

This page is a summary of the information in "Designs for Glued Trusses," MWPS-9. Refer to this publication before building trusses.

ROOF SLOPE (inches of rise/inches of run)

Roof slope significantly affects the forces in the truss members. A steeper roof allows higher roof loads. 3:12 slope—used in low snow load areas or for short spans and narrow spacings. 4:12 slope—most common for farm buildings. 5:12 slope—used in high snow load areas or for long spans and wide spacings.

TRUSS SPACING

Roof and ceiling materials and wall framing influence truss spacing selection. In pole buildings it is desirable to support each truss on a pole. 2' spacing uses more material and labor. It is common for buildings with ceilings and plywood roof decks. 4' spacing is common in insulated livestock buildings with ceilings and metal roofs, and in some storage buildings. 8' spacing uses least material and labor for buildings without ceilings such as machinery storages, uninsulated livestock buildings, etc. Total cost may be greater if a ceiling is needed.

CEILING DEAD LOAD

Three ceiling dead load cases are included in the tables. • 0 psf allows for no materials in addition to the truss bracing and stiffeners. • 5 psf ceiling dead load allows for a metal or plywood ceiling with insulation (warm livestock buildings). • 8 psf ceiling dead load allows for a gypsum board ceiling with insulation (residential or light commercial buildings).

ROOF DEAD LOAD

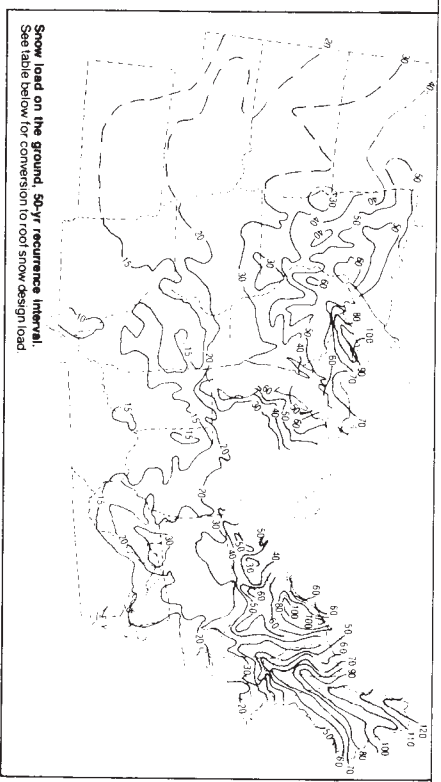
Add the weights of the truss, purlins or decking, roofing, and roof insulation to get the dead load on the top chord.

Approximate weights of trusses, psf.

Example: a 4-web truss for 4' spacing with 2x8 top chord and 2x6 bottom chord weighs about $13 + 0.7 = 2.0$ psf. Dashed lines in table indicate example.

Chord Size	Truss Spacing		Truss dead weight, psf
Top	Bottom		
2x4	2x4	2'	0.8
2x4	2x4	4'	0.8
2x6	2x6	2'	1.2
2x6	2x6	4'	1.2
2x8	2x6	2'	1.3
2x8	2x6	4'	1.3
2x10	2x4-2x4	2'	1.6
2x12	2x4-2x4	2'	2.0
2x12	2x6-2x6	4'	2.2

Add the following for:
2.6-lb Web Truss 1.4
6 Web Truss 2.1



Snow load on the ground, 50-yr recurrence interval. See table below for conversion to roof snow design load.

SNOW LOAD

Use the map above and the table below for determining snow load for your building.

Recommended snow loads. Recommended by the MWPS and NREES Committees for roofs up to about 7.5 slope for buildings outside the jurisdiction of a building code. For buildings, 50-yr map load x 0.9 for 25-yr x 0.8 for snow on roof snow on eave. 50-yr map load x 0.8 to convert from snow on ground to minimum recommended load is 12 psf. In areas where all of the maximum snow load results from a single storm without significant wind the maximum roof load may equal the ground snow load.

Map load	Farm	Other
15	12.0	12
20	14.4	16
30	21.6	24
40	28.8	32
50	36.0	40
60	43.2	48
70	50.4	56
80	57.6	64
90	64.8	72
100	72.0	80
110	79.2	88
120	86.4	96

LUMBER

Three lumber groups are indicated in the tables. Example of species in each group are listed below. SS = Select structural (15%) = moisture content at time of milling.

