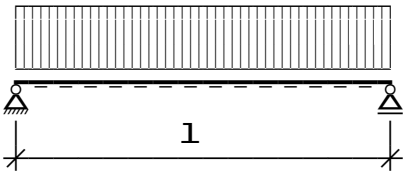
Toetsing ligger op twee steunpunten

Schema



De overspanning is:

l =		3,30 m

Afmetingen balk:

Balk	=	71 x 246
Breedte balk b	=	71 mm
Hoogte balk h	=	246 mm
I_y	=	$8808*10^4$ mm^4
W	=	$716*10^3$ mm³

Houteigenschappen

Sterkteklasse K	=	C24
Buigsterkte $f_{m,0,k}$	=	24 N/mm²
Schuifsterkte $f_{v,k}$	=	4,00 N/mm²
E-modulus BGT $E_{0,mean}$	=	11000 N/mm²
Klimaatklasse KK	=	1
Belastingduurklasse BK	=	Blijvend
Modificatiefactor k_{mod}	=	0,60
Kruipfactor k_{def}	=	0,60
Hoogtefactor k_h =		1,00

Belastingen

Permanent q_G:	2,80 kN/m
Veranderlijk q_Q:	1,60 kN/m
ψ_2 =	0,30

Krachtwerking

$$M_{y,Ed} = \frac{1}{8}*(1{,}2*q_G + 1{,}5*q_Q)*l^2 = 7{,}84 \text{ kNm}$$

$$V_{Ed} = \frac{1}{2}*(1{,}2*q_G + 1{,}5*q_Q)*l = 9{,}50 \text{ kN}$$

Toeting buiging

$$\sigma_{m,d} = \frac{M_{y,Ed}*10^6}{W} = 10{,}9 \text{ N/mm}^2$$

$$f_{m,o,d} = f_{m,0,k}*\frac{k_{mod}}{1{,}3}*k_h = 24*\frac{0{,}60}{1{,}3}*1{,}00 = 11{,}1 \text{ N/mm}^2$$

$$\frac{\sigma_{m,d}}{f_{m,o,d}} = \frac{10{,}9}{11{,}1} = 0{,}98 \leq 1{,}00$$

Toetsing afschuiving

$$\sigma_{v,d} = \frac{3}{2} * \frac{V_{Ed} * 10^3}{b * h} = 0{,}82 \text{ N/mm}^2$$

$$f_{v,d} = f_{v,k} * \frac{k_{mod}}{1{,}3} = 1{,}85 \text{ N/mm}^2$$

$$\frac{\sigma_{v,d}}{f_{v,d}} = \frac{0{,}82}{1{,}85} = 0{,}44 \leq 1{,}00$$

Controle doorbuiging

$$l = l * 10^3 = 3300 \text{ mm}$$

$$w_1 = 0{,}004 * l = 13{,}2 \text{ mm}$$

$$w_2 = 0{,}003 * l = 9{,}9 \text{ mm}$$

$$w_{inst,G} = \frac{5}{384} * \frac{q_G * l^4}{E_{0,mean} * I_y} = 4{,}5 \text{ mm}$$

$$w_{fin,G} = w_{inst,G} * (1 + k_{def}) = 7{,}2 \text{ mm}$$

$$w_{inst,Q} = \frac{5}{384} * \frac{q_Q * l^4}{E_{0,mean} * I_y} = 2{,}6 \text{ mm}$$

$$w_{fin,Q} = w_{inst,Q} * (1 + \psi_2 * k_{def}) = 3{,}1 \text{ mm}$$

$$w_{fin} = w_{fin,G} + w_{fin,Q} = 10{,}3 \text{ mm} < w_1$$

$$w_{fin} - w_{inst,G} = 5{,}8 \text{ mm} < w_2$$