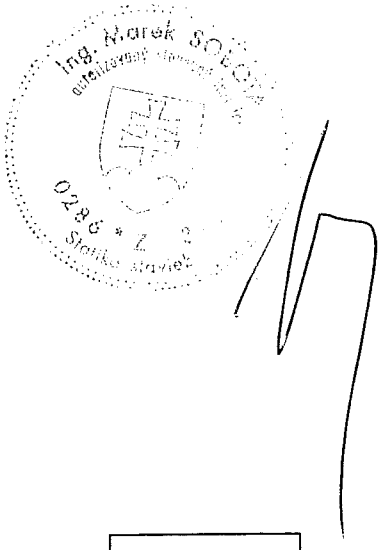
Názov stavby: Construction name:	**Kyslíkový aparát č.9** **Oxygen plant ASU No.9** **Potrubné a kábelové mosty a control building** **Pipe and cable bridges and control building**
Investor:	**U.S. Steel, s.r.o. Vstupný areál U.S. Steel, Košice**
Stupeň: Level:	**Statické posúdenie** **Structural expert's option**
Účel: Scope:	**Posúdenie projektovej dokumentácie fy KMW podľa STN** **Check of original project by KMW co. according to STN**
Archívne číslo: Archival No.:	**RP - 165/2005**



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Košice, 04/2005

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Obsah

Predmet, účel a rozsah posúdenia

Predmetom posúdenia sú podporné oceľové konštrukcie a základové konštrukcie kábelového a potrubného mosta a základu pre control box pre stavbu kyslíkového aparátu č.9. v areáli US Steel Košice. Zoznam nosných oceľových konštrukcií a základových konštrukcií je uvedený v Statickom výpočte firmy KMW na strane 2a. Účelom posúdenia je porovnať, overiť a posúdiť projektovú dokumentáciu vypracovanú podľa DIN s platnými STN normami a miestnymi geotechnickými podmienkami.

Overovaná dokumentácia

- Statický výpočet – Static Calculation 7574 Part 3, KMW Saarbrücen-Brebach, November 2004 strany 1-194 /vrátane strán 2a,71a/
- výkres č. 792.87046 – Pipe and cable bridge

Podklady, Použitá literatúra

- Podrobný inžiniersko-geologický prieskum - Záverečná správa, Montana s.r.o., máj 2004
- DIN 1055 – Lastannahmen für Bauten / Zaťaženie stavebných konštrukcií
- DIN 1054 – Baugrund, Zulässige Belastung des Baugrunds / Navrhovanie základových konštrukcií
- DIN 1045 (07.88) – Beton und Stahlbeton, Bemessung und Ausführung / Navrhovanie betónových konštrukcií
- DIN 18800 – Structural steelwork; design and construction
- STN 73 0035 – Zaťaženie stavebných konštrukcií
- STN 73 1001 – Základová pôda pod plošnými základmi
- STN 73 1201 – Navrhovanie betónových konštrukcií
- STN 73 1401 – Navrhovanie oceľových konštrukcií /Design of steel structures/
- STN EN 206-1 – Betón, Špecifikácia, vlastnosti, výroba a zhoda

Posúdenie

1) Statický výpočet

Pre výpočet metódou konečných prvkov bol použitý výpočtový program IDA NEXIS. Oceľová konštrukcia bola namodelovaná ako 3D model.

Zaťaženie bolo uvažované podľa podkladov dodávateľa technológie. Zaťaženie vetrom bolo uvažované v zmysle DIN 1055 - T4, Strana 4, Tab.1: q=0,5 kN/m^2. Tvarové súčinitele boli uvážené v závislosti na tvare konštrukcie.

Pozn. V zmysle STN 73 0035 je podľa mapy vetrových oblastí pre danú lokalitu základný tlak vetra w0 = 0,55 kN/m2.

