

FOR EQUATIONS SEE NATIONAL DESIGN STANDARD

``SPAN OF FLOOR JOIST`` EXAMPLE

Southern Yellow Pine Reference Design Values:

wood = No 1 Standard Southern Pine

load duration factor (CD) = 1.6 for 10 minute loads

Possible Values: 1.6 for ten minutes
1.25 for seven days
0.9 for dead load

deflection limit = span/360

design bearing length = 1.5 inches

TO GET ALLOWED WEIGHT PER SQUARE FOOT,
TAKE ALLOWED WEIGHT FOR ONE STRINGER PER FOOT,
MULTIPLY BY THE NUMBER OF STRINGERS,
AND DIVIDE BY THE LENGTH OF THE TREAD IN FEET.

- (1) ALLOWED WEIGHT IN LBF/FT BY MOMENT CAPACITY
- (2) ALLOWED WEIGHT IN LBF/FT BY SHEAR
- (3) ALLOWED WEIGHT IN LBF/FT BY DEFLECTION
- (4) ALLOWED WEIGHT IN LBF/FT FOR 1.5 INCH BEARING
- (5) MINIMUM OF ABOVE ALLOWED WEIGHTS IN LBF/FT

Allowable weights (1) and (2) are proportional to CD.

Allowable weight (3) is proportional to
deflection limit.

Allowable weight (4) is proportional to
design bearing length.

| SPAN FT | | 4x4 | 2x6 | 4x6 | 2x8 | 2x10 | 2x12 |
|---------|-----|--------|--------|---------|--------|--------|---------|
| 6 | (1) | 269.95 | 257.12 | 599.96 | 413.69 | 665.49 | 937.50 |
| | (2) | 739.36 | 497.93 | 1161.84 | 656.37 | 837.43 | 1018.50 |
| | (3) | 123.51 | 205.40 | 479.27 | 470.47 | 977.10 | 1757.81 |
| | (4) | 662.46 | 283.91 | 662.46 | 283.91 | 283.91 | 283.91 |
| | (5) | 123.51 | 205.40 | 479.27 | 283.91 | 283.91 | 283.91 |
| 8 | (1) | 151.85 | 144.63 | 337.48 | 232.70 | 374.34 | 527.34 |
| | (2) | 554.52 | 373.45 | 871.38 | 492.28 | 628.08 | 763.88 |
| | (3) | 52.11 | 86.65 | 202.19 | 198.48 | 412.22 | 741.58 |
| | (4) | 496.85 | 212.93 | 496.85 | 212.93 | 212.93 | 212.93 |
| | (5) | 52.11 | 86.65 | 202.19 | 198.48 | 212.93 | 212.93 |
| 10 | (1) | 97.18 | 92.56 | 215.98 | 148.93 | 239.57 | 337.50 |
| | (2) | 443.61 | 298.76 | 697.11 | 393.82 | 502.46 | 611.10 |
| | (3) | 26.68 | 44.37 | 103.52 | 101.62 | 211.05 | 379.69 |
| | (4) | 397.48 | 170.35 | 397.48 | 170.35 | 170.35 | 170.35 |
| | (5) | 26.68 | 44.37 | 103.52 | 101.62 | 170.35 | 170.35 |
| 12 | (1) | 67.49 | 64.28 | 149.99 | 103.42 | 166.37 | 234.38 |
| | (2) | 369.68 | 248.97 | 580.92 | 328.18 | 418.72 | 509.25 |
| | (3) | 15.44 | 25.68 | 59.91 | 58.81 | 122.14 | 219.73 |
| | (4) | 331.23 | 141.96 | 331.23 | 141.96 | 141.96 | 141.96 |
| | (5) | 15.44 | 25.68 | 59.91 | 58.81 | 122.14 | 141.96 |
| 14 | (1) | 49.58 | 47.23 | 110.20 | 75.98 | 122.23 | 172.19 |
| | (2) | 316.87 | 213.40 | 497.93 | 281.30 | 358.90 | 436.50 |
| | (3) | 9.72 | 16.17 | 37.73 | 37.03 | 76.91 | 138.37 |
| | (4) | 283.91 | 121.68 | 283.91 | 121.68 | 121.68 | 121.68 |
| | (5) | 9.72 | 16.17 | 37.73 | 37.03 | 76.91 | 121.68 |
| 16 | (1) | 37.96 | 36.16 | 84.37 | 58.17 | 93.58 | 131.84 |
| | (2) | 277.26 | 186.73 | 435.69 | 246.14 | 314.04 | 381.94 |
| | (3) | 6.51 | 10.83 | 25.27 | 24.81 | 51.53 | 92.70 |
| | (4) | 248.42 | 106.47 | 248.42 | 106.47 | 106.47 | 106.47 |
| | (5) | 6.51 | 10.83 | 25.27 | 24.81 | 51.53 | 92.70 |

| SPAN FT | | 4x4 | 2x6 | 4x6 | 2x8 | 2x10 | 2x12 | NOTES: |
|---------|-----|--------|--------|--------|--------|--------|--------|--|
| 18 | (1) | 29.99 | 28.57 | 66.66 | 45.97 | 73.94 | 104.17 | (1) LRDF for pedestrian bridges requires 90 lbf / sqft, deflection limit = span/360 |
| | (2) | 246.45 | 165.98 | 387.28 | 218.79 | 279.14 | 339.50 | (2) For two stringer boardwalk sections with 3 ft treads, this is met by |
| | (3) | 4.57 | 7.61 | 17.75 | 17.42 | 36.19 | 65.10 | 2x6's for 6 ft span |
| | (4) | 220.82 | 94.64 | 220.82 | 94.64 | 94.64 | 94.64 | 2x8's for 8 ft span |
| | (5) | 4.57 | 7.61 | 17.75 | 17.42 | 36.19 | 65.10 | 2x10's for 10 ft span |
| 20 | (1) | 24.30 | 23.14 | 54.00 | 37.23 | 59.89 | 84.38 | 2x12's for 12 ft span |
| | (2) | 221.81 | 149.38 | 348.55 | 196.91 | 251.23 | 305.55 | (3) For 4 ft treads this is met by (2) if the bearing length is increased by 1 inch |
| | (3) | 3.33 | 5.55 | 12.94 | 12.70 | 26.38 | 47.46 | for 2x10's and 2x12's |
| | (4) | 198.74 | 85.17 | 198.74 | 85.17 | 85.17 | 85.17 | |
| | (5) | 3.33 | 5.55 | 12.94 | 12.70 | 26.38 | 47.46 | |
| 22 | (1) | 20.08 | 19.12 | 44.62 | 30.77 | 49.50 | 69.73 | |
| | (2) | 201.64 | 135.80 | 316.87 | 179.01 | 228.39 | 277.77 | |
| | (3) | 2.51 | 4.17 | 9.72 | 9.54 | 19.82 | 35.66 | |
| | (4) | 180.67 | 77.43 | 180.67 | 77.43 | 77.43 | 77.43 | |
| | (5) | 2.51 | 4.17 | 9.72 | 9.54 | 19.82 | 35.66 | |
| 24 | (1) | 16.87 | 16.07 | 37.50 | 25.86 | 41.59 | 58.59 | |
| | (2) | 184.84 | 124.48 | 290.46 | 164.09 | 209.36 | 254.62 | |
| | (3) | 1.93 | 3.21 | 7.49 | 7.35 | 15.27 | 27.47 | |
| | (4) | 165.62 | 70.98 | 165.62 | 70.98 | 70.98 | 70.98 | |
| | (5) | 1.93 | 3.21 | 7.49 | 7.35 | 15.27 | 27.47 | |