

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: P918584

Luminaire Tested: DFN2DIP-4P3F0-040D020US935-RLLFLL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P918584  
REPORT IS A COMBINATION OF REPORTS P899034 AND P895917  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-4P3F0-040D020US935-RLLFLL  
Description: 3 foot, 90deg - 4way Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

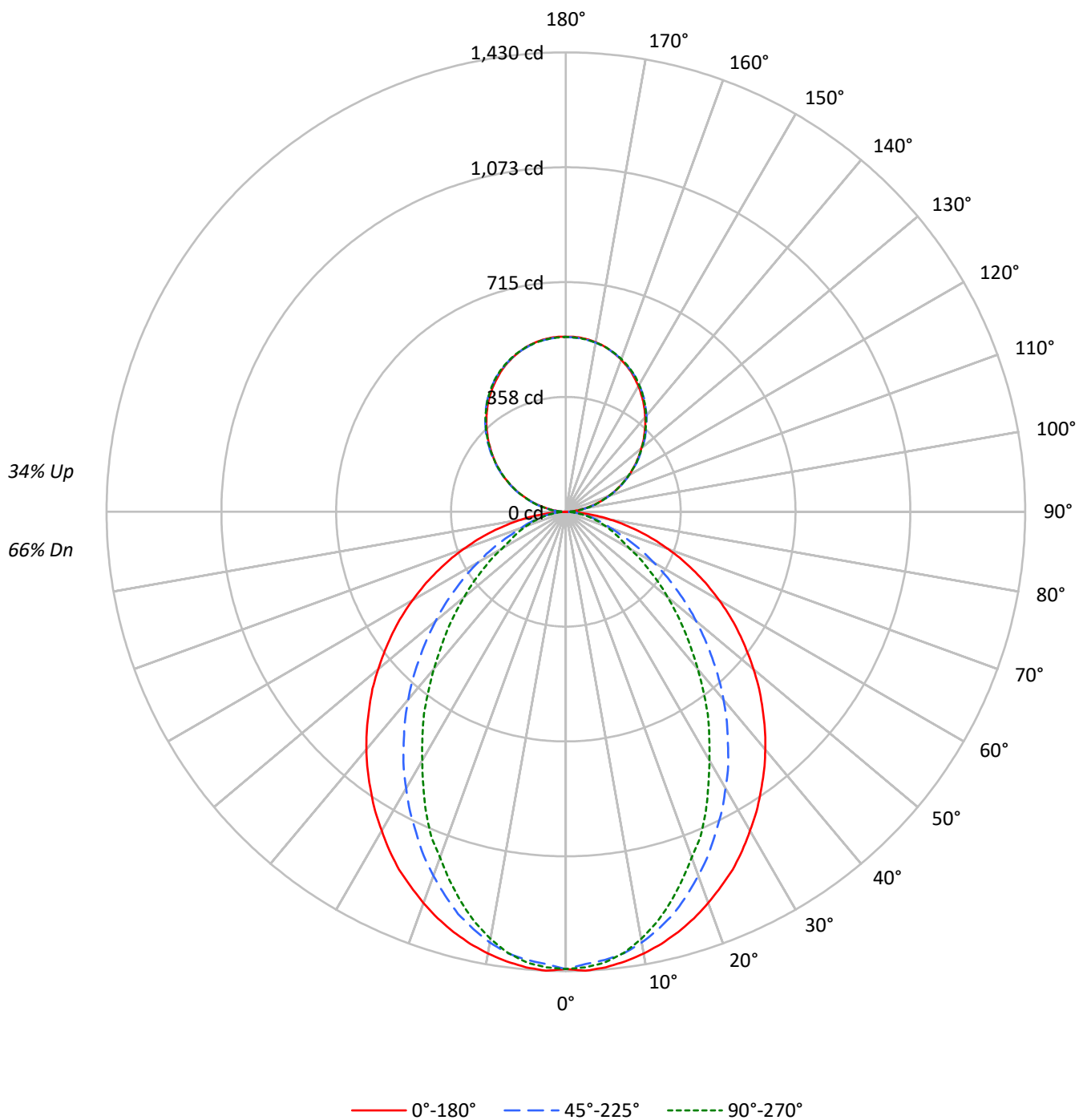
Lumens per Lamp: N/A  
Luminaire Lumens: 4451.3 lumens  
Efficiency: N/A  
Efficacy: 84.0 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 0.99 / 1.16  
Luminous Opening: Rectangular w/ Sides (W: 3.07' x L: 3.07' x H: 0.1')  
CIE Type: Semi-Direct

Input Watts (W): 53  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9789  
Total Harmonic Distortion (THDi): 0.074  
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   | 111 | 111 | 111 | 111 | 104 | 104 | 104 | 104 | 92 | 92 | 92 | 81 | 81 | 81 | 71 | 71 | 71 |
| 1   | 102 | 98  | 94  | 91  | 96  | 92  | 89  | 86  | 82 | 79 | 77 | 72 | 70 | 69 | 63 | 62 | 61 |
| 2   | 93  | 86  | 80  | 75  | 88  | 81  | 76  | 72  | 72 | 68 | 65 | 64 | 61 | 58 | 57 | 54 | 52 |
| 3   | 86  | 76  | 69  | 63  | 80  | 72  | 66  | 61  | 65 | 59 | 55 | 57 | 53 | 50 | 51 | 48 | 45 |
| 4   | 79  | 68  | 60  | 54  | 74  | 65  | 58  | 52  | 58 | 52 | 48 | 52 | 47 | 44 | 46 | 42 | 40 |
| 5   | 73  | 61  | 53  | 47  | 68  | 58  | 51  | 45  | 52 | 46 | 42 | 47 | 42 | 38 | 42 | 38 | 35 |
| 6   | 67  | 55  | 47  | 41  | 63  | 52  | 45  | 40  | 47 | 41 | 37 | 42 | 38 | 34 | 38 | 34 | 31 |
| 7   | 62  | 50  | 42  | 37  | 59  | 48  | 40  | 35  | 43 | 37 | 33 | 39 | 34 | 30 | 35 | 31 | 28 |
| 8   | 58  | 46  | 38  | 33  | 55  | 44  | 37  | 32  | 40 | 34 | 29 | 36 | 31 | 27 | 32 | 28 | 25 |
| 9   | 54  | 42  | 35  | 29  | 51  | 40  | 33  | 29  | 36 | 31 | 27 | 33 | 28 | 25 | 30 | 26 | 23 |
| 10  | 51  | 39  | 31  | 27  | 48  | 37  | 30  | 26  | 34 | 28 | 24 | 31 | 26 | 23 | 28 | 24 | 21 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 1622 | 1622 | 1622 |
| 5°  | 1624 | 1595 | 1606 |
| 10° | 1607 | 1563 | 1553 |
| 15° | 1583 | 1510 | 1472 |
| 20° | 1553 | 1438 | 1372 |
| 25° | 1522 | 1357 | 1276 |
| 30° | 1481 | 1275 | 1155 |
| 35° | 1440 | 1186 | 1048 |
