



(ST) S/N:

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

Statische Berechnung


Auftrag-Nr.:

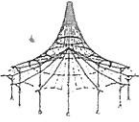
Bauherr: BIS Rohrleitungsbau GmbH

Projekt:

Berechnung Montagehilfsbock U120+L50x7

Angaben zur Erstellung und Revision

Index	Seiten	Bearbeitung	Datum	Name
0	12	Aufstellungsberechnung	17.12.10	Behrendt 



Projekt: Montagegeraete	Position: Montagehilfsbock U120+L50x7	Seite: 1 17.12.2010
-------------------------	---------------------------------------	------------------------

INHALT

Inhalt	1
Basisangaben	1
Strukturdaten	
Knoten	1
Materialien	1
Querschnitte	1
Stäbe	2
Auflager	2
Grafik - Struktur	3
Belastungen	
Basisangaben der Lastfälle	4
LF 1 - Eigengewicht+Einzellast	4
LF-, LG-Ergebnisse	
Schnittgrößen querschnittsbezogen	6
Auflagerkräfte und -momente	9
STAHL	10
STAHL1 - Spannungsanalyse	10
Basisangaben	10
Grenzspannungen	10
Querschnitte	10
Ergebnisse	10
Max. Spannungen in Querschnitten	10
Max. Spannungen in Stäben	10
Stückliste stabbezogen	11

BASISANGABEN

BERECHNUNGSART

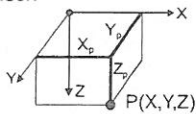
- | | |
|---|--|
| <input checked="" type="checkbox"/> Statik | <input checked="" type="checkbox"/> Theorie I. Ordnung |
| <input type="checkbox"/> Nachweis | <input type="checkbox"/> Theorie II. Ordnung |
| <input type="checkbox"/> Dynamik | <input type="checkbox"/> Seiltheorie |
| <input checked="" type="checkbox"/> Lastfälle | <input checked="" type="checkbox"/> Bemessungsfälle |
| <input type="checkbox"/> LF-Gruppen | <input type="checkbox"/> Dynamikfälle |
| <input type="checkbox"/> LF-Kombinationen | <input type="checkbox"/> Knickfiguren |

STRUKTURKENNWERTE

- | | | |
|---|------------------|--------------------|
| <input type="checkbox"/> 1D-Durchlaufträger | 16 Knoten | 21 Stäbe |
| <input type="checkbox"/> 2D-Stabwerk | 1 Materialien | 0 Seilstäbe |
| <input checked="" type="checkbox"/> 3D-Stabwerk | 3 Querschnitte | 0 Voutenstäbe |
| <input type="checkbox"/> Trägerrost | 0 Stabendgelenke | 0 El. gebet. Stäbe |
| | 0 Stabteilungen | 0 Stabzüge |

STRUKTUR

Kartesisch



KNOTEN

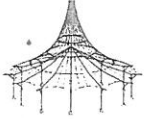
Knoten-Nr.	Koordinatensystem	Bezugs-Knoten	Knotenkoordinaten		
			X [m]	Y [m]	Z [m]
1	Kartesisch	-	0.000	0.000	0.000
2	Kartesisch	-	0.140	0.000	0.000
3	Kartesisch	-	0.860	0.000	0.000
4	Kartesisch	-	1.000	0.000	0.000
5	Kartesisch	-	0.000	0.065	0.200
6	Kartesisch	-	0.000	-0.065	0.200
7	Kartesisch	-	1.000	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	-	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

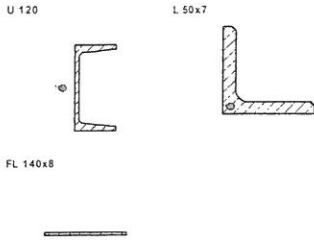
Mater.-Nr.	Material-Bezeichnung	E-Modul [kN/cm ²]	Schubmodul [kN/cm ²]	Sp. Gewicht [kN/cm ³]	Wärmedehn. [1/°C]
1	S 235 JR G2	2.100E+04	8.100E+03	7.850E-05	1.200E-05

QUERSCHNITTE

Quer.-Nr.	Mater.-Nr.	Querschnittsbezeichnung Querschnittsdrehung	I _T A	I ₂ A ₂	I ₃ [cm ⁴] A ₃ [cm ²]
1	1	U 120	4.15	364.00	43.20



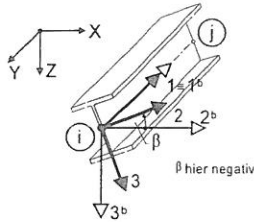
Projekt: Montagegeraete	Position: Montagehilfsbock U120+L50x7	Seite: 2 17.12.2010
--------------------------------	--	----------------------------



QUERSCHNITTE

Quer.-Nr.	Mater.-Nr.	Querschnittsbezeichnung Querschnittsdrehung	I_T A	I_2 A ₂	I_3 [cm ⁴] A ₃ [cm ²]
1			17.000	364.00	43.20
2	1	L 50x7 $\alpha = -45.00^\circ$	1.10 6.560	23.10	6.02
3	1	FL 140x8	2.30 11.200	0.60	182.93

Lokales Stabachsensystem

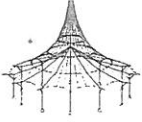


STÄBE

Stab-Nr.	Stab-typ	Knoten		Beta [°]	Querschnitt		Gelenk		Teil.-Nr.	Länge [m]	Stab-lage
		Anf.	Ende		Anf.	Ende	Anf.	Ende			
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 [°]		Festes Auflager bzw. Feder [kN/m] [kNm/rad]					
		Alpha	Beta	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



