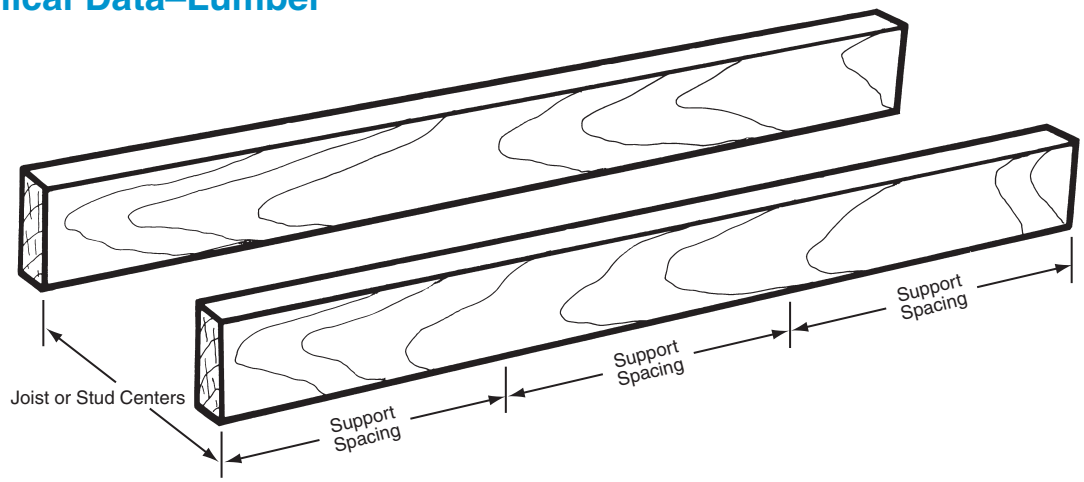
General and Technical Information

Technical Data–Lumber



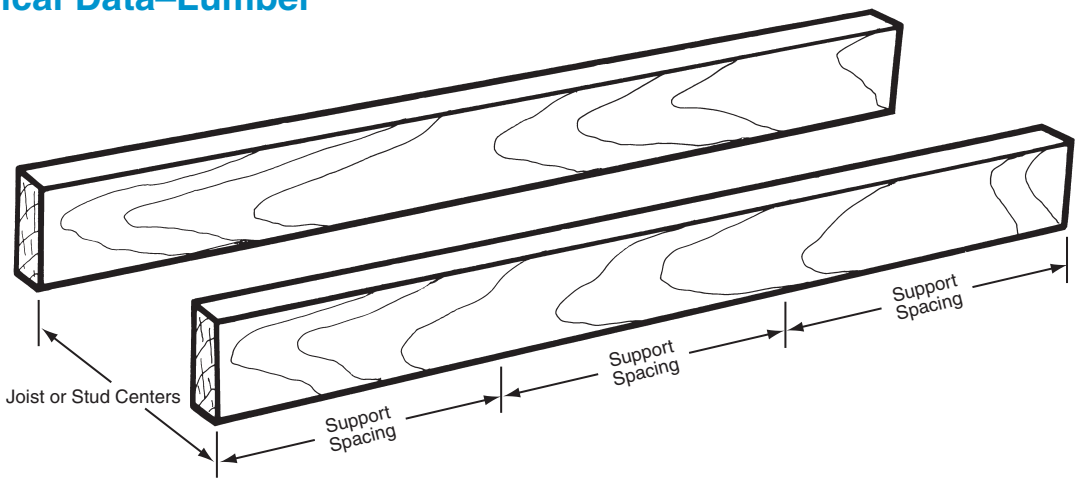
Safe Spacing of Supports for Joists or Studs Continuous Over Four or More Supports Based on use of No. 2 Grade Southern Pine or Douglas Fir-Larch						
Uniform Load, Pounds per Linear Foot (Equals Design Load, Pounds per Sq. Ft. Times Joist or Stud Centers in Feet.)	F_b = varies psi E = 1,400,000 psi F_v = 225 psi					
	Nominal Size Lumber, bxh (S4S) at 19% Maximum Moisture					
	2 x 4	2 x 6	2 x 8	3 x 6	4 x 2	4 x 4
	F_b psi					
	1625	1438	1313	1438	1438	1625
100	64"	89"	110"	101"	42"	79"
200	53"	75"	92"	85"	34"	66"
300	45"	66"	83"	77"	27"	60"
400	39"	57"	72"	72"	24"	56"
500	35"	51"	64"	66"	21"	53"
600	32"	47"	59"	60"	19"	48"
700	29"	43"	54"	56"	18"	45"
800	27"	40"	51"	52"	17"	42"
900	25"	38"	48"	49"	16"	39"
1,000	23"	36"	45"	47"	15"	37"
1,100	21"	34"	43"	44"	14"	36"
1,200	20"	32"	42"	43"	14"	34"
1,300	19"	30"	40"	41"	13"	33"
1,400	18"	29"	38"	39"	13"	32"
1,500	18"	28"	36"	38"	12"	30"
1,600	17"	26"	35"	37"	12"	29"
1,700	16"	26"	34"	35"	12"	29"
1,800	16"	25"	33"	34"	11"	27"
1,900	15"	24"	32"	33"	11"	26"
2,000	15"	23"	31"	32"	11"	25"
2,200	14"	22"	29"	30"	10"	24"
2,400	14"	21"	28"	28"	10"	22"
2,600	13"	21"	27"	27"	9"	21"
2,800	13"	20"	26"	26"	9"	20"
3,000	12"	19"	25"	25"	8"	19"