| 40° | 1399 | 1094 | 925  |
| 45° | 1351 | 992  | 814  |
| 50° | 1302 | 890  | 706  |
| 55° | 1250 | 780  | 602  |
| 60° | 1189 | 666  | 495  |
| 65° | 1120 | 550  | 445  |
| 70° | 1036 | 442  | 402  |
| 75° | 930  | 387  | 364  |
| 80° | 777  | 321  | 314  |
| 85° | 528  | 210  | 234  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 1351 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 133.4  | 3.0       |
| 10°-20°   | 366.2  | 8.2       |
| 20°-30°   | 514.2  | 11.6      |
| 30°-40°   | 560.5  | 12.6      |
| 40°-50°   | 515.1  | 11.6      |
| 50°-60°   | 404.5  | 9.1       |
| 60°-70°   | 263.3  | 5.9       |
| 70°-80°   | 135.6  | 3.0       |
| 80°-90°   | 36.1   | 0.8       |
| 90°-100°  | 33.7   | 0.8       |
| 100°-110° | 107.1  | 2.4       |
| 110°-120° | 183.2  | 4.1       |
| 120°-130° | 241.0  | 5.4       |
| 130°-140° | 270.5  | 6.1       |
| 140°-150° | 265.3  | 6.0       |
| 150°-160° | 222.5  | 5.0       |
| 160°-170° | 147.6  | 3.3       |
| 170°-180° | 51.6   | 1.2       |
| 0°-30°    | 1013.8 | 22.8      |
| 0°-40°    | 1574.2 | 35.4      |
| 0°-60°    | 2493.9 | 56.0      |
| 0°-90°    | 2928.9 | 65.8      |
| 90°-120°  | 324.0  | 7.3       |
| 90°-150°  | 1100.8 | 24.7      |
| 90°-180°  | 1522.0 | 34.2      |
| 0°-180°   | 4451.3 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 1423 | 1423  | 1423 | 1423  | 1423 |      |
| 5°   | 1423 | 1417  | 1400 | 1412  | 1408 | 135  |
| 15°  | 1354 | 1340  | 1296 | 1271  | 1259 | 382  |
| 25°  | 1229 | 1188  | 1103 | 1050  | 1030 | 565  |
| 35°  | 1059 | 993   | 880  | 799   | 770  | 663  |
| 45°  | 866  | 779   | 644  | 553   | 522  | 668  |
| 55°  | 658  | 558   | 419  | 341   | 317  | 588  |
| 65°  | 444  | 340   | 224  | 180   | 176  | 441  |
| 75°  | 237  | 147   | 103  | 94    | 93   | 251  |
| 85°  | 55   | 28    | 24   | 24    | 24   | 64   |
| 90°  | 0    | 6     | 16   | 15    | 16   | 4    |
| 95°  | 24   | 29    | 29   | 29    | 29   | 27   |
| 105° | 99   | 100   | 101  | 102   | 102  | 104  |
| 115° | 184  | 186   | 186  | 185   | 184  | 182  |
| 125° | 267  | 272   | 270  | 269   | 268  | 239  |
| 135° | 346  | 351   | 352  | 352   | 350  | 267  |
| 145° | 420  | 423   | 426  | 426   | 425  | 262  |
| 155° | 480  | 482   | 483  | 485   | 484  | 221  |
