

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: P916960

Luminaire Tested: DFN2DIP-PN4F0-080D120US930-FLLFLL

Issue Date: 11/21/2024

**Test Information**

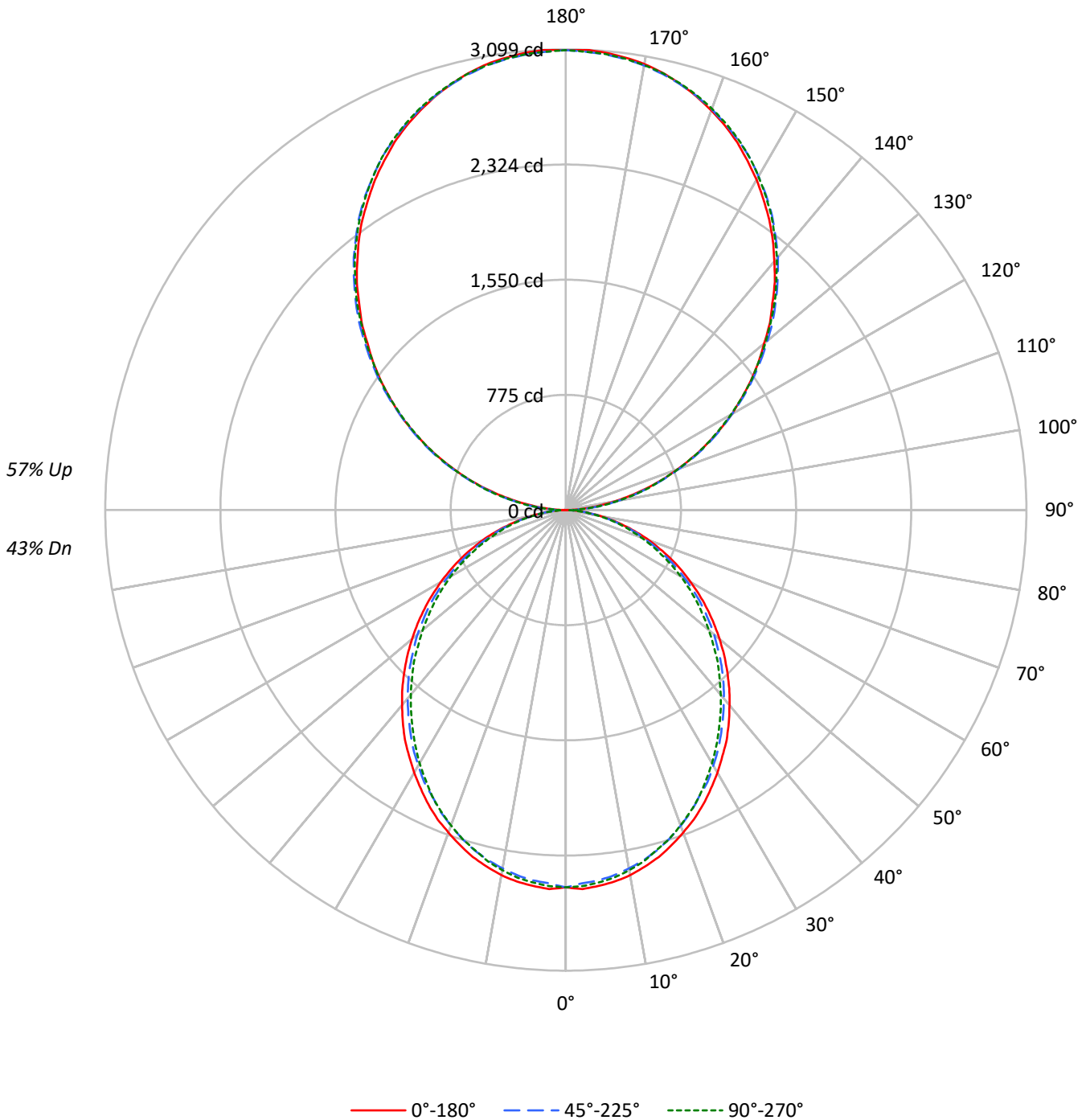
Test Method: LM-79-2019  
Report Number: P916960  
REPORT IS A COMBINATION OF REPORTS P899761 AND P896497  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-PN4F0-080D120US930-FLLFLL  
Description: 4 foot, Pentagon Define Geo, with Direct Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 15115.6 lumens  
Efficiency: N/A  
Efficacy: 83.7 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: General Diffuse  
  
