STIFFNESS AND UNFACTORED RESISTANCE VALUES[a,b] FOR SOUTH AFRICAN PINE CROSS-LAMINATED TIMBER

CLT timber grade	CLT t_p (mm)	CLT Lamination Thickness (mm)							Major Strength Direction				Minor Strength Direction			
		=	⊥	=	⊥	=	⊥	=	$M_{r,0}$ (kNm/m of width)	$(EI)_{eff,0}$ (10^9 Nmm²/m of width)	$(GA)_{eff,0}$ (10^6 N/m of width)	$V_{r,0}$ (kN/m of width)	$M_{r,90}$ (kNm/m of width)	$(EI)_{eff,90}$ (10^9 Nmm²/m of width)	$(GA)_{eff,90}$ (10^6 N/m of width)	$V_{r,90}$ (kN/m of width)
S5	66	22	22	22					8.0	180	3.9	17.6	0.9	6.9	3.9	5.9
	77	22	33	22					10.5	273	4.2	20.5	2.1	23.4	5.8	8.8
	88	33	22	33					14.6	436	5.8	26.4	0.9	6.9	4.2	5.9
	99	33	33	33					18.1	607	5.9	23.8	2.1	23.4	5.9	8.8
	110	22	22	22	22	22			18.4	685	7.8	29.3	8.0	180	7.8	17.6
	121	22	22	33	22	22			21.4	878	9.7	32.3	10.5	273	8.0	20.6
	132	33	22	22	22	33			29.4	1315	9.7	35.2	8.0	180	8.0	17.6
	143	33	22	33	22	33			33.6	1627	11.7	38.1	10.5	273	8.4	20.6
	154	33	33	22	33	33			37.1	1938	10.0	41.0	14.6	436	11.6	23.4
	165	33	33	33	33	33			41.3	2313	11.7	44.0	18.1	607	11.7	26.4
	176	33	22	22	22	22	22	33	47.9	2858	13.4	46.9	18.4	685	11.9	29.3
	187	33	22	22	33	22	22	33	53.2	3372	13.7	49.9	21.4	878	13.7	32.2
	198	33	33	22	22	22	33	33	55.6	3731	13.9	52.8	29.4	1315	15.5	35.2
	209	33	33	22	33	22	33	33	60.8	4307	14.2	55.7	33.6	1627	17.4	38.1
	220	33	33	33	22	33	33	33	66.8	4983	17.4	*58.7*	37.1	1938	15.8	41.1
	231	33	33	33	33	33	33	33	72.8	5700	17.6	61.6	41.3	2313	17.6	44.0

a. Ultimate Limit State moment and shear strengths can be calculated using: $\mathbf{M_{r,ult} = \Phi * k * M_r}$, and $\mathbf{V_{r,ult} = \Phi * k * V_r}$, where **Φ = 0.68** according to SANS 10163-1 for SA pine, and ***k*** is a context-specific combination of partial material factors to be determined by the designer.

b. The values in the table above are recommended values based on the shear analogy method as presented in the Canadian CLT Handbook (2019 Edition).