| 165° | 522  | 522   | 522  | 525   | 523  | 147  |
| 175° | 544  | 542   | 541  | 545   | 542  | 52   |
| 180° | 545  | 545   | 545  | 545   | 545  |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 1423.4 | 1423.4 | 1423.4 | 1423.4 | 1423.4 |
| 2.5°   | 1429.9 | 1423.4 | 1409.2 | 1422.2 | 1419.5 |
| 5°     | 1423.4 | 1416.9 | 1400.2 | 1411.8 | 1408.0 |
| 7.5°   | 1411.8 | 1404.1 | 1386.1 | 1391.1 | 1384.7 |
| 10°    | 1396.4 | 1387.3 | 1361.6 | 1357.6 | 1350.0 |
| 12.5°  | 1377.1 | 1365.5 | 1330.6 | 1322.9 | 1308.7 |
| 15°    | 1353.8 | 1339.6 | 1295.9 | 1271.4 | 1258.6 |
| 17.5°  | 1326.8 | 1306.1 | 1252.0 | 1223.7 | 1203.1 |
| 20°    | 1295.9 | 1270.1 | 1205.7 | 1173.5 | 1145.1 |
| 22.5°  | 1262.4 | 1232.8 | 1158.0 | 1114.2 | 1095.0 |
| 25°    | 1228.9 | 1187.7 | 1102.6 | 1049.9 | 1030.4 |
| 27.5°  | 1189.0 | 1145.1 | 1051.1 | 990.6  | 960.9  |
| 30°    | 1146.5 | 1097.4 | 994.4  | 928.8  | 894.0  |
| 32.5°  | 1105.3 | 1045.9 | 940.4  | 863.1  | 830.8  |
| 35°    | 1058.9 | 993.2  | 879.9  | 798.7  | 770.2  |
| 37.5°  | 1013.8 | 942.9  | 823.1  | 734.2  | 702.1  |
| 40°    | 966.1  | 888.9  | 763.9  | 672.4  | 638.9  |
| 42.5°  | 917.1  | 834.7  | 704.6  | 609.2  | 577.1  |
| 45°    | 865.6  | 779.3  | 644.1  | 552.6  | 521.7  |
| 47.5°  | 816.7  | 725.3  | 586.2  | 494.6  | 466.3  |
| 50°    | 762.6  | 671.1  | 529.4  | 440.5  | 413.5  |
| 52.5°  | 709.7  | 613.1  | 475.4  | 390.3  | 365.8  |
| 55°    | 658.2  | 557.8  | 418.6  | 341.4  | 316.9  |
| 57.5°  | 605.5  | 502.4  | 368.4  | 296.3  | 275.7  |
| 60°    | 551.3  | 448.2  | 315.6  | 249.9  | 229.4  |
| 62.5°  | 498.6  | 395.5  | 270.4  | 208.7  | 198.5  |
| 65°    | 444.4  | 340.0  | 224.1  | 180.4  | 176.4  |
| 67.5°  | 393.0  | 288.5  | 180.4  | 158.4  | 154.5  |
| 70°    | 338.8  | 238.3  | 149.4  | 136.6  | 131.3  |
| 72.5°  | 287.3  | 191.9  | 124.9  | 114.7  | 112.1  |
| 75°    | 236.9  | 146.8  | 103.1  | 94.0   | 92.8   |
| 77.5°  | 186.8  | 104.3  | 81.2   | 76.0   | 73.4   |
| 80°    | 140.3  | 74.7   | 61.7   | 56.7   | 56.7   |
| 82.5°  | 97.9   | 50.3   | 42.5   | 39.9   | 39.9   |
| 85°    | 55.4   | 28.3   | 24.5   | 24.5   | 24.5   |
| 87.5°  | 20.7   | 10.2   | 10.2   | 9.0    | 9.0    |
| 90°    | 0.5    | 5.9    | 16.1   | 15.1   | 15.6   |
