



Roof and Floor Framing SPAN TABLES

**INFORMATION
GUIDELINE**

17

Sept. 2008

CITY OF ESCONDIDO • BUILDING DIVISION • 201 N. BROADWAY, ESCONDIDO, CA 92025 • (760) 839-4647

LUMBER GRADE Douglas Fir Larch N0.2		ALLOWABLE SPANS FOR JOISTS & RAFTERS							
		Floor Joists		Ceiling Joists		Rafter Ceiling Joist Combination ^{2, 3, 4}		Rafters ^{3, 4}	
Finish or Slope		Plaster Below	Drywall Below	Plaster Below	Drywall Below	Plaster Below	Drywall Below	Slope less than 4 in 12	Slope 4 in 12 or greater
Deflection Limit		L/360 w/LL	L/360 w/LL	L/360 w/LL	L/240 w/LL	L/360 w/LL	L/240 w/LL	L/240 w/LL	L/180 w/LL
Load Duration Factor		1.00	1.00	1.00	1.00	1.25 ⁵	1.25 ⁵	1.25 ⁵	1.25 ⁵
Nominal Size Inches	Spacing Inches	DL=20 PSF LL=40 PSF	DL=10 PSF LL=40 PSF	DL=10 PSF LL=10 PSF	DL=5 PSF LL=10 PSF	DL=15 PSF LL=20 PSF	DL=15 PSF LL=20 PSF	DL=10 PSF LL=20 PSF	DL=10 PSF LL=16 PSF
2 X 4	12	---	---	9'-10"	10'-9"	---	---	8'-7"	9'-11"
	16	---	---	7'-9"	9'-10"	---	---	7'-9"	9'-0"
	24	---	---	6'-9"	8'-7"	---	---	6'-9"	7'-10"
2 X 6	12	10'-6"	10'-9"	13'-6"	17'-0"	11'-2"	12'-9"	13'-6"	15'-7"
	16	9'-1"	9'-9"	12'-3"	15'-5"	10'-2"	11'-7"	12'-3"	14'-2"
	24	7'-5"	8'-1"	10'-8"	13'-6"	8'-10"	11'-0"	11'-9"	11'-9"
2 X 8	12	13'-3"	14'-2"	17'-9"	22'-5"	14'-9"	16'-10"	17'-9"	20'-6"
	16	11'-6"	12'-7"	16'-2"	20'-4"	13'-5"	15'-4"	16'-2"	18'-8"
	24	9'-5"	10'-3"	14'-1"	17'-9"	11'-8"	13'-11"	14'-1"	15'-11"
2 X 10	12	16'-3"	17'-9"	22'-8"	NA ¹	18'-10"	21'-6"	22'-8"	26'-2"
	16	14'-1"	15'-5"	20'-7"	26'-0"	17'-1"	19'-7"	20'-7"	23'-9"
	24	11'-6"	12'-7"	18'-0"	20'-7"	14'-11"	17'-0"	18'-2"	19'-5"
2 X 12	12	18'-10"	20'-7"	N/A ¹	N/A ¹	22'-11"	26'-2"	27'-7"	N/A ¹
	16	16'-3"	17'-10"	---	---	20'-9"	23'-10"	25'-9"	N/A ¹
	24	13'-4"	14'-7"	---	---	18'-2"	19'-9"	21'-0"	22'-5"
2 X 14	12	18'-0"	18'-3"	---	---	N/A ¹	N/A ¹	N/A ¹	N/A ¹
	16	16'-0"	17'-0"	---	---	24'-6"	26'-8"	---	---
	24	13'-6"	14'-0"	---	---	21'-5"	22'-2"	---	---
OPEN BEAM CEILING									
Nominal Size (Inches)	On Center Spacing (inches)	Douglas Fir Larch No.2							
4 X 4	24	7'-10"							
	32	7'-4"							
	48	6'-6"							
4 X 6	24	11'-0"							
	32	10'-4"							
	48	9'-4"							
4 X 8	24	13'-6"							
	32	12'-6"							
	48	11'-6"							
4 X 10	24	16'-0"							
	32	15'-0"							
	48	13'-10"							

DESIGN VALUES:
 Lumber Grade: D.F./Larch No. 2
 Allowable Bending Stress: 900 psi
 Allowable Shear Stress: 95 psi
 Modulus Of Elasticity: 1,600,000 psi
 Maximum Roofing Load 6 psf

