Span Tables
Rafters – Ceiling Joists – Floor Joists
Douglas Fir-Larch #2 [1,2,6,7]

					Roof Rafters [5,8]						
Member Size	Spacing (inches)	Floor Joists DL=10 LL=40	Ceiling Joists[3] DL=5 LL=10	Ceiling Joists[4] DL=10 LL=20	Patio Cover DL=7 LL=10	Roof Rafter DL=10 LL=20	Roof Rafter DL=20 LL=20	Roof Rafter DL=10 SL=30	Roof Rafter DL=20 SL=30	Roof Rafter DL=10 SL=40	Roof Rafter DL=20 SL=40
2X4	12	-	12-5	9-10	11-4	10-10	10-0	9-6	8-6	8-6	7-9
	16	-	11-3	8-11	10-4	9-10	8-7	8-3	7-5	7-4	6-9
	24	-	9-10	7-3	9-0	8-2	7-0	6-9	6-0	6-0	5-6
2X6	12	10-9	19-6	15-0	17-11	16-10	14-7	14-0	12-6	12-5	11-3
	16	9-9	17-8	13-0	16-3	14-7	12-7	12-1	10-10	10-9	9-10
	24	8-3	15-0	10-8	14-2	11-11	10-4	9-10	8-10	8-10	8-0
2X8	12	14-2	25-8	19-1	23-7	21-4	18-5	17-8	15-10	15-9	14-5
	16	12-9	23-4	16-6	21-5	18-5	16-0	15-4	13-8	13-8	12-6
	24	10-5	19-1	13-6	18-9	15-1	13-0	12-6	11-2	11-2	10-2
2X10	12	18-0	26-0	23-3	26-0	26-0	22-6	21-7	19-4	19-3	17-7
	16	15-7	26-0	20-2	26-0	22-6	19-6	18-9	16-9	16-8	15-3
	24	12-9	23-3	16-5	23-11	18-5	15-11	15-3	13-8	13-8	12-5
2X12	12	20-11	26-0	26-0	26-0	26-0	26-0	25-1	22-5	22-4	20-5
	16	18-1	26-0	23-4	26-0	26-0	22-7	21-8	19-5	19-4	17-8
	24	14-9	26-0	19-1	26-0	21-4	18-6	17-9	15-10	15-10	14-5

1. All spans are shown in feet-inches
2. All loads are pounds per square foot (psf). DL = Dead Load, LL = Live Load, SL = Ground Snow Load
3. No storage allowed on ceiling joists. Deflection based on L/240.
4. Limited storage allowed on ceiling joists. Deflection based on L/240.
5. No ceilings shall be attached to roof rafters. Deflection based on L/180.
6. Spans are limited to 26 feet.
7. See the 2019 CRC for additional span tables for different design criteria and/or different lumber.
8. Allowable spans assume ceiling joists or rafter ties are located at the bottom of the attic space to resist the outward force of the rafters. If located higher in the attic, rafter spans shall be multiplied by the following factors, where H_R is the height of the ceiling joist or rafter tie above the rafter support and H_C is the height of the roof ridge above the rafter support:

H_C/H_R	Factor
1/3	0.67
1/4	0.76
1/5	0.83
1/6	0.90

Kern County Public Works Building & Code Building Inspection Division 2700 M Street Bakersfield, CA 93301 (661) 862-8650	**SPAN TABLES FOR DOUGLAS FIR LARCH NO. 2**	2019 CRC September 2020 Rev 9/1/2020

Header Span Tables[1]

