

MWPS-60' Truss

60' span, 6-web trusses

with plywood gussets.

CAUTION!

Additional professional services will be required to tailor this plan to your situation, including but not limited to: assurance of compliance with codes and regulations; review of specifications for materials and equipment; supervision of site selection, bid letting and construction; and provision for utilities, waste management, roads or other access. **Furthermore, any deviation from the given specifications may result in structural failure, property damage, and personal injury including loss of life.**

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MIDWEST PLAN SERVICE
Cooperative Extension Work in Agriculture and Home Economics and Agricultural Experiment Stations of North Central Region - USDA Cooperating
60' Truss
Title Page
MIDWEST PLAN NO. 60' TRUSS

This page is a summary of the information in "Designs for Girded 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 storage, un-insulated 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).

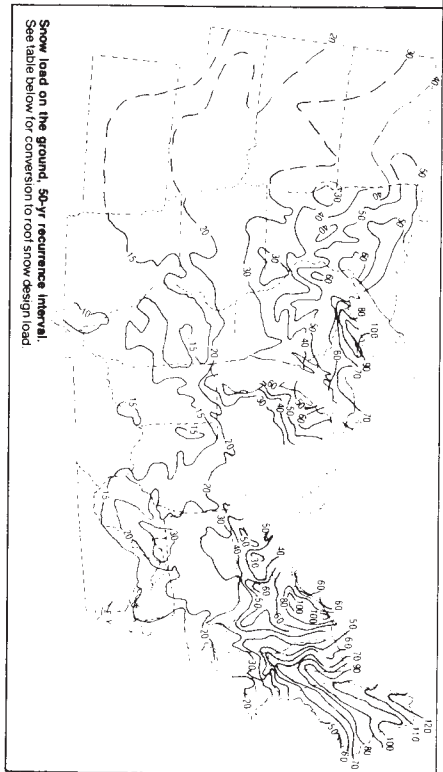
ROOF DEAD LOAD

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 2x6 top chord and 2x6 bottom chord weighs about $13 \times 0.7 = 9.1$ psf. Dashed lines in table indicate example.

[Inch] Spacing	Truss spacing		8'
	2'	4'	
Top	2x4	2x6	0.8
Bottom	2x4	2x6	0.4
	2x6	2x8	0.5
	2x8	2x10	0.6
	2x8	2x12	0.7
	2x10	2x14	0.8
	2x12	2x16	1.0
	2x14	2x18	1.1
	2x16	2x20	1.2
	2x18	2x22	1.3
	2x20	2x24	1.4
	2x22	2x26	1.5
	2x24	2x28	1.6
	2x26	2x30	1.7
	2x28	2x32	1.8
	2x30	2x34	1.9
	2x32	2x36	2.0
	2x34	2x38	2.1
	2x36	2x40	2.2
	2x38	2x42	2.3
	2x40	2x44	2.4
	2x42	2x46	2.5
	2x44	2x48	2.6
	2x46	2x50	2.7
	2x48	2x52	2.8
	2x50	2x54	2.9
	2x52	2x56	3.0
	2x54	2x58	3.1
	2x56	2x60	3.2
	2x58	2x62	3.3
	2x60	2x64	3.4
	2x62	2x66	3.5
	2x64	2x68	3.6
	2x66	2x70	3.7
	2x68	2x72	3.8
	2x70	2x74	3.9
	2x72	2x76	4.0
	2x74	2x78	4.1
	2x76	2x80	4.2
	2x78	2x82	4.3
	2x80	2x84	4.4
	2x82	2x86	4.5
	2x84	2x88	4.6
	2x86	2x90	4.7
	2x88	2x92	4.8
	2x90	2x94	4.9
	2x92	2x96	5.0
	2x94	2x98	5.1
	2x96	2x100	5.2
	2x98	2x102	5.3
	2x100	2x104	5.4
	2x102	2x106	5.5
	2x104	2x108	5.6
	2x106	2x110	5.7
	2x108	2x112	5.8
	2x110	2x114	5.9
	2x112	2x116	6.0
	2x114	2x118	6.1
	2x116	2x120	6.2
	2x118	2x122	6.3
	2x120	2x124	6.4
	2x122	2x126	6.5
	2x124	2x128	6.6
	2x126	2x130	6.7
	2x128	2x132	6.8
	2x130	2x134	6.9
	2x132	2x136	7.0
	2x134	2x138	7.1
	2x136	2x140	7.2
	2x138	2x142	7.3
	2x140	2x144	7.4
	2x142	2x146	7.5
	2x144	2x148	7.6
	2x146	2x150	7.7
	2x148	2x152	7.8
	2x150	2x154	7.9
	2x152	2x156	8.0
	2x154	2x158	8.1
	2x156	2x160	8.2
	2x158	2x162	8.3
	2x160	2x164	8.4
	2x162	2x166	8.5
	2x164	2x168	8.6
	2x166	2x170	8.7
	2x168	2x172	8.8
	2x170	2x174	8.9
	2x172	2x176	9.0
	2x174	2x178	9.1
	2x176	2x180	9.2
	2x178	2x182	9.3
	2x180	2x184	9.4
	2x182	2x186	9.5
	2x184	2x188	9.6
	2x186	2x190	9.7
	2x188	2x192	9.8
	2x190	2x194	9.9
	2x192	2x196	10.0



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.

Map load	Roof snow 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

Recommended snow loads.

Recommended by the AWPS and NAECS Committees for roofs up to about 1/2 slope for buildings outside the jurisdiction of a building code. Farm buildings: 50-yr map load x 0.9 for 25-yr x 0.8 for snow or roof other buildings: 50-yr map load x 0.8 to convert from snow or ground to minimum recommended 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.

Weights of roofing and ceiling materials.

Roof framing	2x4 purlins 2' o.c.	0.7 psf
	2x6 purlins 2' o.c.	1.1
Ceiling framing	1x3 rurring 16' o.c.	0.4 psf
	2x4 rurring 16' o.c.	0.7 psf
Sheathing etc.	1 lumber solid	2.2 psf
	1/2" plywood	1.1
	3/4" plywood	1.4
	0.024 aluminum	0.4
	28 ga steel	0.9
Asphalt shingles	Insulation per inch of thickness	0.1-0.4

Wind Loads

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

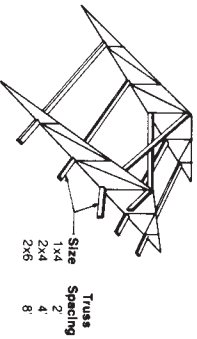
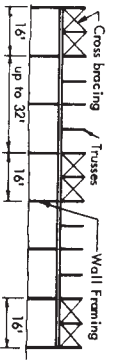
LUMBER

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

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

BUILDING CONSTRUCTION

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

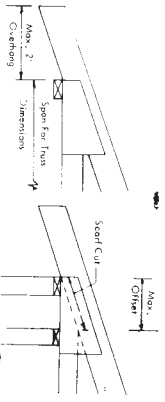
Minimum fasteners for wind anchorage, both ends of each truss:

Truss Span	Truss Spacing	Truss Size
20-24	1x4	2
26-30	1x4 or 1B	2 or 1B
32-46	1A or 1B	2A or 2B
48-50	1A or 1B	3A or 2B
52-60	1A or 1B	2A or 1B
	1A or 1B	2A or 2B
	1A or 1B	4A or 3B
	1A or 1B	4A or 3B

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 1/2" 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 butt joints used. Alternating purlin lengths may be used in pole buildings where the poles are spaced evenly and the trusses are 16' and 18' lengths with staggered and lapped end joints if pairs of trusses are mounted on alternate sides of the poles.