Projekt: Montagegeraete

Position: Montagehilfsbock U120+L50x7

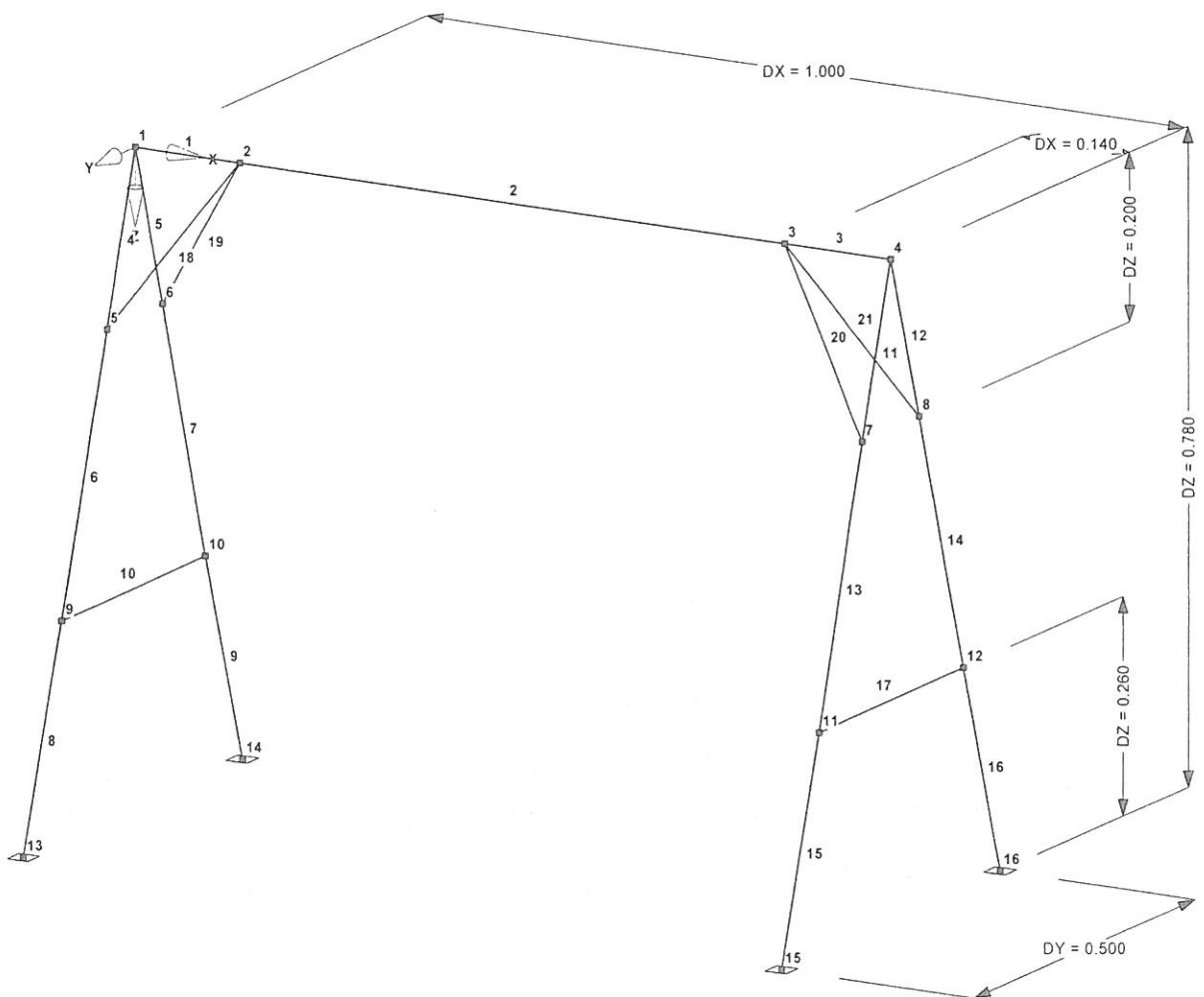
Seite: 3

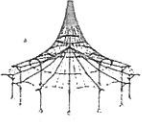
17.12.2010

STRUKTUR

Knotennummerierung
Stabnummerierung

Isometrie





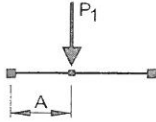
Projekt: Montagegeraete	Position: Montagehilfsbock U120+L50x7	Seite: 4 17.12.2010
--------------------------------	--	----------------------------