| 92.5°  | 10.2   | 13.8   | 14.3   | 14.8   | 14.8   |
| 95°    | 23.9   | 28.6   | 29.4   | 29.4   | 28.6   |
| 97.5°  | 39.9   | 44.2   | 46.0   | 46.0   | 46.0   |
| 100°   | 58.3   | 62.1   | 63.4   | 63.4   | 62.9   |
| 102.5° | 77.7   | 80.4   | 82.2   | 82.7   | 82.2   |
| 105°   | 98.8   | 100.1  | 101.2  | 101.9  | 101.9  |
| 107.5° | 119.9  | 121.8  | 121.8  | 122.2  | 119.9  |
| 110°   | 140.3  | 142.8  | 142.8  | 142.8  | 141.5  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°    | 22.5° | 45°   | 67.5° | 90°   |
|--------|-------|-------|-------|-------|-------|
| 112.5° | 162.2 | 165.0 | 164.5 | 163.2 | 162.2 |
| 115°   | 183.9 | 186.5 | 185.7 | 185.2 | 183.9 |
| 117.5° | 205.4 | 209.1 | 206.7 | 205.4 | 204.1 |
| 120°   | 227.0 | 230.7 | 227.0 | 227.0 | 225.6 |
| 122.5° | 246.8 | 251.3 | 249.1 | 247.8 | 246.8 |
| 125°   | 267.4 | 271.6 | 270.3 | 268.8 | 268.3 |
| 127.5° | 287.7 | 292.7 | 290.9 | 289.0 | 287.7 |
| 130°   | 306.5 | 312.5 | 311.6 | 310.6 | 308.8 |
| 132.5° | 327.7 | 332.3 | 332.6 | 330.4 | 329.0 |
| 135°   | 345.9 | 351.0 | 352.0 | 351.5 | 350.2 |
| 137.5° | 366.3 | 370.4 | 371.3 | 370.9 | 368.9 |
| 140°   | 384.2 | 388.3 | 390.6 | 390.6 | 388.8 |
| 142.5° | 402.6 | 406.6 | 408.0 | 408.5 | 406.6 |
| 145°   | 420.0 | 423.3 | 425.9 | 426.4 | 424.6 |
| 147.5° | 435.6 | 439.7 | 441.7 | 442.5 | 440.7 |
| 150°   | 451.7 | 454.4 | 456.2 | 457.7 | 456.2 |
| 152.5° | 466.0 | 468.7 | 471.1 | 472.9 | 471.1 |
| 155°   | 480.3 | 481.6 | 483.0 | 485.3 | 483.9 |
| 157.5° | 492.6 | 493.5 | 494.4 | 497.7 | 495.3 |
| 160°   | 503.6 | 504.5 | 505.1 | 507.8 | 505.8 |
| 162.5° | 513.8 | 513.8 | 514.2 | 517.4 | 515.0 |
| 165°   | 522.5 | 521.9 | 521.9 | 525.2 | 523.0 |
| 167.5° | 530.3 | 528.8 | 528.8 | 532.1 | 529.9 |
| 170°   | 536.2 | 534.9 | 534.4 | 537.7 | 534.9 |
| 172.5° | 540.4 | 539.0 | 538.6 | 541.8 | 539.0 |
| 175°   | 543.6 | 542.3 | 541.3 | 544.6 | 541.8 |
| 177.5° | 545.4 | 544.2 | 543.1 | 545.9 | 543.1 |
| 180°   | 544.6 | 544.6 | 544.6 | 544.6 | 544.6 |

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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 | 10.15            | 11.13 | 10.97 | 11.97 | 13.00 | 6.12           | 7.09  | 6.93  | 7.93  | 8.96  |
