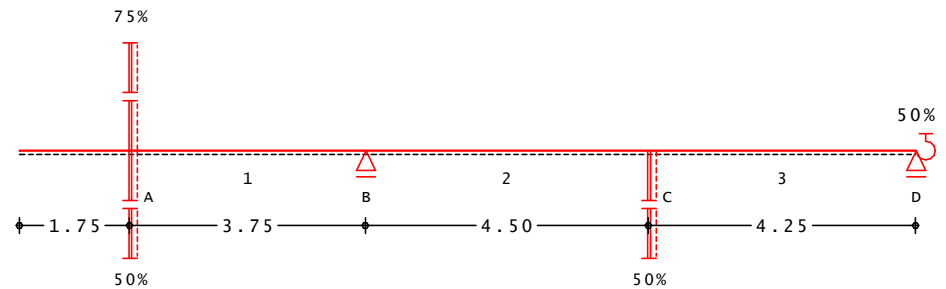
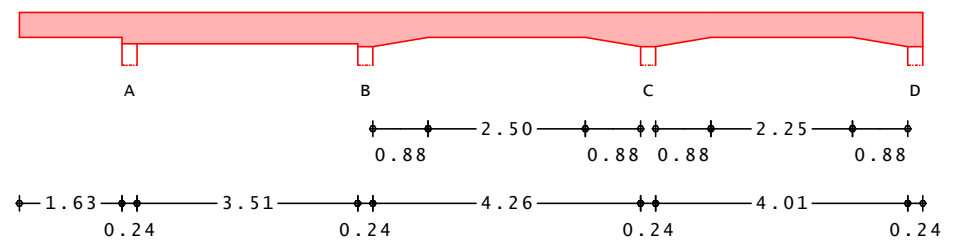


**Pos. B304 Stb.-Balken mit Vouten**

Belastung wie B300

**System**  
 M 1:120


M 1:120



Stützweiten

Feld	l [m]	I/Ic [-]
Kragarm li.	1.75	
1	3.75	0.02000
2	4.50	0.01024
3	4.25	0.01024

Vouten

Feld	I1/Ic	al [m]	I1/Ic	I2/Ic	ar [m]	Ir/Ic
2	0.02662	1.00	0.01024	0.01024	1.00	0.02662
3	0.02662	1.00	0.01024	0.01024	1.00	0.02662

Auflager

A	biegesteif	Länge =	24.00	cm
B	Mauerwerk	Länge =	24.00	cm
C	biegesteif	Länge =	24.00	cm
D	Mauerwerk	Länge =	24.00	cm

Endeinspannung

rechts = 50 %      Ersatzstablänge = 4.25 m

Auflagerstäbe

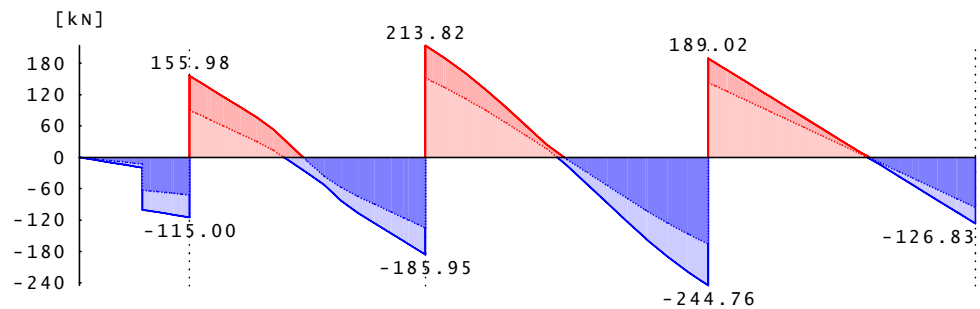
Aufl.	h [m]	E [%]	I/Ic [-]
A oben	3.75	75.00	1.00000
A unten	3.75	50.00	1.00000
C unten	3.75	50.00	1.00000

**Schnittgrößen**

## nach Elastizitäts-Theorie

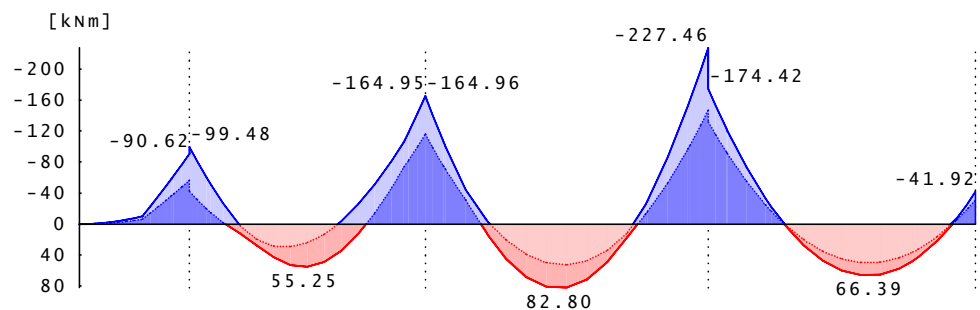
Querkraft

M 1:120



Moment

M 1:120



Stützkräfte [kN]