BELASTUNG

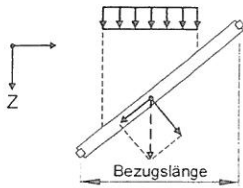
BASISANGABEN DER LASTFÄLLE

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

2 - Einzellast



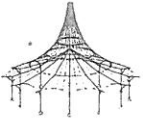
Z - Global in Z-Richtung



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	10.000	0.360		



Projekt: Montagegeraete

Position: Montagehilfsbock U120+L50x7

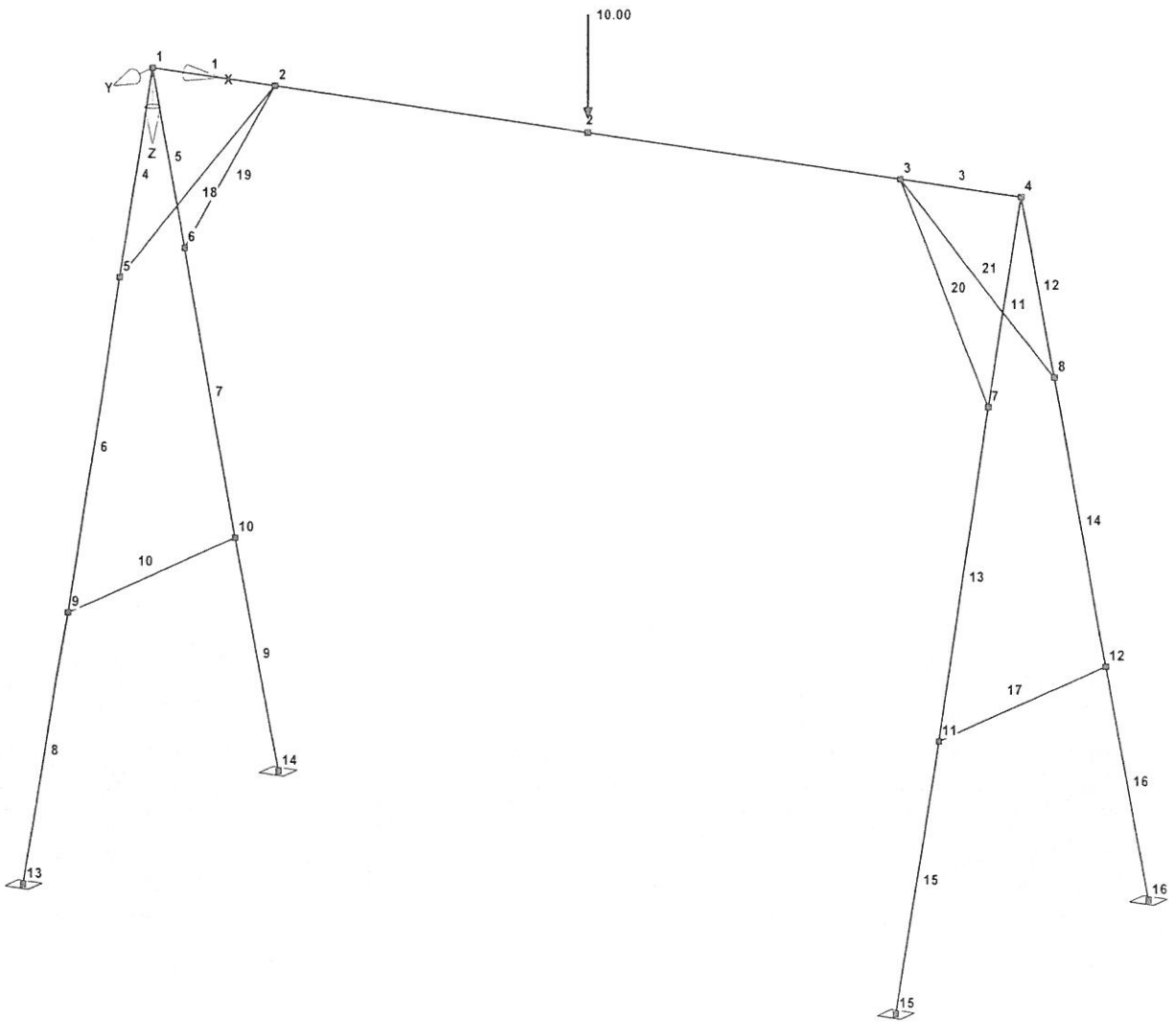
Seite: 5

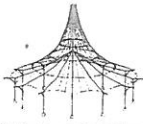
17.12.2010

BELASTUNG

LF 1 - Eigengewicht+Einzellast
[kN]

Isometrie

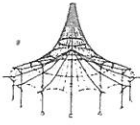




Projekt: Montagegeraete	Position: Montagehilfsbock U120+L50x7	Seite: 6 17.12.2010
-------------------------	---------------------------------------	----------------------------

