372011/0012
Montagebock flach Eigenbau 750kg

(ST) S/N:

Dipl.-Ing. (FH) Behrendt, BIS Rohrleitungsbau GmbH, 06749 Bitterfeld, Hallesche Straße 18

Statische Berechnung

Auftrag-Nr.:

Bauherr: BIS Rohrleitungsbau GmbH

Projekt:

Berechnung Montagehilfsbock KU120x5+L50x7

Angaben zur Erstellung und Revision

Index	Seiten	Bearbeitung	Datum	Name
0	12	Aufstellungsberechnung	17.12.10	Behrendt

BIS Rohrleitungsbau GmbH
Hallesche Straße 18, 06749 BITTERFELD
Tel: 03493/60099-469 - Fax: 03493/6099-481

Projekt: Montagegeraete	**Position:** Montagehilfsbock KU120x5+L50x7	Seite: 1 17.12.2010

INHALT

BASISANGABEN

BERECHNUNGSART

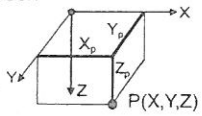
☒ Statik	☒ Theorie I. Ordnung
☐ Nachweis	☐ Theorie II. Ordnung
☐ Dynamik	☐ Seiltheorie
☒ Lastfälle	☒ Bemessungsfälle
☐ LF-Gruppen	☐ Dynamikfälle
☐ LF-Kombinationen	☐ Knickfiguren

STRUKTURKENNWERTE

☐ 1D-Durchlaufträger	16 Knoten	21 Stäbe
☐ 2D-Stabwerk	1 Materialien	0 Seilstäbe
☒ 3D-Stabwerk	3 Querschnitte	0 Voutenstäbe
☐ Trägerrost	0 Stabendgelenke	0 El. gebet. Stäbe
	0 Stabteilungen	0 Stabzüge

STRUKTUR

Kartesisch



KNOTEN

Knoten-Nr.	Koordinaten-system	Bezugs-Knoten	Knotenkoordinaten X [m]	Y [m]	Z [m]
1	Kartesisch	-	0.000	0.000	0.000
2	Kartesisch	-	0.140	0.000	0.000
3	Kartesisch	-	0.860	0.000	0.000
4	Kartesisch	-	1.000	0.000	0.000
5	Kartesisch	-	0.000	0.065	0.200
6	Kartesisch	-	0.000	-0.065	0.200
7	Kartesisch	-	1.000	0.065	0.200
8	Kartesisch	-	1.000	-0.065	0.200
9	Kartesisch	-	0.000	0.165	0.520
10	Kartesisch	-	0.000	-0.165	0.520
11	Kartesisch	-	1.000	0.165	0.520
12	Kartesisch	-	1.000	-0.165	0.520
13	Kartesisch Gelagert	-	0.000	0.250	0.780
14	Kartesisch Gelagert	-	0.000	-0.250	0.780
15	Kartesisch Gelagert	-	1.000	0.250	0.780
16	Kartesisch Gelagert	-	1.000	-0.250	0.780

MATERIALIEN

Mater.-Nr.	Material-Bezeichnung	E-Modul [kN/cm²]	Schubmodul [kN/cm²]	Sp. Gewicht [kN/cm³]	Wärmedehn. [1/°C]
1	S 235 JR G2	2.100E+04	8.100E+03	7.850E-05	1.200E-05

QUERSCHNITTE

Quer.-Nr.	Mater.-Nr.	Querschnittsbezeichnung Querschnittsdrehung	I_T A	I_2 A_2	I_3 [cm⁴] A_3 [cm²]
1	1	KU 120/60x5	0.90	235.00	38.50

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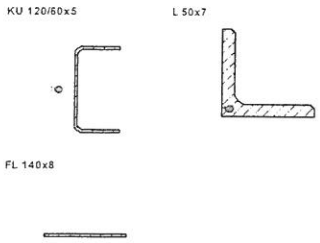
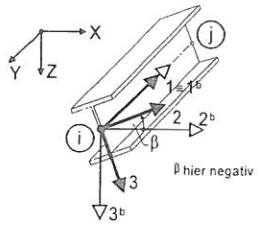


QUERSCHNITTE

Quer.-Nr.	Mater.-Nr.	Querschnittsbezeichnung Querschnittsdrehung	I_T A	I_2 A_2	I_3 [cm⁴] A_3 [cm²]
1			11.000	235.00	38.50
2	1	L 50x7 α = -45.00°	1.10 6.560	23.10	6.02
3	1	FL 140x8	2.30 11.200	0.60	182.93

Lokales Stabachsensystem



STÄBE

Stab-Nr.	Stab-typ	Knoten Anf.	Knoten Ende	Beta [°]	Querschnitt Anf.	Querschnitt Ende	Gelenk Anf.	Gelenk Ende	Teil.-Nr.	Länge [m]	Stab-lage
1	Balken	1	2	90.00	1	1	-	-	-	0.140	HORI
2	Balken	2	3	90.00	1	1	-	-	-	0.720	HORI
3	Balken	3	4	90.00	1	1	-	-	-	0.140	HORI
4	Balken	1	5	0.00	2	2	-	-	-	0.210	ALLG
5	Balken	1	6	270.00	2	2	-	-	-	0.210	ALLG
6	Balken	5	9	0.00	2	2	-	-	-	0.335	ALLG
7	Balken	6	10	270.00	2	2	-	-	-	0.335	ALLG
8	Balken	9	13	0.00	2	2	-	-	-	0.274	ALLG
9	Balken	10	14	270.00	2	2	-	-	-	0.274	ALLG
10	Balken	9	10	180.00	2	2	-	-	-	0.330	HORI
11	Balken	4	7	270.00	2	2	-	-	-	0.210	ALLG
12	Balken	4	8	0.00	2	2	-	-	-	0.210	ALLG
13	Balken	7	11	270.00	2	2	-	-	-	0.335	ALLG
14	Balken	8	12	0.00	2	2	-	-	-	0.335	ALLG
15	Balken	11	15	270.00	2	2	-	-	-	0.274	ALLG
16	Balken	12	16	0.00	2	2	-	-	-	0.274	ALLG
17	Balken	11	12	90.00	2	2	-	-	-	0.330	HORI
18	Balken	2	5	0.00	3	3	-	-	-	0.253	ALLG
19	Balken	2	6	0.00	3	3	-	-	-	0.253	ALLG
20	Balken	3	7	0.00	3	3	-	-	-	0.253	ALLG
21	Balken	3	8	0.00	3	3	-	-	-	0.253	ALLG

AUFLAGER

Lager-Nr.	Gelagerte Knoten	Drehung [°] Alpha	Drehung [°] Beta	Festes Auflager bzw. Feder [kN/m] [kNm/rad] in X	in Y	in Z	um X	um Y	um Z
1	13-16	0.0	0.0	Ja	Ja	Ja	Ja	Ja	Ja

