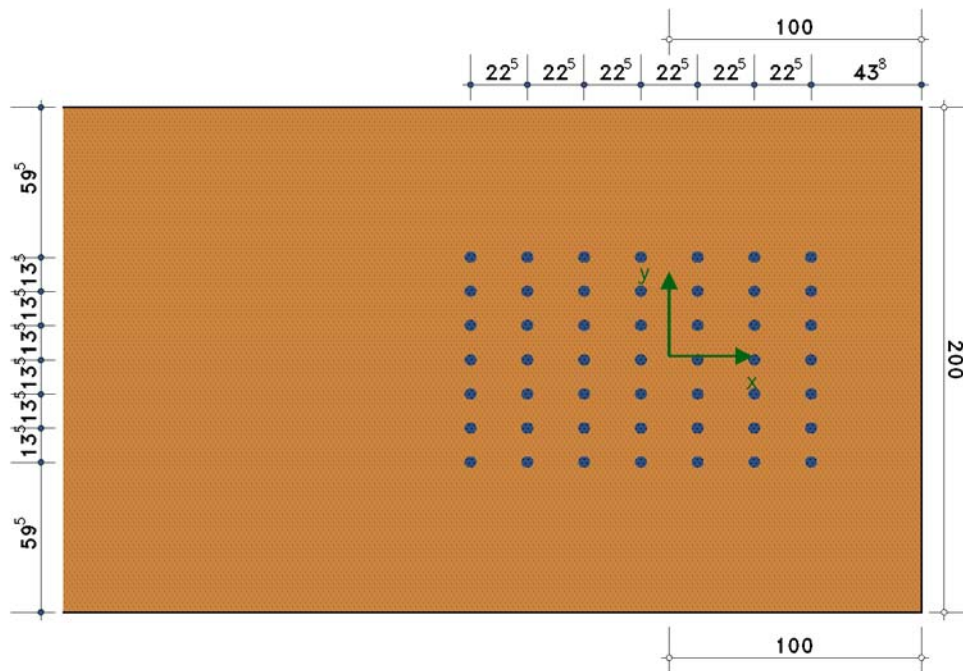


7. Ansicht Mittenholz



8. Ergebnisse nur maßgebende Lastfallkombination

8.1. Ergebnisse Verbindungsmittel

8.2. Verbindungsmittel

8.2.1. Last

$N_d = -30.000 \text{ kN}$, $V_d = 0.000 \text{ kN}$, $M_{v,d} = 0.000 \text{ kNm}$

Nr	F_{M1} kN	F_{MH1} kN	F_{MV1} kN	F_{totH1} kN	F_{totV1} kN	F_{tot1} kN	α_{tot1} °	$F_{v,Rd}$ kN	$U_{n,ef}$ -	$U_{F,v}$ -
1	0.000	0.000	-0.000	-0.612	0.000	0.612	180.0	1.6895	0.84	0.36
2	0.000	0.000	-0.000	-0.612	0.000	0.612	180.0	1.6895	0.84	0.36
3	0.000	0.000	-0.000	-0.612	0.000	0.612	180.0	1.6895	0.84	0.36
4	0.000	0.000	-0.000	-0.612	0.000	0.612	180.0	1.6895	0.84	0.36
5	0.000	-0.000	-0.000	-0.612	0.000	0.612	180.0	1.6895	0.84	0.36
6	0.000	-0.000	-0.000	-0.612	0.000	0.612	180.0	1.6895	0.84	0.36
7	0.000	-0.000	-0.000	-0.612	0.000	0.612	180.0	1.6895	0.84	0.36
8	0.000	0.000	-0.000	-0.612	0.000	0.612	180.0	1.6895	0.84	0.36
9	0.000	0.000	-0.000	-0.612	0.000	0.612	180.0	1.6895	0.84	0.36
10	0.000	0.000	-0.000	-0.612	0.000	0.612	180.0	1.6895	0.84	0.36
11	0.000	0.000	-0.000	-0.612	0.000	0.612	180.0	1.6895	0.84	0.36
12	0.000	-0.000	-0.000	-0.612	0.000	0.612	180.0	1.6895	0.84	0.36
13	0.000	-0.000	-0.000	-0.612	0.000	0.612	180.0	1.6895	0.84	0.36
14	0.000	-0.000	-0.000	-0.612	0.000	0.612	180.0	1.6895	0.84	0.36
15	0.000	0.000	-0.000	-0.612	0.000	0.612	180.0	1.6895	0.84	0.36
16	0.000	0.000	-0.000	-0.612	0.000	0.612	180.0	1.6895	0.84	0.36
17	0.000	0.000	-0.000	-0.612	0.000	0.612	180.0	1.6895	0.84	0.36
18	0.000	0.000	-0.000	-0.612	0.000	0.612	180.0	1.6895	0.84	0.36
19	0.000	-0.000	-0.000	-0.612	0.000	0.612	180.0	1.6895	0.84	0.36
20	0.000	-0.000	-0.000	-0.612	0.000	0.612	180.0	1.6895	0.84	0.36
21	0.000	-0.000	-0.000	-0.612	0.000	0.612	180.0	1.6895	0.84	0.36
22	0.000	0.000	0.000	-0.612	0.000	0.612	180.0	1.6895	0.84	0.36
23	0.000	0.000	0.000	-0.612	0.000	0.612	180.0	1.6895	0.84	0.36
24	0.000	0.000	0.000	-0.612	0.000	0.612	180.0	1.6895	0.84	0.36
25	0.000	0.000	0.000	-0.612	0.000	0.612	180.0	1.6895	0.84	0.36
26	0.000	-0.000	0.000	-0.612	0.000	0.612	180.0	1.6895	0.84	0.36
27	0.000	-0.000	0.000	-0.612	0.000	0.612	180.0	1.6895	0.84	0.36
28	0.000	-0.000	0.000	-0.612	0.000	0.612	180.0	1.6895	0.84	0.36
29	0.000	0.000	0.000	-0.612	0.000	0.612	180.0	1.6895	0.84	0.36
30	0.000	0.000	0.000	-0.612	0.000	0.612	180.0	1.6895	0.84	0.36
31	0.000	0.000	0.000	-0.612	0.000	0.612	180.0	1.6895	0.84	0.36
32	0.000	0.000	0.000	-0.612	0.000	0.612	180.0	1.6895	0.84	0.36
33	0.000	-0.000	0.000	-0.612	0.000	0.612	180.0	1.6895	0.84	0.36
34	0.000	-0.000	0.000	-0.612	0.000	0.612	180.0	1.6895	0.84	0.36
35	0.000	-0.000	0.000	-0.612	0.000	0.612	180.0	1.6895	0.84	0.36