SCHNITTGRÖSSEN QUERSCHNITTSBEZOGEN

Stab-Nr.	LF/LG-Nr.	Knoten-Nr.	x [m]	Kräfte [kN]				Momente [kNm]				
				N	Q ₂	Q ₃	T	M ₂	M ₃			
Querschnitt-Nr. 1: U 120												
1	LF1	1	.00	4.31	-2.44	.00	.00	.00	.00	.00		
		2	.14	4.31	-2.46	.00	.00	.00	.00	.15		
		Max N	.00	4.31	-2.44	.00	.00	.00	.00	.15		
		Min N	.00	4.31	-2.44	.00	.00	.00	.00	.15		
		Max Q-2	.00	4.31	-2.44	.00	.00	.00	.00	.15		
		Min Q-2	.14	4.31	-2.46	.00	.00	.00	.00	.15		
		Max Q-3	.14	4.31	-2.46	.00	.00	.00	.00	.15		
		Min Q-3	.00	4.31	-2.44	.00	.00	.00	.00	.15		
		Max T	.14	4.31	-2.46	.00	.00	.00	.00	.15		
		Min T	.00	4.31	-2.44	.00	.00	.00	.00	.15		
		Max M-2	.00	4.31	-2.44	.00	.00	.00	.00	.15		
		Min M-2	.14	4.31	-2.46	.00	.00	.00	.00	.15		
		Max M-3	.14	4.31	-2.46	.00	.00	.00	.00	.15		
		Min M-3	.00	4.31	-2.44	.00	.00	.00	.00	.15		
		2	LF1	2	.00	-2.12	5.05	.00	.00	.00	.00	.42
				links	.36	-2.12	5.00	.00	.00	.00	.00	-1.38
				rechts	.36	-2.12	-5.00	.00	.00	.00	.00	-1.38
3	.72			-2.12	-5.05	.00	.00	.00	.00	.42		
Max N	.00			-2.12	5.05	.00	.00	.00	.00	.42		
Min N	.00			-2.12	5.05	.00	.00	.00	.00	.42		
Max Q-2	.00			-2.12	5.05	.00	.00	.00	.00	.42		
Min Q-2	.72			-2.12	-5.05	.00	.00	.00	.00	.42		
Max Q-3	.00			-2.12	5.05	.00	.00	.00	.00	.42		
Min Q-3	.00			-2.12	5.05	.00	.00	.00	.00	.42		
Max T	.00			-2.12	5.05	.00	.00	.00	.00	.42		
Min T	.00			-2.12	5.05	.00	.00	.00	.00	.42		
Max M-2	.00			-2.12	5.05	.00	.00	.00	.00	.42		
Min M-2	.72			-2.12	-5.05	.00	.00	.00	.00	.42		
Max M-3	.72			-2.12	-5.05	.00	.00	.00	.00	.42		
Min M-3	.36			-2.12	5.00	.00	.00	.00	.00	-1.38		
3	LF1			3	.00	4.31	2.46	.00	.00	.00	.00	.15
		4	.14	4.31	2.44	.00	.00	.00	.00	.15		
		Max N	.00	4.31	2.46	.00	.00	.00	.00	.15		
		Min N	.00	4.31	2.46	.00	.00	.00	.00	.15		
		Max Q-2	.00	4.31	2.46	.00	.00	.00	.00	.15		
		Min Q-2	.14	4.31	2.44	.00	.00	.00	.00	.15		
		Max Q-3	.00	4.31	2.46	.00	.00	.00	.00	.15		
		Min Q-3	.00	4.31	2.46	.00	.00	.00	.00	.15		
		Max T	.00	4.31	2.46	.00	.00	.00	.00	.15		
		Min T	.00	4.31	2.46	.00	.00	.00	.00	.15		
		Max M-2	.14	4.31	2.44	.00	.00	.00	.00	.15		
		Min M-2	.00	4.31	2.46	.00	.00	.00	.00	.15		
		Max M-3	.00	4.31	2.46	.00	.00	.00	.00	.15		
		Min M-3	.14	4.31	2.44	.00	.00	.00	.00	.15		
		1	LF1	MAX N	.00	4.31	-2.44	.00	.00	.00	.00	.15
				MIN N	.00	-2.12	5.05	.00	.00	.00	.00	.42
				MAX Q-2	.00	-2.12	5.05	.00	.00	.00	.00	.42
MIN Q-2	.72			-2.12	-5.05	.00	.00	.00	.00	.42		
MAX Q-3	.14			4.31	-2.46	.00	.00	.00	.00	.15		
MIN Q-3	.00			4.31	-2.44	.00	.00	.00	.00	.15		
MAX T	.14			4.31	-2.46	.00	.00	.00	.00	.15		
MIN T	.00			4.31	-2.44	.00	.00	.00	.00	.15		
MAX M-2	.00			4.31	-2.44	.00	.00	.00	.00	.15		
MIN M-2	.14			4.31	-2.46	.00	.00	.00	.00	.15		
MAX M-3	.72			-2.12	-5.05	.00	.00	.00	.00	.42		
MIN M-3	.36			-2.12	5.00	.00	.00	.00	.00	-1.38		
Querschnitt-Nr. 2: L 50x7												
4	LF1			1	.00	.97	.84	2.21	.00	.00	-0.09	.06
				5	.21	.96	.84	2.21	.00	.00	.38	-1.12
				Max N	.00	.97	.84	2.21	.00	.00	.00	.06
				Min N	.21	.96	.84	2.21	.00	.00	.38	-1.12
		Max Q-2	.21	.96	.84	2.21	.00	.00	.38	-1.12		
		Min Q-2	.00	.97	.84	2.21	.00	.00	.00	.06		
		Max Q-3	.00	.97	.84	2.21	.00	.00	.00	.06		
		Min Q-3	.21	.96	.84	2.21	.00	.00	.38	-1.12		
		Max T	.00	.97	.84	2.21	.00	.00	.00	.06		
		Min T	.00	.97	.84	2.21	.00	.00	.00	.06		
		Max M-2	.21	.96	.84	2.21	.00	.00	.38	-1.12		
		Min M-2	.00	.97	.84	2.21	.00	.00	.00	.06		
		Max M-3	.00	.97	.84	2.21	.00	.00	.00	.06		
		Min M-3	.21	.96	.84	2.21	.00	.00	.38	-1.12		
		5	LF1	1	.00	.97	.84	-2.21	.00	.00	.09	.06
				6	.21	.96	.84	-2.21	.00	.00	.38	-1.12
				Max N	.00	.97	.84	-2.21	.00	.00	.00	.06
Min N	.21			.96	.84	-2.21	.00	.00	.38	-1.12		
Max Q-2	.21			.96	.84	-2.21	.00	.00	.38	-1.12		
Min Q-2	.00			.97	.84	-2.21	.00	.00	.00	.06		
Max Q-3	.21			.96	.84	-2.21	.00	.00	.38	-1.12		
Min Q-3	.00			.97	.84	-2.21	.00	.00	.00	.06		
Max T	.21			.96	.84	-2.21	.00	.00	.38	-1.12		
Min T	.00			.97	.84	-2.21	.00	.00	.00	.06		
Max M-2	.00			.97	.84	-2.21	.00	.00	.00	.06		
Min M-2	.21			.96	.84	-2.21	.00	.00	.38	-1.12		
Max M-3	.00			.97	.84	-2.21	.00	.00	.00	.06		
Min M-3	.21			.96	.84	-2.21	.00	.00	.38	-1.12		
6	LF1			5	.00	-2.54	-42	-1.08	.00	.40	.03	-1.13
				9	.34	-2.56	-42	-1.09	.00	.03	.01	.01
				Max N	.00	-2.54	-42	-1.08	.00	.40	.03	-1.13