Note: F_b and F_v shown above includes a 25% increase because of short term loading conditions. Horizontal shear stress adjustment assumes members have no splits, checks or shakes.

Support spacings are governed by bending, shear or deflection. Maximum deflection ℓ/270 of spacing, but not more than 1/8". Contact Dayton Superior for safe spacings of supports for joists or studs used over two or three supports.

General and Technical Information

Technical Data–Lumber

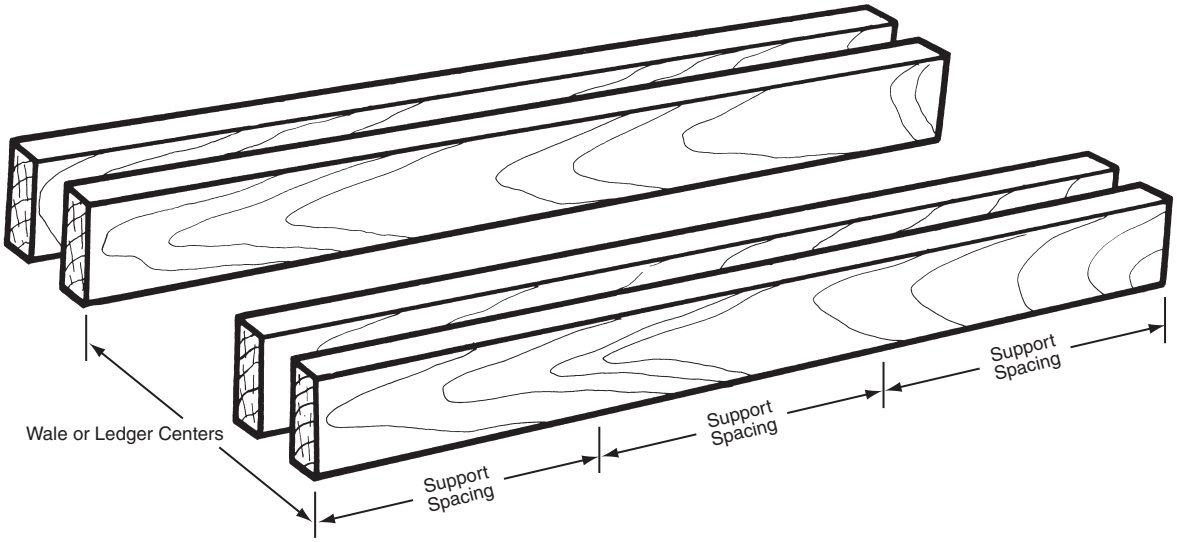


Safe Spacing of Supports for Joists or Studs Continuous Over Four or More Supports Based on use of No. 2 Grade Spruce-Pine-Fir or Hem-Fir						
Uniform Load, Pounds per Linear Foot (Equals Design Load, Pounds per Sq. Ft. Times Joist or Stud Centers in Feet.)	F_b = varies psi E = 1,300,000 psi F_v = 175 psi					
	Nominal Size Lumber, bxh (S4S) at 19% Maximum Moisture					
	2 x 4	2 x 6	2 x 8	3 x 6	4 x 2	4 x 4
	F_b psi					
	1594	1381	1275	1381	1275	1594
100	62"	88"	108"	99"	41"	77"
200	52"	74"	91"	84"	32"	65"
300	44"	65"	82"	76"	26"	59"
400	38"	56"	71"	70"	22"	55"
500	32"	50"	63"	65"	20"	52"
600	27"	43"	57"	59"	18"	48"
700	25"	39"	51"	55"	17"	44"
800	22"	35"	46"	51"	16"	41"
900	21"	32"	43"	47"	15"	39"
1,000	19"	30"	40"	43"	14"	36"
1,100	18"	29"	38"	40"	14"	33"
1,200	17"	27"	36"	38"	13"	31"
1,300	16"	26"	34"	36"	12"	29"
1,400	16"	25"	33"	34"	12"	27"
1,500	15"	24"	31"	32"	11"	26"
1,600	15"	23"	30"	31"	11"	25"
1,700	14"	22"	29"	30"	10"	24"
1,800	14"	22"	29"	29"	10"	23"
1,900	13"	21"	28"	28"	9"	22"
2,000	13"	21"	27"	27"	9"	21"
2,200	13"	20"	26"	26"	9"	20"
2,400	12"	19"	25"	24"	8"	19"
2,600	12"	18"	24"	23"	8"	18"
2,800	11"	18"	24"	22"	7"	17"
3,000	11"	17"	23"	22"	7"	17"

Note: F_b and F_v shown above includes a 25% increase because of short term loading conditions. Horizontal shear stress adjustment assumes members have no splits, checks or shakes.

Support spacings are governed by bending, shear or deflection. Maximum deflection $\ell/270$ of spacing, but not more than 1/8". Contact Dayton Superior for safe spacings of supports for joists or studs used over two or three supports.

