Nordic Lam Decking

CHECKLIST: **Nordic Lam Decking**

To verify that the Decking 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" (K_D)?
K_D is a load duration factor. The tables are based on a standard term load (K_D = 1.0), which includes the effects of dead loads plus live loads due to use and occupancy, and snow loads. For other load durations, the tabulated values w_{FR} shall be multiplied by the appropriate factor permitted by the code.

2. Is the service condition "dry" (K_S)?
K_S is a service condition factor. The tables are based on dry service conditions (K_{Sb} = K_{SE} = 1.0). For wet service conditions, multiply the values by the following factors:

K_{Sb} = 0.80 for w_{FR} K_{SE} = 0.90 for $w_{\Delta R}$

3. Is the material free of incising and/or strength-reducing chemicals (K_T)?
K_T is a treatment factor. The tables are based on untreated timber (K_T = 1.0). For glued-laminated timber treated with fire-retardant or other potentially strength-reducing chemicals, strength and stiffness capacities shall be based on documented results of tests that shall take into account the effects of time, temperature, and moisture content. For preservative treatment, the treatment factor for unincised glued-laminated timber may be taken as unity.

4. Is the width of the pieces 89 mm maximum (K_{Zbg})?
K_{Zbg} is a size factor in bending that is incorporated in the tables for a maximum thickness of 89 mm.

5. Is L/240, based on live load, the applicable deflection limitation (K_Δ)?
K_Δ is a deflection factor. The table L/240 is based on a deflection limit of span/240 (K_Δ = 1.0) under specified live load. Decking may also be checked for a deflection limit for specified total load. For other deflection limits, multiply the $w_{\Delta R}$ values of Table L/240 by the following:

K_Δ = 1.33 for span/180 K_Δ = 0.67 for span/360

6. Is the decking laid in continuous spans (K_{span})?
K_{span} is a factor for deflection depending on the pattern in which the decking is laid. The tables are based on continuous spans (K_{span} = 1.0). For simple spans, multiply $w_{\Delta R}$ values by the following factor:

K_{span} = 0.76 for single span

7. Is the loading of a uniform nature?
The tables are based on uniform loads. In some applications, decking may have to be designed for a concentrated live load (as defined in article 4.1.5.9 of the 2010 NBCC) or other non-uniform loading. In these cases refer to CSA O86-09.

If the answer to any of these questions is no, refer to the description of modification factors above and make the necessary adjustments to the tabulated values. Otherwise, the Decking Selection Tables may be used directly. The selection tables provide the maximum uniform factored load w_{FR} and maximum uniform specified load $w_{\Delta R}$ that may be applied to a two- or more-span continuous decking to ensure that the design criteria are met. The tables do not consider any criterion to limit the effects of floor vibrations.

Note: The tables are based on standard depths for bending on flat (loaded parallel to wide face of laminations). The decking self weight has not been considered in the calculation of maximum loads (i.e. it shall be included in the specified total load). The decking is available in widths of 203, 305, and 406 mm and lengths up to 18 m. Consult Nordic for other options.

Decking Selection Table — Nordic Lam 20F-ES/CPG

W_{FR} Ultimate limit states

Maximum factored load w_{FR} (kPa)

Span	Thickness (mm)				
(m)	38	44	54	64	89
1,0					
1,2					
1,4					
1,6	17,4				
1,8	13,8	18,7			
2,0	11,1	15,2			
2,2	9,21	12,5			
2,4	7,74	10,5	15,5		
2,6	6,60	8,98	13,2		
2,8	5,69	7,74	11,4	15,8	
3,0	4,95	6,74	9,94	13,8	
3,2	4,35	5,93	8,74	12,1	
3,4	3,86	5,25	7,74	10,7	
3,6	3,44	4,68	6,91	9,56	
3,8	3,09	4,20	6,20	8,58	16,8
4,0	2,79	3,79	5,59	7,74	15,2
4,2		3,44	5,07	7,02	13,8
4,4		3,14	4,62	6,40	12,5
4,6		2,87	4,23	5,85	11,5
4,8			3,88	5,38	10,5

Factored loads

$W_{\Delta R}$ Serviceability limit states, L/240 deflection

Maximum specified load $w_{\Delta R}$ (kPa)

Span	Thickness (mm)				
(m)	38	44	54	64	89
1,0					
1,2	13,9				
1,4	8,77	13,9			
1,6	5,87	9,33			
1,8	4,12	6,55	11,7		
2,0	3,01	4,77	8,55		
2,2	2,26	3,59	6,42	10,5	
2,4	1,74	2,76	4,95	8,06	
2,6	1,37	2,17	3,89	6,34	
2,8	1,10	1,74	3,12	5,07	
3,0		1,41	2,53	4,12	11,3
3,2		1,17	2,09	3,40	9,33
3,4		0,97	1,74	2,83	7,77
3,6			1,47	2,39	6,55
3,8			1,25	2,03	5,57
4,0			1,07	1,74	4,77
4,2				1,50	4,12
4,4				1,31	3,59
4,6				1,14	3,14
4,8				1,01	2,76