Input Watts (W): 180.7  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9971  
Total Harmonic Distortion (THDi): 0.049  
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: P916960

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

|     |     |     |     |     |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
|-----|-----|-----|-----|-----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| RF  | 20  |     |     |     | 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   | 105 | 105 | 105 | 105 | 96 | 96 | 96 | 96 | 79 | 79 | 79 | 64 | 64 | 64 | 49 | 49 | 49 | 49 | 49 | 49 | 43 |
| 1   | 96  | 92  | 88  | 85  | 88 | 84 | 81 | 78 | 69 | 67 | 65 | 56 | 54 | 53 | 44 | 43 | 42 | 42 | 42 | 42 | 36 |
| 2   | 88  | 80  | 74  | 69  | 80 | 73 | 68 | 64 | 61 | 57 | 54 | 49 | 47 | 44 | 38 | 37 | 35 | 35 | 35 | 35 | 30 |
| 3   | 80  | 70  | 63  | 57  | 73 | 65 | 58 | 53 | 54 | 49 | 45 | 44 | 40 | 37 | 34 | 32 | 30 | 30 | 30 | 30 | 26 |
| 4   | 73  | 62  | 55  | 49  | 66 | 57 | 50 | 45 | 48 | 43 | 39 | 39 | 35 | 32 | 30 | 28 | 26 | 26 | 26 | 26 | 22 |
| 5   | 67  | 56  | 47  | 42  | 61 | 51 | 44 | 39 | 43 | 37 | 33 | 35 | 31 | 28 | 27 | 25 | 22 | 22 | 22 | 22 | 19 |
| 6   | 62  | 50  | 42  | 36  | 56 | 46 | 39 | 34 | 38 | 33 | 29 | 31 | 27 | 24 | 25 | 22 | 20 | 20 | 20 | 20 | 17 |
| 7   | 57  | 45  | 37  | 31  | 52 | 41 | 34 | 29 | 35 | 29 | 25 | 29 | 24 | 21 | 23 | 20 | 18 | 18 | 18 | 18 | 15 |
| 8   | 53  | 41  | 33  | 28  | 48 | 38 | 31 | 26 | 32 | 26 | 23 | 26 | 22 | 19 | 21 | 18 | 16 | 16 | 16 | 16 | 13 |
| 9   | 49  | 37  | 30  | 25  | 45 | 34 | 28 | 23 | 29 | 24 | 20 | 24 | 20 | 17 | 19 | 16 | 14 | 14 | 14 | 14 | 12 |
| 10  | 46  | 34  | 27  | 22  | 42 | 31 | 25 | 21 | 27 | 22 | 18 | 22 | 18 | 15 | 18 | 15 | 13 | 13 | 13 | 13 | 11 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 1853 | 1853 | 1853 |
| 5°  | 1856 | 1827 | 1839 |
| 10° | 1841 | 1803 | 1815 |
| 15° | 1813 | 1773 | 1776 |
| 20° | 1777 | 1732 | 1737 |
| 25° | 1740 | 1683 | 1691 |
| 30° | 1695 | 1638 | 1633 |
| 35° | 1652 | 1584 | 1571 |
| 40° | 1599 | 1529 | 1513 |
| 45° | 1545 | 1475 | 1453 |
| 50° | 1487 | 1418 | 1383 |
| 55° | 1427 | 1351 | 1319 |
| 60° | 1358 | 1273 | 1246 |
| 65° | 1283 | 1192 | 1160 |
| 70° | 1188 | 1093 | 1068 |
| 75° | 1056 | 974  | 983  |
| 80° | 897  | 823  | 820  |
| 85° | 649  | 562  | 548  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 90°  
 Vertical Angle: 90°  
 Luminance: 2422 cd/sqm