Technical Data–Lumber



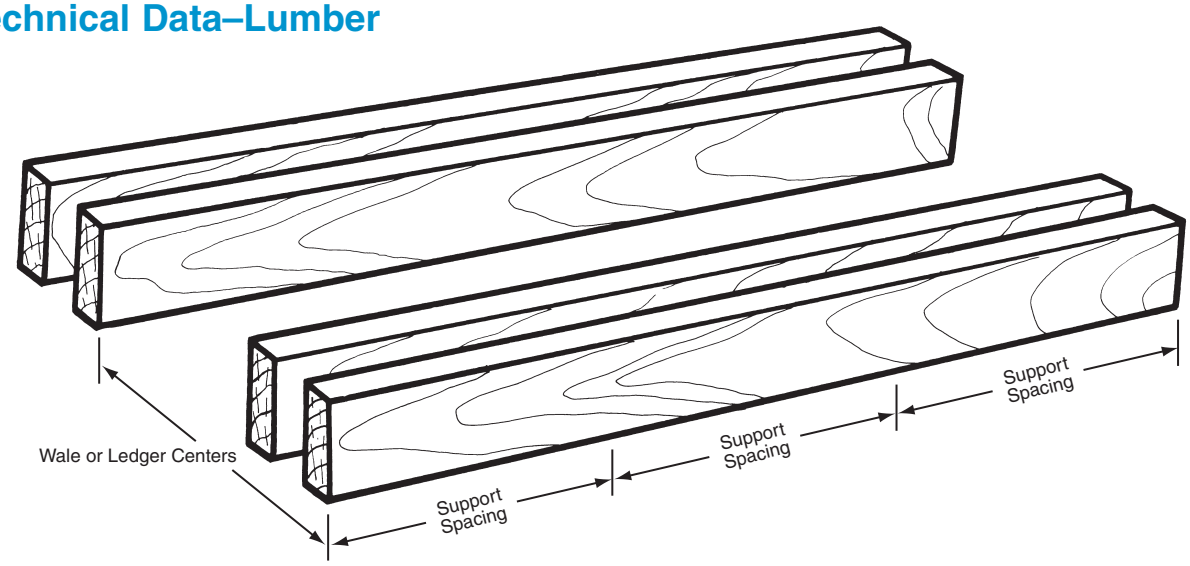
Safe Spacing of Supports for Double Ledgers or Wales Continuous Over Four or More Supports Based on use of No. 2 Grade Southern Pine or Douglas Fir-Larch					
Uniform Load, Pounds per Linear Foot (Equals Design Load, Pounds per Sq. Ft. Times Ledger or Wale Centers in Feet.)	F_b = varies psi E = 1,400,000 psi F_v = 225 psi				
	Nominal Size Lumber, bxh (S4S) at 19% Maximum Moisture				
	Double 2 x 4	Double 2 x 6	Double 2 x 8	Double 3 x 6	Double 3 x 8
	F_b psi				
	1625	1438	1313	1438	1313
1,000	35"	51"	64"	66"	83"
1,100	33"	49"	61"	63"	79"
1,200	32"	47"	59"	60"	76"
1,300	30"	45"	56"	58"	73"
1,400	29"	43"	54"	56"	70"
1,500	28"	42"	53"	54"	68"
1,600	27"	40"	51"	52"	66"
1,700	26"	39"	49"	51"	64"
1,800	25"	38"	48"	49"	62"
1,900	24"	37"	47"	48"	60"
2,000	23"	36"	45"	47"	59"
2,200	21"	34"	43"	44"	56"
2,400	20"	32"	42"	43"	54"
2,600	19"	30"	40"	41"	51"
2,800	18"	29"	38"	39"	50"
3,000	18"	28"	36"	38"	48"
3,200	17"	26"	35"	37"	46"
3,400	16"	26"	34"	35"	45"
3,600	16"	25"	33"	34"	44"
3,800	15"	24"	32"	33"	43"
4,000	15"	23"	31"	32"	42"

Note: F_b and F_v shown above includes a 25% increase because of short term loading conditions.
Horizontal shear stress adjustment assumes members have no splits, checks or shakes.