Aufl.	ständig	q max	q min	Vollast
A	177.18	270.98	162.42	256.21
B	286.98	399.78	286.60	399.40
C	312.65	433.78	308.60	429.73
D	95.93	126.83	95.68	126.57

Kragarm links

x [m]	Q max [kN]	Q min [kN]	M max [kNm]	M min [kNm]
0.00	0.00	0.00	0.00	0.00
1.75	-71.88	-115.00	-56.64	-90.62

Feld 1

x [m]	Q max [kN]	Q min [kN]	M max [kNm]	M min [kNm]
0.00	155.98	90.54	-42.22	-99.48
0.78 o				0.00
1.50 *				29.41
1.81 *			55.25	
2.36 o				0.00
3.75	-134.94	-185.95	-116.21	-164.95

Feld 2

x [m]	Q max [kN]	Q min [kN]	M max [kNm]	M min [kNm]
0.00	213.82	151.66	-116.22	-164.96
1.03 o				0.00
2.11 *			82.80	
2.20 *				52.47
3.33 o				0.00
4.50	-165.50	-244.76	-147.16	-227.46

**Feld 3**

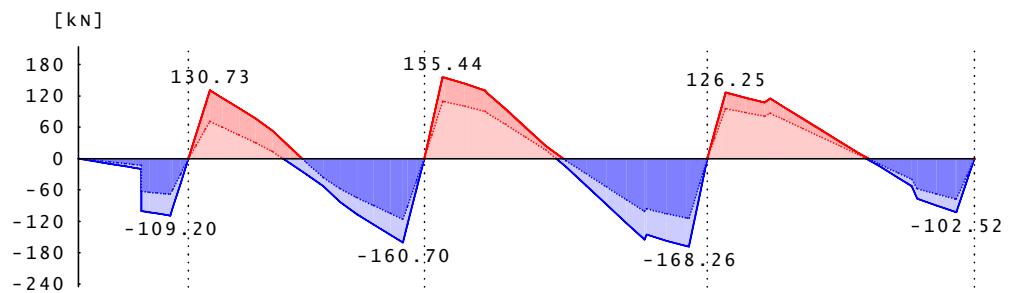
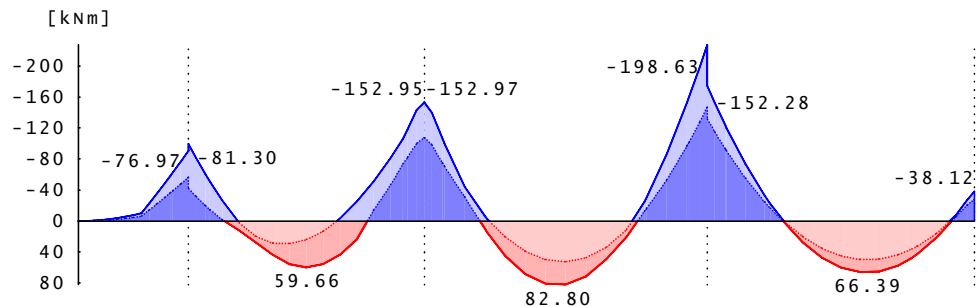
x [m]	Q max [kN]	Q min [kN]	M max [kNm]	M min [kNm]
0.00	189.02	143.11	-131.84	-174.42
1.22 o				0.00
2.54 *			66.39	49.96
3.88 o				0.00
4.25	-95.68	-126.83	-31.41	-41.92

**Stabmomente**

Aufl.	Mo max [kNm]	Mo min [kNm]	Mu max [kNm]	Mu min [kNm]
A	22.05	-24.93	23.15	-20.47
C			94.15	-25.80

**Bemessung  
Querkraft  
M 1:120**

Schnittgrößen gemäß DIN 1045, Ausgabe: Juli 1988


**Moment  
M 1:120**

**Material**
**Beton B 25**
**Betonstahl BSt 500 S**
**Vouten**

Feld	Seite	a [m]	b [cm]	d [cm]	b' [cm]	d' [cm]
2	links	1.00	24.0	55.0	24.0	40.0
2	rechts	1.00	24.0	55.0	24.0	40.0
3	links	1.00	24.0	55.0	24.0	40.0
3	rechts	1.00	24.0	55.0	24.0	40.0

