

SOUTHERN PINE ALLOWABLE LOAD TABLES



Requirements for Use of Allowable Load Tables

1. These tables are for gravity loads only. Consult a registered design professional for wind and seismic load analysis and design.
2. All tables are based on uniformly distributed loads only. Other loads, such as concentrated or unbalanced snow loads, have not been considered and must be analyzed separately.
3. These tables are only applicable to members used under dry-service conditions where the moisture content in use is a maximum of 19% for lumber and less than 16% for glued laminated timber.
4. The compression edge of the header or beam must be laterally supported at intervals of 24" or less. In addition, lateral support must be provided at bearing points.
5. Allowable total and live plf (pounds per lineal foot) loads used to select a header or beam must be equal to or greater than the actual plf loads applied.
6. Multiple-member headers and beams must be properly connected together. See page 5 for connection guidelines.
7. These tables assume unbalanced glued laminated timber combinations used in simple-span applications. Balanced beam combinations with equal or greater design values may be substituted and used in either simple-span or continuous-span applications.
8. These tables are only applicable to members used under ordinary ranges of temperature and occasionally heated in use up to 150° F.

Example: Allowable Floor Loads

Key – for each clear opening there are three rows of values:

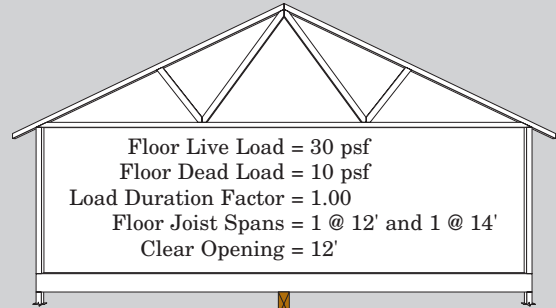
TL: Maximum total load in pounds per lineal foot (plf) with deflection limited to $\ell/240$

LL: Maximum live load in pounds per lineal foot (plf) with deflection limited to $\ell/360$

BL: Required bearing length in inches

Steps in Sizing Headers and Beams:

1. Determine the required total load (live load + dead load) in plf.
2. Determine the required live load in plf.
3. Select a clear opening and find columns where the plf value in the TL row equals or exceeds the required total load, *and* the plf value in the LL row equals or exceeds the required live load.
4. Check required bearing lengths in the BL row.
5. Find product size options at the top of the columns meeting the total load, live load and bearing length requirements.



$$\text{Total Load} = (12'/2 + 14'/2) \times (30 + 10) \text{ psf} = 520 \text{ plf}$$

$$\text{Live Load} = (12'/2 + 14'/2) \times 30 \text{ psf} = 390 \text{ plf}$$

Select the 12' clear opening in Tables 21-26. Read across the TL row in each table to find columns with total loads equal to or greater than the required 520 plf. Then check the LL row in those columns to make sure the corresponding live loads are equal to or greater than the required 390 plf. Solutions include: from Table 21 for No.1 SP lumber, select a 4-ply 2x12 beam requiring a 1.5" bearing length; from Table 24 for 24F-1.7E (V4) SP glulam, select a 3-1/2x11-1/4" beam requiring a 3.0" bearing length; from Table 26 for 24F-1.8E (V3) SP glulam, select a 3-1/8x11" beam requiring a 3.0" bearing length.

