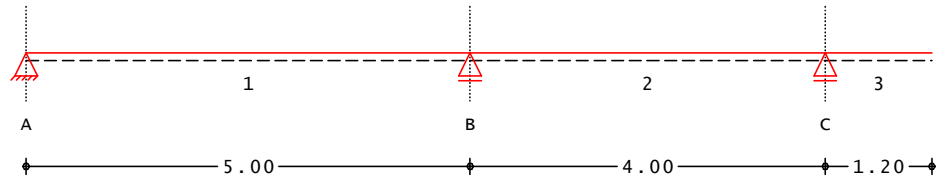


Pos. B305 Holz-Durchlaufträger, DIN 1052 (08/04)
System Holz-Zweifeldträger mit Kragarm

M 1:85


 Abmessungen /
Nutzungsklassen

Feld	L [m]	$l_{\text{eff,m}}$ [m]	NKL
1	5.00	5.00	NKL 1
2	4.00	4.00	NKL 1
3	1.20	2.40	NKL 3

Auflager

Aufl.	x [m]	b [cm]	Transl. [kN/m]	Rotation [kNm/°]
A	0.00	25.00	starr	frei
B	5.00	25.00	starr	frei
C	9.00	25.00	starr	frei

 Material
Querschnitt

 Nadelholz Festigkeitsklasse C24
 $b/h = 12/34$ cm

Einwirkungen

 ständig
NutzA
Schnee

 ständige Einwirkung
 Nutzlast, Kategorie A
 Schnee-/Eislast ≤ 1000 m fw

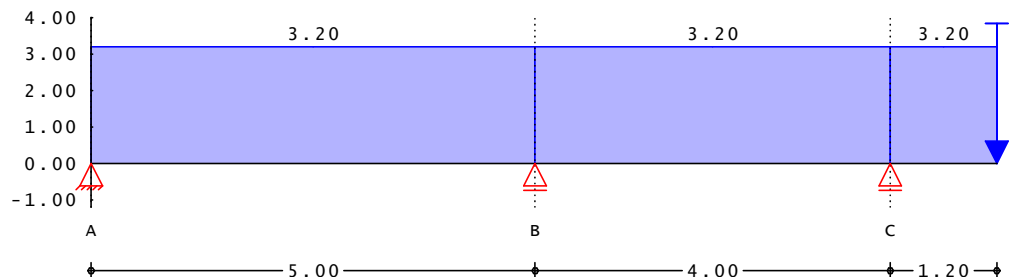
Erläuterungen

 feldweise (fw)
 Die Lasten der Einwirkung werden als feldweise wirkend aufgeteilt.

Belastung

Einw. ständig

M 1:85



Eigengewicht

 $0.12\text{m} * 0.34\text{m} * 5.00\text{kN/m}^3 = 0.204$ kN/m

Einzellasten

Nr.	Feld	a [m]	F [kN]
1	3	1.20	2.56

zu Zeile 1

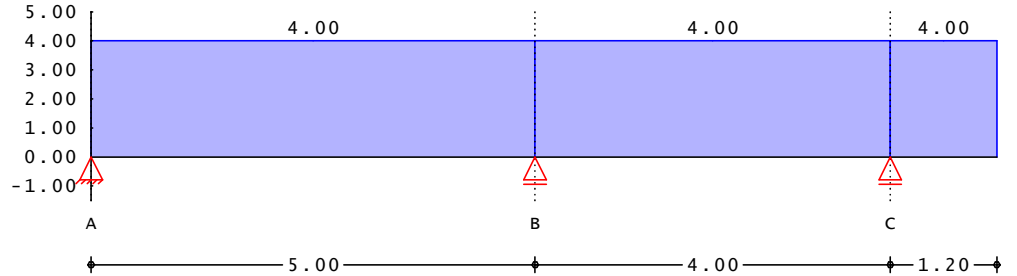
 EG Stütze $1.6 * 0.4 * 4 = 2.560$

Gleichlasten

Nr	F _{anf} [m]	F _{end} [m]	s [m]	q [kN/m]		
1	1	0.00	3	1.20	10.20	3.00

Einw. Nutza

M 1:85

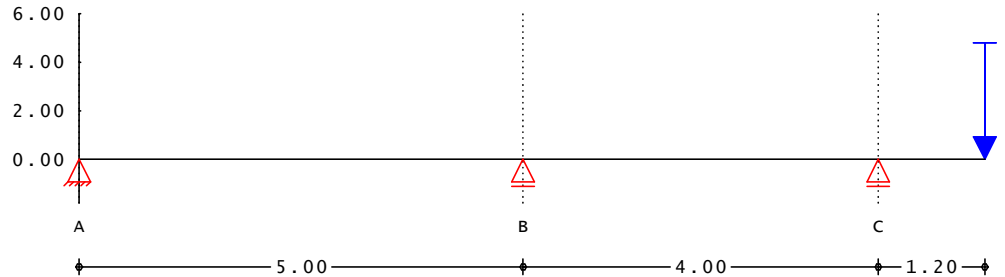


Gleichlasten

Nr	F _{anf} [m]	F _{end} [m]	s [m]	q [kN/m]		
1	1	0.00	3	1.20	10.20	4.00

Einw. Schnee

M 1:85



Einzellasten

Nr.	Feld	a [m]	F [kN]
1	3	1.20	4.80

zu zeile 1

Schneelast stütze

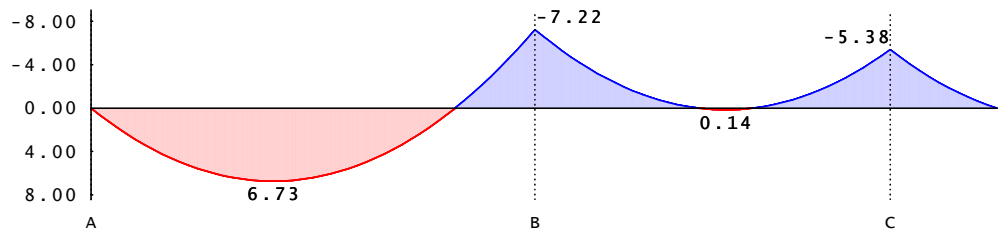
$$1.6 \cdot 0.75 \cdot 4 =$$

4.800

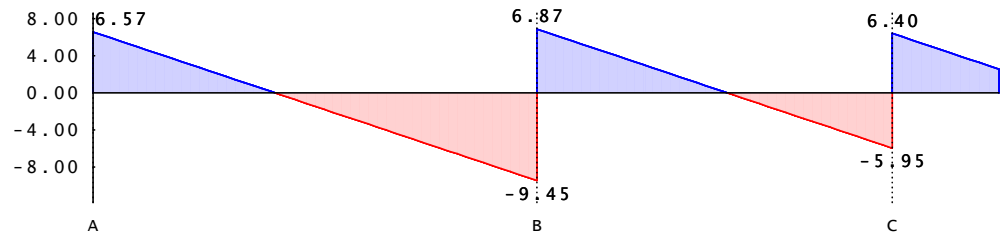
char. Schnittgrößen

Einw. ständig

M 1:85

 charakteristische Momenten-Linie M_k [kNm]