Support spacings are governed by bending, shear or deflection. Maximum deflection $\ell/270$ of spacing, but not more than 1/8". Contact Dayton Superior for safe spacings of supports for joists or studs used over two or three supports.

General and Technical Information

Technical Data–Lumber



Safe Spacing of Supports for Double Ledgers or Wales Continuous Over Four or More Supports Based on use of No. 2 Grade Spruce-Pine-Fir or Hem-Fir					
Uniform Load, Pounds per Linear Foot (Equals Design Load, Pounds per Sq. Ft. Times Ledger or Wale Centers in Feet.)	F_b = varies psi E = 1,300,000 psi F_v = 175 psi				
	Nominal Size Lumber, bxh (S4S) at 19% Maximum Moisture				
	Double 2 x 4	Double 2 x 6	Double 2 x 8	Double 3 x 6	Double 3 x 8
	F_b psi				
	1594	1381	1275	1381	1275
1,000	32"	50"	63"	65"	82"
1,100	29"	46"	60"	62"	78"
1,200	27"	43"	57"	59"	75"
1,300	26"	41"	54"	57"	72"
1,400	25"	39"	51"	55"	69"
1,500	23"	37"	48"	53"	67"
1,600	22"	35"	46"	51"	65"
1,700	21"	34"	44"	49"	63"
1,800	21"	32"	43"	47"	61"
1,900	20"	31"	41"	45"	59"
2,000	19"	30"	40"	43"	57"
2,200	18"	29"	38"	40"	53"
2,400	17"	27"	36"	38"	50"
2,600	16"	26"	34"	36"	47"
2,800	16"	25"	33"	34"	45"
3,000	15"	24"	31"	32"	43"
3,200	15"	23"	30"	31"	41"
3,400	14"	22"	29"	30"	39"
3,600	14"	22"	29"	29"	38"
3,800	13"	21"	28"	28"	37"
4,000	13"	21"	27"	27"	36"

Note: F_b and F_v shown above includes a 25% increase because of short term loading conditions. Horizontal shear stress adjustment assumes members have no splits, checks or shakes.