Prevodná tabuľka použitých materiálov

DIN 1045	STN 73 1201
oceľ S235	oceľ S235
betón B25 – tab.1, strana 19 kocková pevnosť betaWN = 25 MPa normová pevnosť betaR = 17,5 MPa modul pružnosti E = 30 GPa	betón B25 – tab.1, strana 19 kocková pevnosť 25 MPa normová pevnosť Rbn = 18,5 MPa výpočtová pevnosť Rbd = 14,5 MPa modul pružnosti E = 30 GPa
oceľ BSt 420 – tab.6, strana 24 pevnosť v ťahu betaZ = 500 MPa medza klzu betaS = 420 MPa	oceľ 10425 (V) – tab.29, príloha 1, str.2 pevnosť v ťahu 420 MPa normová pevnosť v ťahu Rsn = 410 MPa výpočtová pevnosť v ťahu Rsd = 375 MPa
oceľ BSt 500 – tab.6, strana 24 pevnosť v ťahu betaZ = 550 MPa medza klzu betaS = 500 MPa	oceľ 10505 (R) – tab.29, príloha 1, str.2 pevnosť v ťahu 500 MPa normová pevnosť v ťahu Rsn = 490 MPa výpočtová pevnosť v ťahu Rsd = 450 MPa

2) Oceľová konštrukcia potrubných mostov:

Nosná konštrukcia je navrhnutá ako kombinácia votknutých stĺpov na ktoré sú uložené rovinné priehradové nosníky. Stĺpy sú votknuté systémom zaliatia do kalicha vytvoreného v hornej časti základovej pätky. Podporu pre káble a potrubia tvoria výpažníky v tvare T. Výpočet užitočného zaťaženia na konštrukciu je urobený štandardný spôsobom. Jednotlivé zaťaženia sú zrejmé zo strany 3-9. Následne sú zavedené do výpočtového modelu ako rovnomerné zaťaženia na priečníky.
V rámci posudku bol prevedený kontrolný prepočet nosnej OK podľa kritérií STN 731401. Do výpočtu boli oproti pôvodnému statickému výpočtu zahrnuté vodorovné účinky predstavujúce cca 30% zo zvislej sily.
Výsledky výpočtu sú v zásade totožné.

3) Výkresová dokumentácia

Výkresová dokumentácia je spracovaná podľa štandardov používaných v Nemecku. Kótovanie je v milimetroch. Výkres spĺňa požiadavky kreslenia podľa STN. Označovanie materiálov podľa DIN normy je totožné s označovaním podľa STN.

4) Základové konštrukcie

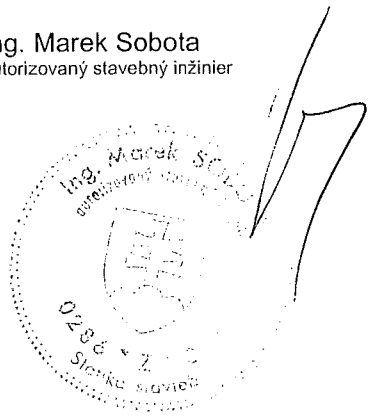
Pri návrhu základových konštrukcií projekt vychádza z predpokladu, že únosná vrstva zeminy sa nachádza cca od 1,5 do 2,6 m pod úrovňou terénu. Únosnosť zeminy je 250 kN/m^2.
Základová pätka je navrhnutá na účinky zaťaženia od nosnej OK. Pätka je stupňovitá, armovaná, výstuž prenáša účinky od krútiaceho momentu a vodorovnej sily do spodnej časti pätky.

Záver

Realizovaním nosných oceľových konštrukcií a základových konštrukcií podľa pôvodnej projektovej dokumentácie budú tieto konštrukcie bezpečné a schopné prenášať zaťaženie na nich pôsobiace a súčasne budú spĺňať ustanovenia platných technických noriem pre navrhovanie stavebných konštrukcií.

V Košiciach, 04/2005

Vypracoval: Ing. Marek Sobota
autorizovaný stavebný inžinier



Názov stavby: Construction name:	**Kyslíkový aparát č.9** **Oxygen plant ASU No.9** **Potrubné a kábelové mosty a control building** **Pipe and cable bridges and control building**
Investor:	**U.S. Steel, s.r.o. Vstupný areál U.S. Steel, Košice**
Stupeň: Level:	**Statické posúdenie** **Structural expert's option**
Účel: Scope:	**Posúdenie projektovej dokumentácie fy KMW podl'a STN** **Check of original project by KMW co. according to STN**
Archívne číslo: Archival No.:	**RP - 165/2005**

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Košice, 04/2005

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Content

Subject, Purpose and Scope of Opinion

The subject of opinion are support steel structure and foundation structures of cable and pipe brige and control box foundation for ASU No: 9 equipment located in US Steel Košice. The list of support steel structures and foundations is stated in Structural Analysis prepared by KMW on page No.2a. Purpose of opinion is to compare, to verify and to check the original project prepared according to DIN standards with valid STN (Slovak Technical Standard) as well as with local geotechnical conditions.