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GRAFIK

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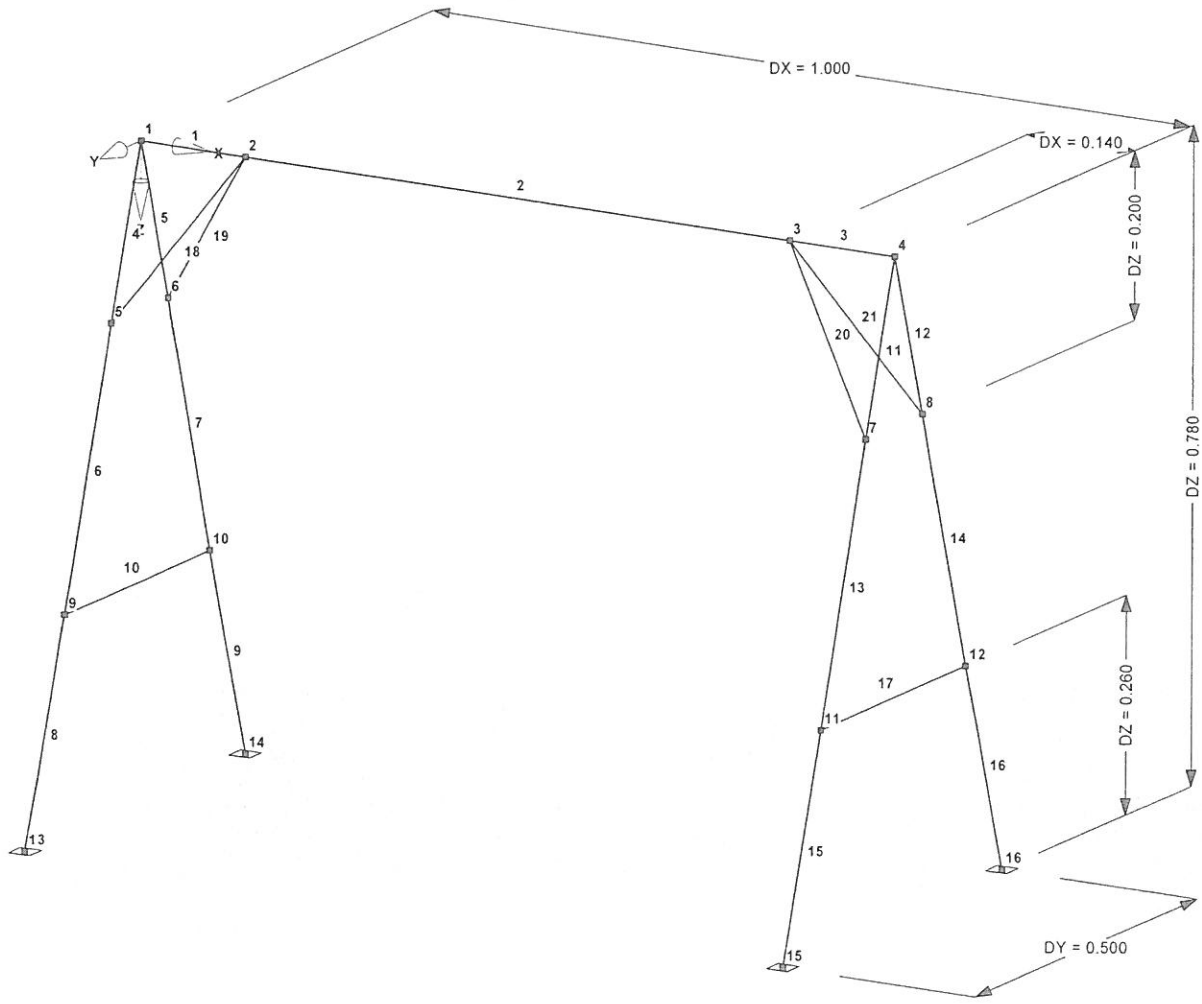
STRUKTUR

Knotennummerierung
Stabnummerierung

Isometrie

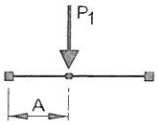


BELASTUNG

BASISANGABEN DER LASTFÄLLE

LF-Nr.	LF-Bezeichnung	Faktor	Überlagerungsart	Eigengewicht
1	Eigengewicht+Einzellast	1.00	Ständig	1.00

2 - Einzellast

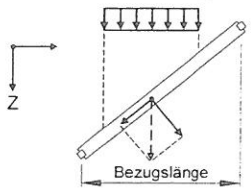


STABLASTEN

LF 1

Nr.	Belastete Stäbe	Last-art	Last-Richtung	Parameter [kN, kNm, m, °C, kN/m, kNm/m] P_1		A	
1	2	2	Z	7.500		0.360	