Group	Species	Grade	Size
1600 Group	Douglas Fir—Larch	No. 1	2x4
	Douglas Fir—Larch (North)	SS	2x6
	Douglas Fir—Larch (North)	SS	2x4
1400 Group	Douglas Fir—Larch	No. 2 dense	2x4
	Douglas Fir—Larch (North)	No. 1	2x4
	Douglas Fir—Larch (North)	No. 2 dense	2x6
1100 Group	Douglas Fir—Larch	No. 1	2x4
	Douglas Fir—Larch (North)	No. 2	2x4
	Douglas Fir—Larch (North)	No. 1	2x4
Hem—Fir	Hem—Fir	No. 1	2x4
	Hem—Fir (North)	SS	2x6
	Hem—Fir (North)	SS	2x4
Southern Pine (15%)	Southern Pine (15%)	No. 2	2x4
	Southern Pine (15%)	No. 1	2x4
	Southern Pine (15%)	No. 2	2x6
Spruce—Pine—Fir	Spruce—Pine—Fir	SS	2x4
	Douglas Fir—Larch	No. 2	2x6
	Douglas Fir—Larch	No. 2	2x6
Douglas Fir (South)	Douglas Fir (South)	No. 2	2x4
	Douglas Fir (South)	No. 2	2x6
	Douglas Fir (South)	No. 2	2x4
Hem—Fir (North)	Hem—Fir (North)	No. 1	2x4
	Hem—Fir (North)	SS	2x6
	Hem—Fir (North)	SS	2x4
Southern Pine (15%)	Southern Pine (15%)	No. 2	2x6
	Southern Pine (15%)	No. 2	2x6
	Southern Pine (15%)	No. 1	2x4
Spruce Pine Fir	Spruce Pine Fir	SS	2x6
	Spruce Pine Fir	SS	2x6
	Spruce Pine Fir	SS	2x6

Weights of roofing and ceiling materials.

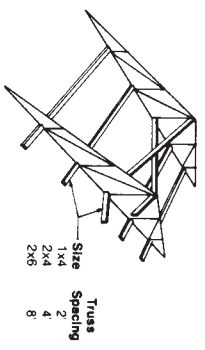
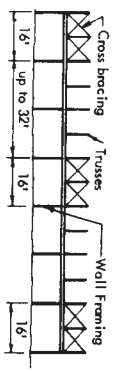
Material	Weight (psf)
Roof framing	0.7 psf
2x4 purlins 2 o.c.	0.7 psf
2x6 purlins 2 o.c.	1.1
Ceiling framing	0.4 psf
1x3 lurring 16 o.c.	0.7
2x4 lurring 2 o.c.	0.7
Sheathing, etc.	2.2 psf
1 lumber solid	1.1
2 plywood	1.4
0.024 aluminum	0.4
28 ga steel	0.9
Asphalt shingles	2.6
Insulation per inch of thickness	0.1 to 0.4

Wind Loads

Trusses are designed to withstand winds of 80 mph on a building less than 30 high.

BUILDING CONSTRUCTION

Windbracing
Brace and anchor the trusses as they are placed. Bottom chord stiffeners are required at panel points unless a rigid ceiling is to be installed. Use king post crossbracing in all buildings.

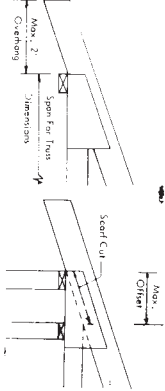


Wind Anchorage
Minimum fasteners for wind anchorage, both ends of each truss.

Truss Span	Truss Spacing	Truss Size	Truss Spacing
20-24	2	1x4	4
26-30	4	2x4	8
32-46	8	2x4	8
48-50	16	2x4	8
52-60	24	2x4	8

A = metal framing anchor
4-30d ring-shank nails = 1/2" bolt
B = 1/2" bolt

Overhang
For a 2' to 4' overhang, use the top chord and heel gusset design for a 1/4-larger snow load.



Roof Purlins

Stagger purlin joints for continuity across the trusses. Purlins may be laid flat with 2' and 4' truss spacings and not joints used. Alternating purlin lengths may be used in pole buildings where the poles are spaced evenly and the trusses are not. For poles 8' o.c. they may be of alternating 16' and 18' lengths with staggered and lapped end joints if pairs of trusses are mounted on alternate sides of the poles.