Documents to be verified

- Structural Analysis – Static Calculation 7574 Part 3, KMW Saarbrücen-Brebach, November 2004 pages 1-194 /include pages 2a,71a/
- Drawing No. 792.87046 – Pipe and cable bridge

Used ccdes, Literature

- Detailed Engineering Geological Survey – Final Report, Montana s.r.o., May 2004
- DIN 1055 – Lastannahmen für Bauten / Actions on structures
- DIN 1054 – Baugrund, Zulässige Belastung des Baugrunds / Subsoil, Permissible loading of subsoil
- DIN 1045 (07.88) – Beton und Stahlbeton, Bemessung und Ausführung / Reinforced concrete structures, Design and construction
- DIN 18800 – Návrh oceľových konštrukcií
- STN 73 0035 – Zaťaženie stavebných konštrukcií / Actions on structures
- STN 73 1001 – Základová pôda pod plošnými základmi / Subsoil under shallow foundations
- STN 73 1201 – Navrhovanie betónových konštrukcií / Design of concrete structures/
- STN 73 1401 – Navrhovanie oceľových konštrukcií /Design of steel structures/
- STN EN 206-1 – Betón, Špecifikácia, vlastnosti, výroba a zhoda / Concrete, Specification, performances, production and conformity

Document check

1) Structural Analysis

For the calculation was FEM 3D model used with elastic-bedded foundation slabs. The bedding coefficient assumed for calculation was ks=15 MN/m3. Concrete and reinforcement material characteristics were used according to DIN 1045 standard. Loading was considered according to data by equipment supplier. Wind load was considered according to DIN 1055 – T4, Page 4, Table 1: q=0,5 kN/m^2. Wind shape coefficients were considered depending on shape of structure.

According to STN 73 0035 – Map of wind load areas, the basic wind load for given site location is w0 = 0,55 kN/m2.

Conversion material table

DIN 1045	STN 73 1201
steel S235	steel S235
concrete B25 – table.1, page 19 cube strength betaWN = 25 MPa characteristic strength betaR = 17,5 MPa modulus of elasticity E = 30 GPa	concrete B25 – table.1, page 19 cube strength 25 MPa characteristic strength Rbn = 18,5 MPa design strength Rbd = 14,5 MPa modulus of elasticity E = 30 GPa
reinforcement steel BSt 420 – table.6, page 24 tensile strength betaZ = 500 MPa yield strength betaS = 420 MPa	reinforcement steel 10425 (V)–table.29, app.1,page 2 tensile strength 420 MPa characteristic yield strength Rsn = 410 MPa design yield strength Rsd = 375 MPa
reinforcement steel BSt 500 – table.6, page 24 tensile strength betaZ = 550 MPa yield strength betaS = 500 MPa	reinforcement steel 10505 (R)–table.29, app.1, page 2 tensile strength 500 MPa characteristic yield strength Rsn = 490 MPa design yield strength Rsd = 450 MPa

2) Support steel structure:

Support steel structure of pipe and cable bridge is designed like combination of fixed columns and flat truss bridges. Columns are connected with foundation by vase, which is designed in upper part of fundament.
Cables and pipes are supported by binders T shape.
Calculation of actual load is made by common form. Values of actual loading are shown on pages No 3-9. In These loading are used in next part of structural analysis as continual loadings on bindeers.
Control structural analysis according to STN 731401 was made within of this report. Control analysi reckons with horizontal loading which is cca 30% of vertical loading.
Results of these two calculations are basicly identical.

3) Drawing part

The drawings of support steel structure is prepared according to standards used in Germany. Dimensions are in mm.
Drawing fulfills requirements of STN.
Material marking according to DIN and STN is identical.

4) Foundations

Carrying capacity of subsoil is 250 kN/m^2. Level of bearing ground is from 1,5 to 2,6 m under ground level.

