MWPS-50' Truss

50' span, 4-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

50' Truss

Title Page

MIDWEST PLAN NO. 50' Truss

50' Trusses

50' span, 4-web trusses with plywood gussets

7

estimate roof dead load
 determine appropriate snow load
 roof dead load plus snow load = roof design load pst
 select a truss to carry at least the total roof load for the lumber quality, slope, spacing, and ceiling dead load you will use.

To select a truss:

For more information see back page and MWPS-9, Designs for Glued Trusses, 4th Edition, 1981.

Table of le

4+4, 4+6, 6+6 indicates stacked lower chord. 4&4, 6&4, indicate double web: a 2x4 is attached to the web member to increase its stiffness.

This sheet is to help you SELECT and ERECT trusses. DO NOT try to BUILD trusses from it, because it does not include enough information on gluing, joints, splices, and fabrication. See "Designs for Glued Trusses," MWPS-9 If you buy metal-plate trusses, use their designer's data.

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			1400		lope	\15 2	ε
ari8 eg	Bottom	Chord: 20' - 10' + 20' Bottom Chord:	-22' - 6' - 22' -20' - 10' - 20'			WS	(a) (a)
W4 W5	8'-4"	Splice				V4 v	10. 6
Spilit	- 80	S	thick pl			W3	4 10
		70	d Eare 3/8"			W2	10.+9
////w ₂	.4.		, D, an			×	60 m
Top Chord			Gussets B, C, D, and E are 3/8" thick plywood.			Top Chord	20'+6'
	84"	111	Ū		lengths	Rise	8.4"

,				7			.,											Gue	Guanet Sizes.	5	
-	g.	Bottom			-	Celling	Celling dead load, ps	ad, par					Web	Web member sizes	Sazie 1		4		o		
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	2×12	9+9	85	28	7.4	75	32	2	0	14	0	=	797	:	=	ı	3x4x44	:	18×12	ž	14×10
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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.

long spans and wide spacings. 4/12 **slope**—most common for farm buildings. 5/12 **slope**—used in high snow load areas or for

TRUSS SPACING

Roof and ceiling materials and wall framing influence truss spacing election. 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

storage buildings.
8' spacing uses least material and labor for build-4' spacing is common in insulated livestock buildings with ceilings and metal roofs, and in some

greater if a ceiling is needed. ings without ceilings such as machinery storages, uninsulated livestock buildings, etc. Total cost may be

CEILING DEAD LOAD

Three ceiling dead load cases are included in the

- 0 psf allows for no materials in addition to the
- truss bracing and stiffeners
 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

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

Approximate weights of trusses, psf.

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

Add the following 2-64-Web Truss 6 Web Truss	2x12 2x6+2x6	2x12 2x4+2x6	2x10 2x4+2x4	2x8 2x6	2x6 2x6	2x6 2x4	2×4 2×4	Top Bottom	Chord size
lowing for: 1.4 2.1	2x6 4.4	2×6 4.0	2×4 3.3	2.7	2.4	2.0	1.6		2'
1.2	2.2	2.0	1.6	1.3	1.2	1.0	0.8	Truss dead weight,	4,
0.4	1.1	1.0	0.8	0.7	0.6	0.5	0.4	, psf	œ

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 MAPS and NRAES Committees for roots up to about a slope for buildings outside the jurisaction of a building code farm buildings. Soly in replicads of Bird 25-yr. of Bir show on not other buildings. Soly in replicad of Bir 50-yr. or offer some on or ground to other buildings. Soly in replicad x 0 B to convert from show on ground to

Srow on root.

Minimum recommenses load is 12 gst

Minimum recommenses load is 12 gst

In areas where all of the maximum snow load results from a single storm

without significant wind, the maximum root load may equal the ground snow

load.

90 648 72 110 790 86

Weights of roofing and ceiling materials.

2x4purtins 2 oc 17 pst 2x4purting 16 oc 17 pst 2x4purting 2 oc 17 pst 2x4purting 2
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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 2x6 + = 2x6, 2x8, 2x10, 2x12.

Douglas Fir—Larch	1600 Group Species	SS = Select structural (15%) = moisture content at time of milling
No. 1	Grade	me of milling
2×4	Size	

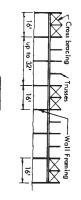
Species	Grade	Size
Douglas Fir—Larch	SS 1	2x4 2x6
Douglas Fir—Larch (North)	No. 1	2x4 2x6
Southern Pine (15%)	No. 2 dense No. 1	2x4 2x6:
Southern Pine (19%)	No. 1 No. 2 dense	2x4 2x6
1400 Group Douglas Fir—Larch	No 2	2x4 2x6
Douglas Fir—Larch (North)	No. 2	2x4 2x6
Hem—Fir	No. 1	2x4 2x6
Southern Pine (15%) Southern Pine (19%)	No 2	2x4 2x4
Spruce—Pine—Fir	SS	2×4
1100 Group		
Douglas Fir—Larch Douglas Fir (North)	No. 2	2x6 2x6
Douglas Fir (South)	No. 2 No. 2	2x6 2x6
Hem—Fir	No. 2	2x4 2x6
Hem—Fir (North) Hem—Fir (North)	No. 1	2x4 2x6 ⁻
Hem—Fir (North)	No. 1	2x6*
Southern Pine (15%) Southern Pine (19%)	No. 2	2x6·
Spruce Pine Fir	SS 1	2x4 2x6

Use exterior, C-C grade '/₄" or '/₂" plywood with outer pites of Group 1 species wood, Identification Indexes, 2400 and 2216 respectively.

Use 3-ply '/₄" plywood and 5-ply '/₂" plywood or use Structural I, 4-ply, '/₂" plywood.

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.



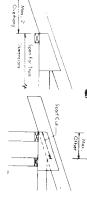


Wind Anchorage

of each truss Minimum fasteners for wind anchorage, both ends

A = metal framing anchor 4-30d ring-shank nails = 1	52'-60'	48:-50	32'-46'	26:-30	20:-24	Truss Span
A = metal framing anchor 4-30d ring-shank nails = 1/2" bott	1A or 18	1A or 1B	1A or 1B	1A or 1B	1A or 1B	Truss S 2'
χlt	9	2A or 1B	9	윽	익	russ Spacing 4
B = 1/2" bolt	4A or 3B	4A or 2B	3A or 2B	2A or 2B	2A or 1B	œ,.

For a 2' to 4' overhang, use the top chord and heel gusset design for a 1/3 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 not. For poles 8 oc. 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.

7	_		-	_	16
Trusses		Lap Joint -	18' Purli		Purlin
V woll ✓	•	1	5'		16' Purlin (2x4 on edge)—
<u></u>			6.) (se)
Pole			orlin		181
Pole					18' Purlin-
			+	-1	