

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: P912914

Luminaire Tested: DFN2DIP-TR4F0-090D060US850-FLLFLL

Issue Date: 11/21/2024

**Test Information**

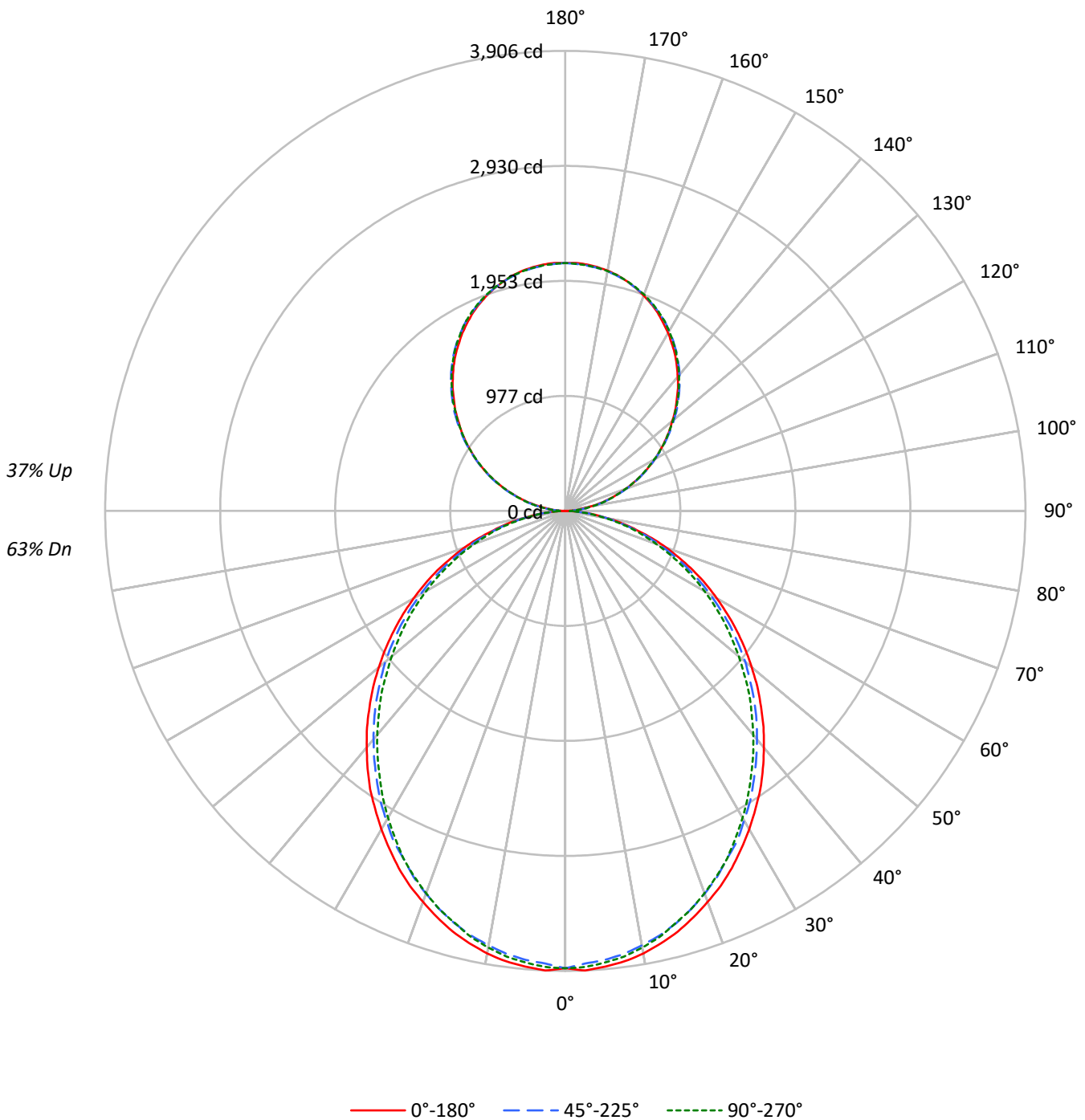
Test Method: LM-79-2019  
Report Number: P912914  
REPORT IS A COMBINATION OF REPORTS P900415 AND P897293  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-TR4F0-090D060US850-FLLFLL  
Description: 4 foot, Triangle Define Geo, with Direct Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 15770.0 lumens  
Efficiency: N/A  
Efficacy: 119.3 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-Direct  
  