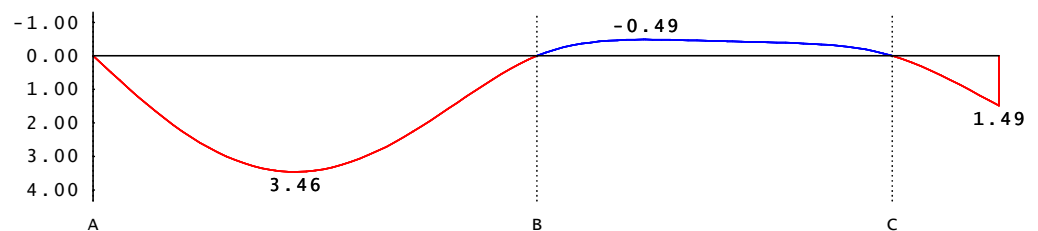
M 1:85

 charakteristische Querkraft-Linie V_k [kN]


Schnittgrößen

Feld	x [m]	min M_k [kNm]	max M_k [kNm]	min V_k [kN]	max V_k [kN]
1	0.00	0.00	0.00	6.57	6.57*
	1.00	4.96	4.96	3.36	3.36
	2.00	6.73	6.73	0.16	0.16
	2.05	6.73	6.73*	0.00	0.00
	2.27	6.65	6.65	-0.71	-0.71
	3.00	5.28	5.28	-3.05	-3.05
	5.00	0.64	0.64	-6.25	-6.25
		-7.22*	-7.22	-9.45*	-9.45
2	0.00	-7.22*	-7.22	6.87	6.87*
	0.80	-2.75	-2.75	4.30	4.30
	1.22	-1.22	-1.22	2.96	2.96
	1.60	-0.33	-0.33	1.74	1.74
	2.14	0.14	0.14*	0.00	0.00
	2.40	0.04	0.04	-0.82	-0.82
	4.00	-1.65	-1.65	-3.39	-3.39
		-5.38	-5.38	-5.95*	-5.95
3	0.00	-5.38*	-5.38	6.40	6.40*
	0.24	-3.93	-3.93	5.64	5.64
	0.48	-2.67	-2.67	4.87	4.87
	0.72	-1.60	-1.60	4.10	4.10
	0.96	-0.71	-0.71	3.33	3.33
	1.20	0.00	0.00	2.56	2.56

M 1:85

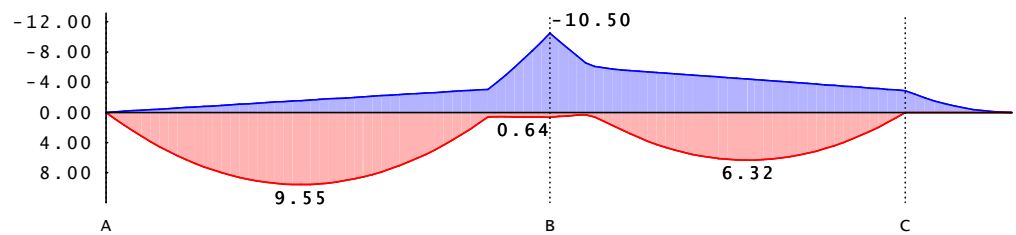
 verformungslinie w_k [mm]


Auflagerkräfte

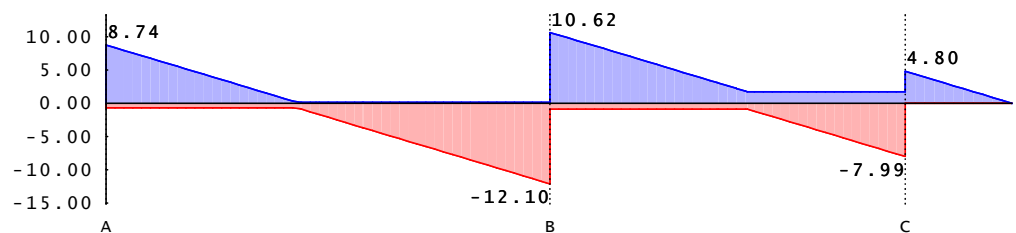
Achse	x [m]	min M_k [kNm]	max M_k [kNm]	min F_k [kN]	max F_k [kN]
A	0.00			6.57	6.57
B	5.00			16.32	16.32
C	9.00			12.35	12.35

Einw. Nutza

M 1:85

 charakteristische Momenten-Linie M_k [kNm]


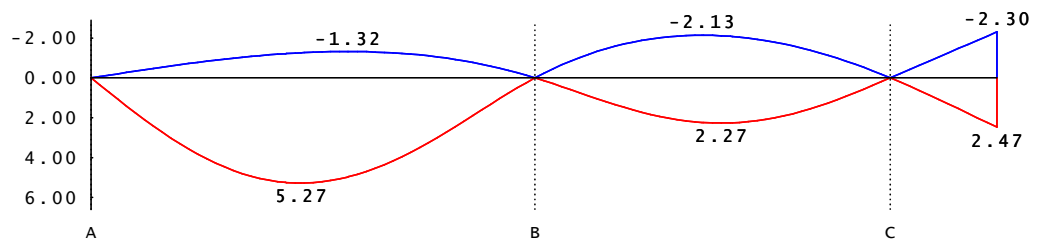
M 1:85

 charakteristische Querkraft-Linie V_k [kN]


