 |
| 4   | 70  | 60  | 52  | 47  | 62 | 54 | 47 | 42 | 42 | 38 | 34 | 32 | 29 | 26 | 22 | 20 | 18 |
| 5   | 64  | 53  | 45  | 40  | 57 | 48 | 41 | 36 | 38 | 33 | 29 | 28 | 25 | 22 | 19 | 17 | 16 |
| 6   | 59  | 48  | 40  | 34  | 53 | 43 | 36 | 31 | 34 | 29 | 25 | 25 | 22 | 20 | 18 | 16 | 14 |
| 7   | 55  | 43  | 35  | 30  | 49 | 39 | 32 | 27 | 31 | 26 | 22 | 23 | 20 | 17 | 16 | 14 | 12 |
| 8   | 51  | 39  | 31  | 26  | 45 | 35 | 28 | 24 | 28 | 23 | 20 | 21 | 18 | 15 | 15 | 13 | 11 |
| 9   | 47  | 35  | 28  | 23  | 42 | 32 | 26 | 21 | 25 | 21 | 17 | 19 | 16 | 14 | 14 | 11 | 10 |
| 10  | 44  | 32  | 25  | 21  | 39 | 29 | 23 | 19 | 23 | 19 | 16 | 18 | 15 | 12 | 13 | 10 | 9  |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 1494 | 1494 | 1494 |
| 5°  | 1495 | 1470 | 1481 |
| 10° | 1480 | 1447 | 1458 |
| 15° | 1456 | 1420 | 1425 |
| 20° | 1425 | 1384 | 1390 |
| 25° | 1393 | 1341 | 1350 |
| 30° | 1354 | 1301 | 1301 |
| 35° | 1317 | 1254 | 1248 |
| 40° | 1272 | 1206 | 1198 |
| 45° | 1226 | 1159 | 1147 |
| 50° | 1177 | 1109 | 1088 |
| 55° | 1125 | 1051 | 1033 |
| 60° | 1066 | 983  | 970  |
| 65° | 1001 | 911  | 896  |
| 70° | 918  | 824  | 815  |
| 75° | 805  | 720  | 737  |
| 80° | 668  | 588  | 595  |
| 85° | 453  | 370  | 371  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 90°

Vertical Angle: 90°

Luminance: 2134 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 63.1   | 1.0       |
| 10°-20°   | 177.4  | 2.8       |
| 20°-30°   | 260.8  | 4.2       |
| 30°-40°   | 302.9  | 4.8       |
| 40°-50°   | 302.5  | 4.8       |
| 50°-60°   | 263.8  | 4.2       |
| 60°-70°   | 195.0  | 3.1       |
| 70°-80°   | 110.3  | 1.8       |
| 80°-90°   | 33.7   | 0.5       |
| 90°-100°  | 101.1  | 1.6       |
| 100°-110° | 321.2  | 5.1       |
| 110°-120° | 549.7  | 8.8       |
| 120°-130° | 723.0  | 11.5      |
| 130°-140° | 811.5  | 12.9      |
| 140°-150° | 795.8  | 12.7      |
| 150°-160° | 667.5  | 10.6      |
| 160°-170° | 442.7  | 7.1       |
| 170°-180° | 154.7  | 2.5       |
| 0°-30°    | 501.3  | 8.0       |
| 0°-40°    | 804.1  | 12.8      |
| 0°-60°    | 1370.4 | 21.8      |
| 0°-90°    | 1709.4 | 27.2      |
| 90°-120°  | 972.0  | 15.5      |
| 90°-150°  | 3302.3 | 52.6      |
| 90°-180°  | 4567.0 | 72.8      |
| 0°-180°   | 6276.7 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 670  | 670   | 670  | 670   | 670  |      |
| 5°   | 670  | 668   | 660  | 666   | 664  | 64   |
| 15°  | 638  | 634   | 626  | 628   | 625  | 180  |