For Exterior Bearing Walls

Supporting a Single Roof and Ceiling Only

Member Size[9]	GROUND SNOW LOAD (PSF)[3]																	
	30						50						70					
	Building Width[4] (feet)																	
	12		18		25		12		18		25		12		18		25	
	Span	NJ	Span	NJ	Span	NJ	Span	NJ	Span	NJ	Span	NJ	Span	NJ	Span	NJ	Span	NJ
	Maximum Header Spans for No. 2 Grade Lumber of Douglas Fir-Larch[2,5]																	
1-2x6	4-0	1	3-6	2	3-0	2	3-5	1	3-0	2	2-7	2	3-0	2	2-8	2	2-3	2
1-2x8	5-1	2	4-6	2	3-10	2	4-4	2	3-10	2	3-3	2	3-10	2	3-5	2	2-11	3
1-2x10	6-0	2	5-4	2	4-7	2	5-2	2	4-7	2	3-11	3	4-7	2	4-0	3	3-5	3
1-2x12	7-1	2	6-3	2	5-4	3	6-1	2	5-4	3	4-7	3	5-5	2	4-9	3	4-1	3
2-2x4	4-0	1	3-6	2	3-0	1	3-5	1	3-0	2	2-6	2	3-0	1	2-8	2	2-3	2
2-2x6	6-0	1	5-3	2	4-6	2	5-1	1	4-6	2	3-10	2	4-6	1	4-0	2	3-5	2
2-2x8	7-7	1	6-8	2	5-8	2	6-5	1	5-8	2	4-11	2	5-9	1	5-1	2	4-4	3
2-2x10	9-0	1	7-11	2	6-8	2	7-8	1	6-9	2	5-10	2	6-9	1	6-0	2	5-2	3
2-2x12	10-7	1	9-4	2	7-11	2	9-0	1	7-11	2	6-9	3	8-0	1	7-1	3	6-1	4
3-2x8	9-5	1	8-4	2	7-1	2	8-1	1	7-2	2	6-2	2	7-2	1	6-4	2	5-5	2
3-2x10	11-3	1	9-11	2	8-5	2	9-7	1	8-5	2	7-2	2	8-6	1	7-6	2	6-5	3
3-2x12	13-2	1	11-7	2	9-11	2	11-3	1	9-11	2	8-6	3	10-0	1	8-10	2	7-7	3
4-2x8	10-11	1	9-7	2	8-2	2	9-4	1	8-3	2	7-0	2	8-3	1	7-3	2	6-3	2
4-2x10	12-11	1	11-5	2	9-9	2	11-1	1	9-9	2	8-4	2	9-10	1	8-8	2	7-5	3
4-2x12	15-3	1	13-5	2	11-6	2	13-0	1	11-6	2	9-10	2	11-7	1	10-3	2	8-9	3
	Maximum Header Spans for Glued Laminated Timber Beams[7,8]																	
3.125x5.500	8-1	2	7-2	2	6-2	2	7-0	2	6-2	2	5-3	2	6-2	2	5-5	2	4-8	3
3.125x6.875	10-1	2	8-11	2	7-7	2	8-8	2	7-8	2	6-6	3	7-8	2	6-9	3	5-10	3
3.125x8.250	12-0	2	10-7	2	9-1	3	10-3	2	9-1	3	7-10	3	9-2	3	8-1	4	6-11	4
3.125x9.625	13-8	2	12-2	3	10-6	3	11-10	2	10-6	3	9-0	4	10-7	3	9-5	4	8-1	4
3.125x11.000	15-1	2	13-6	3	11-10	3	13-2	3	11-9	3	10-2	4	11-10	3	10-6	4	9-1	4
3.125x12.375	16-2	3	14-7	3	12-11	4	14-3	3	12-10	4	11-3	4	12-11	3	11-7	4	10-1	4
3.125x13.750	17-0	3	15-5	3	13-9	4	15-1	3	13-8	4	12-1	4	13-9	3	12-5	4	10-11	4
3.125x15.125	17-9	3	16-2	4	14-5	4	15-9	3	14-4	4	12-9	4	14-5	4	13-1	4	11-7	4
3.125x16.500	18-4	3	16-8	4	14-11	4	16-4	3	14-10	4	13-3	4	15-0	4	13-7	4	12-1	5
3.125x17.875	18-10	3	17-2	4	15-5	4	16-10	3	15-4	4	13-9	4	15-5	4	14-1	5	12-7	5
3.125x19.250	19-4	3	17-8	4	15-10	4	17-3	3	15-9	4	14-1	5	15-10	4	14-5	5	12-11	5
3.125x20.625	19-9	3	18-0	4	16-2	4	17-8	3	16-1	4	14-5	5	16-3	4	14-10	5	13-3	5
3.125x22.000	20-0	3	18-4	4	16-6	4	18-1	4	16-6	4	14-9	5	16-7	4	15-2	5	13-7	5
3.125x23.375	20-0	3	18-6	4	16-10	4	18-5	4	16-10	4	15-1	5	16-11	4	15-5	5	13-10	5
3.125x24.750	20-0	3	18-8	4	17-2	4	18-9	4	17-1	4	15-4	5	17-2	4	15-8	5	14-1	6
5.125x5.500	9-7	1	8-9	2	7-10	2	8-7	1	7-9	2	6-9	2	7-11	2	7-0	2	6-0	2
5.125x6.875	12-0	1	11-0	2	9-10	2	10-9	2	9-8	2	8-5	2	9-11	2	8-9	2	7-6	2
5.125x8.250	14-4	2	13-2	2	11-10	2	12-11	2	11-7	2	10-1	3	11-10	2	10-6	2	9-0	3
5.125x9.625	16-9	2	15-4	2	13-8	2	15-1	2	13-6	2	11-10	3	13-9	2	12-2	3	10-6	3
5.125x11.000	19-2	2	17-6	2	15-7	3	17-3	2	15-5	3	13-5	3	15-8	2	13-11	3	12-0	3
5.125x12.375	20-0	2	18-10	2	17-6	3	19-5	2	17-4	3	15-0	4	17-7	3	15-7	3	13-4	4
5.125x13.750	20-0	2	19-9	2	19-4	3	20-0	2	18-5	3	16-7	4	19-4	3	17-2	4	14-10	4
5.125x15.125	20-0	2	20-0	2	19-10	3	20-0	2	19-2	3	18-2	4	20-0	3	18-2	4	16-2	4
5.125x16.500	20-0	2	20-0	2	19-11	3	20-0	2	19-11	3	19-7	4	20-0	3	18-10	4	17-6	4

1. All spans are shown in feet-inches
2. Spans are based on minimum design properties for No. 2 grade lumber of Douglas fir-larch.
3. Use 30 psf ground snow load for cases in which ground snow load is less than 30 psf and the roof live load is equal to or less than 20 psf.
4. Building width is measured perpendicular to the ridge. For widths between those shown, spans are permitted to be interpolated.
5. Douglas fir-larch spans are calculated assuming the top of the header is laterally braced by perpendicular framing. Where the top of the header or girder is not laterally braced (for example, cripple studs bearing on the header), tabulated spans of headers consisting of 2 x 8, 2 x 10, or 2 x 12 sizes shall be multiplied by 0.70 or the header or girder shall be designed by a Registered Design Professional (RDP).
6. NJ = Number of jack studs required to support each end. Where to number of required jack studs equals one, the header is permitted to be supported by an approved framing anchor attached to the full-height wall stud and to the header.
7. Tabulated spans assume 20F combination glulam with a minimum F_{bx}=2,000psi, F_{vx}=210psi, and E=1,500,000psi.
8. Spans checked for live load deflection only.
9. Built-up headers shall consist of 2" to 2" with ½" spacer and be face nailed together along each edge with 16d common nails at 16" o.c. or 16d box nails at 12" o.c.

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