Schnittgrößen

Feld	x [m]	min M_k [kNm]	max M_k [kNm]	min V_k [kN]	max V_k [kN]
1	0.00	0.00	0.00	-0.71	8.74*
	1.00	-0.71	6.74	-0.71	4.74
	2.00	-1.42	9.48	-0.71	0.74
	2.18	-1.55	9.55*	-0.84	0.13
	2.36	-1.68	9.48	-1.54	0.13
	2.89	-2.05	8.56	-3.65	0.13
	3.00	-2.13	8.22	-4.10	0.13
	4.00	-2.84	2.96	-8.10	0.13
	5.00	-10.50*	0.64	-12.10*	0.13
2	0.00	-10.50*	0.64	-0.88	10.62*
	0.80	-5.62	2.28	-0.88	7.43
	1.60	-4.93	5.55	-0.88	4.23
	1.88	-4.70	6.08	-0.88	3.12
	2.09	-4.51	6.29	-0.88	2.25
	2.22	-4.40	6.32*	-0.88	1.74
	2.40	-4.25	6.26	-1.59	1.74
	3.20	-3.56	4.41	-4.79	1.74
	4.00	-2.88	0.00	-7.99*	1.74
3	0.00	-2.88*	0.00	0.00	4.80*
	0.24	-1.84	0.00	0.00	3.84
	0.48	-1.04	0.00	0.00	2.88
	0.72	-0.46	0.00	0.00	1.92
	0.96	-0.12	0.00	0.00	0.96
	1.20	0.00	0.00	0.00	0.00

M 1:85

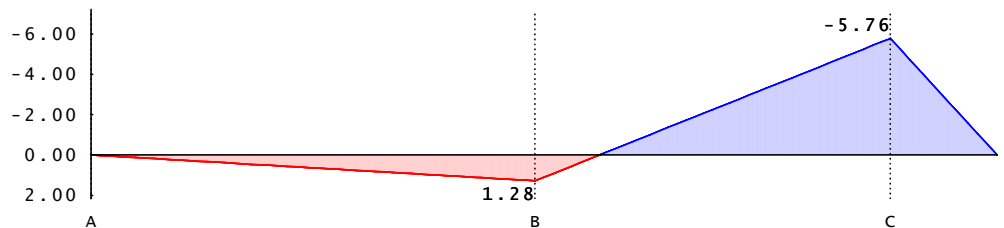
 Verformungslinie w_k [mm]


Auflagerkräfte

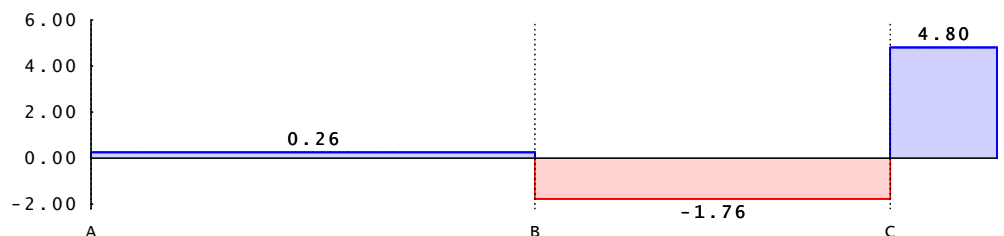
Achse	x [m]	min M_k [kNm]	max M_k [kNm]	min F_k [kN]	max F_k [kN]
A	0.00			-0.71	8.74
B	5.00			-1.01	22.73
C	9.00			-1.74	12.79

Einw. Schnee

M 1:85

 charakteristische Momenten-Linie M_k [kNm]


M 1:85

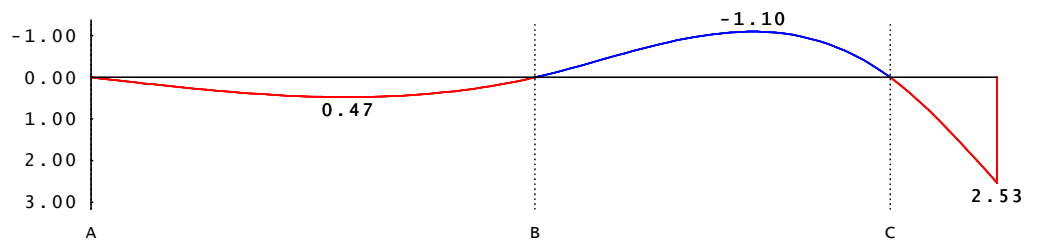
 charakteristische Querkraft-Linie V_k [kN]


Schnittgrößen

Feld	x [m]	min M_k [kNm]	max M_k [kNm]	min V_k [kN]	max V_k [kN]
1	0.00	0.00	0.00	0.26	0.26
	1.00	0.26	0.26	0.26	0.26
	2.00	0.51	0.51	0.26	0.26
	2.89	0.74	0.74	0.26	0.26
	3.00	0.77	0.77	0.26	0.26
	4.00	1.02	1.02	0.26	0.26
	5.00	1.28	1.28	0.26	0.26*
	5.00	1.28	1.28*	0.26	0.26
2	0.00	1.28	1.28*	-1.76	-1.76
	0.80	-0.13	-0.13	-1.76	-1.76
	1.60	-1.54	-1.54	-1.76	-1.76
	2.40	-2.94	-2.94	-1.76	-1.76
	2.45	-3.02	-3.02	-1.76	-1.76
	3.20	-4.35	-4.35	-1.76	-1.76
	4.00	-5.76	-5.76	-1.76*	-1.76
	4.00	-5.76*	-5.76	-1.76	-1.76

Feld	x [m]	min M_k [kNm]	max M_k [kNm]	min V_k [kN]	max V_k [kN]
3	0.00	-5.76*	-5.76	4.80	4.80
	0.24	-4.61	-4.61	4.80	4.80
	0.48	-3.46	-3.46	4.80	4.80
	0.72	-2.30	-2.30	4.80	4.80
	0.96	-1.15	-1.15	4.80	4.80
	1.20	-0.00	-0.00	4.80	4.80*
	1.20	0.00	0.00	4.80	4.80

M 1:85

 Verformungslinie w_k [mm]


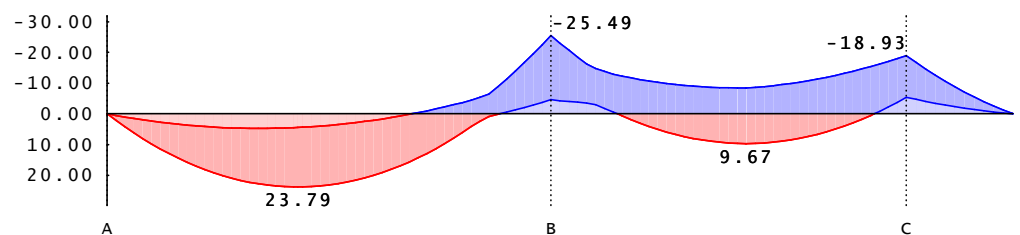
Auflagerkräfte

Achse	x [m]	min M_k [kNm]	max M_k [kNm]	min F_k [kN]	max F_k [kN]
A	0.00			0.26	0.26
B	5.00			-2.02	-2.02
C	9.00			6.56	6.56