| 25°  | 577  | 572   | 561  | 562   | 561  | 266  |
| 35°  | 498  | 492   | 481  | 477   | 474  | 311  |
| 45°  | 405  | 401   | 391  | 384   | 381  | 313  |
| 55°  | 307  | 303   | 295  | 287   | 284  | 274  |
| 65°  | 207  | 203   | 197  | 191   | 188  | 205  |
| 75°  | 108  | 107   | 104  | 100   | 101  | 116  |
| 85°  | 26   | 26    | 25   | 23    | 23   | 29   |
| 90°  | 2    | 18    | 48   | 45    | 47   | 6    |
| 95°  | 72   | 86    | 88   | 88    | 86   | 80   |
| 105° | 296  | 300   | 303  | 306   | 306  | 313  |
| 115° | 552  | 560   | 557  | 556   | 552  | 546  |
| 125° | 802  | 815   | 811  | 806   | 805  | 717  |
| 135° | 1038 | 1053  | 1056 | 1055  | 1051 | 802  |
| 145° | 1260 | 1270  | 1278 | 1279  | 1274 | 787  |
| 155° | 1441 | 1445  | 1449 | 1456  | 1452 | 663  |
| 165° | 1567 | 1566  | 1566 | 1576  | 1569 | 442  |
| 175° | 1631 | 1627  | 1624 | 1634  | 1625 | 155  |
| 180° | 1634 | 1634  | 1634 | 1634  | 1634 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°    | 22.5° | 45°   | 67.5° | 90°   |
|--------|-------|-------|-------|-------|-------|
| 0°     | 670.0 | 670.0 | 670.0 | 670.0 | 670.0 |
| 2.5°   | 673.9 | 670.7 | 663.6 | 670.0 | 668.8 |
| 5°     | 670.0 | 667.5 | 660.4 | 665.6 | 664.3 |
| 7.5°   | 665.6 | 661.7 | 654.6 | 659.8 | 658.5 |
| 10°    | 658.5 | 654.0 | 646.3 | 651.3 | 649.5 |
| 12.5°  | 648.8 | 645.0 | 637.2 | 640.4 | 639.1 |
| 15°    | 637.8 | 634.0 | 625.6 | 628.2 | 625.0 |
| 17.5°  | 624.3 | 620.5 | 612.1 | 615.3 | 612.1 |
| 20°    | 609.5 | 605.6 | 596.6 | 598.6 | 596.0 |
| 22.5°  | 594.7 | 588.9 | 580.5 | 580.5 | 579.2 |
| 25°    | 577.3 | 572.1 | 561.2 | 562.4 | 561.2 |
| 27.5°  | 557.9 | 553.4 | 545.1 | 543.2 | 539.9 |
| 30°    | 538.6 | 533.5 | 523.8 | 521.9 | 519.3 |
| 32.5°  | 518.0 | 514.2 | 503.9 | 500.0 | 497.4 |
| 35°    | 498.1 | 491.6 | 481.3 | 477.4 | 474.2 |
| 37.5°  | 475.5 | 469.7 | 459.3 | 454.9 | 451.6 |
| 40°    | 452.3 | 447.1 | 436.8 | 431.1 | 428.4 |
| 42.5°  | 429.7 | 424.6 | 414.3 | 407.9 | 404.0 |
| 45°    | 405.3 | 400.8 | 391.1 | 384.0 | 381.4 |
| 47.5°  | 381.4 | 376.9 | 366.6 | 359.5 | 355.7 |
| 50°    | 356.3 | 353.1 | 344.1 | 335.0 | 331.8 |
| 52.5°  | 331.8 | 327.3 | 318.9 | 311.9 | 307.4 |
| 55°    | 306.7 | 302.8 | 295.1 | 287.4 | 284.1 |
| 57.5°  | 281.5 | 278.4 | 269.9 | 262.3 | 259.6 |
| 60°    | 256.4 | 253.9 | 244.9 | 237.7 | 235.8 |
| 62.5°  | 232.0 | 227.4 | 221.0 | 214.6 | 212.0 |
| 65°    | 206.8 | 202.9 | 196.6 | 190.7 | 187.5 |
| 67.5°  | 181.1 | 177.8 | 172.0 | 167.6 | 165.0 |