FOOTNOTES:
¹ "N/A" designation is for spans over 25 feet. Single pieces of sawn lumber of this length are generally special stock order items and have not been shown.
² Minimum Slopes 1/4" in 12". Roof surfaces with a slope of less than 1/4" in 12" are considered to be flat roofs. Flat roofs must be designed to accommodate potential ponding of water. This Span Chart shall not be used for Flat Roof Design.
³ DL (Roof dead load)= 15 psf Max. Roofing Load: 6psf (Asphalt Shingles)
⁴ LL (Roof live load) = 20 psf
⁵ Load Duration factor = 1.25 (no floor above)

**ALLOWABLE SPANS AND LOADS FOR WOOD STRUCTURAL PANEL SHEATHING AND SINGLE FLOOR GRADES
CONTINUOUS OVER TWO OR MORE SPANS WITH STRENGTH AXIS PERPENDICULAR TO SUPPORTS ^{1, 2}**

SHEATHING GRADES		ROOF ³				FLOOR ⁴
Panel Span Rating	Panel Thickness (Inches)	Maximum Span (Inches)		Load ⁵ (pounds per square foot)		Maximum Span (inches)
Roof/Floor Span		With Edge Support ⁶	Without Edge Support ⁶	Total Load	Live Load	
12/0	5/16	12	12	40	30	0
16/0	5/16, 3/8	16	16	40	30	0
20/0	5/16, 3/8	20	20	40	30	0
24/0	3/8, 7/16, 1/2	24	20 ⁷	40	30	0
24/16	7/16, 1/2	24	24	50	40	16
32/16	15/32, 1/2, 7/8	32	28	40	30	16 ⁸
40/20	19/32, 5/8, 7/8	40	32	40	30	20 ^{8,9}
48/24	23/32, 3/4, 7/8	48	36	45	35	24
54/32	7/8, 1	54	40	45	35	32
60/48	7/8, 1, 1- ¹ / ₈	60	48	45	35	48
SINGLE FLOOR GRADES		ROOF ³				FLOOR ⁴
Panel Span Rating Joist spacing	Panel Thickness (Inches)	Maximum Span (Inches)		Load ⁵ (pounds per square foot)		Maximum Span (inches)
		With Edge Support ⁶	Without Edge Support ⁶	Total Load	Live Load	
16" oc	1/2, 19/32, 5/8	24	24	50	40	16 ⁸
20" oc	19/32, 5/8, 3/4	32	32	40	30	20 ^{8,9}
24" oc	23/32, 3/4	48	36	35	25	24
32" oc	7/8, 1	48	40	50	40	32
48"Oc	1- ³ / ₃₂ , 1- ¹ / ₈	60	48	50	50	48

FOOTNOTES:

- ¹ Applies to panels 24 inches and wider.
- ² Floor and roof sheathing conforming with this table shall be deemed to meet the design criteria of Section 2312.
- ³ Uniform load deflection limitations ¹/₁₈₀ of span under live load plus dead load, ¹/₂₄₀ under live load only.
- ⁴ Panel edges shall have approved tongue-and-groove joints or shall be supported with blocking unless ¹/₄-inch minimum thickness underlayment or 1-¹/₂ inches of approved cellular or lightweight concrete is placed over the subfloor, or finish floor is ³/₄-inch wood strip. Allowable uniform load based on deflection of ¹/₃₆₀ of span is 100 pounds per square foot (psf) except the span rating of 48 inches on center is based on a total load of 65 psf.
- ⁵ Allowable load at maximum span.
- ⁶ Tongue-and-groove edges, panel edge clips [one midway between each support, except two equally spaced between supports 48 inches on center], lumber blocking, or other. Only lumber blocking shall satisfy blocked diaphragms requirements.
- ⁷ For ¹/₂-inch panel, maximum span shall be 24 inches.
- ⁸ May be 24 inches on center where ³/₄-inch wood strip flooring is installed at right angles to joist.
- ⁹ May be 24 inches on center for floors where 1-¹/₂ inches of cellular or lightweight concrete is applied over the panels.

ALLOWABLE SHEATHING SPAN			
Sheathing ¹		Maximum Spans	
		ROOF	FLOOR
1" Thick Nominal	Solid	16"	not applicable
	Spaced ²	16"	not applicable
2" Thick Nominal	Supporting Ceiling	5'-6" ³	4'-0"
	No Ceiling	6'-6" ³	4'-0"

FOOTNOTES:

- ¹ Span of sheathing boards placed diagonally across rafters or joists shall be measured along the longitudinal axis of the plank.
- ² Shall be continuous over three or more supports and no board shall be less than six feet long.
- ³ Douglas Fir Larch No. 3 or better permitted.