Projekt: Montagegeraete

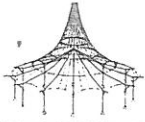
Position: Montagehilfsbock U120+L50x7

Seite: 7

17.12.2010

SCHNITTGRÖSSEN QUERSCHNITTSBEZOGEN

Stab-Nr.	LF/LG-Nr.	Knoten-Nr.	x [m]	Kräfte [kN]			Momente [kNm]				
				N	Q ₂	Q ₃	T	M ₂	M ₃		
6	LF1	Min N	.34	-2.56	-42	-1.09	.00	.03	.01		
		Max Q-2	.34	-2.56	-42	-1.09	.00	.03	.01		
		Min Q-2	.00	-2.54	-42	-1.08	.00	.40	-.13		
		Max Q-3	.00	-2.54	-42	-1.08	.00	.40	-.13		
		Min Q-3	.34	-2.56	-42	-1.09	.00	.03	.01		
		Max T	.00	-2.54	-42	-1.08	.00	.40	-.13		
		Min T	.00	-2.54	-42	-1.08	.00	.40	-.13		
		Max M-2	.00	-2.54	-42	-1.08	.00	.40	-.13		
		Min M-2	.34	-2.56	-42	-1.09	.00	.03	.01		
		Max M-3	.34	-2.56	-42	-1.09	.00	.03	.01		
		Min M-3	.00	-2.54	-42	-1.08	.00	.40	-.13		
		7	LF1	6	.00	-2.54	-42	1.08	.00	-.40	-.13
				10	.34	-2.56	-42	1.09	.00	-.03	.01
Max N	.00			-2.54	-42	1.08	.00	-.40	-.13		
Min N	.34			-2.56	-42	1.09	.00	-.03	.01		
Max Q-2	.34			-2.56	-42	1.09	.00	-.03	.01		
Min Q-2	.00			-2.54	-42	1.08	.00	-.40	-.13		
Max Q-3	.34			-2.56	-42	1.09	.00	-.03	.01		
Min Q-3	.00			-2.54	-42	1.08	.00	-.40	-.13		
Max T	.34			-2.56	-42	1.09	.00	-.03	.01		
Min T	.00			-2.54	-42	1.08	.00	-.40	-.13		
Max M-2	.34			-2.56	-42	1.09	.00	-.03	.01		
Min M-2	.00			-2.54	-42	1.08	.00	-.40	-.13		
Max M-3	.34			-2.56	-42	1.09	.00	-.03	.01		
Min M-3	.00	-2.54	-42	1.08	.00	-.40	-.13				
8	LF1	9	.00	-2.50	-26	-1.24	.00	.03	.00		
		13	.27	-2.51	-26	-1.24	.00	-.31	.07		
		Max N	.00	-2.50	-26	-1.24	.00	.03	.00		
		Min N	.27	-2.51	-26	-1.24	.00	-.31	.07		
		Max Q-2	.27	-2.51	-26	-1.24	.00	-.31	.07		
		Min Q-2	.00	-2.50	-26	-1.24	.00	.03	.00		
		Max Q-3	.00	-2.50	-26	-1.24	.00	.03	.00		
		Min Q-3	.27	-2.51	-26	-1.24	.00	-.31	.07		
		Max T	.00	-2.50	-26	-1.24	.00	.03	.00		
		Min T	.00	-2.50	-26	-1.24	.00	.03	.00		
		Max M-2	.00	-2.50	-26	-1.24	.00	.03	.00		
		Min M-2	.27	-2.51	-26	-1.24	.00	-.31	.07		
		Max M-3	.27	-2.51	-26	-1.24	.00	-.31	.07		
Min M-3	.00	-2.50	-26	-1.24	.00	.03	.00				
9	LF1	10	.00	-2.50	-26	1.24	.00	-.03	.00		
		14	.27	-2.51	-26	1.24	.00	.31	.07		
		Max N	.00	-2.50	-26	1.24	.00	-.03	.00		
		Min N	.27	-2.51	-26	1.24	.00	.31	.07		
		Max Q-2	.27	-2.51	-26	1.24	.00	.31	.07		
		Min Q-2	.00	-2.50	-26	1.24	.00	-.03	.00		
		Max Q-3	.27	-2.51	-26	1.24	.00	.31	.07		
		Min Q-3	.00	-2.50	-26	1.24	.00	-.03	.00		
		Max T	.27	-2.51	-26	1.24	.00	-.03	.07		
		Min T	.00	-2.50	-26	1.24	.00	.31	.07		
		Max M-2	.27	-2.51	-26	1.24	.00	.31	.07		
		Min M-2	.00	-2.50	-26	1.24	.00	-.03	.00		
		Max M-3	.27	-2.51	-26	1.24	.00	-.03	.07		
Min M-3	.00	-2.50	-26	1.24	.00	.31	.07				
10	LF1	9	.00	.19	.01	-.01	.00	.01	.00		
		10	.33	.19	-.01	.01	.00	.01	.00		
		Max N	.00	.19	.01	-.01	.00	.01	.00		
		Min N	.00	.19	.01	-.01	.00	.01	.00		
		Max Q-2	.00	.19	.01	-.01	.00	.01	.00		
		Min Q-2	.33	.19	-.01	.01	.00	.01	.00		
		Max Q-3	.33	.19	-.01	.01	.00	.01	.00		
		Min Q-3	.00	.19	.01	-.01	.00	.01	.00		
		Max T	.00	.19	.01	-.01	.00	.01	.00		
		Min T	.00	.19	.01	-.01	.00	.01	.00		
		Max M-2	.33	.19	-.01	.01	.00	.01	.00		
		Min M-2	.17	.19	.00	.00	.00	.01	.00		
		Max M-3	.33	.19	-.01	.01	.00	.01	.00		
Min M-3	.17	.19	.00	.00	.00	.01	.00				
11	LF1	4	.00	.97	.84	-2.21	.00	.09	.06		
		7	.21	.96	.84	-2.21	.00	-.38	-.12		
		Max N	.00	.97	.84	-2.21	.00	.09	.06		
		Min N	.21	.96	.84	-2.21	.00	-.38	-.12		
		Max Q-2	.21	.96	.84	-2.21	.00	-.38	-.12		
		Min Q-2	.00	.97	.84	-2.21	.00	.09	.06		
		Max Q-3	.21	.96	.84	-2.21	.00	-.38	-.12		
		Min Q-3	.00	.97	.84	-2.21	.00	.09	.06		
		Max T	.21	.96	.84	-2.21	.00	-.38	-.12		
		Min T	.00	.97	.84	-2.21	.00	.09	.06		
		Max M-2	.00	.97	.84	-2.21	.00	.09	.06		
		Min M-2	.21	.96	.84	-2.21	.00	-.38	-.12		
		Max M-3	.00	.97	.84	-2.21	.00	.09	.06		
Min M-3	.21	.96	.84	-2.21	.00	-.38	-.12				
12	LF1	4	.00	.97	.84	2.21	.00	-.09	-.06		
		8	.21	.96	.84	2.21	.00	.38	.12		
		Max N	.00	.97	.84	2.21	.00	-.09	-.06		
		Min N	.21	.96	.84	2.21	.00	.38	.12		
		Max Q-2	.21	.96	.84	2.21	.00	.38	.12		
		Min Q-2	.00	.97	.84	2.21	.00	-.09	-.06		
Max Q-3	.00	.97	.84	2.21	.00	-.09	-.06				
Min Q-3	.21	.96	.84	2.21	.00	.38	.12				

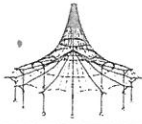


Projekt: Montagegeraete	Position: Montagehilfsbock U120+L50x7	Seite: 8
		17.12.2010