**Abmessungen [cm]**

Feld	b0	d0	b1	br	bm	dP1	h'u/h'o/h'b
Krli	24.0	40.0					4.5/6.0/2.5
1	24.0	50.0					4.5/6.0/2.5
2	24.0	40.0					4.5/6.0/2.5
3	24.0	40.0					4.5/6.0/2.5

**Längsbewehrung  
Kragarm links**

x [m]	M max [kNm]	M min [kNm]	As u [cm <sup>2</sup> ]	As o [cm <sup>2</sup> ]
0.00	0.00	0.00	-	-
1.00	-6.25	-10.00	-	1.07
1.46	-36.32	-58.11	-	6.88
1.63 a	-48.10	-76.97	-	9.64
1.75	-56.64	-90.62	-	-

**Schubbewehrung  
Kragarm links**

x [m]	Q red  [kN]	tau0 [MN/m <sup>2</sup> ]	tau	Schub- bereich	as s [cm <sup>2</sup> /m]
0.00	0.00	0.00	0.00	1	-
1.00	20.00	0.26	0.10	1	0.86
1.00	100.00	1.28	0.91	2	7.66
1.46 *	109.20	1.54	1.31	2	11.04
1.63	45.19	0.67	0.27	1	2.25
1.75	-0.00	0.00	0.00	1	-

**Längsbewehrung  
Feld 1**

x [m]	M max [kNm]	M min [kNm]	As u [cm <sup>2</sup> ]	As o [cm <sup>2</sup> ]
0.00	-42.22	-99.48	-	-
0.12 a	-31.76	-81.30	-	7.25
0.34	-14.69	-50.75	-	4.43
1.87 *	59.66 §	-	5.06	-
3.41	-73.57	-106.01	-	9.82
3.63	-100.42	-143.17	-	14.20
3.75	-107.61	-152.95	-	15.43

§ = Mindestfeldmoment nach DIN 1045, 15.4.1.3

**Schubbewehrung  
Feld 1**

x [m]	Q red  [kN]	tau0 [MN/m <sup>2</sup> ]	tau	Schub- bereich	as s [cm <sup>2</sup> /m]
0.00	0.00	0.00	0.00	1	-
0.12	46.14	0.49	0.20	1	1.65
0.34 *	130.73	1.35	1.01	2	8.49
3.41 *	160.70	1.77	1.75	2	14.66
3.63	56.72	0.67	0.27	1	2.25
3.75	-0.00	0.00	0.00	1	-

**Längsbewehrung  
Feld 2**

x [m]	M max [kNm]	M min [kNm]	As u [cm <sup>2</sup> ]	As o [cm <sup>2</sup> ]
0.00	-107.62	-152.97	-	13.08
0.12	-98.43	-139.85	-	12.38
0.29	-74.67	-106.19	-	9.65
1.00	14.58	-2.86	1.52	0.30
2.11 *	82.80	-	9.83	-
3.50	-12.71	-25.01	-	2.80
4.21	-101.60	-159.72	-	15.94
4.38 a	-127.71	-198.63	1.48	18.79
4.50	-147.16	-227.46	-	-

**Schubbewehrung  
Feld 2**

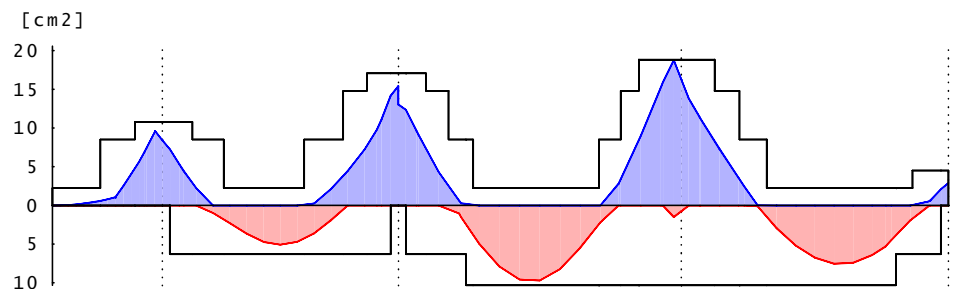
x [m]	Q red  [kN]	tau0 [MN/m <sup>2</sup> ]	tau	Schub- bereich	as s [cm <sup>2</sup> /m]
0.00	0.00	0.00	0.00	1	-
0.12	64.32	0.68	0.27	1	2.28
0.29 *	155.44	1.68	1.57	2	13.20
1.00	125.58	1.57	1.37	2	11.54
3.50 *	154.91	2.05	2.05	3	17.22
4.21	168.26	2.01	2.01	3	16.89
4.38	69.63	0.79	0.79	2	6.65
4.50	-0.00	0.00	0.00	1	-