Z - Global in Z-Richtung



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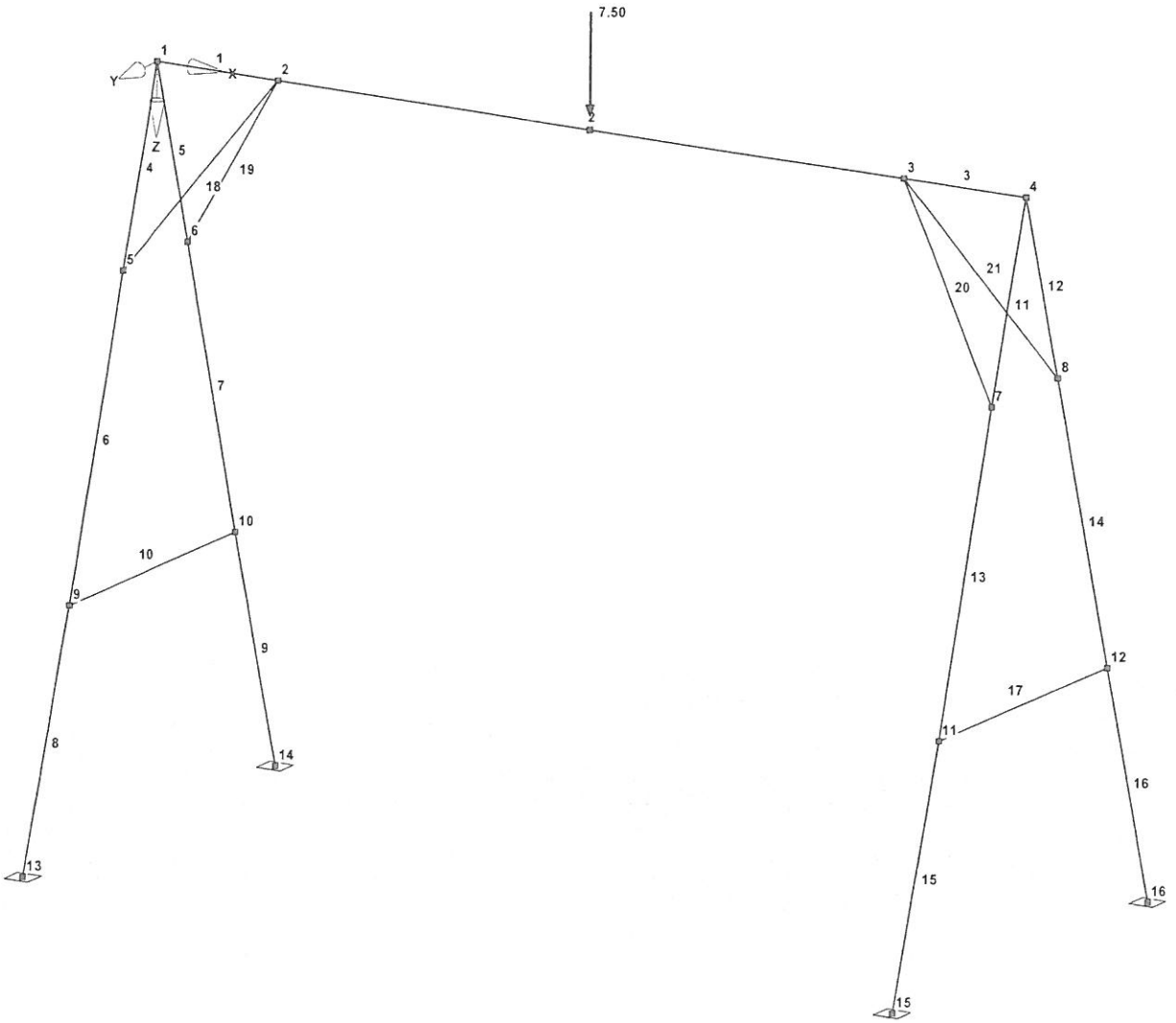
BELASTUNG

LF 1 - Eigengewicht+Einzellast
[kN]

Isometrie



SCHNITTGRÖSSEN QUERSCHNITTSBEZOGEN

Stab-Nr.	LF/LG-Nr.	Knoten-Nr.	x [m]	Kräfte [kN] N	Q_2	Q_3	Momente [kNm] T	M_2	M_3
Querschnitt-Nr. 1: KU 120/60x5									
1	LF1	1	.00	3.32	-1.96	.00	.00	.00	-.15
		2	.14	3.32	-1.98	.00	.00	.00	.13
		Max N	.14	3.32	-1.98	.00	.00	.00	.13
		Min N	.00	3.32	-1.96	.00	.00	.00	-.15
		Max Q-2	.00	3.32	-1.96	.00	.00	.00	-.15
		Min Q-2	.14	3.32	-1.98	.00	.00	.00	.13
		Max Q-3	.00	3.32	-1.96	.00	.00	.00	-.15
		Min Q-3	.00	3.32	-1.96	.00	.00	.00	-.15
		Max T	.00	3.32	-1.96	.00	.00	.00	-.15
		Min T	.00	3.32	-1.96	.00	.00	.00	-.15
		Max M-2	.14	3.32	-1.98	.00	.00	.00	.13
		Min M-2	.00	3.32	-1.96	.00	.00	.00	-.15
		Max M-3	.14	3.32	-1.98	.00	.00	.00	.13
		Min M-3	.00	3.32	-1.96	.00	.00	.00	-.15
2	LF1	2	.00	-1.64	3.78	.00	.00	.00	.34
		links	.36	-1.64	3.75	.00	.00	.00	-1.01
		rechts	.36	-1.64	-3.75	.00	.00	.00	-1.01
		3	.72	-1.64	-3.78	.00	.00	.00	.34
		Max N	.72	-1.64	-3.78	.00	.00	.00	.34
		Min N	.00	-1.64	3.78	.00	.00	.00	.34
		Max Q-2	.00	-1.64	3.78	.00	.00	.00	.34
		Min Q-2	.72	-1.64	-3.78	.00	.00	.00	.34
		Max Q-3	.00	-1.64	3.78	.00	.00	.00	.34
		Min Q-3	.00	-1.64	3.78	.00	.00	.00	.34
		Max T	.72	-1.64	-3.78	.00	.00	.00	.34
		Min T	.00	-1.64	3.78	.00	.00	.00	.34
		Max M-2	.72	-1.64	-3.78	.00	.00	.00	.34
		Min M-2	.00	-1.64	3.78	.00	.00	.00	.34
		Max M-3	.72	-1.64	-3.78	.00	.00	.00	.34
		Min M-3	.36	-1.64	3.75	.00	.00	.00	-1.01
3	LF1	3	.00	3.32	1.98	.00	.00	.00	.13
		4	.14	3.32	1.96	.00	.00	.00	-.15
		Max N	.14	3.32	1.96	.00	.00	.00	-.15
		Min N	.00	3.32	1.98	.00	.00	.00	.13
		Max Q-2	.00	3.32	1.98	.00	.00	.00	.13
		Min Q-2	.14	3.32	1.96	.00	.00	.00	-.15
		Max Q-3	.00	3.32	1.98	.00	.00	.00	.13
		Min Q-3	.00	3.32	1.98	.00	.00	.00	.13
		Max T	.14	3.32	1.96	.00	.00	.00	-.15
		Min T	.00	3.32	1.98	.00	.00	.00	.13
		Max M-2	.00	3.32	1.98	.00	.00	.00	.13
		Min M-2	.14	3.32	1.96	.00	.00	.00	-.15
		Max M-3	.00	3.32	1.98	.00	.00	.00	.13
		Min M-3	.14	3.32	1.96	.00	.00	.00	-.15
1	LF1	MAX N	.14	3.32	-1.98	.00	.00	.00	.13
2	LF1	MIN N	.00	-1.64	3.78	.00	.00	.00	.34
2	LF1	MAX Q-2	.00	-1.64	3.78	.00	.00	.00	.34
2	LF1	MIN Q-2	.72	-1.64	-3.78	.00	.00	.00	.34
1	LF1	MAX Q-3	.00	3.32	-1.96	.00	.00	.00	-.15
1	LF1	MIN Q-3	.00	3.32	-1.96	.00	.00	.00	-.15
1	LF1	MAX T	.00	3.32	-1.96	.00	.00	.00	-.15
1	LF1	MIN T	.00	3.32	-1.96	.00	.00	.00	-.15
1	LF1	MAX M-2	.14	3.32	-1.98	.00	.00	.00	.13
1	LF1	MIN M-2	.00	3.32	-1.96	.00	.00	.00	-.15
2	LF1	MAX M-3	.72	-1.64	-3.78	.00	.00	.00	.34
2	LF1	MIN M-3	.36	-1.64	3.75	.00	.00	.00	-1.01
Querschnitt-Nr. 2: L 50x7									
4	LF1	1	.00	.78	.64	1.71	.00	-.07	.04
		5	.21	.77	.64	1.71	.00	.29	-.09
		Max N	.00	.78	.64	1.71	.00	-.07	.04
		Min N	.21	.77	.64	1.71	.00	.29	-.09
		Max Q-2	.21	.77	.64	1.71	.00	.29	-.09
		Min Q-2	.00	.78	.64	1.71	.00	-.07	.04
		Max Q-3	.00	.78	.64	1.71	.00	-.07	.04
		Min Q-3	.21	.77	.64	1.71	.00	.29	-.09
		Max T	.00	.78	.64	1.71	.00	-.07	.04
		Min T	.00	.78	.64	1.71	.00	-.07	.04
		Max M-2	.21	.77	.64	1.71	.00	.29	-.09
		Min M-2	.00	.78	.64	1.71	.00	-.07	.04
		Max M-3	.00	.78	.64	1.71	.00	-.07	.04
		Min M-3	.21	.77	.64	1.71	.00	.29	-.09
5	LF1	1	.00	.78	.64	-1.71	.00	.07	.04
		6	.21	.77	.64	-1.71	.00	-.29	-.09
		Max N	.00	.78	.64	-1.71	.00	.07	.04
		Min N	.21	.77	.64	-1.71	.00	-.29	-.09
		Max Q-2	.21	.77	.64	-1.71	.00	-.29	-.09
		Min Q-2	.00	.78	.64	-1.71	.00	.07	.04
		Max Q-3	.21	.77	.64	-1.71	.00	-.29	-.09
		Min Q-3	.00	.78	.64	-1.71	.00	.07	.04
		Max T	.21	.77	.64	-1.71	.00	-.29	-.09
		Min T	.00	.78	.64	-1.71	.00	.07	.04
		Max M-2	.00	.78	.64	-1.71	.00	.07	.04
		Min M-2	.21	.77	.64	-1.71	.00	-.29	-.09
		Max M-3	.00	.78	.64	-1.71	.00	.07	.04
		Min M-3	.21	.77	.64	-1.71	.00	-.29	-.09
6	LF1	5	.00	-1.91	-.32	-.84	.00	.31	-.10
		9	.34	-1.92	-.32	-.84	.00	.02	.01
		Max N	.00	-1.91	-.32	-.84	.00	.31	-.10