Nr	F _{M1} kN	F _{MH1} kN	F _{MV1} kN	F _{totH1} kN	F _{totV1} kN	F _{tot1} kN	α _{tot1} °	F _{v,Rd} kN	U _{n,ef} -	U _{F,v} -
36	0.000	0.000	0.000	-0.612	0.000	0.612	180.0	1.6895	0.84	0.36
37	0.000	0.000	0.000	-0.612	0.000	0.612	180.0	1.6895	0.84	0.36
38	0.000	0.000	0.000	-0.612	0.000	0.612	180.0	1.6895	0.84	0.36
39	0.000	0.000	0.000	-0.612	0.000	0.612	180.0	1.6895	0.84	0.36
40	0.000	-0.000	0.000	-0.612	0.000	0.612	180.0	1.6895	0.84	0.36
41	0.000	-0.000	0.000	-0.612	0.000	0.612	180.0	1.6895	0.84	0.36
42	0.000	-0.000	0.000	-0.612	0.000	0.612	180.0	1.6895	0.84	0.36
43	0.000	0.000	0.000	-0.612	0.000	0.612	180.0	1.6895	0.84	0.36
44	0.000	0.000	0.000	-0.612	0.000	0.612	180.0	1.6895	0.84	0.36
45	0.000	0.000	0.000	-0.612	0.000	0.612	180.0	1.6895	0.84	0.36
46	0.000	0.000	0.000	-0.612	0.000	0.612	180.0	1.6895	0.84	0.36
47	0.000	-0.000	0.000	-0.612	0.000	0.612	180.0	1.6895	0.84	0.36
48	0.000	-0.000	0.000	-0.612	0.000	0.612	180.0	1.6895	0.84	0.36
49	0.000	-0.000	0.000	-0.612	0.000	0.612	180.0	1.6895	0.84	0.36

Maximale Ausnutzung der Verbindungsmittel $U_{\max} = 0.84 \leq 1 \Rightarrow$ **Nachweis erfüllt**

8.3. Ergebnisse Stäbe

8.3.1. Seitenholz mit $A_n = 1400 \text{ mm}^2$, $W_n = 32667 \text{ mm}^3$, $I_n = 2286667 \text{ mm}^4$, $k_h = 0.000$

Last	f _{y,d} N/mm ²	f _{v,d} N/mm ²	N _d kN	M _d kNm	σ _{y,d} N/mm ²	V _d kN	τ _{v,d} N/mm ²	σ _{sv,d} N/mm ²	U _{σsv} -	U _σ -	U _τ -
1	235.00	135.68	30.000	0.000	21.43	0.000	0.00	21.43	0.09	0.09	0.00

Maximale Ausnutzung des Stabes $U_{\max} = 0.09 \leq 1 \Rightarrow$ **Nachweis erfüllt**