| 70°    | 157.2 | 154.6 | 148.8 | 144.3 | 141.8 |
| 72.5°  | 132.8 | 130.2 | 126.9 | 122.4 | 120.5 |
| 75°    | 108.2 | 107.0 | 103.7 | 99.9  | 101.2 |
| 77.5°  | 86.4  | 83.8  | 82.4  | 80.5  | 78.6  |
| 80°    | 64.5  | 63.8  | 62.5  | 60.5  | 59.2  |
| 82.5°  | 43.8  | 43.8  | 43.2  | 40.6  | 40.6  |
| 85°    | 26.3  | 25.7  | 25.1  | 23.2  | 22.6  |
| 87.5°  | 11.6  | 10.3  | 9.0   | 7.1   | 6.5   |
| 90°    | 1.5   | 17.7  | 48.3  | 45.3  | 46.8  |
| 92.5°  | 30.6  | 41.4  | 42.9  | 44.3  | 44.3  |
| 95°    | 71.9  | 85.7  | 88.2  | 88.2  | 85.7  |
| 97.5°  | 119.7 | 132.5 | 137.9 | 137.9 | 137.9 |
| 100°   | 174.9 | 186.1 | 190.1 | 190.1 | 188.6 |
| 102.5° | 233.0 | 241.3 | 246.8 | 248.2 | 246.8 |
| 105°   | 296.5 | 300.5 | 303.4 | 305.9 | 305.9 |
| 107.5° | 359.6 | 365.5 | 365.5 | 366.4 | 359.6 |
| 110°   | 420.7 | 428.5 | 428.5 | 428.5 | 424.6 |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 486.6  | 495.0  | 493.5  | 489.6  | 486.6  |
| 115°   | 551.6  | 559.6  | 557.1  | 555.6  | 551.6  |
| 117.5° | 616.2  | 627.1  | 620.1  | 616.2  | 612.3  |
| 120°   | 681.2  | 692.1  | 681.2  | 681.2  | 676.7  |
| 122.5° | 740.3  | 754.1  | 747.2  | 743.3  | 740.3  |
| 125°   | 802.4  | 814.7  | 810.7  | 806.3  | 804.9  |
| 127.5° | 863.0  | 878.2  | 872.8  | 866.9  | 863.0  |
| 130°   | 919.6  | 937.4  | 934.9  | 931.9  | 926.5  |
| 132.5° | 983.2  | 996.9  | 997.9  | 991.0  | 987.0  |
| 135°   | 1037.8 | 1053.1 | 1056.0 | 1054.6 | 1050.6 |
| 137.5° | 1098.9 | 1111.2 | 1113.7 | 1112.7 | 1106.8 |
| 140°   | 1152.6 | 1164.9 | 1171.8 | 1171.8 | 1166.4 |
| 142.5° | 1207.7 | 1220.0 | 1224.0 | 1225.5 | 1220.0 |
| 145°   | 1260.0 | 1269.8 | 1277.7 | 1279.2 | 1273.8 |
| 147.5° | 1306.7 | 1319.0 | 1325.0 | 1327.4 | 1322.0 |
| 150°   | 1355.0 | 1363.4 | 1368.8 | 1373.2 | 1368.8 |
| 152.5° | 1397.8 | 1406.3 | 1413.2 | 1418.6 | 1413.2 |
| 155°   | 1440.7 | 1444.7 | 1449.1 | 1456.0 | 1451.6 |
| 157.5° | 1477.6 | 1480.7 | 1483.1 | 1493.0 | 1486.1 |
| 160°   | 1510.7 | 1513.6 | 1515.1 | 1523.4 | 1517.6 |
| 162.5° | 1541.2 | 1541.2 | 1542.6 | 1552.0 | 1545.1 |
| 165°   | 1567.3 | 1565.8 | 1565.8 | 1575.7 | 1568.8 |
| 167.5° | 1591.0 | 1586.6 | 1586.6 | 1596.4 | 1589.5 |
| 170°   | 1608.7 | 1604.7 | 1603.3 | 1613.1 | 1604.7 |
| 172.5° | 1621.0 | 1617.0 | 1615.6 | 1625.4 | 1617.0 |
| 175°   | 1630.8 | 1626.9 | 1623.9 | 1633.8 | 1625.4 |
| 177.5° | 1636.2 | 1632.4 | 1629.4 | 1637.7 | 1629.4 |
| 180°   | 1633.8 | 1633.8 | 1633.8 | 1633.8 | 1633.8 |