Input Watts (W): 132.2  
Input Voltage (V):  
Input Current (A<sub>in</sub>): NR  
Voltage Rise (V): NR  
Power Factor: 0.099  
Total Harmonic Distortion (THDi): 0.979  
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: P912914

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**COEFFICIENT OF UTILIZATION - ZONAL CAVITY METHOD:**

|     |     |     |     |     |     |     |     |     |    |    |    |    |    |    |    |    |    |    |    |    |    |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| RF  | 20  |     |     |     | 20  |     |     |     | 20 |    |    |    | 20 |    |    |    | 20 |    |    |    |    |
| RC  | 80  |     |     |     | 70  |     |     |     | 50 |    |    |    | 30 |    |    |    | 10 |    |    | 0  |    |
| RW  | 70  | 50  | 30  | 10  | 70  | 50  | 30  | 10  | 50 | 30 | 10 | 50 | 30 | 10 | 50 | 30 | 10 | 50 | 30 | 10 | 0  |
| RCR |     |     |     |     |     |     |     |     |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 0   | 110 | 110 | 110 | 110 | 103 | 103 | 103 | 103 | 90 | 90 | 90 | 79 | 79 | 79 | 68 | 68 | 68 | 68 | 68 | 68 | 63 |
| 1   | 101 | 96  | 92  | 89  | 94  | 90  | 87  | 84  | 79 | 77 | 74 | 69 | 67 | 66 | 60 | 59 | 57 | 60 | 59 | 57 | 53 |
| 2   | 92  | 84  | 78  | 72  | 86  | 79  | 73  | 69  | 70 | 65 | 62 | 61 | 58 | 55 | 53 | 50 | 48 | 53 | 50 | 48 | 44 |
| 3   | 84  | 74  | 66  | 60  | 78  | 70  | 63  | 58  | 61 | 56 | 52 | 54 | 50 | 46 | 47 | 44 | 41 | 47 | 44 | 41 | 37 |
| 4   | 77  | 66  | 57  | 51  | 71  | 62  | 54  | 49  | 55 | 49 | 44 | 48 | 43 | 40 | 42 | 38 | 35 | 42 | 38 | 35 | 32 |
| 5   | 70  | 58  | 50  | 44  | 66  | 55  | 48  | 42  | 49 | 43 | 38 | 43 | 38 | 35 | 38 | 34 | 31 | 38 | 34 | 31 | 28 |
| 6   | 65  | 53  | 44  | 38  | 61  | 50  | 42  | 37  | 44 | 38 | 33 | 39 | 34 | 30 | 34 | 30 | 27 | 34 | 30 | 27 | 25 |
| 7   | 60  | 48  | 39  | 34  | 56  | 45  | 38  | 32  | 40 | 34 | 30 | 36 | 31 | 27 | 31 | 27 | 24 | 31 | 27 | 24 | 22 |
| 8   | 56  | 43  | 35  | 30  | 52  | 41  | 34  | 29  | 37 | 31 | 26 | 33 | 28 | 24 | 29 | 25 | 22 | 29 | 25 | 22 | 20 |
| 9   | 52  | 40  | 32  | 27  | 49  | 38  | 30  | 26  | 34 | 28 | 24 | 30 | 25 | 22 | 27 | 23 | 20 | 27 | 23 | 20 | 18 |
| 10  | 49  | 36  | 29  | 24  | 46  | 35  | 28  | 23  | 31 | 25 | 21 | 28 | 23 | 20 | 25 | 21 | 18 | 25 | 21 | 18 | 16 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 3085 | 3085 | 3085 |
| 5°  | 3090 | 3042 | 3063 |
| 10° | 3065 | 3001 | 3021 |
| 15° | 3020 | 2952 | 2956 |
| 20° | 2959 | 2883 | 2890 |
| 25° | 2899 | 2801 | 2813 |
| 30° | 2823 | 2725 | 2715 |
| 35° | 2751 | 2634 | 2612 |
| 40° | 2662 | 2543 | 2514 |
| 45° | 2574 | 2452 | 2413 |
| 50° | 2478 | 2356 | 2297 |
| 55° | 2377 | 2245 | 2190 |
| 60° | 2262 | 2114 | 2067 |
| 65° | 2138 | 1978 | 1923 |
| 70° | 1979 | 1812 | 1767 |
| 75° | 1759 | 1613 | 1623 |
| 80° | 1495 | 1360 | 1349 |
| 85° | 1081 | 923  | 894  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°  
 Vertical Angle: 45°  
 Luminance: 2574 cd/sqm