Support spacings are governed by bending, shear or deflection. Maximum deflection $\ell/270$ of spacing, but not more than 1/8". Contact Dayton Superior for safe spacings of supports for joists or studs used over two or three supports.

Technical Data–Lumber

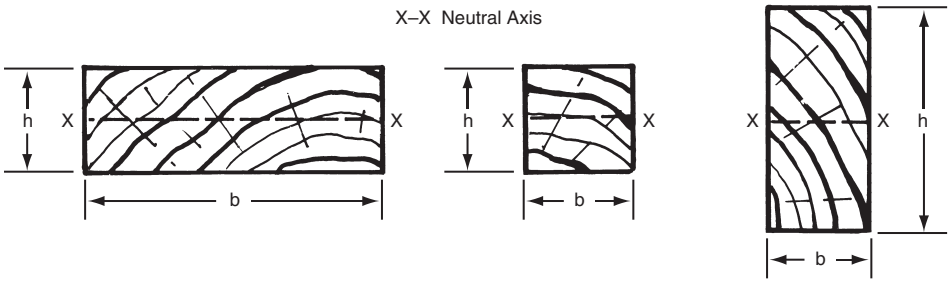
Formulas for Calculating Safe Support Spacings of Lumber Formwork Members			
To Check	**for Single Span Beam**	**for Two-Span Beam**	**for Three of More Span Beam**
$\Delta_{max} = \ell/360$	$\ell = 1.37\sqrt[3]{\frac{EI}{w}}$	$\ell = 1.83\sqrt[3]{\frac{EI}{w}}$	$\ell = 1.69\sqrt[3]{\frac{EI}{w}}$
$\Delta_{max} = \ell/270$	$\ell = 1.51\sqrt[3]{\frac{EI}{w}}$	$\ell = 2.02\sqrt[3]{\frac{EI}{w}}$	$\ell = 1.86\sqrt[3]{\frac{EI}{w}}$
Δ_{max} = 1/16 in.	$\ell = 2.75\sqrt[4]{\frac{EI}{w}}$	$\ell = 3.43\sqrt[4]{\frac{EI}{w}}$	$\ell = 3.23\sqrt[4]{\frac{EI}{w}}$
Δ_{max} = 1/8 in.	$\ell = 3.27\sqrt[4]{\frac{EI}{w}}$	$\ell = 4.08\sqrt[4]{\frac{EI}{w}}$	$\ell = 3.84\sqrt[4]{\frac{EI}{w}}$
Δ_{max} = 1/4 in.	$\ell = 3.90\sqrt[4]{\frac{EI}{w}}$	$\ell = 4.85\sqrt[4]{\frac{EI}{w}}$	$\ell = 4.57\sqrt[4]{\frac{EI}{w}}$
Bending	$\ell = 9.80\sqrt[2]{\frac{F_bS}{w}}$	$\ell = 9.80\sqrt[2]{\frac{F_bS}{w}}$	$\ell = 10.95\sqrt[2]{\frac{F_bS}{w}}$
Horizontal Shear	$\ell = \frac{16F_vbh}{w} + 2h$	$\ell = \frac{192F_vbh}{15w} + 2h$	$\ell = \frac{40F_vbh}{3w} + 2h$

Notation:

A = area of cross section, sq. in.
b = width of section, in.
E = modulus of elasticity, psi
F_b = design value for extreme fiber in bending, psi
F_v = design value in horizontal shear, psi
F_c = design value in compression parallel to grain, psi
$F_{c\perp}$ = design value in compression perpendicular to grain, psi
h = depth of section, in.
I = moment of inertia, $in.^4$
ℓ = safe spacing of supports, in.
S = section modulus, $in.^3$
w = load, lbs. per lineal ft.
Δ = deflection, in.