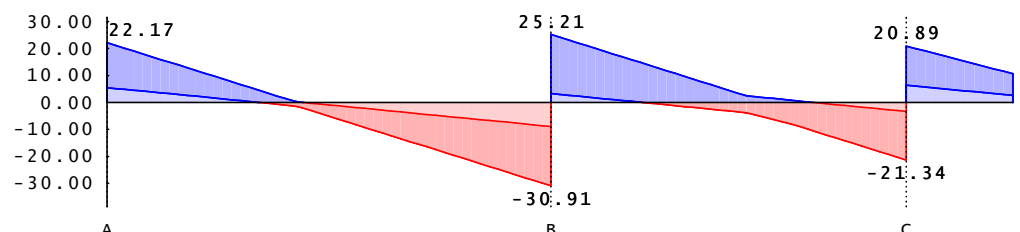
Kombinationen
ständige und vorübergehende Bemessungssituation

Ek			
2	+1.35*ständig	+1.50*Nutza	
4	+1.35*ständig	+1.50*Nutza	+0.75*Schnee
5	+1.35*ständig	+1.05*Nutza	+1.50*Schnee
7	+1.00*ständig	+1.50*Nutza	
9	+1.00*ständig	+1.50*Nutza	+0.75*Schnee
10	+1.00*ständig	+1.05*Nutza	+1.50*Schnee

M 1:85

 Momenten-Linie M_d [kNm]


M 1:85

 Querkraft-Linie V_d [kN]


Schnittgrößen

x [m]	Ek	min M _d [kNm]	Ek	max M _d [kNm]	Ek	min V _d [kN]	Ek	max V _d [kN]
Feld 1								
0.00	-	0.00	-	0.00	7	5.50	4	22.17*
1.00	7	3.90	4	17.00	7	2.30	4	11.84
2.00	7	4.59	4	23.68	7	-0.91	4	1.52
2.15	7	4.42	4	23.79*	2	-1.49	10	0.23
3.00	7	2.08	4	20.03	2	-10.26	10	-2.53
4.00	7	-3.63	4	6.06	2	-20.59	10	-5.73
5.00	2	-25.49*10	-	-4.62	2	-30.91*10	-	-8.93
Feld 2								
0.00	2	-25.49*10	-	-4.62	10	3.30	2	25.21*
0.80	4	-12.23	7	0.67	10	0.74	2	16.95
1.60	4	-9.00	7	7.99	10	-1.82	2	8.69
2.19	9	-8.43	2	9.67*	5	-3.76	7	2.66
2.40	10	-8.84	2	9.44	5	-5.42	7	1.78
3.20	5	-12.49	7	4.97	4	-13.08	7	-0.78
4.00	5	-18.93	7	-5.38	4	-21.34*	7	-3.34
Feld 3								
0.00	5	-18.93*	7	-5.38	7	6.40	5	20.89*
0.24	5	-14.16	7	-3.93	7	5.64	5	18.84
0.48	5	-9.88	7	-2.67	7	4.87	5	16.79
0.72	5	-6.10	7	-1.60	7	4.10	5	14.75
0.96	5	-2.80	7	-0.71	7	3.33	5	12.70
1.20	-	0.00	-	0.00	7	2.56	5	10.66

Auflagerkräfte

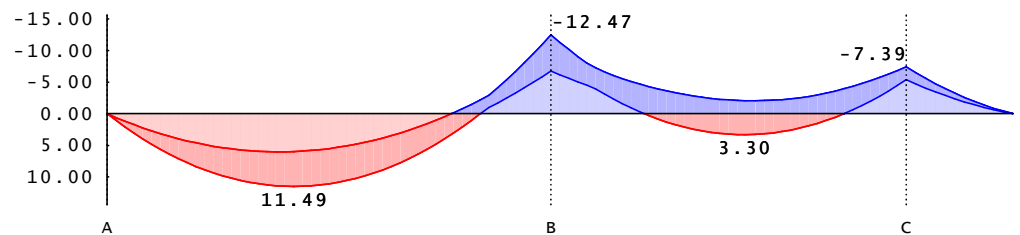
	x [m]	Ek	min M _d [kNm]	Ek	max M _d [kNm]	Ek	min F _d [kN]	Ek	max F _d [kN]
A	0.00	-	-	-	-	7	5.50	4	22.17
B	5.00	-	-	-	-	10	12.24	2	56.12
C	9.00	-	-	-	-	7	9.75	4	40.78

außergewöhnliche Bemessungssituation Brandfall
Ek

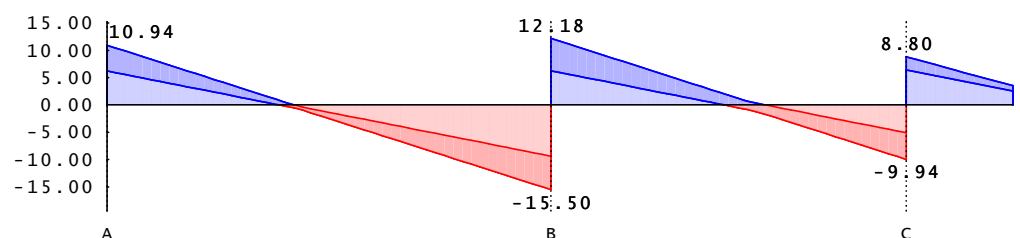
12	+1.00*ständig	+0.50*Nutza	
14	+1.00*ständig	+0.30*Nutza	+0.20*Schnee

Momenten-Linie M_d [kNm]

M 1:85


Querkraft-Linie V_d [kN]

M 1:85



Schnittgrößen

x [m]	Ek	min M _d [kNm]	Ek	max M _d [kNm]	Ek	min V _d [kN]	Ek	max V _d [kN]
Feld 1								
0.00	-	0.00	-	0.00	12	6.21	12	10.94*
1.00	12	4.61	12	8.33	12	3.01	12	5.73
2.00	12	6.01	12	11.47	12	-0.20	12	0.53
2.10	12	5.98	12	11.49*	12	-0.52	-	0.00
3.00	12	4.22	12	9.39	12	-5.10	14	-2.96
4.00	12	-0.79	12	2.11	12	-10.30	14	-6.16
5.00	12	-12.47*14	-6.77	12	-15.50*14	-9.36		
Feld 2								
0.00	12	-12.47*14	-6.77	14	6.25	12	12.18*	
0.80	12	-5.56	12	-1.61	14	3.69	12	8.02
1.60	12	-2.80	12	2.44	14	1.12	12	3.85
2.17	12	-2.08	12	3.30*14	-0.71	12	0.87	
2.40	12	-2.09	12	3.17	14	-1.65	12	0.05
3.20	14	-3.58	12	0.56	12	-5.78	12	-2.52
4.00	14	-7.39	12	-5.38	12	-9.94*12	-5.08	
Feld 3								
0.00	14	-7.39*12	-5.38	12	6.40	14	8.80*	
0.24	14	-5.41	12	-3.93	12	5.64	14	7.75
0.48	14	-3.68	12	-2.67	12	4.87	14	6.69
0.72	14	-2.20	12	-1.60	12	4.10	14	5.63
0.96	14	-0.97	12	-0.71	12	3.33	14	4.58
1.20	-	0.00	-	0.00	12	2.56	14	3.52