SCHNITTGRÖSSEN QUERSCHNITTSBEZOGEN

Stab-Nr.	LF/LG-Nr.	Knoten-Nr.	x [m]	Kräfte [kN]			Momente [kNm]		
				N	Q ₂	Q ₃	T	M ₂	M ₃
12	LF1	Max T	.00	97	84	2.21	00	-09	.06
		Min T	.00	97	84	2.21	00	-09	.06
		Max M-2	.21	96	84	2.21	00	.38	-.12
		Min M-2	.00	97	84	2.21	00	-09	.06
		Max M-3	.00	97	84	2.21	00	-09	.06
		Min M-3	.21	96	84	2.21	00	.38	-.12
13	LF1	7	.00	-2.54	-42	1.08	00	-40	-.13
		11	.34	-2.56	-42	1.09	00	-03	.01
		Max N	.00	-2.54	-42	1.08	00	-40	-.13
		Min N	.34	-2.56	-42	1.09	00	-03	.01
		Max Q-2	.34	-2.56	-42	1.09	00	-03	.01
		Min Q-2	.00	-2.54	-42	1.08	00	-40	-.13
		Max Q-3	.34	-2.56	-42	1.09	00	-03	.01
		Min Q-3	.00	-2.54	-42	1.08	00	-40	-.13
		Max T	.34	-2.56	-42	1.09	00	-03	.01
		Min T	.00	-2.54	-42	1.08	00	-40	-.13
		Max M-2	.34	-2.56	-42	1.09	00	-03	.01
		Min M-2	.00	-2.54	-42	1.08	00	-40	-.13
		Max M-3	.34	-2.56	-42	1.09	00	-03	.01
		Min M-3	.00	-2.54	-42	1.08	00	-40	-.13
14	LF1	8	.00	-2.54	-42	-1.08	00	.40	-.13
		12	.34	-2.56	-42	-1.09	00	.03	.01
		Max N	.00	-2.54	-42	-1.08	00	.40	-.13
		Min N	.34	-2.56	-42	-1.09	00	.03	.01
		Max Q-2	.34	-2.56	-42	-1.09	00	.03	.01
		Min Q-2	.00	-2.54	-42	-1.08	00	.40	-.13
		Max Q-3	.00	-2.54	-42	-1.08	00	.40	-.13
		Min Q-3	.34	-2.56	-42	-1.09	00	.03	.01
		Max T	.00	-2.54	-42	-1.08	00	.40	-.13
		Min T	.00	-2.54	-42	-1.08	00	.40	-.13
		Max M-2	.00	-2.54	-42	-1.08	00	.40	-.13
		Min M-2	.34	-2.56	-42	-1.09	00	.03	.01
		Max M-3	.34	-2.56	-42	-1.09	00	.03	.01
		Min M-3	.00	-2.54	-42	-1.08	00	.40	-.13
15	LF1	11	.00	-2.50	-26	1.24	00	-03	.00
		15	.27	-2.51	-26	1.24	00	.31	.07
		Max N	.00	-2.50	-26	1.24	00	-03	.00
		Min N	.27	-2.51	-26	1.24	00	.31	.07
		Max Q-2	.27	-2.51	-26	1.24	00	.31	.07
		Min Q-2	.00	-2.50	-26	1.24	00	-03	.00
		Max Q-3	.27	-2.51	-26	1.24	00	.31	.07
		Min Q-3	.00	-2.50	-26	1.24	00	-03	.00
		Max T	.27	-2.51	-26	1.24	00	.31	.07
		Min T	.00	-2.50	-26	1.24	00	-03	.00
		Max M-2	.27	-2.51	-26	1.24	00	.31	.07
		Min M-2	.00	-2.50	-26	1.24	00	-03	.00
		Max M-3	.27	-2.51	-26	1.24	00	.31	.07
		Min M-3	.00	-2.50	-26	1.24	00	-03	.00
16	LF1	12	.00	-2.50	-26	-1.24	00	.03	.00
		16	.27	-2.51	-26	-1.24	00	-.31	.07
		Max N	.00	-2.50	-26	-1.24	00	.03	.00
		Min N	.27	-2.51	-26	-1.24	00	-.31	.07
		Max Q-2	.27	-2.51	-26	-1.24	00	-.31	.07
		Min Q-2	.00	-2.50	-26	-1.24	00	.03	.00
		Max Q-3	.00	-2.50	-26	-1.24	00	.03	.00
		Min Q-3	.27	-2.51	-26	-1.24	00	-.31	.07
		Max T	.00	-2.50	-26	-1.24	00	.03	.00
		Min T	.00	-2.50	-26	-1.24	00	.03	.00
		Max M-2	.00	-2.50	-26	-1.24	00	.03	.00
		Min M-2	.27	-2.51	-26	-1.24	00	-.31	.07
		Max M-3	.27	-2.51	-26	-1.24	00	-.31	.07
		Min M-3	.00	-2.50	-26	-1.24	00	.03	.00
17	LF1	11	.00	.19	.01	.00	00	-.01	.00
		12	.33	.19	-.01	-.01	00	-.01	.00
		Max N	.00	.19	.01	.01	00	-.01	.00
		Min N	.00	.19	.01	.01	00	-.01	.00
		Max Q-2	.00	.19	.01	.01	00	-.01	.00
		Min Q-2	.33	.19	-.01	-.01	00	-.01	.00
		Max Q-3	.00	.19	.01	.01	00	-.01	.00
		Min Q-3	.33	.19	-.01	-.01	00	-.01	.00
		Max T	.00	.19	.01	.01	00	-.01	.00
		Min T	.00	.19	.01	.01	00	-.01	.00
		Max M-2	.17	.19	.00	.00	00	-.01	.00
		Min M-2	.00	.19	.01	.01	00	-.01	.00
		Max M-3	.33	.19	-.01	-.01	00	-.01	.00
		Min M-3	.17	.19	.00	.00	00	-.01	.00
4	LF1	MAX N	.00	.97	84	2.21	00	-09	.06
6	LF1	MIN N	.34	-2.56	-42	-1.09	00	.03	.01
4	LF1	MAX Q-2	.21	96	84	2.21	00	.38	-.12
6	LF1	MIN Q-2	.00	-2.54	-42	-1.08	00	.40	-.13
4	LF1	MAX Q-3	.00	97	84	2.21	00	-09	.06
5	LF1	MIN Q-3	.00	97	84	-2.21	00	.09	.06
4	LF1	MAX T	.00	97	84	2.21	00	-09	.06
4	LF1	MIN T	.00	97	84	2.21	00	-09	.06
6	LF1	MAX M-2	.00	-2.54	-42	-1.08	00	.40	-.13
7	LF1	MIN M-2	.00	-2.54	-42	1.08	00	-.40	-.13
8	LF1	MAX M-3	.27	-2.51	-26	-1.24	00	-.31	.07
6	LF1	MIN M-3	.00	-2.54	-42	-1.08	00	.40	-.13