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Stab-Nr.	LF/LG-Nr.	Knoten-Nr.	x [m]	Kräfte [kN] N	Q_2	Q_3	Momente [kNm] T	M_2	M_3
6	LF1	Min N	.34	-1.92	-.32	-.84	.00	.02	.01
		Max Q-2	.34	-1.92	-.32	-.84	.00	.02	.01
		Min Q-2	.00	-1.91	-.32	-.84	.00	.31	-.10
		Max Q-3	.00	-1.91	-.32	-.84	.00	.31	-.10
		Min Q-3	.34	-1.92	-.32	-.84	.00	.02	.01
		Max T	.34	-1.92	-.32	-.84	.00	.02	.01
		Min T	.00	-1.91	-.32	-.84	.00	.31	-.10
		Max M-2	.00	-1.91	-.32	-.84	.00	.31	-.10
		Min M-2	.34	-1.92	-.32	-.84	.00	.02	.01
		Max M-3	.34	-1.92	-.32	-.84	.00	.02	.01
		Min M-3	.00	-1.91	-.32	-.84	.00	.31	-.10
7	LF1	6	.00	-1.91	-.32	.84	.00	-.31	-.10
		10	.34	-1.92	-.32	.84	.00	-.02	.01
		Max N	.00	-1.91	-.32	.84	.00	-.31	-.10
		Min N	.34	-1.92	-.32	.84	.00	-.02	.01
		Max Q-2	.34	-1.92	-.32	.84	.00	-.02	.01
		Min Q-2	.00	-1.91	-.32	.84	.00	-.31	-.10
		Max Q-3	.34	-1.92	-.32	.84	.00	-.02	.01
		Min Q-3	.00	-1.91	-.32	.84	.00	-.31	-.10
		Max T	.00	-1.91	-.32	.84	.00	-.31	-.10
		Min T	.00	-1.91	-.32	.84	.00	-.31	-.10
		Max M-2	.34	-1.92	-.32	.84	.00	-.02	.01
		Min M-2	.00	-1.91	-.32	.84	.00	-.31	-.10
		Max M-3	.34	-1.92	-.32	.84	.00	-.02	.01
		Min M-3	.00	-1.91	-.32	.84	.00	-.31	-.10
8	LF1	9	.00	-1.88	-.20	-.96	.00	.02	.00
		13	.27	-1.90	-.20	-.96	.00	-.24	.06
		Max N	.00	-1.88	-.20	-.96	.00	.02	.00
		Min N	.27	-1.90	-.20	-.96	.00	-.24	.06
		Max Q-2	.27	-1.90	-.20	-.96	.00	-.24	.06
		Min Q-2	.00	-1.88	-.20	-.96	.00	.02	.00
		Max Q-3	.00	-1.88	-.20	-.96	.00	.02	.00
		Min Q-3	.27	-1.90	-.20	-.96	.00	-.24	.06
		Max T	.27	-1.90	-.20	-.96	.00	-.24	.06
		Min T	.00	-1.88	-.20	-.96	.00	.02	.00
		Max M-2	.00	-1.88	-.20	-.96	.00	.02	.00
		Min M-2	.27	-1.90	-.20	-.96	.00	-.24	.06
		Max M-3	.27	-1.90	-.20	-.96	.00	-.24	.06
		Min M-3	.00	-1.88	-.20	-.96	.00	.02	.00
9	LF1	10	.00	-1.88	-.20	.96	.00	-.02	.00
		14	.27	-1.90	-.20	.96	.00	.24	.06
		Max N	.00	-1.88	-.20	.96	.00	-.02	.00
		Min N	.27	-1.90	-.20	.96	.00	.24	.06
		Max Q-2	.27	-1.90	-.20	.96	.00	.24	.06
		Min Q-2	.00	-1.88	-.20	.96	.00	-.02	.00
		Max Q-3	.27	-1.90	-.20	.96	.00	.24	.06
		Min Q-3	.00	-1.88	-.20	.96	.00	-.02	.00
		Max T	.00	-1.88	-.20	.96	.00	-.02	.00
		Min T	.00	-1.88	-.20	.96	.00	-.02	.00
		Max M-2	.27	-1.90	-.20	.96	.00	.24	.06
		Min M-2	.00	-1.88	-.20	.96	.00	-.02	.00
		Max M-3	.27	-1.90	-.20	.96	.00	.24	.06
		Min M-3	.00	-1.88	-.20	.96	.00	-.02	.00
10	LF1	9	.00	.14	.01	-.01	.00	.00	.00
		10	.33	.14	-.01	.01	.00	.00	.00
		Max N	.00	.14	.01	-.01	.00	.00	.00
		Min N	.00	.14	.01	-.01	.00	.00	.00
		Max Q-2	.00	.14	.01	-.01	.00	.00	.00
		Min Q-2	.33	.14	-.01	.01	.00	.00	.00
		Max Q-3	.33	.14	-.01	.01	.00	.00	.00
		Min Q-3	.00	.14	.01	-.01	.00	.00	.00
		Max T	.00	.14	.01	-.01	.00	.00	.00
		Min T	.00	.14	.01	-.01	.00	.00	.00
		Max M-2	.33	.14	-.01	.01	.00	.00	.00
		Min M-2	.17	.14	.00	.00	.00	.00	.00
		Max M-3	.33	.14	-.01	.01	.00	.00	.00
		Min M-3	.17	.14	.00	.00	.00	.00	.00
11	LF1	4	.00	.78	.64	-1.71	.00	.07	.04
		7	.21	.77	.64	-1.71	.00	-.29	-.09
		Max N	.00	.78	.64	-1.71	.00	.07	.04
		Min N	.21	.77	.64	-1.71	.00	-.29	-.09
		Max Q-2	.21	.77	.64	-1.71	.00	-.29	-.09
		Min Q-2	.00	.78	.64	-1.71	.00	.07	.04
		Max Q-3	.21	.77	.64	-1.71	.00	-.29	-.09
		Min Q-3	.00	.78	.64	-1.71	.00	.07	.04
		Max T	.21	.77	.64	-1.71	.00	-.29	-.09
		Min T	.00	.78	.64	-1.71	.00	.07	.04
		Max M-2	.00	.78	.64	-1.71	.00	.07	.04
		Min M-2	.21	.77	.64	-1.71	.00	-.29	-.09
		Max M-3	.00	.78	.64	-1.71	.00	.07	.04
		Min M-3	.21	.77	.64	-1.71	.00	-.29	-.09
12	LF1	4	.00	.78	.64	1.71	.00	-.07	.04
		8	.21	.77	.64	1.71	.00	.29	-.09
		Max N	.00	.78	.64	1.71	.00	-.07	.04
		Min N	.21	.77	.64	1.71	.00	.29	-.09
		Max Q-2	.21	.77	.64	1.71	.00	.29	-.09
		Min Q-2	.00	.78	.64	1.71	.00	-.07	.04
		Max Q-3	.00	.78	.64	1.71	.00	-.07	.04
		Min Q-3	.21	.77	.64	1.71	.00	.29	-.09