8.3.2. Mittenholz mit $A_n = 36850 \text{ mm}^2$, $W_n = 1310317 \text{ mm}^3$, $I_n = 131031668 \text{ mm}^4$, $k_h = 1.000$

Last	f _{m,d} N/mm ²	f _{t,d} N/mm ²	f _{c,d} N/mm ²	f _{v,d} N/mm ²	N _d kN	M _d kNm	σ _{0,d} N/mm ²	σ _{mo,d} N/mm ²	σ _{mu,d} N/mm ²	V _d kN	τ _d N/mm ²	U _σ -	U _τ -
1	9.85	5.23	10.46	1.97	30.000	0.000	0.81	0.00	0.00	0.000	0.00	0.16	0.00

Maximale Ausnutzung des Stabes $U_{\max} = 0.16 \leq 1 \Rightarrow$ **Nachweis erfüllt**

8.4. Lochleibungskräfte

$p_1 = 23 \text{ mm}$, $e_1 = 30 \text{ mm}$, $e_2 = 30 \text{ mm}$, $p_2 = 13.50 \text{ mm}$, $\alpha_b = 1.00$, $k_1 = 1.74 \Rightarrow F_{b,Rk} = 14.06 \text{ kN}$
 $e_1 = 30 \text{ mm}$, $e_2 = 30 \text{ mm}$, $p_2 = 14 \text{ mm}$, $\alpha_b = 1.00$, $k_1 = 1.74 \Rightarrow F_{b,Rk,Rand} = 14.06 \text{ kN}$

8.4.1. Last

Nr	F _{tot1} kN	F _{v,Rd} kN	U	Nr	F _{tot1} kN	F _{v,Rd} kN	U	Nr	F _{tot1} kN	F _{v,Rd} kN	U
1	0.31	11.25	0.03	18	0.31	11.25	0.03	35	0.31	11.25	0.03
2	0.31	11.25	0.03	19	0.31	11.25	0.03	36	0.31	11.25	0.03
3	0.31	11.25	0.03	20	0.31	11.25	0.03	37	0.31	11.25	0.03
4	0.31	11.25	0.03	21	0.31	11.25	0.03	38	0.31	11.25	0.03
5	0.31	11.25	0.03	22	0.31	11.25	0.03	39	0.31	11.25	0.03
6	0.31	11.25	0.03	23	0.31	11.25	0.03	40	0.31	11.25	0.03
7	0.31	11.25	0.03	24	0.31	11.25	0.03	41	0.31	11.25	0.03
8	0.31	11.25	0.03	25	0.31	11.25	0.03	42	0.31	11.25	0.03
9	0.31	11.25	0.03	26	0.31	11.25	0.03	43	0.31	11.25	0.03
10	0.31	11.25	0.03	27	0.31	11.25	0.03	44	0.31	11.25	0.03
11	0.31	11.25	0.03	28	0.31	11.25	0.03	45	0.31	11.25	0.03
12	0.31	11.25	0.03	29	0.31	11.25	0.03	46	0.31	11.25	0.03
13	0.31	11.25	0.03	30	0.31	11.25	0.03	47	0.31	11.25	0.03
14	0.31	11.25	0.03	31	0.31	11.25	0.03	48	0.31	11.25	0.03
15	0.31	11.25	0.03	32	0.31	11.25	0.03	49	0.31	11.25	0.03
16	0.31	11.25	0.03	33	0.31	11.25	0.03				
17	0.31	11.25	0.03	34	0.31	11.25	0.03				

Maximale Ausnutzung der Lochleibungskräfte $U_{\max} = 0.03 \leq 1 \Rightarrow$ **Nachweis erfüllt**

8.5. Nachweis Blockscherversagen gemäß DIN EN 1995-1-1, Anhang A

$L_{net,t} = 81 \text{ mm}$, $t_1 = 25 \text{ mm} \Rightarrow A_{net,t} = 2025 \text{ mm}^2$, $M_{y,k} = 4500.0 \text{ Nmm}$
 $L_{net,v} = 358 \text{ mm}$, $t_{ef} = 25 \text{ mm} \Rightarrow A_{net,v} = 8938 \text{ mm}^2$ (Versagensmechanismus c,f,j/l,k,m)
 $L_{net,v} = 358 \text{ mm} \Rightarrow A_{net,v} = 8938 \text{ mm}^2 \Rightarrow F_{bs,Rk} = 25.82 \text{ kN}$

8.5.1. Last

Last	N _d kN	F _{bs,Rd} kN	U _{bs} -
1	15.000	15.888	0.94

Maximale Ausnutzung Blockscherversagen $U_{\max} = 0.94 \leq 1 \Rightarrow$ **Nachweis erfüllt**