Foundations respects loads - results of steel structure calculation. Fundament is designed as stair-step. Reinforcement is calculated for transmition of reactions from column, specifically horizontal force and twisting moment.

Foundation fulfill STN 73 1001and STN 73 1201 requirements for stability and bearing capacity.

Conclusion

By construction of support steel structures and foundation structures according to original project considering comments mentioned above will foundations safe and be able to carry loads from equipment as well as they will fulfill requirements of valid technical standards for design of structures.

Košice, 04/2005

Prepared: Ing. Marek Sobota
structural engineer

Static Calculation 7574

Part 3

Air Liquide AGS GmbH
Fütingsweg 34
47805 Krefeld

K70101, ASU No. 9 Kosice
Tank Farm
Pipe Bridge, Control Box

Saarbrücken, im November 2004

(statische Berechnung Seiten 1-194)

Ingenieurkammer des Saarlandes 397 Tragwerkplaner

Ing. Marek SOBOTA autorizovaný stavebný inžinier 0296 * Z * 3 Statika stavieb

04/2005

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Remarks

The following structural (static) calculations provide the calculatory proof for the steel construction of the new pipe and cable bridge, for its foundation consisting of single footings as well as for the foundation of the Control Box consisting of an elastically bedded foundation slab for the tank storage facility ASU No. 9 at Kosice.
The foundations for single structures consist of shallow build single footings or foundation slabs. According to the submitted soil report there is load bearing soil at approx. depths – 1.50 to max. 2.60 m below ground level consisting of a layer of dense coarse grained gravel with fine grained sand/clay admixture. The non-load bearing sand/clay layer above is to be exavated, an exchange of soil is to be carried out, backfilled in layers and compacted down to be load bearing gravel layer. According to the soil report soil loads > 250 kN/m^2 are then permissible. The bedding coefficient assumed for the calculations of elastic-bedded foundation slabs with is ks = 15 MN/m^3 to be on the safe side.

All foundations cast are frost-free at a depth of approx. - 1.20 m below ground level.

The load specifications for single structures have been provided by Air Liquide AGS and are attached to the following calculations. Wind and snow loads have been calculated in cooperation with Air Liquide AGS GmbH in accordance with DIN 1055 Standard Parts 4 and 5. According to Air Liquide AGS GmbH loads resulting from earthquakes need not be taken into consideration.

The dimensions for all reinforced concrete structures have been calculated in cooperation with Air Liquide AGS GmbH according to DIN 1045 Standard (07.88).

Calculation are based on:

- Specifications through the Cotracting Agency
- Soil Report
- Standard DIN 1055
- Standard DIN 1045 (07.88)
- any relevant regulations
- DIN 18800

Materials:

- Concrete class B 25
- Reinforcement steel, class BSt 500S (Reinf. steel IV)