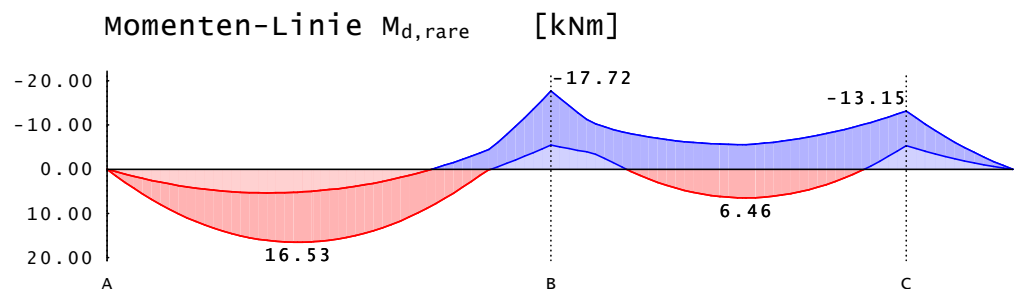
Auflagerkräfte

	x [m]	Ek	min M _d [kNm]	Ek	max M _d [kNm]	Ek	min F _d [kN]	Ek	max F _d [kN]
A	0.00					12	6.21	12	10.94
B	5.00					14	15.61	12	27.68
C	9.00					12	11.49	12	18.75

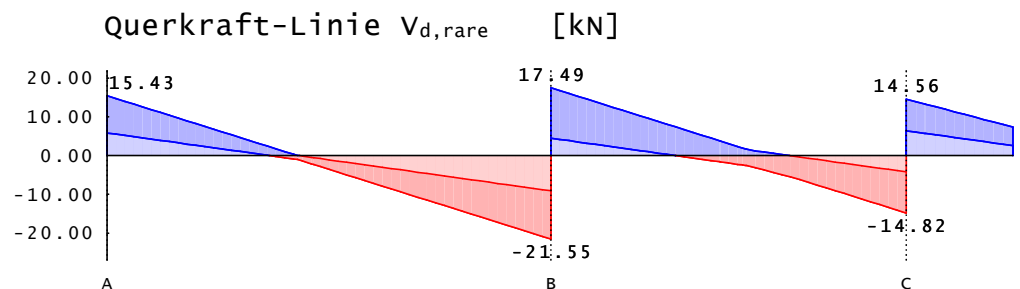
seltene Bemessungssituation

Ek			
16	+1.00*ständig	+1.00*Nutza	
18	+1.00*ständig	+1.00*Nutza	+0.50*Schnee
19	+1.00*ständig	+0.70*Nutza	+1.00*Schnee

M 1:85



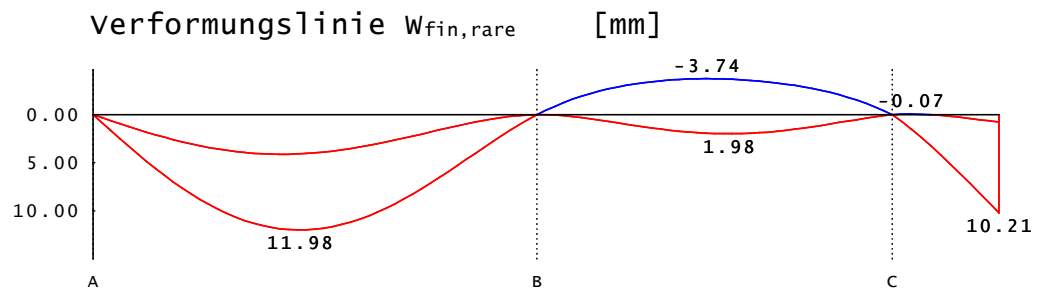
M 1:85



Schnittgrößen

x [m]	Ek	min M _d [kNm]	Ek	max M _d [kNm]	Ek	min V _d [kN]	Ek	max V _d [kN]
Feld 1								
0.00	-	0.00	-	0.00	16	5.86	18	15.43*
1.00	16	4.25	18	11.83	16	2.65	18	8.23
2.00	16	5.30	18	16.46	16	-0.55	18	1.03
2.14	16	5.19	18	16.53*	16	-1.01	19	0.08
2.33	16	4.95	18	16.41	16	-2.28	19	-0.54
3.00	16	3.15	18	13.88	16	-7.15	19	-2.70
4.00	16	-2.21	18	4.10	16	-14.35	19	-5.90
5.00	16	-17.72*	19	-5.49	16	-21.55*	19	-9.11
Feld 2								
0.00	16	-17.72*	19	-5.49	19	4.49	16	17.49*
0.80	18	-8.43	16	-0.47	19	1.93	16	11.73
1.60	18	-6.03	16	5.22	19	-0.64	16	5.97
1.91	18	-5.65	16	6.18	19	-1.63	16	3.73
2.16	18	-5.57	16	6.46	19	-2.42	16	1.96
2.19	18	-5.58	16	6.46*	19	-2.52	16	1.74
2.40	19	-5.88	16	6.30	19	-3.70	16	0.91
3.20	19	-8.49	16	2.76	18	-9.06	16	-1.65
4.00	19	-13.15	16	-5.38	18	-14.82*	16	-4.21
Feld 3								
0.00	19	-13.15*	16	-5.38	16	6.40	19	14.56*
0.21	19	-10.25	16	-4.11	16	5.74	19	13.31
0.24	19	-9.83	16	-3.93	16	5.64	19	13.12
0.48	19	-6.86	16	-2.67	16	4.87	19	11.68
0.72	19	-4.22	16	-1.60	16	4.10	19	10.24
0.96	19	-1.94	16	-0.71	16	3.33	19	8.80
1.20	-	0.00	-	0.00	16	2.56	19	7.36