General and Technical Information

Technical Data–Lumber



Properties of Structural Lumber									
Nominal Size in Inches, *bxh*	American Standard Sizes in Inches, *bxh S4S** 19% Maximum Moisture	Area of section $A = bh$, sq. in.		Moment of Inertia, in.^{4} $I = \frac{bh^3}{12}$		Section Modulus, in.^{3} $S = \frac{bh^2}{6}$		Board Feet per Lineal Foot of Piece	Approx. Weight per Lineal Foot (lbs.) of S4S Lumber
		Rough	S4S	Rough	S4S	Rough	S4S		
4x1	3-1/2 x 3/4	3.17	2.62	0.20	0.12	0.46	0.33	1/3	.7
6x1	5-1/2 x 3/4	4.92	4.12	0.31	0.19	0.72	0.52	1/2	1.0
8x1	7-1/4 x 3/4	6.45	5.44	0.41	0.25	0.94	0.68	2/3	1.4
10x1	9-1/4 x 3/4	8.20	6.94	0.52	0.32	1.20	0.87	5/6	1.7
12x1	11-1/4 x 3/4	9.95	8.44	0.63	0.39	1.45	1.05	1	2.1
4x2	3-1/2 x 1-1/2	5.89	5.25	1.30	0.98	1.60	1.31	2/3	1.3
6x2	5-1/2 x 1-1/2	9.14	8.25	2.01	1.55	2.48	2.06	1	2.0
8x2	7-1/4 x 1-1/2	11.98	10.87	2.64	2.04	3.25	2.72	1-1/3	2.7
10x2	9-1/4 x 1-1/2	15.23	13.87	3.35	2.60	4.13	3.47	1-2/3	3.4
12x2	11-1/4 x 1-1/2	18.48	16.87	4.07	3.16	5.01	4.21	2	4.1
2x4	1-1/2 x 3-1/2	5.89	5.25	6.45	5.36	3.56	3.06	2/3	1.3
2x6	1-1/2 x 5-1/2	9.14	8.25	24.10	20.80	8.57	7.56	1	2.0
2x8	1-1/2 x 7-1/4	11.98	10.87	54.32	47.63	14.73	13.14	1-1/3	2.7
2x10	1-1/2 x 9-1/4	15.23	13.87	111.58	98.93	23.80	21.39	1-2/3	3.4
2x12	1-1/2 x 11-1/4	18.48	16.87	199.31	177.97	35.04	31.64	2	4.1
3x4	2-1/2 x 3-1/2	9.52	8.75	10.42	8.93	5.75	5.10	1	2.2
3x6	2-1/2 x 5-1/2	14.77	13.75	38.93	34.66	13.84	12.60	1-1/2	3.4
3x8	2-1/2 x 7-1/4	19.36	18.12	87.74	79.39	23.80	21.90	2	4.4
3x10	2-1/2 x 9-1/4	24.61	23.12	180.24	164.89	38.45	35.65	2-1/2	5.7
3x12	2-1/2 x 11-1/4	29.86	28.12	321.96	296.63	56.61	52.73	3	6.9
4x4	3-1/2 x 3-1/2	13.14	12.25	14.39	12.50	7.94	7.15	1-1/3	3.0
4x6	3-1/2 x 5-1/2	20.39	19.26	53.76	48.53	19.12	17.65	2	4.7
4x8	3-1/2 x 7-1/4	26.73	25.38	121.17	111.15	32.86	30.66	2-2/3	6.2
4x10	3-1/2 x 9-1/4	33.98	32.38	248.91	230.84	53.10	49.91	3-1/3	7.9
6x3	5-1/2 x 2-1/2	14.77	13.75	8.48	7.16	6.46	5.73	1-1/2	3.4
6x4	5-1/2 x 3-1/2	20.39	19.25	22.33	19.65	12.32	11.23	2	4.7
6x6	5-1/2 x 5-1/2	31.64	30.25	83.43	76.26	29.66	27.73	3	7.4
6x8	5-1/2 x 7-1/2	42.89	41.25	207.81	193.36	54.51	51.56	4	10.0
8x8	7-1/2 x 7-1/2	58.14	56.25	281.69	263.67	73.89	70.31	5-1/3	13.7

*Rough dry sizes are 1/8 in. larger, both dimensions.

Properties and weights of American Standard Board, Dimension and Timber sizes commonly used for formwork construction are based on data supplied by the National Forest Products Association.

Approximate weights listed are based on lumber weighing 35 lbs. per cubic foot.