SCHNITTGRÖSSEN QUERSCHNITTSBEZOGEN

Stab-Nr.	LF/LG-Nr.	Knoten-Nr.	x [m]	Kräfte [kN] N	Q_2	Q_3	Momente [kNm] T	M_2	M_3
12	LF1	Max T	.00	.78	.64	1.71	.00	-.07	.04
		Min T	.00	.78	.64	1.71	.00	-.07	.04
		Max M-2	.21	.77	.64	1.71	.00	.29	-.09
		Min M-2	.00	.78	.64	1.71	.00	-.07	.04
		Max M-3	.00	.78	.64	1.71	.00	-.07	.04
		Min M-3	.21	.77	.64	1.71	.00	.29	-.09
13	LF1	7	.00	-1.91	-.32	.84	.00	-.31	-.10
		11	.34	-1.92	-.32	.84	.00	-.02	.01
		Max N	.00	-1.91	-.32	.84	.00	-.31	-.10
		Min N	.34	-1.92	-.32	.84	.00	-.02	.01
		Max Q-2	.34	-1.92	-.32	.84	.00	-.02	.01
		Min Q-2	.00	-1.91	-.32	.84	.00	-.31	-.10
		Max Q-3	.34	-1.92	-.32	.84	.00	-.02	.01
		Min Q-3	.00	-1.91	-.32	.84	.00	-.31	-.10
		Max T	.00	-1.91	-.32	.84	.00	-.31	-.10
		Min T	.00	-1.91	-.32	.84	.00	-.31	-.10
		Max M-2	.34	-1.92	-.32	.84	.00	-.02	.01
		Min M-2	.00	-1.91	-.32	.84	.00	-.31	-.10
		Max M-3	.34	-1.92	-.32	.84	.00	-.02	.01
		Min M-3	.00	-1.91	-.32	.84	.00	-.31	-.10
14	LF1	8	.00	-1.91	-.32	-.84	.00	.31	-.10
		12	.34	-1.92	-.32	-.84	.00	.02	.01
		Max N	.00	-1.91	-.32	-.84	.00	.31	-.10
		Min N	.34	-1.92	-.32	-.84	.00	.02	.01
		Max Q-2	.34	-1.92	-.32	-.84	.00	.02	.01
		Min Q-2	.00	-1.91	-.32	-.84	.00	.31	-.10
		Max Q-3	.00	-1.91	-.32	-.84	.00	.31	-.10
		Min Q-3	.34	-1.92	-.32	-.84	.00	.02	.01
		Max T	.34	-1.92	-.32	-.84	.00	.02	.01
		Min T	.00	-1.91	-.32	-.84	.00	.31	-.10
		Max M-2	.00	-1.91	-.32	-.84	.00	.31	-.10
		Min M-2	.34	-1.92	-.32	-.84	.00	.02	.01
		Max M-3	.34	-1.92	-.32	-.84	.00	.02	.01
		Min M-3	.00	-1.91	-.32	-.84	.00	.31	-.10
15	LF1	11	.00	-1.88	-.20	.96	.00	-.02	.00
		15	.27	-1.90	-.20	.96	.00	.24	.06
		Max N	.00	-1.88	-.20	.96	.00	-.02	.00
		Min N	.27	-1.90	-.20	.96	.00	.24	.06
		Max Q-2	.27	-1.90	-.20	.96	.00	.24	.06
		Min Q-2	.00	-1.88	-.20	.96	.00	-.02	.00
		Max Q-3	.27	-1.90	-.20	.96	.00	.24	.06
		Min Q-3	.00	-1.88	-.20	.96	.00	-.02	.00
		Max T	.00	-1.88	-.20	.96	.00	-.02	.00
		Min T	.00	-1.88	-.20	.96	.00	-.02	.00
		Max M-2	.27	-1.90	-.20	.96	.00	.24	.06
		Min M-2	.00	-1.88	-.20	.96	.00	-.02	.00
		Max M-3	.27	-1.90	-.20	.96	.00	.24	.06
		Min M-3	.00	-1.88	-.20	.96	.00	-.02	.00
16	LF1	12	.00	-1.88	-.20	-.96	.00	.02	.00
		16	.27	-1.90	-.20	-.96	.00	-.24	.06
		Max N	.00	-1.88	-.20	-.96	.00	.02	.00
		Min N	.27	-1.90	-.20	-.96	.00	-.24	.06
		Max Q-2	.27	-1.90	-.20	-.96	.00	-.24	.06
		Min Q-2	.00	-1.88	-.20	-.96	.00	.02	.00
		Max Q-3	.00	-1.88	-.20	-.96	.00	.02	.00
		Min Q-3	.27	-1.90	-.20	-.96	.00	-.24	.06
		Max T	.27	-1.90	-.20	-.96	.00	-.24	.06
		Min T	.00	-1.88	-.20	-.96	.00	.02	.00
		Max M-2	.00	-1.88	-.20	-.96	.00	.02	.00
		Min M-2	.27	-1.90	-.20	-.96	.00	-.24	.06
		Max M-3	.27	-1.90	-.20	-.96	.00	-.24	.06
		Min M-3	.00	-1.88	-.20	-.96	.00	.02	.00
17	LF1	11	.00	.14	.01	.01	.00	.00	.00
		12	.33	.14	-.01	-.01	.00	.00	.00
		Max N	.00	.14	.01	.01	.00	.00	.00
		Min N	.00	.14	.01	.01	.00	.00	.00
		Max Q-2	.00	.14	.01	.01	.00	.00	.00
		Min Q-2	.33	.14	-.01	-.01	.00	.00	.00
		Max Q-3	.00	.14	.01	.01	.00	.00	.00
		Min Q-3	.33	.14	-.01	-.01	.00	.00	.00
		Max T	.00	.14	.01	.01	.00	.00	.00
		Min T	.00	.14	.01	.01	.00	.00	.00
		Max M-2	.17	.14	.00	.00	.00	.00	.00
		Min M-2	.00	.14	.01	.01	.00	.00	.00
		Max M-3	.33	.14	-.01	-.01	.00	.00	.00
		Min M-3	.17	.14	.00	.00	.00	.00	.00
4	LF1	MAX N	.00	.78	.64	1.71	.00	-.07	.04
6	LF1	MIN N	.34	-1.92	-.32	-.84	.00	.02	.01
4	LF1	MAX Q-2	.21	.77	.64	1.71	.00	.29	-.09
6	LF1	MIN Q-2	.00	-1.91	-.32	-.84	.00	.31	-.10
4	LF1	MAX Q-3	.00	.78	.64	1.71	.00	-.07	.04
5	LF1	MIN Q-3	.00	.78	.64	-1.71	.00	.07	.04
4	LF1	MAX T	.00	.78	.64	1.71	.00	-.07	.04
4	LF1	MIN T	.00	.78	.64	1.71	.00	-.07	.04
6	LF1	MAX M-2	.00	-1.91	-.32	-.84	.00	.31	-.10
7	LF1	MIN M-2	.00	-1.91	-.32	.84	.00	-.31	-.10
8	LF1	MAX M-3	.27	-1.90	-.20	-.96	.00	-.24	.06
6	LF1	MIN M-3	.00	-1.91	-.32	-.84	.00	.31	-.10