Decking Selection Table — Nordic Lam 20F-ES/CPG

$w_{\Delta R}$

Serviceability limit states, L/180 deflection

Maximum specified load $w_{\Delta R}$ (kPa)

Span	Thickness (mm)				
(m)	38	44	54	64	89
1,0					
1,2					
1,4	11,7				
1,6	7,83	12,4			
1,8	5,50	8,73			
2,0	4,01	6,37	11,4		
2,2	3,01	4,78	8,56		
2,4	2,32	3,68	6,60	10,7	
2,6		2,90	5,19	8,45	
2,8		2,32	4,15	6,76	
3,0			3,38	5,50	
3,2			2,78	4,53	
3,4			2,32	3,78	10,4
3,6			1,95	3,18	8,73
3,8				2,71	7,42
4,0				2,32	6,37
4,2				2,00	5,50
4,4					4,78
4,6					4,19
4,8					3,68

$w_{\Delta R}$

Serviceability limit states, L/360 deflection

Maximum specified load $w_{\Delta R}$ (kPa)

Span	Thickness (mm)				
(m)	38	44	54	64	89
1,0	16,0				
1,2	9,28	14,7			
1,4	5,84	9,28			
1,6	3,91	6,22	11,1		
1,8	2,75	4,37	7,82	12,7	
2,0	2,00	3,18	5,70	9,28	
2,2	1,51	2,39	4,28	6,97	
2,4	1,16	1,84	3,30	5,37	
2,6		1,45	2,59	4,22	11,6
2,8		1,16	2,08	3,38	9,28
3,0		0,94	1,69	2,75	7,54
3,2			1,39	2,27	6,22
3,4			1,16	1,89	5,18
3,6			0,98	1,59	4,37
3,8				1,35	3,71
4,0				1,16	3,18
4,2				1,00	2,75
4,4					2,39
4,6					2,09
4,8					1,84

Nordic Lam Decking (continued)

EXAMPLE: **Roof decking**

Roof decking
Specified dead load = 1.5 kPa (including panel self weight)
Specified snow load for strength calculations = 2.2 kPa
Specified snow load for serviceability calculations = 2.0 kPa
Purlin spacing (span) = 2.0 m
Dry service condition, untreated lumber
Deflection limitations: L/240 based on live load, L/180 based on total load
Double span pattern

Calculation
Factored load w_f = (1.25 x 1.5) + (1.5 x 2.2) = 5.18 kPa
Specified live (snow) load w_L = 2.0 kPa
Specified total load w = 1.5 + 2.0 = 3.5 kPa

From Decking Selection Tables, select 38 mm thickness:

w_{FR} = 11.1 kPa > 5.18 kPa	√	Table w_{FR}
$w_{\Delta R}$ = 3.01 kPa > 2.0 kPa for L/240 deflection (live load)	√	Table $w_{\Delta R}$, L/240 deflection
$w_{\Delta R}$ = 4.01 kPa > 3.5 kPa for L/180 deflection (total load)	√	Table $w_{\Delta R}$, L/180 deflection

Use 38 mm thick 20F-ES/CPG grade decking.

Note: Where decking is used to support roof loads, the maximum spans for decking may be limited by the NBCC roof point load requirements (refer to 2010 NBCC, article 4.1.5.9).

EXAMPLE: **Floor decking**

Floor decking
Specified dead load = 1.5 kPa (including panel self weight)
Specified live load = 1.9 kPa
Purlin spacing (span) = 3.0 m
Dry service condition, untreated lumber
Deflection limitations: L/360 based on live load, L/240 based on total load
Double span pattern

Calculation
Factored load w_f = (1.25 x 1.5) + (1.5 x 1.9) = 4.73 kPa
Specified live load w_L = 1.9 kPa
Specified total load w = 1.5 + 1.9 = 3.4 kPa

From Decking Selection Tables, select 64 mm thickness:

w_{FR} = 13.8 kPa > 4.73 kPa	√	Table w_{FR}
$w_{\Delta R}$ = 2.75 kPa > 1.9 kPa for L/360 deflection (live load)	√	Table $w_{\Delta R}$, L/360 deflection
$w_{\Delta R}$ = 4.12 kPa > 3.4 kPa for L/240 deflection (total load)	√	Table $w_{\Delta R}$, L/240 deflection

Use 64 mm thick 20F-ES/CPG grade decking.

Note: A complete design shall include among other things the verification of a concentrated live load (if applicable), bearing resistance, effect of vibrations, and fire safety requirements.