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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 238.9   | 1.6       |
| 10°-20°   | 672.1   | 4.4       |
| 20°-30°   | 987.7   | 6.5       |
| 30°-40°   | 1147.1  | 7.6       |
| 40°-50°   | 1145.7  | 7.6       |
| 50°-60°   | 999.0   | 6.6       |
| 60°-70°   | 738.5   | 4.9       |
| 70°-80°   | 417.8   | 2.8       |
| 80°-90°   | 119.1   | 0.8       |
| 90°-100°  | 191.5   | 1.3       |
| 100°-110° | 608.3   | 4.0       |
| 110°-120° | 1041.1  | 6.9       |
| 120°-130° | 1369.2  | 9.1       |
| 130°-140° | 1536.9  | 10.2      |
| 140°-150° | 1507.1  | 10.0      |
| 150°-160° | 1264.2  | 8.4       |
| 160°-170° | 838.4   | 5.5       |
| 170°-180° | 293.0   | 1.9       |
| 0°-30°    | 1898.6  | 12.6      |
| 0°-40°    | 3045.8  | 20.1      |
| 0°-60°    | 5190.5  | 34.3      |
| 0°-90°    | 6466.0  | 42.8      |
| 90°-120°  | 1840.9  | 12.2      |
| 90°-150°  | 6254.0  | 41.4      |
| 90°-180°  | 8650.0  | 57.2      |
| 0°-180°   | 15115.6 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 2538 | 2538  | 2538 | 2538  | 2538 |      |
| 5°   | 2538 | 2528  | 2501 | 2521  | 2516 | 241  |
| 15°  | 2416 | 2402  | 2370 | 2379  | 2367 | 680  |
| 25°  | 2186 | 2167  | 2126 | 2130  | 2126 | 1006 |
| 35°  | 1886 | 1862  | 1823 | 1808  | 1796 | 1178 |
| 45°  | 1535 | 1518  | 1481 | 1455  | 1445 | 1185 |
| 55°  | 1162 | 1147  | 1118 | 1088  | 1076 | 1039 |
| 65°  | 784  | 769   | 744  | 722   | 710  | 775  |
| 75°  | 410  | 405   | 393  | 378   | 383  | 438  |
| 85°  | 100  | 98    | 95   | 88    | 85   | 112  |
| 90°  | 3    | 34    | 91   | 86    | 89   | 15   |
| 95°  | 136  | 162   | 167  | 167   | 162  | 152  |
| 105° | 562  | 569   | 575  | 579   | 579  | 593  |
| 115° | 1045 | 1060  | 1055 | 1052  | 1045 | 1033 |
| 125° | 1520 | 1543  | 1536 | 1527  | 1524 | 1358 |
| 135° | 1965 | 1994  | 2000 | 1997  | 1990 | 1519 |
| 145° | 2386 | 2405  | 2420 | 2423  | 2412 | 1491 |
| 155° | 2728 | 2736  | 2744 | 2757  | 2749 | 1256 |
| 165° | 2968 | 2966  | 2966 | 2984  | 2971 | 837  |
| 175° | 3089 | 3081  | 3076 | 3094  | 3078 | 293  |
| 180° | 3094 | 3094  | 3094 | 3094  | 3094 |      |