M 1:85

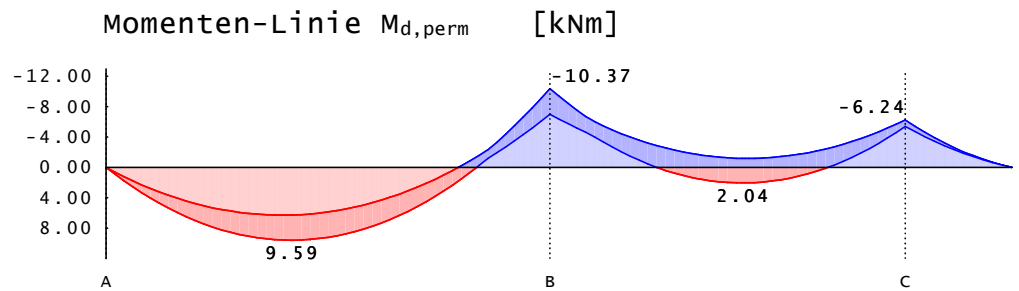

Auflagerkräfte

	x [m]	Ek	min M _d [kNm]	Ek	max M _d [kNm]	Ek	min F _d [kN]	Ek	max F _d [kN]
A	0.00					16	5.86	18	15.43
B	5.00					19	13.60	16	39.05
C	9.00					16	10.62	18	28.42

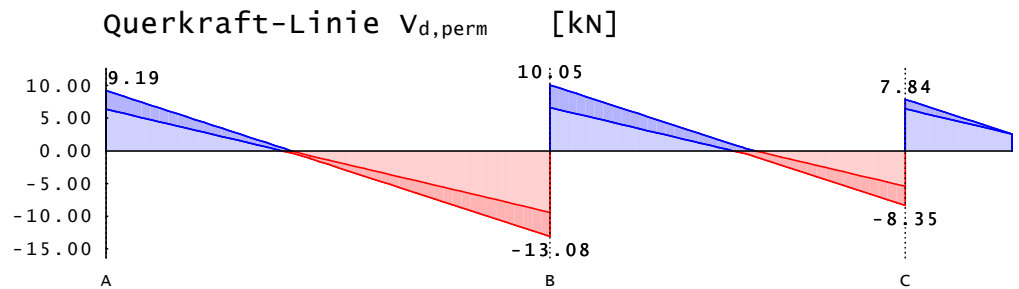
quasi-ständige Bemessungssituation

Ek	
21	+1.00*ständig +0.30*Nutza

M 1:85



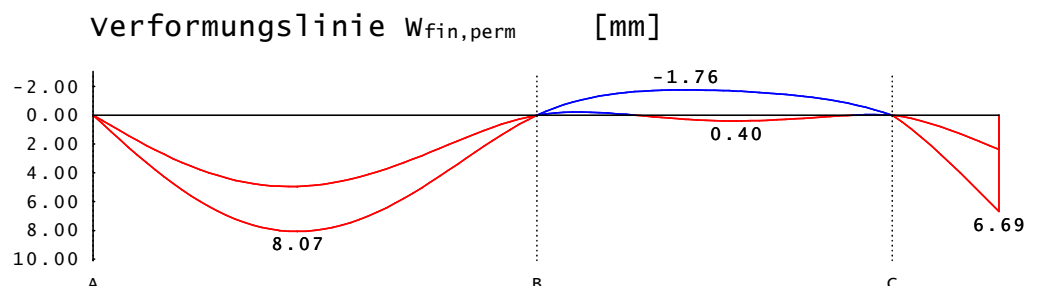
M 1:85



Schnittgrößen

x [m]	Ek	min M_d [kNm]	Ek	max M_d [kNm]	Ek	min V_d [kN]	Ek	max V_d [kN]
Feld 1								
0.00	-	0.00	-	0.00	21	6.35	21	9.19*
1.00	21	4.75	21	6.99	21	3.15	21	4.78
2.00	21	6.30	21	9.57	21	-0.05	21	0.38
2.09	21	6.28	21	9.59*	21	-0.33	-	0.00
2.30	21	6.14	21	9.49	21	-1.18	21	-0.76
3.00	21	4.64	21	7.75	21	-4.28	21	-3.01
4.00	21	-0.22	21	1.52	21	-8.68	21	-6.21
5.00	21	-10.37*	21	-7.02	21	-13.08*	21	-9.41
Feld 2								
0.00	21	-10.37*	21	-7.02	21	6.60	21	10.05*
0.80	21	-4.43	21	-2.06	21	4.04	21	6.53
1.60	21	-1.81	21	1.34	21	1.48	21	3.01
1.67	21	-1.68	21	1.50	21	1.25	21	2.70
2.16	21	-1.19	21	2.04*	21	-0.33	21	0.52
2.24	21	-1.19	21	2.03	21	-0.59	21	0.21
2.40	21	-1.24	21	1.92	21	-1.30	21	-0.30
3.20	21	-2.71	21	-0.32	21	-4.82	21	-2.86
4.00	21	-6.24	21	-5.38	21	-8.35*	21	-5.43
Feld 3								
0.00	21	-6.24*	21	-5.38	21	6.40	21	7.84*
0.24	21	-4.49	21	-3.93	21	5.64	21	6.79
0.48	21	-2.98	21	-2.67	21	4.87	21	5.73
0.72	21	-1.74	21	-1.60	21	4.10	21	4.67
0.96	21	-0.74	21	-0.71	21	3.33	21	3.62
1.20	-	0.00	-	0.00	21	2.56	21	2.56

M 1:85



Auflagerkräfte

	x [m]	Ek	minM _d [kNm]	Ek	maxM _d [kNm]	Ek	minF _d [kN]	Ek	maxF _d [kN]
A	0.00					21	6.35	21	9.19
B	5.00					21	16.02	21	23.14
C	9.00					21	11.83	21	16.19

Nachweise

Material

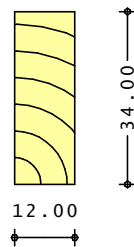
Material	f _{m,k}	f _{t0k}	f _{c0k}	f _{c90k}	f _{vk}	G _{mean}	E _{0mean}
Holz				[N/mm ²]			
C24	24.0	14.0	21.0	2.5	2.0	690	11000

Grenzzustand der Tragfähigkeit

Querschnitt

b [cm]	h [cm]	A [cm ²]	I _y [cm ⁴]	I _z [cm ⁴]
12.0	34.0	408.0	39304	4896

M 1:15



Biegebemessung DIN 1052, Gl.(55), Gl.(67)