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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 | 5.93             | 6.62  | 7.06  | 7.74  | 9.30  | 5.51           | 6.20 | 6.64  | 7.32  | 8.88  |
|                 | 3H   | 7.55             | 8.17  | 8.69  | 9.30  | 10.88 | 7.09           | 7.71 | 8.23  | 8.84  | 10.42 |
|                 | 4H   | 8.12             | 8.70  | 9.26  | 9.83  | 11.42 | 7.66           | 8.24 | 8.81  | 9.37  | 10.96 |
|                 | 6H   | 8.49             | 9.03  | 9.65  | 10.16 | 11.76 | 8.03           | 8.57 | 9.19  | 9.70  | 11.30 |
|                 | 8H   | 8.58             | 9.09  | 9.74  | 10.24 | 11.83 | 8.12           | 8.63 | 9.28  | 9.78  | 11.37 |
|                 | 12H  | 8.61             | 9.10  | 9.78  | 10.24 | 11.85 | 8.15           | 8.64 | 9.31  | 9.78  | 11.39 |
| 4H              | 2H   | 6.36             | 6.95  | 7.52  | 8.08  | 9.66  | 6.02           | 6.61 | 7.18  | 7.74  | 9.32  |
|                 | 3H   | 8.18             | 8.67  | 9.34  | 9.83  | 11.42 | 7.80           | 8.29 | 8.96  | 9.45  | 11.04 |
|                 | 4H   | 8.87             | 9.32  | 10.03 | 10.47 | 12.08 | 8.48           | 8.93 | 9.64  | 10.07 | 11.69 |
|                 | 6H   | 9.35             | 9.74  | 10.52 | 10.91 | 12.51 | 8.96           | 9.34 | 10.13 | 10.51 | 12.12 |
|                 | 8H   | 9.49             | 9.85  | 10.66 | 11.01 | 12.63 | 9.09           | 9.45 | 10.26 | 10.61 | 12.23 |
|                 | 12H  | 9.54             | 9.87  | 10.73 | 11.04 | 12.67 | 9.14           | 9.46 | 10.32 | 10.63 | 12.26 |
| 8H              | 4H   | 9.04             | 9.40  | 10.21 | 10.56 | 12.18 | 8.69           | 9.05 | 9.86  | 10.21 | 11.83 |
|                 | 6H   | 9.64             | 9.94  | 10.83 | 11.14 | 12.76 | 9.29           | 9.58 | 10.47 | 10.79 | 12.40 |
|                 | 8H   | 9.84             | 10.10 | 11.04 | 11.28 | 12.92 | 9.49           | 9.74 | 10.68 | 10.92 | 12.56 |
|                 | 12H  | 9.95             | 10.18 | 11.15 | 11.36 | 13.03 | 9.58           | 9.81 | 10.78 | 10.99 | 12.66 |
| 12H             | 4H   | 9.02             | 9.34  | 10.20 | 10.52 | 12.14 | 8.67           | 9.00 | 9.86  | 10.17 | 11.80 |
|                 | 6H   | 9.66             | 9.92  | 10.86 | 11.10 | 12.74 | 9.32           | 9.58 | 10.51 | 10.76 | 12.40 |
|                 | 8H   | 9.88             | 10.11 | 11.08 | 11.28 | 12.96 | 9.53           | 9.76 | 10.73 | 10.94 | 12.61 |

END OF REPORT