

ROOF LOADS

HOW TO USE ROOF LOAD TABLES

1. Choose a joist spacing and convert the live and total design loads specified in pounds per square foot (psf) to joist loads in pounds per lineal foot (plf).
Joist Spacing (ft) x Design Load (psf) = Joist Load (plf).

JOIST LOAD (PSF)

Joist Spacing		Design Load (psf)								
(inches)	(feet)	20	30	40	50	60	70	80	90	100
12	1	20	30	40	50	60	70	80	90	100
16	1.33	27	40	53	67	80	93	106	120	133
19.2	1.6	32	48	64	80	96	112	128	144	160
24	2	40	60	80	100	120	140	160	180	200

2. Check the local building code for deflection requirements. Building codes typically require L/180 for total load and L/240 for live load. The values in the Total columns are based on L/180.
3. Choose a span. Use the horizontal span dimension from the building plans for roofs that slope up to 2" in 12". For roof slopes greater than 2" in 12", multiply the horizontal dimension by the appropriate factor from the table below.

Slope	2½ in 12	3 in 12	3½ in 12	4 in 12	4½ in 12	5 in 12	6 in 12	7 in 12	8 in 12	9 in 12	10 in 12	11 in 12	12 in 12
Factor	1.01	1.02	1.03	1.04	1.05	1.07	1.10	1.14	1.19	1.23	1.28	1.34	1.39

4. Choose a load duration category – 100% for heavy snow, 115% for snow and 125% for non-snow. When in doubt, consult the local building department.
5. Scan across the Span row to find a joist size with sufficient Live and applicable Total load capacities. Both requirements must be satisfied. When no value is shown in a Live column, Total load governs.
6. Sloping joists must be fastened to each support to resist a sliding force equal to:

$$\frac{0.5XWL}{\sqrt{X^2 + 144}} \text{ at end supports and } \frac{1.25XWL}{\sqrt{X^2 + 144}} \text{ at intermediate supports}$$

where X = roof slope in 12, L = span (ft) and $W = S \left\{ LL + \frac{DL\sqrt{X^2 + 144}}{12} \right\}$, where S = joist spacing (ft), LL = live load (psf) and DL = dead load (psf)

7. Web stiffeners are required at all supports for 22" and 24" joists. See *Web Stiffener Requirements* on page 81 for more details.

UP-THE-SLOPE SPANS & CUTTING LENGTHS FOR SLOPED ROOFS

Slope	Factor	Joist Depth (inches)			
		9½	11⅞	14	16
		Depth Correction (feet)			
1 in 12	1.00	0.07	0.08	0.10	0.11
2 in 12	1.01	0.13	0.16	0.19	0.22
2.5 in 12	1.02	0.16	0.21	0.24	0.28
3 in 12	1.03	0.20	0.25	0.29	0.33
3.5 in 12	1.04	0.23	0.29	0.34	0.39
4 in 12	1.05	0.26	0.33	0.39	0.44
4.5 in 12	1.07	0.30	0.37	0.44	0.50
5 in 12	1.08	0.33	0.41	0.49	0.56
6 in 12	1.12	0.40	0.49	0.58	0.67
7 in 12	1.16	0.46	0.58	0.68	0.78
8 in 12	1.20	0.53	0.66	0.78	0.89
9 in 12	1.25	0.59	0.74	0.88	1.00
10 in 12	1.30	0.66	0.82	0.97	1.11
11 in 12	1.36	0.73	0.91	1.07	1.22
12 in 12	1.41	0.79	0.99	1.17	1.33