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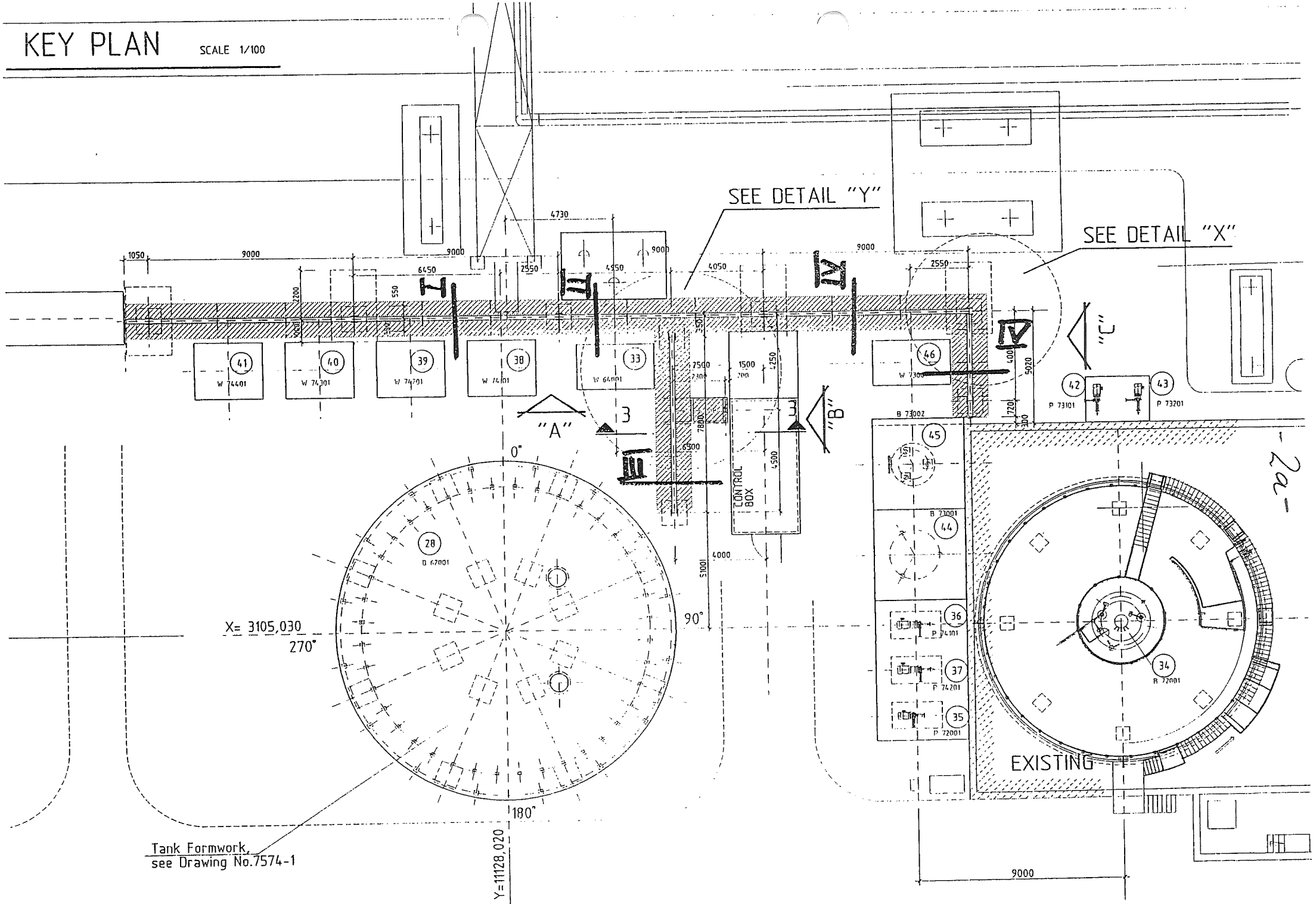
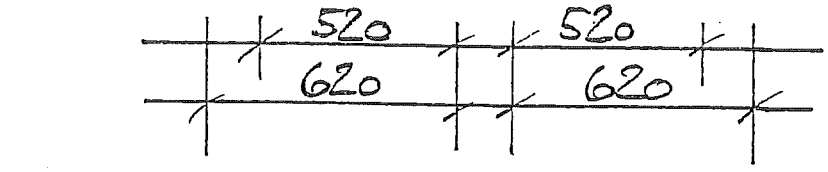
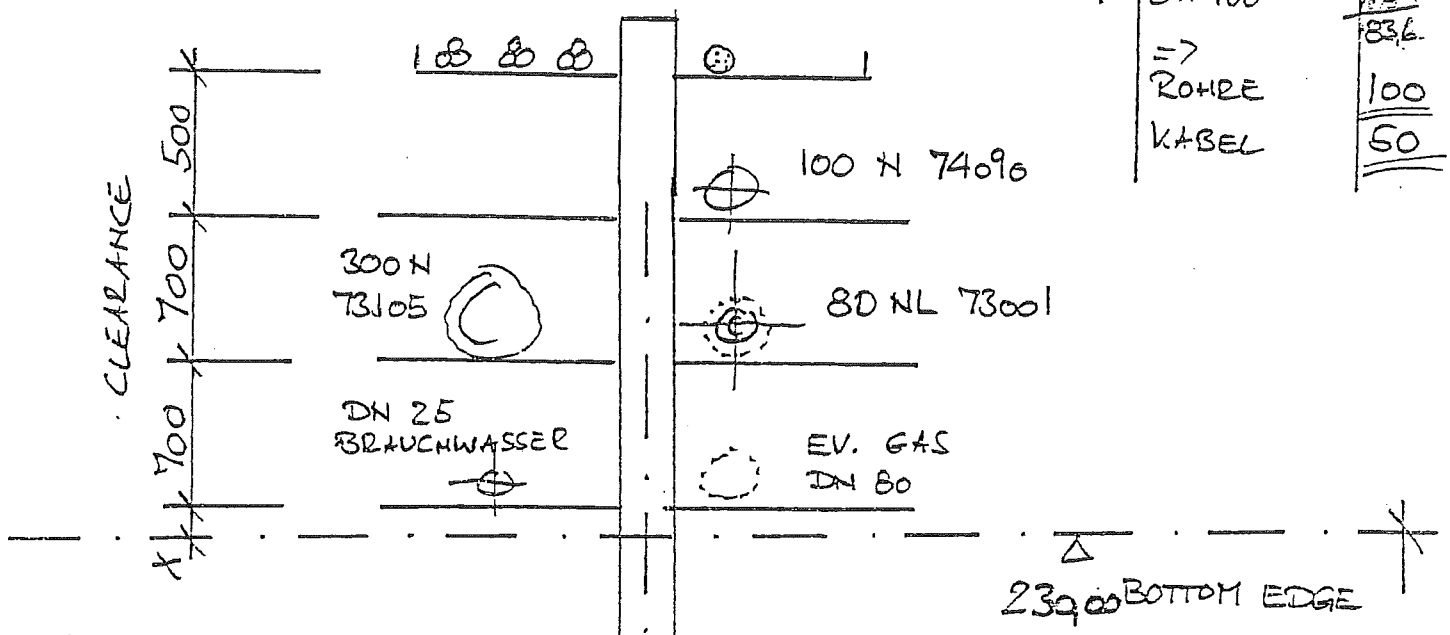
KEY PLAN