Querschnitt-Nr. 3: FL 140x8

SCHNITTGRÖSSEN QUERSCHNITTSBEZOGEN

Stab-Nr.	LF/LG-Nr.	Knoten-Nr.	x [m]	Kräfte [kN] N	Q_2	Q_3	Momente [kNm] T	M_2	M_3
18	LF1	2	.00	-3.59	-1.28	-.06	.00	.01	-.33
		5	.25	-3.60	-1.28	-.08	.00	-.01	-.01
		Max N	.00	-3.59	-1.28	-.06	.00	.01	-.33
		Min N	.25	-3.60	-1.28	-.08	.00	-.01	-.01
		Max Q-2	.00	-3.59	-1.28	-.06	.00	.01	-.33
		Min Q-2	.00	-3.59	-1.28	-.06	.00	.01	-.33
		Max Q-3	.00	-3.59	-1.28	-.06	.00	.01	-.33
		Min Q-3	.25	-3.60	-1.28	-.08	.00	-.01	-.01
		Max T	.00	-3.59	-1.28	-.06	.00	.01	-.33
		Min T	.00	-3.59	-1.28	-.06	.00	.01	-.33
		Max M-2	.00	-3.59	-1.28	-.06	.00	.01	-.33
		Min M-2	.25	-3.60	-1.28	-.08	.00	-.01	-.01
		Max M-3	.25	-3.60	-1.28	-.08	.00	-.01	-.01
		Min M-3	.00	-3.59	-1.28	-.06	.00	.01	-.33
19	LF1	2	.00	-3.59	1.28	-.06	.00	.01	.33
		6	.25	-3.60	1.28	-.08	.00	-.01	.01
		Max N	.00	-3.59	1.28	-.06	.00	.01	.33
		Min N	.25	-3.60	1.28	-.08	.00	-.01	.01
		Max Q-2	.25	-3.60	1.28	-.08	.00	-.01	.01
		Min Q-2	.00	-3.59	1.28	-.06	.00	.01	.33
		Max Q-3	.00	-3.59	1.28	-.06	.00	.01	.33
		Min Q-3	.25	-3.60	1.28	-.08	.00	-.01	.01
		Max T	.25	-3.60	1.28	-.08	.00	-.01	.01
		Min T	.00	-3.59	1.28	-.06	.00	.01	.33
		Max M-2	.00	-3.59	1.28	-.06	.00	.01	.33
		Min M-2	.25	-3.60	1.28	-.08	.00	-.01	.01
		Max M-3	.00	-3.59	1.28	-.06	.00	.01	.33
		Min M-3	.25	-3.60	1.28	-.08	.00	-.01	.01
20	LF1	3	.00	-3.59	1.28	-.06	.00	.01	.33
		7	.25	-3.60	1.28	-.08	.00	-.01	.01
		Max N	.00	-3.59	1.28	-.06	.00	.01	.33
		Min N	.25	-3.60	1.28	-.08	.00	-.01	.01
		Max Q-2	.25	-3.60	1.28	-.08	.00	-.01	.01
		Min Q-2	.00	-3.59	1.28	-.06	.00	.01	.33
		Max Q-3	.00	-3.59	1.28	-.06	.00	.01	.33
		Min Q-3	.25	-3.60	1.28	-.08	.00	-.01	.01
		Max T	.25	-3.60	1.28	-.08	.00	-.01	.01
		Min T	.00	-3.59	1.28	-.06	.00	.01	.33
		Max M-2	.00	-3.59	1.28	-.06	.00	.01	.33
		Min M-2	.25	-3.60	1.28	-.08	.00	-.01	.01
		Max M-3	.00	-3.59	1.28	-.06	.00	.01	.33
		Min M-3	.25	-3.60	1.28	-.08	.00	-.01	.01
21	LF1	3	.00	-3.59	-1.28	-.06	.00	.01	-.33
		8	.25	-3.60	-1.28	-.08	.00	-.01	-.01
		Max N	.00	-3.59	-1.28	-.06	.00	.01	-.33
		Min N	.25	-3.60	-1.28	-.08	.00	-.01	-.01
		Max Q-2	.00	-3.59	-1.28	-.06	.00	.01	-.33
		Min Q-2	.00	-3.59	-1.28	-.06	.00	.01	-.33
		Max Q-3	.00	-3.59	-1.28	-.06	.00	.01	-.33
		Min Q-3	.25	-3.60	-1.28	-.08	.00	-.01	-.01
		Max T	.00	-3.59	-1.28	-.06	.00	.01	-.33
		Min T	.00	-3.59	-1.28	-.06	.00	.01	-.33
		Max M-2	.00	-3.59	-1.28	-.06	.00	.01	-.33
		Min M-2	.25	-3.60	-1.28	-.08	.00	-.01	-.01
		Max M-3	.25	-3.60	-1.28	-.08	.00	-.01	-.01
		Min M-3	.00	-3.59	-1.28	-.06	.00	.01	-.33
18	LF1	MAX N	.00	-3.59	-1.28	-.06	.00	.01	-.33
18	LF1	MIN N	.25	-3.60	-1.28	-.08	.00	-.01	-.01
19	LF1	MAX Q-2	.25	-3.60	1.28	-.08	.00	-.01	.01
18	LF1	MIN Q-2	.00	-3.59	-1.28	-.06	.00	.01	-.33
18	LF1	MAX Q-3	.00	-3.59	-1.28	-.06	.00	.01	-.33
18	LF1	MIN Q-3	.25	-3.60	-1.28	-.08	.00	-.01	-.01
18	LF1	MAX T	.00	-3.59	-1.28	-.06	.00	.01	-.33
18	LF1	MIN T	.00	-3.59	-1.28	-.06	.00	.01	-.33
18	LF1	MAX M-2	.00	-3.59	-1.28	-.06	.00	.01	-.33
18	LF1	MIN M-2	.25	-3.60	-1.28	-.08	.00	-.01	-.01
19	LF1	MAX M-3	.00	-3.59	1.28	-.06	.00	.01	.33
18	LF1	MIN M-3	.00	-3.59	-1.28	-.06	.00	.01	-.33