TEST NUMBER: P912914

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 365.5   | 2.3       |
| 10°-20°   | 1028.5  | 6.5       |
| 20°-30°   | 1511.4  | 9.6       |
| 30°-40°   | 1755.4  | 11.1      |
| 40°-50°   | 1753.3  | 11.1      |
| 50°-60°   | 1528.8  | 9.7       |
| 60°-70°   | 1130.1  | 7.2       |
| 70°-80°   | 639.4   | 4.1       |
| 80°-90°   | 174.7   | 1.1       |
| 90°-100°  | 130.2   | 0.8       |
| 100°-110° | 413.7   | 2.6       |
| 110°-120° | 708.0   | 4.5       |
| 120°-130° | 931.2   | 5.9       |
| 130°-140° | 1045.3  | 6.6       |
| 140°-150° | 1025.0  | 6.5       |
| 150°-160° | 859.8   | 5.5       |
| 160°-170° | 570.2   | 3.6       |
| 170°-180° | 199.3   | 1.3       |
| 0°-30°    | 2905.4  | 18.4      |
| 0°-40°    | 4660.9  | 29.6      |
| 0°-60°    | 7942.9  | 50.4      |
| 0°-90°    | 9887.2  | 62.7      |
| 90°-120°  | 1252.0  | 7.9       |
| 90°-150°  | 4253.5  | 27.0      |
| 90°-180°  | 5883.0  | 37.3      |
| 0°-180°   | 15770.0 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 3884 | 3884  | 3884 | 3884  | 3884 |      |
| 5°   | 3884 | 3869  | 3828 | 3858  | 3850 | 369  |
| 15°  | 3697 | 3675  | 3626 | 3641  | 3622 | 1041 |
| 25°  | 3346 | 3316  | 3253 | 3260  | 3253 | 1540 |
| 35°  | 2887 | 2850  | 2790 | 2767  | 2748 | 1803 |
| 45°  | 2349 | 2323  | 2267 | 2226  | 2211 | 1813 |
| 55°  | 1778 | 1755  | 1710 | 1666  | 1647 | 1589 |
| 65°  | 1199 | 1176  | 1139 | 1106  | 1087 | 1185 |
| 75°  | 627  | 620   | 601  | 579   | 586  | 670  |
| 85°  | 153  | 149   | 146  | 134   | 131  | 171  |
| 90°  | 2    | 23    | 62   | 58    | 60   | 15   |
| 95°  | 93   | 110   | 114  | 114   | 110  | 103  |
| 105° | 382  | 387   | 391  | 394   | 394  | 403  |
| 115° | 710  | 721   | 718  | 716   | 710  | 703  |
| 125° | 1034 | 1049  | 1044 | 1039  | 1037 | 924  |
| 135° | 1337 | 1356  | 1360 | 1358  | 1353 | 1033 |
| 145° | 1623 | 1636  | 1646 | 1648  | 1641 | 1014 |
| 155° | 1856 | 1861  | 1866 | 1875  | 1870 | 854  |
| 165° | 2019 | 2017  | 2017 | 2030  | 2021 | 569  |
| 175° | 2101 | 2096  | 2092 | 2104  | 2094 | 200  |
| 180° | 2104 | 2104  | 2104 | 2104  | 2104 |      |