F	Ek	k _{mod} [-]	x [m]	M _{yd} [kNm]	σ _{myd} [N/mm ²]	f _{myd} [N/mm ²]	η [-]
1	(L = 5.00 m, km = 1.00, l _{eff,m} = 5.00 m)						
	2	0.80	0.00	0.00	0.00	14.77	0.00
	2	0.80	1.00	16.81	7.27	14.77	0.49
	2	0.80	2.00	23.30	10.08	14.77	0.68
	2	0.80	2.13	23.38	10.11	14.77	0.68
	2	0.80	3.00	19.46	8.42	14.77	0.57
	4	0.90	4.00	6.06	2.62	16.62	0.16
	2	0.80	5.00	-25.49	11.03	14.77	0.75*
2	(L = 4.00 m, km = 1.00, l _{eff,m} = 4.00 m)						
	2	0.80	0.00	-25.49	11.03	14.77	0.75*
	2	0.80	0.80	-12.14	5.25	14.77	0.36
	4	0.90	1.60	-9.00	3.89	16.62	0.23
	2	0.80	2.40	9.44	4.08	14.77	0.28
	5	0.90	3.20	-12.49	5.40	16.62	0.33
	5	0.90	4.00	-18.92	8.18	16.62	0.49
	5	0.90	4.00	-18.93	8.19	16.62	0.49
3	(L = 1.20 m, km = 1.00, l _{eff,m} = 2.40 m)						
	5	0.70	0.00	-18.93	8.19	12.92	0.63*
	5	0.70	0.00	-18.91	8.18	12.92	0.63
	5	0.70	0.24	-14.16	6.12	12.92	0.47
	5	0.70	0.48	-9.88	4.27	12.92	0.33
	5	0.70	0.72	-6.10	2.64	12.92	0.20
	5	0.70	0.96	-2.80	1.21	12.92	0.09
	3	0.70	1.20	-0.00	0.00	12.92	0.00

Der Einfluss der Stabilität ist im Nachweis der Biegefestigkeit enthalten. Die dabei berücksich-

tigte, effektive Feldlänge ist für jedes Feld ausgewiesen.

Querkraftbemessung
DIN 1052, Gl.(59)

F	Ek	k_{mod} [-]	x [m]	V_{zd} [kN]	τ_{zd} [N/mm ²]	f_{vd} [N/mm ²]	η [-]
1	2	0.80	0.42	17.60	0.65	1.23	0.53
	2	0.80	1.00	11.65	0.43	1.23	0.35
	4	0.90	2.00	1.52	0.06	1.38	0.04
	2	0.80	3.00	-10.26	0.38	1.23	0.31
	2	0.80	4.00	-20.59	0.76	1.23	0.61
	2	0.80	4.54	-26.11	0.96	1.23	0.78*
2	2	0.80	0.46	20.41	0.75	1.23	0.61*
	2	0.80	0.80	16.95	0.62	1.23	0.51
	2	0.80	1.60	8.69	0.32	1.23	0.26
	5	0.90	2.40	-5.42	0.20	1.38	0.14
	2	0.80	3.20	-11.76	0.43	1.23	0.35
	2	0.80	3.58	-15.65	0.58	1.23	0.47
3	5	0.70	0.46	16.92	0.62	1.08	0.58*
	5	0.70	0.48	16.79	0.62	1.08	0.57
	5	0.70	0.72	14.75	0.54	1.08	0.50
	5	0.70	0.96	12.70	0.47	1.08	0.43
	5	0.70	1.20	10.66	0.39	1.08	0.36

Auflagerpressung
DIN 1052, Gl(47)

	Ek	k_{mod} [-]	F_d [kN]	A_{ef} [cm ²]	k_{c90} [-]	σ_{c90d} [N/mm ²]	f_{c90d} [N/mm ²]	η [-]
A	2	0.80	21.97	336.0	1.00	0.65	1.54	0.43
B	2	0.80	56.12	372.0	1.00	1.51	1.54	0.98
C	4	0.90	40.78	372.0	1.00	1.10	1.73	0.63

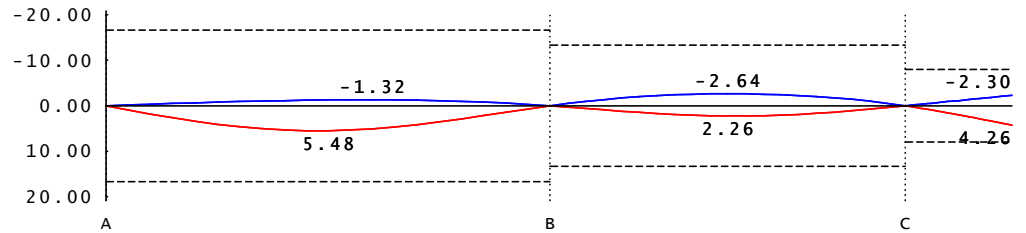
Grenzzustand der Gebrauchstauglichkeit

max. Verformungen
DIN 1052, 9.2

	Ek	x [m]	vorhw [mm]	zulw [mm]	η [-]
Feld 1 (L=5.00 m, NKL 1, kdef=0.60)					
Gl(40)	18	2.38	5.5	16.7	0.33
Gl(41)	18	2.35	8.5	25.0	0.34
Gl(42)	21	2.30	8.1	25.0	0.32
DIN 1052, 9.3	21	2.30	5.0	6.0	0.84
Feld 2 (L=4.00 m, NKL 1, kdef=0.60)					
Gl(40)	18	2.00	-2.6	13.3	0.20
Gl(41)	18	1.96	-3.3	20.0	0.16
Gl(42)	21	1.67	-1.8	20.0	0.09
DIN 1052, 9.3	21	1.67	-1.1	6.0	0.18
Feld 3 (L=1.20 m, NKL 3, kdef=2.00)					
Gl(40)	19	1.20	4.3	8.0	0.53
Gl(41)	19	1.20	8.7	12.0	0.73
Gl(42)	21	1.20	6.7	12.0	0.56
DIN 1052, 9.3	21	1.20	2.2	6.0	0.37

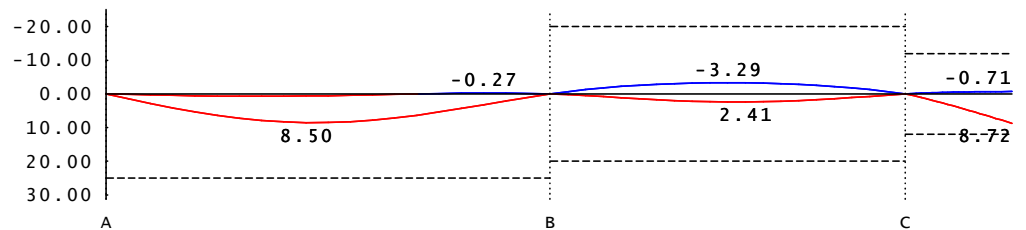
elastische Durchbiegung [mm] (Gleichung 40: $w_{Q,inst}$)

