

1. input data

1.1. general settings

vibration verification acc. to DIN EN 1995-1-1, 7.3

value acc. to DIN EN 1995-1-1, 7.3.3, figure 7.2: $a = 1.50 \text{ mm/kN} \Rightarrow b = 100.00$

modal damping ratio $\xi = 0.01000$

calculation using approximation formulas acc. to DIN EN 1995-1-1, 7.3.3

1.2. dimensions

ceiling width $b = 5.000 \text{ m}$, 1 span(s), all outer edges are hinged

span	l m
1	4.044

1.3. permanent action effects

Nr.	action eff	g kN/m ²
1	permanent loads	1.600
Σ		1.600

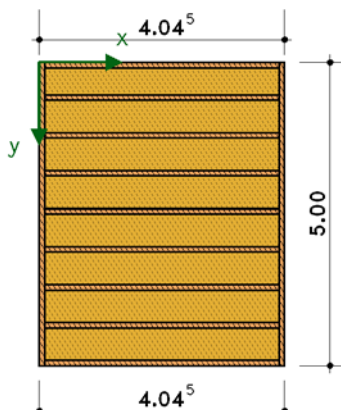
1.4. screed

screed is not taken into account

1.5. beam floor

beam Steico Joist SJ LVL,HB 90/240 90/240 mm, spacing $a_r = 625.000 \text{ mm}$, $\rho_k = 480 \text{ kg/m}^3$

1.6. plan view scale 1:125



2. results

2.1. natural frequency

$E_{\text{lengthwise}} = 14151 \text{ N/mm}^2$, $I_{\text{lengthwise}} = 119408000 \text{ mm}^4$, $E_{\text{cross}} = 0 \text{ N/mm}^2$, $I_{\text{cross}} = 0 \text{ mm}^4$

$EI_{\text{lengthwise}} = 1.689600 \text{ MNm}^2/\text{m}$, $EI_{\text{cross}} = 0.000000 \text{ MNm}^2/\text{m}$

$k_f = 1.000$, $b_{ef} = 0.625$, $\alpha = 1.000 \Rightarrow f(\alpha) = 1.000$, $m = 163.1 \text{ kG/m}^2$

$f_e = 9.776 \text{ Hz} \geq f_e = 8 \text{ Hz} \Rightarrow$ **criterion fulfilled!**

2.2. unit pulse velocity

$n_{40} = 0.0000$

$v = 4.202 \text{ mm/s} \leq v_{\text{grenz}} = 15.686 \text{ mm/s} \Rightarrow$ **criterion fulfilled!**

2.3. heel strike

$v = 231.114 \text{ mm/s} > v_{\text{grenz}} = 94.118 \text{ mm/s} \Rightarrow$ **criterion not fulfilled (not relevant)**

2.4. acceleration/resonance

$a = 2.9791 \text{ m/s}^2 \leq a > 0.7000 \text{ m/s}^2 \Rightarrow$ **criterion not fulfilled (not relevant)**

2.5. stiffness criterion

$b_{ef} = 0.625 \text{ m}$

$w(1\text{kN}) = 1.30 \text{ mm} \leq w_{\text{grenz}} = 1.5 \text{ mm} \Rightarrow$ **criterion fulfilled!**

2.6. unit pulse velocity

$n_{40} = 0.0000$

$v = 4.202 \text{ mm/s} \leq v_{\text{grenz}} = 15.686 \text{ mm/s} \Rightarrow$ **criterion fulfilled!**

verification fulfilled!