TEST NUMBER: P912914

CATALOG NUMBER: DFN2DIP-TR4F0-090D060US850-FLLFL

**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 3883.6 | 3883.6 | 3883.6 | 3883.6 | 3883.6 |
| 2.5°   | 3906.2 | 3887.6 | 3846.5 | 3883.6 | 3876.5 |
| 5°     | 3883.6 | 3869.0 | 3827.8 | 3857.5 | 3850.3 |
| 7.5°   | 3857.5 | 3835.4 | 3794.1 | 3824.3 | 3816.7 |
| 10°    | 3816.7 | 3790.6 | 3745.8 | 3775.5 | 3764.4 |
| 12.5°  | 3760.4 | 3738.2 | 3693.5 | 3712.0 | 3704.6 |
| 15°    | 3697.1 | 3674.9 | 3626.1 | 3641.2 | 3622.5 |
| 17.5°  | 3618.6 | 3596.4 | 3547.7 | 3566.3 | 3547.7 |
| 20°    | 3532.6 | 3510.4 | 3458.1 | 3469.2 | 3454.5 |
| 22.5°  | 3447.0 | 3413.4 | 3364.6 | 3364.6 | 3357.1 |
| 25°    | 3346.0 | 3316.2 | 3252.9 | 3260.0 | 3252.9 |
| 27.5°  | 3233.8 | 3207.7 | 3159.4 | 3148.3 | 3129.7 |
| 30°    | 3122.2 | 3092.0 | 3036.1 | 3025.0 | 3010.0 |
| 32.5°  | 3002.5 | 2980.3 | 2920.4 | 2897.9 | 2882.8 |
| 35°    | 2886.8 | 2849.6 | 2789.7 | 2767.2 | 2748.5 |
| 37.5°  | 2756.1 | 2722.4 | 2662.5 | 2636.4 | 2617.8 |
| 40°    | 2621.7 | 2591.6 | 2531.7 | 2498.5 | 2483.5 |
| 42.5°  | 2490.9 | 2460.9 | 2401.4 | 2363.8 | 2341.7 |
| 45°    | 2349.1 | 2323.0 | 2266.7 | 2225.9 | 2210.9 |
| 47.5°  | 2210.9 | 2184.7 | 2124.8 | 2083.7 | 2061.5 |
| 50°    | 2065.1 | 2046.4 | 1994.1 | 1941.9 | 1923.2 |
| 52.5°  | 1923.2 | 1897.1 | 1848.7 | 1807.6 | 1781.4 |
| 55°    | 1777.8 | 1755.2 | 1710.4 | 1665.7 | 1647.1 |
| 57.5°  | 1632.0 | 1613.4 | 1564.7 | 1519.9 | 1504.8 |
| 60°    | 1486.2 | 1471.5 | 1419.2 | 1378.0 | 1367.0 |
| 62.5°  | 1344.3 | 1318.2 | 1280.9 | 1243.7 | 1228.7 |
| 65°    | 1198.9 | 1176.3 | 1139.1 | 1105.5 | 1086.8 |
| 67.5°  | 1049.6 | 1030.6 | 997.2  | 971.2  | 956.1  |
| 70°    | 911.3  | 896.2  | 862.6  | 836.4  | 821.8  |
| 72.5°  | 769.4  | 754.3  | 735.7  | 709.6  | 698.6  |
| 75°    | 627.3  | 620.0  | 601.1  | 578.9  | 586.4  |
| 77.5°  | 500.4  | 485.4  | 477.9  | 466.8  | 455.7  |
| 80°    | 373.6  | 369.6  | 362.1  | 351.0  | 343.6  |
| 82.5°  | 254.0  | 254.0  | 250.4  | 235.3  | 235.3  |
| 85°    | 152.9  | 149.4  | 145.8  | 134.3  | 130.8  |
| 87.5°  | 67.3   | 59.8   | 52.3   | 41.3   | 37.3   |
| 90°    | 1.9    | 22.8   | 62.2   | 58.3   | 60.2   |
| 92.5°  | 39.4   | 53.3   | 55.2   | 57.1   | 57.1   |
| 95°    | 92.6   | 110.3  | 113.6  | 113.6  | 110.3  |
| 97.5°  | 154.2  | 170.7  | 177.7  | 177.7  | 177.7  |
| 100°   | 225.2  | 239.8  | 244.9  | 244.9  | 243.0  |
| 102.5° | 300.1  | 310.9  | 317.8  | 319.7  | 317.8  |
| 105°   | 381.9  | 387.0  | 390.8  | 394.0  | 394.0  |
| 107.5° | 463.1  | 470.8  | 470.8  | 472.0  | 463.1  |
| 110°   | 541.9  | 551.9  | 551.9  | 551.9  | 546.8  |