M 1:85



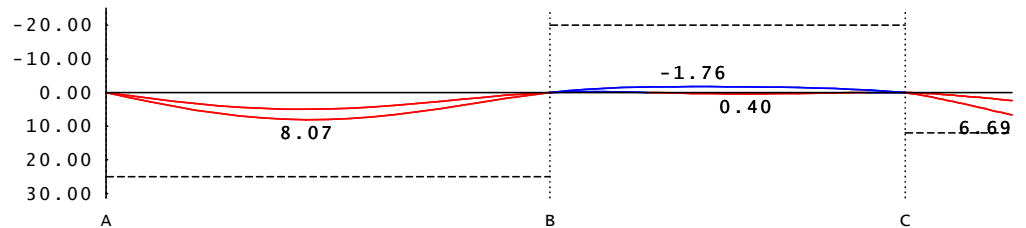
Enddurchbiegung [mm] (Gleichung 41: $w_{fin} - w_{G,inst}$)

M 1:85



Durchhang [mm] (Gleichung 42: $w_{fin} - w_0$)

M 1:85



Nachweise für den Brandfall (DIN 4102-4, 22)

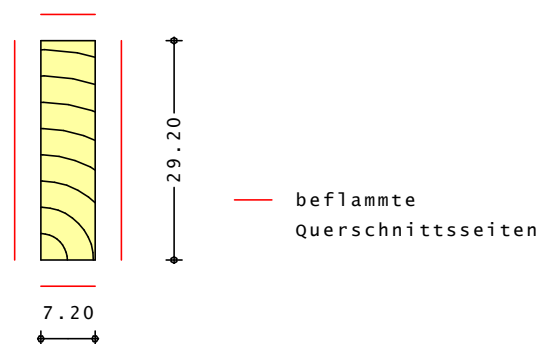
Querschnitt

befl. Seite	β_n	t_f [min]	b [cm]	h [cm]	A_r [cm ²]	u_r [cm ²]	I_y [cm ⁴]
1/r/o/u	0.8	30	7.2	29.2	210.2	72.8	14938.3

Material

Holz	k_{fi}	$f_{m,d,fi}$ [N/mm ²]	$f_{vd,fi}$ [N/mm ²]	$G_{d,fi}$ [N/mm ²]	$E_{d,fi}$ [N/mm ²]
C24	1.25	25.4	2.1	343	8213

M 1:10



Biegebemessung
DIN 1052, Gl.(55),
Gl.(67)

F	E_k	$k_{mod,fi}$ [-]	x [m]	$M_{yd,fi}$ [kNm]	$\sigma_{yd,fi}$ [N/mm ²]	$f_{myd,fi}$ [N/mm ²]	η_{fi} [-]
1	(L = 5.00 m,	$k_{mod} = 0.69,$	$l_{eff,m} = 5.00$ m)				

F	Ek	$k_{mod,fi}$ [-]	x [m]	$M_{yd,fi}$ [kNm]	$\sigma_{myd,fi}$ [N/mm ²]	$f_{myd,fi}$ [N/mm ²]	η_{fi} [-]
12		0.85	0.00	0.00	0.00	25.38	0.00
12		0.85	1.00	8.33	8.15	25.38	0.47
12		0.85	2.00	11.47	11.21	25.38	0.64
12		0.85	2.10	11.49	11.23	25.38	0.64
12		0.85	3.00	9.39	9.18	25.38	0.53
12		0.85	4.00	2.11	2.07	25.38	0.12
12		0.85	5.00	-12.47	12.18	25.38	0.70*
2 (L = 4.00 m, $k_m = 0.78$, $l_{eff,m} = 4.00$ m)							
12		0.85	0.00	-12.47	12.18	25.38	0.62*
12		0.85	0.80	-5.56	5.43	25.38	0.27
12		0.85	1.60	-2.80	2.73	25.38	0.14
12		0.85	2.40	3.17	3.10	25.38	0.16
14		0.85	3.20	-3.58	3.50	25.38	0.18
14		0.85	4.00	-7.39	7.23	25.38	0.37
14		0.85	4.00	-7.39	7.23	25.38	0.37
3 (L = 1.20 m, $k_m = 0.96$, $l_{eff,m} = 2.40$ m)							
14		0.85	0.00	-7.39	7.23	25.38	0.30*
14		0.85	0.00	-7.39	7.22	25.38	0.30
14		0.85	0.24	-5.41	5.29	25.38	0.22
14		0.85	0.48	-3.68	3.59	25.38	0.15
14		0.85	0.72	-2.20	2.15	25.38	0.09
14		0.85	0.96	-0.97	0.95	25.38	0.04
13		0.85	1.20	-0.00	0.00	25.38	0.00

Der Einfluss der Stabilität ist im Nachweis der Biegefestigkeit enthalten. Die dabei berücksichtigte, effektive Feldlänge ist für jedes Feld ausgewiesen.

Querkraftbemessung
DIN 1052, Gl.(59)

F	Ek	$k_{mod,fi}$ [-]	x [m]	$V_{zd,fi}$ [kN]	$\tau_{zd,fi}$ [N/mm ²]	$f_{vd,fi}$ [N/mm ²]	η_{fi} [-]
1	12	0.90	0.42	8.73	0.62	2.12	0.29
	12	0.90	1.00	5.73	0.41	2.12	0.19
	12	0.90	2.00	0.53	0.04	2.12	0.02
	12	0.90	3.00	-5.10	0.36	2.12	0.17
	12	0.90	4.00	-10.30	0.73	2.12	0.35
	12	0.90	4.54	-13.08	0.93	2.12	0.44*
2	12	0.90	0.46	9.76	0.70	2.12	0.33*
	12	0.90	0.80	8.02	0.57	2.12	0.27
	12	0.90	1.60	3.85	0.27	2.12	0.13
	14	0.90	2.40	-1.65	0.12	2.12	0.06
	12	0.90	3.20	-5.78	0.41	2.12	0.20
	12	0.90	3.58	-7.74	0.55	2.12	0.26
3	14	0.90	0.46	6.76	0.48	2.12	0.23*
	14	0.90	0.48	6.69	0.48	2.12	0.23
	14	0.90	0.72	5.63	0.40	2.12	0.19
	14	0.90	0.96	4.58	0.33	2.12	0.15
	14	0.90	1.20	3.52	0.25	2.12	0.12