AUFLAGERKRÄFTE UND -MOMENTE

Knoten-Nr.	LF/LG-Nr.	Auflagerkräfte [kN] P_X	P_Y	P_Z	Auflagermomente [kNm] M_X	M_Y	M_Z
13	LF1	-.820	.080	1.969	-.129	.201	-.065
14	LF1	-.820	-.080	1.969	.129	.201	.065
15	LF1	.820	.080	1.969	-.129	-.201	.065
16	LF1	.820	-.080	1.969	.129	-.201	-.065
ΣKräfte	LF1	.000	.000	7.878			
ΣLasten		.000	.000	7.878			

STAHL1 - SPANNUNGSANALYSE

BASISANGABEN

ZU BEMESSENDE STÄBE	Alle	
ZU BEMESSENDE LASTFÄLLE	LF1	Eigengewicht+Einzellast

GRENZSPANNUNGEN

Mat.-Nr.	Material-Bezeichnung	Material-Norm, Kriterium	Grenzspannungen [kN/cm^2] Sigma	Tau	Sigma-v
1	S 235 JR G2	DIN 18800 t <= 40 mm	21.82	12.6	21.82

KU 120/60x5

L 50x7

FL 140x8

QUERSCHNITTE

Quer.-Nr.	Mat.-Nr.	Querschnittsbezeichnung Querschnittsdrehung	I-T [cm^4] A [cm^2]	I-2 [cm^4] Alpha pl. y	I-3 [cm^4] Alpha pl. z
1	1	KU 120/60x5	0.90 11.00	235.00 1.00	38.50 1.00
2	1	L 50x7 α = -45.00°	1.10 6.56	23.10 1.00	6.02 1.00
3	1	FL 140x8	2.30 11.20	0.60 1.00	182.93 1.00

MAX. SPANNUNGEN IN QUERSCHNITTEN

Spannungsart	Stab-Nr.	x-Stelle [m]	S-Punkt Nr.	LF Nr.	Spannung [kN/cm^2] vorh	grenz	Ausnutzung
Querschnitt Nr. 1 - KU 120/60x5							
Sigma gesamt	2	0.360	1	LF1	10.97	21.82	0.50
Tau gesamt	2	0.000	2	LF1	-0.89	12.60	0.07
Sigma-v	2	0.360	1	LF1	10.97	21.82	0.50
Querschnitt Nr. 2 - L 50x7							
Sigma gesamt	7	0.000	2	LF1	6.83	21.82	0.31
Tau gesamt	5	0.000	4	LF1	-0.68	12.60	0.05
Sigma-v	7	0.000	2	LF1	6.83	21.82	0.31
Querschnitt Nr. 3 - FL 140x8							
Sigma gesamt	18	0.000	2	LF1	-2.25	21.82	0.10
Tau gesamt	18	0.000	1	LF1	0.00	12.60	0.00
Sigma-v	18	0.000	2	LF1	2.25	21.82	0.10