|                 | 3H   | 11.84            | 12.71 | 12.67 | 13.56 | 14.61 | 7.31           | 8.18  | 8.14  | 9.03  | 10.08 |
|                 | 4H   | 12.45            | 13.28 | 13.30 | 14.13 | 15.20 | 7.76           | 8.59  | 8.61  | 9.44  | 10.51 |
|                 | 6H   | 12.88            | 13.64 | 13.73 | 14.49 | 15.58 | 8.08           | 8.84  | 8.94  | 9.70  | 10.78 |
|                 | 8H   | 13.01            | 13.73 | 13.87 | 14.60 | 15.69 | 8.18           | 8.90  | 9.04  | 9.77  | 10.86 |
|                 | 12H  | 13.07            | 13.76 | 13.94 | 14.63 | 15.73 | 8.22           | 8.91  | 9.09  | 9.78  | 10.89 |
| 4H              | 2H   | 10.19            | 11.01 | 11.04 | 11.86 | 12.93 | 6.73           | 7.55  | 7.58  | 8.40  | 9.47  |
|                 | 3H   | 12.03            | 12.71 | 12.89 | 13.59 | 14.68 | 8.08           | 8.77  | 8.94  | 9.65  | 10.73 |
|                 | 4H   | 12.72            | 13.34 | 13.59 | 14.22 | 15.33 | 8.63           | 9.25  | 9.50  | 10.13 | 11.25 |
|                 | 6H   | 13.24            | 13.78 | 14.13 | 14.68 | 15.79 | 9.05           | 9.59  | 9.94  | 10.49 | 11.61 |
|                 | 8H   | 13.41            | 13.92 | 14.31 | 14.81 | 15.94 | 9.18           | 9.68  | 10.07 | 10.58 | 11.71 |
|                 | 12H  | 13.51            | 13.96 | 14.42 | 14.88 | 16.01 | 9.25           | 9.70  | 10.16 | 10.62 | 11.75 |
| 8H              | 4H   | 12.70            | 13.20 | 13.59 | 14.10 | 15.22 | 8.92           | 9.42  | 9.81  | 10.32 | 11.45 |
|                 | 6H   | 13.26            | 13.68 | 14.18 | 14.62 | 15.74 | 9.43           | 9.85  | 10.35 | 10.79 | 11.92 |
|                 | 8H   | 13.48            | 13.84 | 14.41 | 14.78 | 15.92 | 9.62           | 9.99  | 10.55 | 10.92 | 12.06 |
|                 | 12H  | 13.62            | 13.94 | 14.55 | 14.87 | 16.06 | 9.74           | 10.06 | 10.67 | 10.99 | 12.19 |
| 12H             | 4H   | 12.66            | 13.11 | 13.57 | 14.03 | 15.16 | 8.93           | 9.38  | 9.84  | 10.30 | 11.43 |
|                 | 6H   | 13.24            | 13.61 | 14.17 | 14.54 | 15.68 | 9.48           | 9.85  | 10.41 | 10.78 | 11.93 |
|                 | 8H   | 13.46            | 13.79 | 14.39 | 14.71 | 15.91 | 9.69           | 10.02 | 10.62 | 10.94 | 12.14 |

END OF REPORT