TEST NUMBER: P916960

CATALOG NUMBER: DFN2DIP-PN4F0-080D120US930-FLLFLL

**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 2537.9 | 2537.9 | 2537.9 | 2537.9 | 2537.9 |
| 2.5°   | 2552.6 | 2540.5 | 2513.6 | 2537.9 | 2533.2 |
| 5°     | 2537.9 | 2528.3 | 2501.4 | 2520.8 | 2516.2 |
| 7.5°   | 2520.8 | 2506.3 | 2479.4 | 2499.1 | 2494.2 |
| 10°    | 2494.2 | 2477.0 | 2447.8 | 2467.2 | 2460.0 |
| 12.5°  | 2457.4 | 2442.9 | 2413.6 | 2425.8 | 2420.9 |
| 15°    | 2416.0 | 2401.5 | 2369.6 | 2379.4 | 2367.3 |
| 17.5°  | 2364.7 | 2350.2 | 2318.3 | 2330.5 | 2318.3 |
| 20°    | 2308.5 | 2294.0 | 2259.8 | 2267.1 | 2257.5 |
| 22.5°  | 2252.6 | 2230.6 | 2198.7 | 2198.7 | 2193.8 |
| 25°    | 2186.5 | 2167.1 | 2125.7 | 2130.4 | 2125.7 |
| 27.5°  | 2113.3 | 2096.2 | 2064.6 | 2057.3 | 2045.2 |
| 30°    | 2040.3 | 2020.6 | 1984.1 | 1976.9 | 1967.0 |
| 32.5°  | 1962.1 | 1947.6 | 1908.5 | 1893.7 | 1883.9 |
| 35°    | 1886.4 | 1862.1 | 1823.0 | 1808.2 | 1796.1 |
| 37.5°  | 1801.0 | 1779.0 | 1739.9 | 1722.8 | 1710.7 |
| 40°    | 1713.3 | 1693.5 | 1654.5 | 1632.7 | 1622.9 |
| 42.5°  | 1627.8 | 1608.1 | 1569.3 | 1544.7 | 1530.2 |
| 45°    | 1535.1 | 1518.0 | 1481.2 | 1454.6 | 1444.8 |
| 47.5°  | 1444.8 | 1427.7 | 1388.5 | 1361.6 | 1347.1 |
| 50°    | 1349.5 | 1337.3 | 1303.1 | 1268.9 | 1256.8 |
| 52.5°  | 1256.8 | 1239.7 | 1208.1 | 1181.2 | 1164.1 |
| 55°    | 1161.7 | 1147.0 | 1117.8 | 1088.5 | 1076.3 |
| 57.5°  | 1066.5 | 1054.3 | 1022.5 | 993.2  | 983.3  |
| 60°    | 971.2  | 961.6  | 927.4  | 900.5  | 893.2  |
| 62.5°  | 878.5  | 861.4  | 837.1  | 812.8  | 802.9  |
| 65°    | 783.5  | 768.7  | 744.4  | 722.4  | 710.2  |
| 67.5°  | 685.8  | 673.4  | 651.7  | 634.6  | 624.8  |
| 70°    | 595.5  | 585.6  | 563.7  | 546.6  | 537.0  |
| 72.5°  | 502.8  | 493.0  | 480.8  | 463.7  | 456.5  |
| 75°    | 409.9  | 405.2  | 392.8  | 378.3  | 383.2  |
| 77.5°  | 327.0  | 317.2  | 312.3  | 305.0  | 297.7  |
| 80°    | 244.2  | 241.6  | 236.7  | 229.4  | 224.5  |
| 82.5°  | 166.0  | 166.0  | 163.6  | 153.8  | 153.8  |
| 85°    | 100.0  | 97.6   | 95.3   | 87.8   | 85.4   |
| 87.5°  | 44.0   | 39.1   | 34.2   | 26.9   | 24.4   |
| 90°    | 2.8    | 33.6   | 91.4   | 85.9   | 88.6   |
| 92.5°  | 57.8   | 78.4   | 81.1   | 84.0   | 84.0   |
| 95°    | 136.2  | 162.3  | 167.0  | 167.0  | 162.3  |
| 97.5°  | 226.7  | 250.9  | 261.2  | 261.2  | 261.2  |
| 100°   | 331.2  | 352.6  | 360.0  | 360.0  | 357.3  |
| 102.5° | 441.2  | 457.1  | 467.3  | 470.2  | 467.3  |
| 105°   | 561.6  | 569.0  | 574.6  | 579.3  | 579.3  |
| 107.5° | 680.9  | 692.2  | 692.2  | 694.0  | 680.9  |
| 110°   | 796.6  | 811.5  | 811.5  | 811.5  | 804.1  |



TEST NUMBER: P916960

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 921.6  | 937.5  | 934.7  | 927.2  | 921.6  |
| 115°   | 1044.7 | 1059.7 | 1055.0 | 1052.2 | 1044.7 |
| 117.5° | 1166.9 | 1187.5 | 1174.4 | 1166.9 | 1159.5 |
| 120°   | 1290.1 | 1310.6 | 1290.1 | 1290.1 | 1281.7 |
| 122.5° | 1402.1 | 1428.2 | 1415.1 | 1407.6 | 1402.1 |
| 125°   | 1519.6 | 1542.9 | 1535.5 | 1527.1 | 1524.2 |
| 127.5° | 1634.3 | 1663.2 | 1652.9 | 1641.8 | 1634.3 |
| 130°   | 1741.6 | 1775.1 | 1770.5 | 1764.9 | 1754.6 |
| 132.5° | 1861.9 | 1888.1 | 1889.9 | 1876.8 | 1869.4 |
| 135°   | 1965.4 | 1994.4 | 2000.0 | 1997.2 | 1989.7 |
| 137.5° | 2081.1 | 2104.4 | 2109.1 | 2107.2 | 2096.1 |
| 140°   | 2182.8 | 2206.1 | 2219.2 | 2219.2 | 2208.9 |
| 142.5° | 2287.3 | 2310.6 | 2318.1 | 2320.8 | 2310.6 |
| 145°   | 2386.1 | 2404.8 | 2419.7 | 2422.6 | 2412.3 |
| 147.5° | 2474.8 | 2498.1 | 2509.3 | 2514.0 | 2503.7 |
| 150°   | 2566.2 | 2582.0 | 2592.3 | 2600.7 | 2592.3 |
| 152.5° | 2647.4 | 2663.2 | 2676.3 | 2686.6 | 2676.3 |
| 155°   | 2728.5 | 2736.0 | 2744.4 | 2757.4 | 2749.0 |
| 157.5° | 2798.5 | 2804.1 | 2808.7 | 2827.4 | 2814.3 |
| 160°   | 2861.0 | 2866.6 | 2869.4 | 2885.3 | 2874.0 |
| 162.5° | 2918.8 | 2918.8 | 2921.6 | 2939.3 | 2926.3 |
| 165°   | 2968.3 | 2965.5 | 2965.5 | 2984.1 | 2971.0 |
| 167.5° | 3013.0 | 3004.6 | 3004.6 | 3023.3 | 3010.2 |
| 170°   | 3046.6 | 3039.1 | 3036.3 | 3055.0 | 3039.1 |
| 172.5° | 3069.9 | 3062.4 | 3059.7 | 3078.3 | 3062.4 |
| 175°   | 3088.6 | 3081.1 | 3075.5 | 3094.1 | 3078.3 |
| 177.5° | 3098.9 | 3091.4 | 3085.7 | 3101.6 | 3085.7 |
| 180°   | 3094.1 | 3094.1 | 3094.1 | 3094.1 | 3094.1 |