MAX. SPANNUNGEN IN STÄBEN

Spannungsart	x-Stelle [m]	S-Punkt Nr.	LF Nr.	Spannung [kN/cm^2] vorh	grenz	Ausnutzung
Stab Nr. 1: Querschnitt Nr. 1 - KU 120/60x5						
Sigma gesamt	0.000	1	LF1	1.95	21.82	0.09
Tau gesamt	0.140	2	LF1	0.46	12.60	0.04
Sigma-v	0.000	1	LF1	1.95	21.82	0.09
Stab Nr. 2: Querschnitt Nr. 1 - KU 120/60x5						
Sigma gesamt	0.360	1	LF1	10.97	21.82	0.50
Tau gesamt	0.000	2	LF1	-0.89	12.60	0.07
Sigma-v	0.360	1	LF1	10.97	21.82	0.50
Stab Nr. 3: Querschnitt Nr. 1 - KU 120/60x5						
Sigma gesamt	0.140	1	LF1	1.95	21.82	0.09
Tau gesamt	0.000	2	LF1	-0.46	12.60	0.04
Sigma-v	0.140	1	LF1	1.95	21.82	0.09
Stab Nr. 4: Querschnitt Nr. 2 - L 50x7						
Sigma gesamt	0.210	8	LF1	6.69	21.82	0.31
Tau gesamt	0.000	6	LF1	0.68	12.60	0.05
Sigma-v	0.210	8	LF1	6.69	21.82	0.31
Stab Nr. 5: Querschnitt Nr. 2 - L 50x7						
Sigma gesamt	0.210	2	LF1	6.69	21.82	0.31
Tau gesamt	0.000	4	LF1	-0.68	12.60	0.05
Sigma-v	0.210	2	LF1	6.69	21.82	0.31
Stab Nr. 6: Querschnitt Nr. 2 - L 50x7						
Sigma gesamt	0.000	8	LF1	6.83	21.82	0.31
Tau gesamt	0.000	6	LF1	-0.33	12.60	0.03
Sigma-v	0.000	8	LF1	6.83	21.82	0.31
Stab Nr. 7: Querschnitt Nr. 2 - L 50x7						
Sigma gesamt	0.000	2	LF1	6.83	21.82	0.31
Tau gesamt	0.000	4	LF1	0.33	12.60	0.03
Sigma-v	0.000	2	LF1	6.83	21.82	0.31
Stab Nr. 8: Querschnitt Nr. 2 - L 50x7						
Sigma gesamt	0.270	8	LF1	-5.39	21.82	0.25

MAX. SPANNUNGEN IN STÄBEN

Spannungs-art	x-Stelle [m]	S-Punkt Nr.	LF Nr.	Spannung [kN/cm^2] vorh	grenz	Aus-nutzung
Tau gesamt	0.000	6	LF1	-0.34	12.60	0.03
Sigma-v	0.270	8	LF1	5.39	21.82	0.25
Stab Nr. 9: Querschnitt Nr. 2 - L 50x7						
Sigma gesamt	0.270	2	LF1	-5.39	21.82	0.25
Tau gesamt	0.000	4	LF1	0.34	12.60	0.03
Sigma-v	0.270	2	LF1	5.39	21.82	0.25
Stab Nr. 10: Querschnitt Nr. 2 - L 50x7						
Sigma gesamt	0.000	1	LF1	0.02	21.82	0.00
Tau gesamt	0.000	3	LF1	-0.01	12.60	0.00
Sigma-v	0.000	3	LF1	0.02	21.82	0.00
Stab Nr. 11: Querschnitt Nr. 2 - L 50x7						
Sigma gesamt	0.210	2	LF1	6.69	21.82	0.31
Tau gesamt	0.000	4	LF1	-0.68	12.60	0.05
Sigma-v	0.210	2	LF1	6.69	21.82	0.31
Stab Nr. 12: Querschnitt Nr. 2 - L 50x7						
Sigma gesamt	0.210	8	LF1	6.69	21.82	0.31
Tau gesamt	0.000	6	LF1	0.68	12.60	0.05
Sigma-v	0.210	8	LF1	6.69	21.82	0.31
Stab Nr. 13: Querschnitt Nr. 2 - L 50x7						
Sigma gesamt	0.000	2	LF1	6.83	21.82	0.31
Tau gesamt	0.000	4	LF1	0.33	12.60	0.03
Sigma-v	0.000	2	LF1	6.83	21.82	0.31
Stab Nr. 14: Querschnitt Nr. 2 - L 50x7						
Sigma gesamt	0.000	8	LF1	6.83	21.82	0.31
Tau gesamt	0.000	6	LF1	-0.33	12.60	0.03
Sigma-v	0.000	8	LF1	6.83	21.82	0.31
Stab Nr. 15: Querschnitt Nr. 2 - L 50x7						
Sigma gesamt	0.270	2	LF1	-5.39	21.82	0.25
Tau gesamt	0.000	4	LF1	0.34	12.60	0.03
Sigma-v	0.270	2	LF1	5.39	21.82	0.25
Stab Nr. 16: Querschnitt Nr. 2 - L 50x7						
Sigma gesamt	0.270	8	LF1	-5.39	21.82	0.25
Tau gesamt	0.000	6	LF1	-0.34	12.60	0.03
Sigma-v	0.270	8	LF1	5.39	21.82	0.25
Stab Nr. 17: Querschnitt Nr. 2 - L 50x7						
Sigma gesamt	0.000	1	LF1	0.02	21.82	0.00
Tau gesamt	0.000	7	LF1	0.01	12.60	0.00
Sigma-v	0.000	7	LF1	0.02	21.82	0.00
Stab Nr. 18: Querschnitt Nr. 3 - FL 140x8						
Sigma gesamt	0.000	2	LF1	-2.25	21.82	0.10
Tau gesamt	0.000	1	LF1	0.00	12.60	0.00
Sigma-v	0.000	2	LF1	2.25	21.82	0.10
Stab Nr. 19: Querschnitt Nr. 3 - FL 140x8						
Sigma gesamt	0.000	1	LF1	-2.25	21.82	0.10
Tau gesamt	0.000	1	LF1	0.00	12.60	0.00
Sigma-v	0.000	1	LF1	2.25	21.82	0.10
Stab Nr. 20: Querschnitt Nr. 3 - FL 140x8						
Sigma gesamt	0.000	1	LF1	-2.25	21.82	0.10
Tau gesamt	0.000	1	LF1	0.00	12.60	0.00
Sigma-v	0.000	1	LF1	2.25	21.82	0.10
Stab Nr. 21: Querschnitt Nr. 3 - FL 140x8						
Sigma gesamt	0.000	2	LF1	-2.25	21.82	0.10
Tau gesamt	0.000	1	LF1	0.00	12.60	0.00
Sigma-v	0.000	2	LF1	2.25	21.82	0.10

STÜCKLISTE STABBEZOGEN

Pos-Nr.	Anzahl Stäbe	Querschnitt	Länge [m]	G-Länge [m]	E-Gewicht [kg/m]	Gewicht [kg]	G-Gewicht [t]
1	2	1 - KU 120/60x5	0.140	0.280	8.635	1.21	0.00
2	1	1 - KU 120/60x5	0.720	0.720	8.635	6.22	0.01
3	4	2 - L 50x7	0.210	0.841	5.150	1.08	0.00
4	4	2 - L 50x7	0.335	1.341	5.150	1.73	0.01
5	4	2 - L 50x7	0.274	1.094	5.150	1.41	0.01
6	2	2 - L 50x7	0.330	0.660	5.150	1.70	0.00
7	4	3 - FL 140x8	0.253	1.011	8.792	2.22	0.01
Summe	21			5.947			0.04