TEST NUMBER: P912914

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 626.8  | 637.6  | 635.7  | 630.6  | 626.8  |
| 115°   | 710.5  | 720.7  | 717.5  | 715.6  | 710.5  |
| 117.5° | 793.7  | 807.7  | 798.7  | 793.7  | 788.6  |
| 120°   | 877.4  | 891.4  | 877.4  | 877.4  | 871.7  |
| 122.5° | 953.5  | 971.3  | 962.4  | 957.4  | 953.5  |
| 125°   | 1033.5 | 1049.3 | 1044.2 | 1038.6 | 1036.7 |
| 127.5° | 1111.6 | 1131.2 | 1124.2 | 1116.7 | 1111.6 |
| 130°   | 1184.5 | 1207.4 | 1204.2 | 1200.4 | 1193.4 |
| 132.5° | 1266.4 | 1284.1 | 1285.3 | 1276.5 | 1271.4 |
| 135°   | 1336.8 | 1356.4 | 1360.2 | 1358.3 | 1353.2 |
| 137.5° | 1415.4 | 1431.3 | 1434.5 | 1433.2 | 1425.6 |
| 140°   | 1484.6 | 1500.5 | 1509.3 | 1509.3 | 1502.4 |
| 142.5° | 1555.6 | 1571.5 | 1576.6 | 1578.4 | 1571.5 |
| 145°   | 1622.9 | 1635.6 | 1645.8 | 1647.6 | 1640.7 |
| 147.5° | 1683.1 | 1699.0 | 1706.6 | 1709.7 | 1702.8 |
| 150°   | 1745.3 | 1756.1 | 1763.1 | 1768.7 | 1763.1 |
| 152.5° | 1800.5 | 1811.3 | 1820.2 | 1827.2 | 1820.2 |
| 155°   | 1855.7 | 1860.8 | 1866.4 | 1875.4 | 1869.7 |
| 157.5° | 1903.3 | 1907.1 | 1910.3 | 1923.0 | 1914.1 |
| 160°   | 1945.9 | 1949.6 | 1951.5 | 1962.3 | 1954.7 |
| 162.5° | 1985.1 | 1985.1 | 1987.0 | 1999.1 | 1990.2 |
| 165°   | 2018.7 | 2016.8 | 2016.8 | 2029.6 | 2020.7 |
| 167.5° | 2049.2 | 2043.6 | 2043.6 | 2056.2 | 2047.3 |
| 170°   | 2072.1 | 2067.0 | 2065.1 | 2077.7 | 2067.0 |
| 172.5° | 2087.9 | 2082.8 | 2080.9 | 2093.6 | 2082.8 |
| 175°   | 2100.6 | 2095.6 | 2091.7 | 2104.4 | 2093.6 |
| 177.5° | 2107.5 | 2102.6 | 2098.7 | 2109.4 | 2098.7 |
| 180°   | 2104.4 | 2104.4 | 2104.4 | 2104.4 | 2104.4 |