**Längsbewehrung  
Feld 3**

x [m]	M max [kNm]	M min [kNm]	As u [cm <sup>2</sup> ]	As o [cm <sup>2</sup> ]
0.00	-131.84	-174.42	-	-
0.12 a	-115.07	-152.28	-	13.82
0.29	-92.71	-122.73	-	11.44
1.00	-16.86	-22.53	-	2.50
2.54 *	66.39		7.58	
3.25	47.78	36.14	5.27	-
3.96	-6.03	-8.27	-	0.66
4.13	-20.33	-27.24	-	2.13
4.25	-28.54	-38.12	-	2.91

**Schubbewehrung  
Feld 3**

x [m]	Q red  [kN]	tau0 [MN/m <sup>2</sup> ]	tau [MN/m <sup>2</sup> ]	Schub- bereich	as s [cm <sup>2</sup> /m]
0.00	0.00	0.00	0.00	1	-
0.12	52.24	0.56	0.22	1	1.88
0.29	126.25	1.40	1.09	2	9.16
1.00 *	114.76	1.51	1.27	2	10.67
3.25	52.58	0.68	0.27	1	2.30
3.96 *	102.52	0.98	0.54	2	4.52
4.13	42.42	0.40	0.16	1	1.33
4.25	-0.00	0.00	0.00	1	-

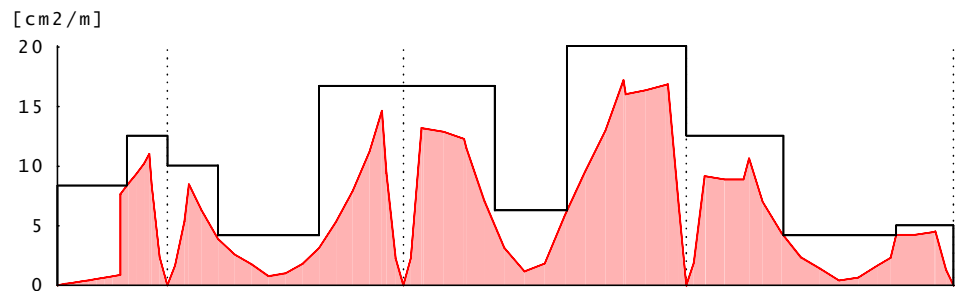
**Bewehrungswahl  
Längsbewehrung  
M 1:120**


durchgehende Bewehrung oben  $2 * 12$  ( 2.26 cm<sup>2</sup>)  
 $v_{li}/v_{re} = 95 / 74$  cm

Feld/ Aufl.	Typ	Anzahl	ds [mm]	As [cm <sup>2</sup> ]	a [m]	ls [m]	Lage
1	unten	2	20	6.28	0.00	3.75	1
2	unten	2	20	6.28	0.00	9.00	1
2	unten	2	16	4.02	0.44	8.11	1
A	oben	2	20	6.28	-2.57	5.14	1
A	oben	2	12	2.26	-1.39	2.82	2
B	oben	2	20	6.28	-3.08	5.86	1
B	oben	2	20	6.28	-2.46	4.85	2
B	oben	2	12	2.26	-1.45	2.84	2
C	oben	2	20	6.28	-2.90	5.84	1
C	oben	2	20	6.28	-2.55	5.06	2
C	oben	2	16	4.02	-1.94	3.74	2
D	oben	2	12	2.26	-1.53	2.26	1

Stabstahllängen sind incl. der Verankerungslängen

### Schubbewehrung M 1:120



Feld	Typ	Abst. [cm]	ds [mm]	as s [cm <sup>2</sup> /m]	aB [m]	lB [m]	Schn.
Krli	Bgl	12.0	8	8.38	0.00	1.10	2
Krli	Bgl	8.0	8	12.57	1.10	0.65	2
1	Bgl	10.0	8	10.05	0.00	0.80	2
1	Bgl	24.0	8	4.19	0.80	1.61	2
1	Bgl	6.0	8	16.76	2.41	1.34	2
2	Bgl	6.0	8	16.76	0.00	1.45	2
2	Bgl	16.0	8	6.28	1.45	1.15	2
2	Bgl	5.0	8	20.11	2.60	1.90	2
3	Bgl	8.0	8	12.57	0.00	1.55	2
3	Bgl	24.0	8	4.19	1.55	1.79	2
3	Bgl	20.0	8	5.03	3.34	0.91	2

### Auflagerpressung

Aufl.	vorh. [MN/m <sup>2</sup> ]	zul. gewählt
A	4.70	.....
B	6.94	.....
C	7.53	.....
D	2.20	2.40 Mw 20 / MG III

zul. Druckspannungen für Lager aus Mauerwerk nach  
DIN 1053(11.96), Tabelle 4, Abminderungsfaktor k=1