Table 21 – No. 1 Southern Pine Lumber

Clear Opening		1-ply				2-ply				3-ply				4-ply			
		2 x 6	2 x 8	2 x 10	2 x 12	2 x 6	2 x 8	2 x 10	2 x 12	2 x 6	2 x 8	2 x 10	2 x 12	2 x 6	2 x 8	2 x 10	2 x 12
4'	TL	406	637	849	1150	812	1273	1697	2299	1392	2174	2887	3887	1856	2899	3849	5182
	LL	406	637	849	1150	812	1273	1697	2299	1392	2174	2887	3887	1856	2899	3849	5182
	BL	1.5	3.0	3.0	3.0	1.5	3.0	3.0	3.0	1.5	3.0	3.0	4.5	1.5	3.0	3.0	4.5
6'	TL	184	293	396	549	367	585	792	1097	632	1006	1358	1878	843	1341	1811	2504
	LL	184	293	396	549	367	585	792	1097	632	1006	1358	1878	843	1341	1811	2504
	BL	1.5	1.5	1.5	3.0	1.5	1.5	1.5	3.0	1.5	1.5	3.0	3.0	1.5	1.5	3.0	3.0
8'	TL	103	166	225	315	207	331	451	630	357	571	776	1083	475	762	1035	1444
	LL	95	166	225	315	190	331	451	630	284	571	776	1083	378	762	1035	1444
	BL	1.5	1.5	1.5	3.0	1.5	1.5	1.5	3.0	1.5	1.5	1.5	3.0	1.5	1.5	1.5	3.0
10'	TL	66	106	144	203	131	211	288	405	214	365	498	698	285	487	664	931
	LL	49	106	144	203	98	211	288	405	146	332	498	698	195	443	664	931
	BL	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
12'	TL	41	73	100	140	81	146	199	281	122	252	345	485	162	336	459	647
	LL	28	65	100	140	57	129	199	281	85	194	345	485	113	258	459	647
	BL	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
14'	TL	25	53	73	102	50	106	145	205	75	176	251	355	99	234	335	473
	LL	18	41	73	102	36	82	145	205	54	122	251	355	72	163	335	473
	BL	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
16'	TL	16	39	55	78	32	77	110	155	48	116	191	270	64	154	254	359
	LL	12	27	55	78	24	55	110	155	36	82	170	270	48	110	227	359
	BL	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
18'	TL	11	26	43	61	21	53	85	121	32	79	149	211	43	105	198	281
	LL	8	19	40	61	17	39	80	121	25	58	120	211	34	77	160	281
	BL	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5

(See *Requirements for Use* on page 23, and *Key, Example and Notes* on this page)

Notes for Tables 21 - 26: Allowable Floor Loads (plf) - 1.00 Load Duration Factor

- Tabulated total loads (TL) and live loads (LL) represent the allowable uniformly distributed loads that a beam can support in addition to its own weight. Deflection is limited to $\ell/240$ for total load and $\ell/360$ for live load. To determine an allowable live load for a deflection limit other than $\ell/360$, multiply the LL value by the ratio of 360 divided by the desired deflection constant. The result must not exceed the corresponding TL value for the same clear opening and product.
- Tabulated bearing lengths (BL) reflect the number of 2x trimmers required at each end of the header or beam based on the corresponding plf loads (e.g., 1.5" = one trimmer, 3.0" = two trimmers, etc.). Additional checks may be required for bearing length and trimmers.
- See *Assumptions for Table Development* beginning on page 2 for details on design assumptions made to generate these tables.
- Interpolation between clear openings is permitted.
- The design span is assumed to be the clear opening plus 1/2 the required bearing length at each end.

Table 21A – 2400F-2.0E Southern Pine Lumber

Clear Opening		1-ply				2-ply				3-ply				4-ply			
		2 x 6	2 x 8	2 x 10	2 x 12	2 x 6	2 x 8	2 x 10	2 x 12	2 x 6	2 x 8	2 x 10	2 x 12	2 x 6	2 x 8	2 x 10	2 x 12
4'	TL	676	984	1426	2008	1352	1968	2853	4015	2027	2953	4279	6023	2703	3937	5706	8030
	LL	676	984	1426	2008	1352	1968	2853	4015	2027	2953	4279	6023	2703	3937	5706	8030
	BL	1.5	3.0	3.0	4.5	1.5	3.0	3.0	4.5	1.5	3.0	3.0	4.5	1.5	3.0	3.0	4.5
6'	TL	326	558	785	1032	653	1117	1570	2064	1123	1717	2355	3097	1497	2289	3140	4129
	LL	275	558	785	1032	551	1117	1570	2064	822	1717	2355	3097	1096	2289	3140	4129
	BL	1.5	1.5	3.0	3.0	1.5	1.5	3.0	3.0	1.5	1.5	3.0	3.0	1.5	1.5	3.0	3.0
8'	TL	175	318	512	694	350	637	1024	1388	525	1096	1622	2081	701	1461	2163	2775
	LL	118	266	512	694	236	533	1024	1388	354	795	1622	2081	472	1060	2163	2775
	BL	1.5	1.5	3.0	3.0	1.5	1.5	3.0	3.0	1.5	1.5	3.0	3.0	1.5	1.5	3.0	3.0
10'	TL	90	204	331	485	179	409	662	969	269	613	1139	1566	358	818	1518	2088
	LL	61	138	283	485	122	276	566	969	183	414	844	1497	244	552	1125	1997
	BL	1.5	1.5	1.5	3.0	1.5	1.5	1.5	3.0	1.5	1.5	3.0	3.0	1.5	1.5	3.0	3.0
12'	TL	51	118	230	339	102	237	461	678	153	355	733	1167	205	473	978	1556
	LL	35	81	165	294	71	161	331	588	106	242	496	878	142	323	661	1170
	BL	1.5	1.5	1.5	3.0	1.5	1.5	1.5	3.0	1.5	1.5	1.5	3.0	1.5	1.5	1.5	3.0
14'	TL	32	74	154	250	63	148	308	499	95	222	463	827	126	295	617	1102
	LL	22	51	105	187	45	102	210	374	67	153	315	560	90	204	420	746
	BL	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	3.0	1.5	1.5	1.5	3.0
16'	TL	20	49	103	185	41	97	205	370	61	146	308	555	82	195	411	740
	LL	15	34	71	126	30	69	142	252	45	103	212	379	60	137	283	505
	BL	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
18'	TL	14	33	71	130	28	67	143	259	41	100	214	389	55	134	286	518
	LL	11	24	50	89	21	48	100	178	32	72	150	267	42	96	199	357
	BL	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5