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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 | 12.28            | 13.26 | 13.12 | 14.13 | 15.20 | 11.84          | 12.83 | 12.68 | 13.69 | 14.77 |
|                 | 3H   | 13.95            | 14.83 | 14.80 | 15.70 | 16.81 | 13.47          | 14.36 | 14.33 | 15.23 | 16.34 |
|                 | 4H   | 14.54            | 15.38 | 15.41 | 16.26 | 17.37 | 14.07          | 14.90 | 14.93 | 15.78 | 16.90 |
|                 | 6H   | 14.94            | 15.72 | 15.83 | 16.60 | 17.73 | 14.47          | 15.24 | 15.35 | 16.13 | 17.26 |
|                 | 8H   | 15.05            | 15.79 | 15.94 | 16.69 | 17.82 | 14.58          | 15.32 | 15.47 | 16.22 | 17.35 |
|                 | 12H  | 15.11            | 15.81 | 16.00 | 16.70 | 17.86 | 14.63          | 15.33 | 15.52 | 16.22 | 17.38 |
| 4H              | 2H   | 12.75            | 13.59 | 13.63 | 14.47 | 15.58 | 12.41          | 13.25 | 13.28 | 14.13 | 15.24 |
|                 | 3H   | 14.63            | 15.33 | 15.51 | 16.24 | 17.37 | 14.24          | 14.94 | 15.12 | 15.85 | 16.98 |
|                 | 4H   | 15.35            | 15.99 | 16.25 | 16.89 | 18.05 | 14.94          | 15.58 | 15.84 | 16.49 | 17.65 |
|                 | 6H   | 15.87            | 16.42 | 16.78 | 17.35 | 18.51 | 15.46          | 16.01 | 16.37 | 16.94 | 18.10 |
|                 | 8H   | 16.02            | 16.54 | 16.94 | 17.46 | 18.64 | 15.61          | 16.13 | 16.53 | 17.05 | 18.22 |
|                 | 12H  | 16.10            | 16.57 | 17.04 | 17.51 | 18.69 | 15.68          | 16.15 | 16.62 | 17.09 | 18.27 |
| 8H              | 4H   | 15.56            | 16.07 | 16.47 | 17.00 | 18.17 | 15.20          | 15.71 | 16.11 | 16.64 | 17.81 |
|                 | 6H   | 16.19            | 16.62 | 17.13 | 17.59 | 18.76 | 15.83          | 16.26 | 16.77 | 17.22 | 18.39 |
|                 | 8H   | 16.41            | 16.79 | 17.36 | 17.75 | 18.94 | 16.05          | 16.42 | 17.00 | 17.38 | 18.57 |
|                 | 12H  | 16.55            | 16.88 | 17.51 | 17.83 | 19.07 | 16.17          | 16.50 | 17.12 | 17.45 | 18.69 |
| 12H             | 4H   | 15.55            | 16.01 | 16.48 | 16.96 | 18.13 | 15.20          | 15.66 | 16.13 | 16.60 | 17.78 |
|                 | 6H   | 16.22            | 16.60 | 17.17 | 17.56 | 18.75 | 15.87          | 16.25 | 16.82 | 17.21 | 18.40 |
|                 | 8H   | 16.47            | 16.80 | 17.43 | 17.75 | 18.99 | 16.11          | 16.45 | 17.07 | 17.40 | 18.64 |