TEST NUMBER: P916960  
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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 | 8.71             | 9.51  | 9.73  | 10.54 | 11.91 | 8.27           | 9.07  | 9.29  | 10.10 | 11.47 |
|                 | 3H   | 10.37            | 11.09 | 11.40 | 12.12 | 13.51 | 9.89           | 10.60 | 10.91 | 11.64 | 13.03 |
|                 | 4H   | 10.96            | 11.64 | 12.00 | 12.67 | 14.07 | 10.47          | 11.15 | 11.51 | 12.19 | 13.59 |
|                 | 6H   | 11.36            | 11.98 | 12.41 | 13.02 | 14.43 | 10.86          | 11.49 | 11.91 | 12.53 | 13.94 |
|                 | 8H   | 11.46            | 12.06 | 12.52 | 13.11 | 14.52 | 10.97          | 11.56 | 12.02 | 12.62 | 14.03 |
|                 | 12H  | 11.51            | 12.07 | 12.57 | 13.13 | 14.56 | 11.01          | 11.57 | 12.07 | 12.63 | 14.06 |
| 4H              | 2H   | 9.17             | 9.85  | 10.21 | 10.88 | 12.28 | 8.82           | 9.49  | 9.86  | 10.53 | 11.93 |
|                 | 3H   | 11.03            | 11.60 | 12.08 | 12.66 | 14.07 | 10.63          | 11.19 | 11.68 | 12.26 | 13.67 |
|                 | 4H   | 11.74            | 12.26 | 12.80 | 13.32 | 14.75 | 11.33          | 11.85 | 12.39 | 12.90 | 14.34 |
|                 | 6H   | 12.26            | 12.71 | 13.33 | 13.78 | 15.21 | 11.83          | 12.28 | 12.90 | 13.36 | 14.79 |
|                 | 8H   | 12.41            | 12.83 | 13.48 | 13.90 | 15.34 | 11.98          | 12.40 | 13.05 | 13.47 | 14.91 |
|                 | 12H  | 12.48            | 12.86 | 13.57 | 13.94 | 15.39 | 12.04          | 12.42 | 13.13 | 13.50 | 14.95 |
| 8H              | 4H   | 11.94            | 12.35 | 13.01 | 13.43 | 14.87 | 11.56          | 11.98 | 12.64 | 13.05 | 14.50 |
|                 | 6H   | 12.57            | 12.91 | 13.66 | 14.03 | 15.47 | 12.19          | 12.54 | 13.28 | 13.65 | 15.09 |
|                 | 8H   | 12.79            | 13.09 | 13.89 | 14.19 | 15.65 | 12.41          | 12.71 | 13.51 | 13.80 | 15.27 |
|                 | 12H  | 12.92            | 13.19 | 14.02 | 14.28 | 15.78 | 12.52          | 12.79 | 13.62 | 13.88 | 15.38 |
| 12H             | 4H   | 11.92            | 12.30 | 13.01 | 13.38 | 14.83 | 11.56          | 11.93 | 12.64 | 13.02 | 14.47 |
|                 | 6H   | 12.60            | 12.90 | 13.70 | 14.00 | 15.46 | 12.23          | 12.54 | 13.33 | 13.63 | 15.09 |
|                 | 8H   | 12.84            | 13.11 | 13.94 | 14.20 | 15.70 | 12.47          | 12.73 | 13.57 | 13.83 | 15.32 |