Querschnitt-Nr. 3: FL 140x8



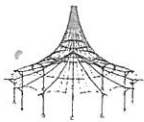
Projekt: Montagegeraete	Position: Montagehilfsbock U120+L50x7	Seite: 9
		17.12.2010

SCHNITTGRÖSSEN QUERSCHNITTSBEZOGEN

Stab-Nr.	LF/LG-Nr.	Knoten-Nr.	x [m]	Kräfte [kN]			Momente [kNm]		
				N	Q ₂	Q ₃	T	M ₂	M ₃
18	LF1	2	.00	-4.67	-1.64	-0.09	.00	.01	-0.43
		5	.25	-4.69	-1.64	-1.10	.00	-0.02	-0.01
		Max N	.00	-4.67	-1.64	-0.09	.00	.01	-0.43
		Min N	.25	-4.69	-1.64	-1.10	.00	-0.02	-0.01
		Max Q-2	.25	-4.69	-1.64	-1.10	.00	-0.02	-0.01
		Min Q-2	.00	-4.67	-1.64	-0.09	.00	.01	-0.43
		Max Q-3	.00	-4.67	-1.64	-0.09	.00	.01	-0.43
		Min Q-3	.25	-4.69	-1.64	-1.10	.00	-0.02	-0.01
		Max T	.00	-4.67	-1.64	-0.09	.00	.01	-0.43
		Min T	.00	-4.67	-1.64	-0.09	.00	.01	-0.43
		Max M-2	.00	-4.67	-1.64	-0.09	.00	.01	-0.43
		Min M-2	.25	-4.69	-1.64	-1.10	.00	-0.02	-0.01
		Max M-3	.25	-4.69	-1.64	-1.10	.00	-0.02	-0.01
		Min M-3	.00	-4.67	-1.64	-0.09	.00	.01	-0.43
19	LF1	2	.00	-4.67	1.64	-0.09	.00	.01	-0.43
		6	.25	-4.69	1.64	-1.10	.00	-0.02	-0.01
		Max N	.00	-4.67	1.64	-0.09	.00	.01	-0.43
		Min N	.25	-4.69	1.64	-1.10	.00	-0.02	-0.01
		Max Q-2	.00	-4.67	1.64	-0.09	.00	.01	-0.43
		Min Q-2	.00	-4.67	1.64	-0.09	.00	.01	-0.43
		Max Q-3	.00	-4.67	1.64	-0.09	.00	.01	-0.43
		Min Q-3	.25	-4.69	1.64	-1.10	.00	-0.02	-0.01
		Max T	.25	-4.69	1.64	-1.10	.00	-0.02	-0.01
		Min T	.00	-4.67	1.64	-0.09	.00	.01	-0.43
		Max M-2	.00	-4.67	1.64	-0.09	.00	.01	-0.43
		Min M-2	.25	-4.69	1.64	-1.10	.00	-0.02	-0.01
		Max M-3	.00	-4.67	1.64	-0.09	.00	.01	-0.43
		Min M-3	.25	-4.69	1.64	-1.10	.00	-0.02	-0.01
20	LF1	3	.00	-4.67	1.64	-0.09	.00	.01	-0.43
		7	.25	-4.69	1.64	-1.10	.00	-0.02	-0.01
		Max N	.00	-4.67	1.64	-0.09	.00	.01	-0.43
		Min N	.25	-4.69	1.64	-1.10	.00	-0.02	-0.01
		Max Q-2	.00	-4.67	1.64	-0.09	.00	.01	-0.43
		Min Q-2	.00	-4.67	1.64	-0.09	.00	.01	-0.43
		Max Q-3	.00	-4.67	1.64	-0.09	.00	.01	-0.43
		Min Q-3	.25	-4.69	1.64	-1.10	.00	-0.02	-0.01
		Max T	.25	-4.69	1.64	-1.10	.00	-0.02	-0.01
		Min T	.00	-4.67	1.64	-0.09	.00	.01	-0.43
		Max M-2	.00	-4.67	1.64	-0.09	.00	.01	-0.43
		Min M-2	.25	-4.69	1.64	-1.10	.00	-0.02	-0.01
		Max M-3	.00	-4.67	1.64	-0.09	.00	.01	-0.43
		Min M-3	.25	-4.69	1.64	-1.10	.00	-0.02	-0.01
21	LF1	3	.00	-4.67	-1.64	-0.09	.00	.01	-0.43
		8	.25	-4.69	-1.64	-1.10	.00	-0.02	-0.01
		Max N	.00	-4.67	-1.64	-0.09	.00	.01	-0.43
		Min N	.25	-4.69	-1.64	-1.10	.00	-0.02	-0.01
		Max Q-2	.25	-4.69	-1.64	-1.10	.00	-0.02	-0.01
		Min Q-2	.00	-4.67	-1.64	-0.09	.00	.01	-0.43
		Max Q-3	.00	-4.67	-1.64	-0.09	.00	.01	-0.43
		Min Q-3	.25	-4.69	-1.64	-1.10	.00	-0.02	-0.01
		Max T	.00	-4.67	-1.64	-0.09	.00	.01	-0.43
		Min T	.00	-4.67	-1.64	-0.09	.00	.01	-0.43
		Max M-2	.00	-4.67	-1.64	-0.09	.00	.01	-0.43
		Min M-2	.25	-4.69	-1.64	-1.10	.00	-0.02	-0.01
		Max M-3	.25	-4.69	-1.64	-1.10	.00	-0.02	-0.01
		Min M-3	.00	-4.67	-1.64	-0.09	.00	.01	-0.43
18	LF1	MAX N	.00	-4.67	-1.64	-0.09	.00	.01	-0.43
18	LF1	MIN N	.25	-4.69	-1.64	-1.10	.00	-0.02	-0.01
19	LF1	MAX Q-2	.00	-4.67	1.64	-0.09	.00	.01	-0.43
18	LF1	MIN Q-2	.00	-4.67	-1.64	-0.09	.00	.01	-0.43
18	LF1	MAX Q-3	.00	-4.67	-1.64	-0.09	.00	.01	-0.43
18	LF1	MIN Q-3	.25	-4.69	-1.64	-1.10	.00	-0.02	-0.01
18	LF1	MAX T	.00	-4.67	-1.64	-0.09	.00	.01	-0.43
18	LF1	MIN T	.00	-4.67	-1.64	-0.09	.00	.01	-0.43
18	LF1	MAX M-2	.00	-4.67	-1.64	-0.09	.00	.01	-0.43
18	LF1	MIN M-2	.25	-4.69	-1.64	-1.10	.00	-0.02	-0.01
19	LF1	MAX M-3	.00	-4.67	1.64	-0.09	.00	.01	-0.43
18	LF1	MIN M-3	.00	-4.67	-1.64	-0.09	.00	.01	-0.43