Table 21B – M-23 Southern Pine Lumber

Clear Opening		1-ply				2-ply				3-ply				4-ply			
		2 x 6	2 x 8	2 x 10	2 x 12	2 x 6	2 x 8	2 x 10	2 x 12	2 x 6	2 x 8	2 x 10	2 x 12	2 x 6	2 x 8	2 x 10	2 x 12
4'	TL	676	984	1426	2008	1352	1968	2853	4015	2027	2953	4279	6023	2703	3937	5706	8030
	LL	676	984	1426	2008	1352	1968	2853	4015	2027	2953	4279	6023	2703	3937	5706	8030
	BL	1.5	3.0	3.0	4.5	1.5	3.0	3.0	4.5	1.5	3.0	3.0	4.5	1.5	3.0	3.0	4.5
6'	TL	326	558	785	1032	653	1117	1570	2064	1104	1717	2355	3097	1472	2289	3140	4129
	LL	248	554	785	1032	496	1108	1570	2064	740	1661	2355	3097	987	2215	3140	4129
	BL	1.5	1.5	3.0	3.0	1.5	1.5	3.0	3.0	1.5	1.5	3.0	3.0	1.5	1.5	3.0	3.0
8'	TL	158	318	512	694	315	637	1024	1388	473	1066	1622	2081	631	1421	2163	2775
	LL	107	240	487	694	213	480	975	1388	320	716	1460	2081	426	955	1947	2775
	BL	1.5	1.5	3.0	3.0	1.5	1.5	3.0	3.0	1.5	1.5	3.0	3.0	1.5	1.5	3.0	3.0
10'	TL	80	184	331	485	161	368	662	969	241	552	1129	1566	322	736	1506	2088
	LL	55	125	255	450	110	249	509	900	165	374	760	1348	220	498	1013	1797
	BL	1.5	1.5	1.5	3.0	1.5	1.5	1.5	3.0	1.5	1.5	3.0	3.0	1.5	1.5	3.0	3.0
12'	TL	46	106	220	339	92	213	440	678	138	319	661	1167	183	425	881	1556
	LL	32	73	149	265	64	145	298	530	96	218	447	790	128	291	596	1053
	BL	1.5	1.5	1.5	3.0	1.5	1.5	1.5	3.0	1.5	1.5	1.5	3.0	1.5	1.5	1.5	3.0
14'	TL	28	66	139	248	56	133	277	497	85	199	416	745	113	265	555	993
	LL	20	46	95	168	40	92	189	337	60	138	284	505	81	184	379	673
	BL	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
16'	TL	18	44	92	167	36	87	184	333	55	131	277	500	73	174	369	666
	LL	14	31	64	114	27	62	128	228	41	93	191	341	54	123	255	455
	BL	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
18'	TL	12	30	64	116	24	60	128	233	37	90	192	349	49	119	256	465
	LL	9	22	45	80	19	43	90	161	28	65	135	241	38	87	180	321
	BL	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5

(See Requirements for Use on page 23, Key, Example and Notes on page 24)