

## Nordic Cross-Laminated Timber

### CHECKLIST: Nordic X-Lam

To verify that the CLT Selection Tables are appropriate for the structure being designed, the following questions should be asked (the appropriate modification factor is given in brackets):

1. Is load duration "standard" ( $C_D$ )?

$C_D$  is a load duration factor. The tables are based on a normal duration of load ( $C_D = 1.0$ ), which includes the effects of dead loads plus live loads due to use and occupancy. For other durations of load, the tabulated values  $w_{FR}$  shall be multiplied by the appropriate factor permitted by the code.

2. Is the service condition "dry" ( $C_M$ )?

$C_M$  is a service condition factor. The tables are limited to dry service conditions ( $C_M = 1.0$ ).

3. Is the material free of incising and/or strength-reducing chemicals ( $C_T$ )?

$C_T$  is a treatment factor. The tables are based on untreated lumber ( $C_T = 1.0$ ).

4. Is L/240 based on total load or L/360 based on live load, the applicable deflection limitation ( $C_\Delta$ )?

$C_\Delta$  is a deflection factor. The tables are based on a deflection limit of span/240 under specified total load or span/360 under specified live load. For other deflection limits, multiply the  $w_{\Delta R}$  values by the following:

Table L/240, TL

$C_\Delta = 1.33$  for span/180  
 $= 0.80$  for span/300  
 $= 0.67$  for span/360

Table L/360, LL

$C_\Delta = 2.00$  for span/180  
 $= 1.50$  for span/240  
 $= 1.20$  for span/300

5. The effect of floor vibrations can be controlled by respecting the following limits:

	Thickness (mm)		
	105-3s	175-5s	245-7s
Span (ft)	12'-3"	17'-0"	21'-2"
Ratio L/d	33,9	28,2	25,0

However, it should be noted that the criteria has been established for bare floors only. For other applications, contact Nordic.  
 (Ref.: *Vibration performance of cross-laminated timber floors, FPInnovations CLT Handbook, Chapter 7*)

6. Should creep effects be considered?

A 25% reduction in shear stiffness has been used when checking the elastic deflection limit and a 50% reduction in shear stiffness for the permanent deformation limit in order to account for the deformations caused by shear perpendicular to grain (rolling shear).

7. Is the loading uniform?

Note: The tables are based on standard depths for industrial grade and for bending about the longitudinal axis of the panel. Consult Nordic for other options.

If the answer to any of those questions is no, consult Nordic. Otherwise, the CLT Selection Tables may be used directly. The selection tables provide the allowable uniform total load,  $w_{FR}$  (based on strengths), and the allowable uniform total or live load,  $w_R$  (based on serviceability), that may be applied to a panel to ensure that the design criteria are met. The pannels weight is not considered and shall be included in the total load calculation. Occasionally, panels may have to be designed for concentrated loads or other non-uniform loading (for example as defined in article 1607.4, IBC). In these cases refer to NDS 2005 Standard or Nordic.

## CLT Selection Tables (L/240, TL)

### Nordic X-Lam

S-P-F

**$W_{FR}$**  Allowable uniform total load  $W_{FR}$  based on strengths (psf)

Span (ft)	Simple Span			Multiple Span		
	105-3s	175-5s	245-7s	105-3s	175-5s	245-7s
10,0	297			238		
10,5	283			226		
11,0	270			216		
11,5	258	430		207		
12,0	248	413		198	330	
12,5	238	396		190	317	
13,0	228	381		183	305	
13,5	220	367		176	293	
14,0	212	354		170	283	
14,5	203	341		164	273	
15,0	189	330	462	158	264	
15,5	177	319	447	153	255	
16,0		309	433	149	248	347
16,6		298	417	143	239	334
17,0		291	408	140	233	326
17,5		283	396		226	317
18,0		275	385		220	308
18,5		268	375		214	300
19,0		261	365		208	292
19,5		254	355		203	284

**$W_{\Delta R}$**  Allowable uniform total load for L/240 deflection  $W_{\Delta R}$  (psf)

Span (ft)	Simple Span			Multiple Span		
	105-3s	175-5s	245-7s	105-3s	175-5s	245-7s
10,0	183			218		
10,5	162			195		
11,0	144			175		
11,5	129	407		157		
12,0	116	369		142	433	
12,5	104	335		128	396	
13,0	94,1	306		116	362	
13,5	85,2	279		105	333	
14,0	77,4	256		96,0	306	
14,5	70,4	234		87,7	282	
15,0	64,3	216	457	80,3	260	
15,5	58,8	199	424	73,7	241	
16,0		183	394	67,8	223	464
16,6		167	361	61,4	204	428
17,0		157	341	57,6	192	406
17,5		145	318		179	380
18,0		135	297		167	356
18,5		126	278		155	334
19,0		117	260		145	313
19,5		109	244		136	295

Note: A complete design shall include the verification of the bearing capacity, and a consideration for the effect of vibrations when applicable. A 50% reduction in shear stiffness has been used in order to account for the deformations caused by rolling shear.

## CLT Selection Tables (L/360, LL)

### Nordic X-Lam

S-P-F

**$W_{FR}$**  Allowable uniform total load  $W_{FR}$  based on strengths (psf)

Span (ft)	Simple Span			Multiple Span		
	105-3s	175-5s	245-7s	105-3s	175-5s	245-7s
10,0	297			238		
10,5	283			226		
11,0	270			216		
11,5	258	430		207		
12,0	248	413		198	330	
12,5	238	396		190	317	
13,0	228	381		183	305	
13,5	220	367		176	293	
14,0	212	354		170	283	
14,5	203	341		164	273	
15,0	189	330	462	158	264	
15,5	177	319	447	153	255	
16,0		309	433	149	248	347
16,6		298	417	143	239	334
17,0		291	408	140	233	326
17,5		283	396		226	317
18,0		275	385		220	308
18,5		268	375		214	300
19,0		261	365		208	292
19,5		254	355		203	284

**$W_{\Delta R}$**  Allowable uniform live load for L/360 deflection  $W_{\Delta R}$  (psf)

Span (ft)	Simple Span			Multiple Span		
	105-3s	175-5s	245-7s	105-3s	175-5s	245-7s
10,0	135			165		
10,5	119			146		
11,0	105			130		
11,5	93,2	308		116		
12,0	83,2	278		104	335	
12,5	74,5	251		93,2	304	
13,0	67,0	227		84,1	276	
13,5	60,4	206		76,0	252	
14,0	54,6	188		69,0	230	
14,5	49,6	171		62,7	211	
15,0	45,1	157	346	57,2	194	
15,5	41,2	144	319	52,3	178	
16,0		132	295	47,9	164	357
16,6		120	268	43,3	149	326
17,0		112	253	40,5	140	308
17,5		104	235		130	287
18,0		96,2	218		121	268
18,5		89,2	203		112	250
19,0		82,9	189		105	234
19,5		77,2	177		97,5	219

Note: A complete design shall include the verification of the bearing capacity, and a consideration for the effect of vibrations when applicable. A 25% reduction in shear stiffness has been used in order to account for the deformations caused by rolling shear.