AUFLAGERKRÄFTE UND -MOMENTE

Knoten-Nr.	LF/LG-Nr.	P _x	Auflagerkräfte [kN]			Auflagermomente [kNm]		
			P _y	P _z	M _x	M _y	M _z	
13	LF1	-1.062	.119	2.606	-0.168	.260	-0.084	
14	LF1	-1.062	-0.119	2.606	.168	.260	0.084	
15	LF1	1.062	.119	2.606	-0.168	-0.260	0.084	
16	LF1	1.062	-0.119	2.606	.168	-0.260	-0.084	
ΣKräfte	LF1	.000	.000	10.425				
ΣLasten		.000	.000	10.425				



Projekt: Montagegeraete	Position: Montagehilfsbock U120+L50x7	Seite: 11
		17.12.2010

MAX. SPANNUNGEN IN STÄBEN

Spannungsart	x-Stelle [m]	S-Punkt Nr.	LF Nr.	Spannung [kN/cm ²]		Ausnutzung
				vorh	grenz	
Tau gesamt	0.000	6	LF1	-0.44	12.60	0.04
Sigma-v	0.270	8	LF1	6.79	21.82	0.31
Stab Nr. 9: Querschnitt Nr. 2 - L 50x7						
Sigma gesamt	0.270	2	LF1	-6.79	21.82	0.31
Tau gesamt	0.000	4	LF1	0.44	12.60	0.04
Sigma-v	0.270	2	LF1	6.79	21.82	0.31
Stab Nr. 10: Querschnitt Nr. 2 - L 50x7						
Sigma gesamt	0.000	8	LF1	0.18	21.82	0.01
Tau gesamt	0.000	3	LF1	-0.01	12.60	0.00
Sigma-v	0.000	8	LF1	0.18	21.82	0.01
Stab Nr. 11: Querschnitt Nr. 2 - L 50x7						
Sigma gesamt	0.210	2	LF1	8.81	21.82	0.40
Tau gesamt	0.000	4	LF1	-0.88	12.60	0.07
Sigma-v	0.210	2	LF1	8.81	21.82	0.40
Stab Nr. 12: Querschnitt Nr. 2 - L 50x7						
Sigma gesamt	0.210	8	LF1	8.81	21.82	0.40
Tau gesamt	0.000	6	LF1	0.88	12.60	0.07
Sigma-v	0.210	8	LF1	8.81	21.82	0.40
Stab Nr. 13: Querschnitt Nr. 2 - L 50x7						
Sigma gesamt	0.000	2	LF1	8.82	21.82	0.40
Tau gesamt	0.270	4	LF1	0.44	12.60	0.03
Sigma-v	0.000	2	LF1	8.82	21.82	0.40
Stab Nr. 14: Querschnitt Nr. 2 - L 50x7						
Sigma gesamt	0.000	8	LF1	8.82	21.82	0.40
Tau gesamt	0.270	6	LF1	-0.44	12.60	0.03
Sigma-v	0.000	8	LF1	8.82	21.82	0.40
Stab Nr. 15: Querschnitt Nr. 2 - L 50x7						
Sigma gesamt	0.270	2	LF1	-6.79	21.82	0.31
Tau gesamt	0.000	4	LF1	0.44	12.60	0.04
Sigma-v	0.270	2	LF1	6.79	21.82	0.31
Stab Nr. 16: Querschnitt Nr. 2 - L 50x7						
Sigma gesamt	0.270	8	LF1	-6.79	21.82	0.31
Tau gesamt	0.000	6	LF1	-0.44	12.60	0.04
Sigma-v	0.270	8	LF1	6.79	21.82	0.31
Stab Nr. 17: Querschnitt Nr. 2 - L 50x7						
Sigma gesamt	0.000	2	LF1	0.18	21.82	0.01
Tau gesamt	0.000	7	LF1	0.01	12.60	0.00
Sigma-v	0.000	2	LF1	0.18	21.82	0.01
Stab Nr. 18: Querschnitt Nr. 3 - FL 140x8						
Sigma gesamt	0.000	2	LF1	-2.73	21.82	0.13
Tau gesamt	0.000	1	LF1	0.00	12.60	0.00
Sigma-v	0.000	2	LF1	2.73	21.82	0.13
Stab Nr. 19: Querschnitt Nr. 3 - FL 140x8						
Sigma gesamt	0.000	1	LF1	-2.73	21.82	0.13
Tau gesamt	0.000	1	LF1	0.00	12.60	0.00
Sigma-v	0.000	1	LF1	2.73	21.82	0.13
Stab Nr. 20: Querschnitt Nr. 3 - FL 140x8						
Sigma gesamt	0.000	1	LF1	-2.73	21.82	0.13
Tau gesamt	0.000	1	LF1	0.00	12.60	0.00
Sigma-v	0.000	1	LF1	2.73	21.82	0.13
Stab Nr. 21: Querschnitt Nr. 3 - FL 140x8						
Sigma gesamt	0.000	2	LF1	-2.73	21.82	0.13
Tau gesamt	0.000	1	LF1	0.00	12.60	0.00
Sigma-v	0.000	2	LF1	2.73	21.82	0.13

STÜCKLISTE STABBEZOGEN

Pos-Nr.	Anzahl Stäbe	Querschnitt	Länge [m]	G-Länge [m]	E-Gewicht [kg/m]	Gewicht [kg]	G-Gewicht [t]
1	2	1 - U 120	0.140	0.280	13.345	1.87	0.00
2	1	1 - U 120	0.720	0.720	13.345	9.61	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