$\sigma_{m,adm,//} = \sigma_{m,g,//} * K_2 * K_3 * K_6 * K_7 * K_8 * K_{15}$

$K_2 = 1.0$ for service class 1 (dry condition, ~~except~~ low moisture content)

$K_3 = 1.0$ (long-term loading)

$K_6 = 1.0$ (Form factor for solid rectangular cross section)

K_7 = depth factor $= \frac{0.81(h^2+92300)}{(h^2+56800)} = 0.81 * \frac{(360^2+92300)}{(360^2+56800)}$

$= 0.964$

$K_8 = 1.0$ (Assume no load sharing – isolated beam)

$K_{15} = 1.39 + \frac{1}{3}(1.42-1.39) = 1.40$ (Table 24)

(For C24 and no of laminations = 8)

$\therefore \sigma_{m,adm,//} = 7.5 * 1.0 * 1.0 * 1.0 * 0.964 * 1.0 * 1.40$

$= 10.12 \text{ N/mm}^2$

Max^m applied stress $\leq$ permissible stress

$2.74w \leq 10.12$

$\therefore w = \frac{10.12}{2.74} = 3.69 \text{ kN/m}$ – max^m safe load

iv) Consider shear criteria

max^m shear force is at the support i.e. $\frac{wl}{2} = \frac{w*8}{2} = 4w$ kN

$\tau_{a,//} = \frac{1.5V}{\text{Area}} = \frac{1.5 * 4w \times 10^3}{48.6 \times 10^3} = 0.123w \text{ N/mm}^2$

$\tau_{adm,//} = \tau_{g,//} * K_2 * K_3 * K_5 * K_8 * K_{19}$

As before $K_2 = K_3 = K_8 = 1.0$

Assume no notched ends, therefore $K_5 = 1.0$

K_{19} (from table 24) $= 2.34$