SCALE 1/100





	WEIGHT.	Kg/
1	KABELPR.	20
2	KABEL	30
3	DN 300	5
4	DN 25	1,9
5	DN 80	6,7
6	DN 80 NL	15
7	DN 100	10
		83,6
	=>	
	ROHRE	100
	KABEL	60



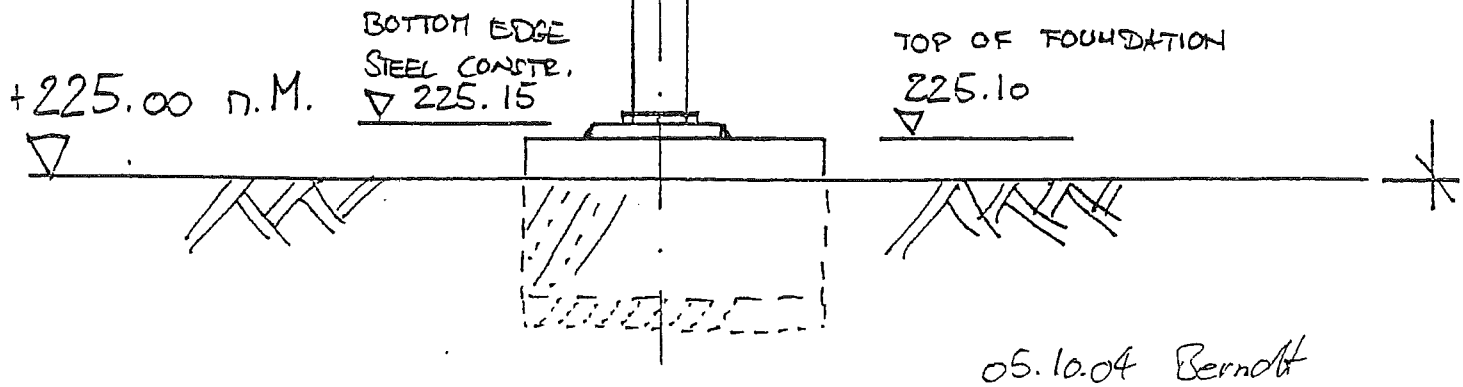
AUFLAGER ABSTÄNDE:

KABEL : á 1,50 m

ROHRE : á 3,00 m

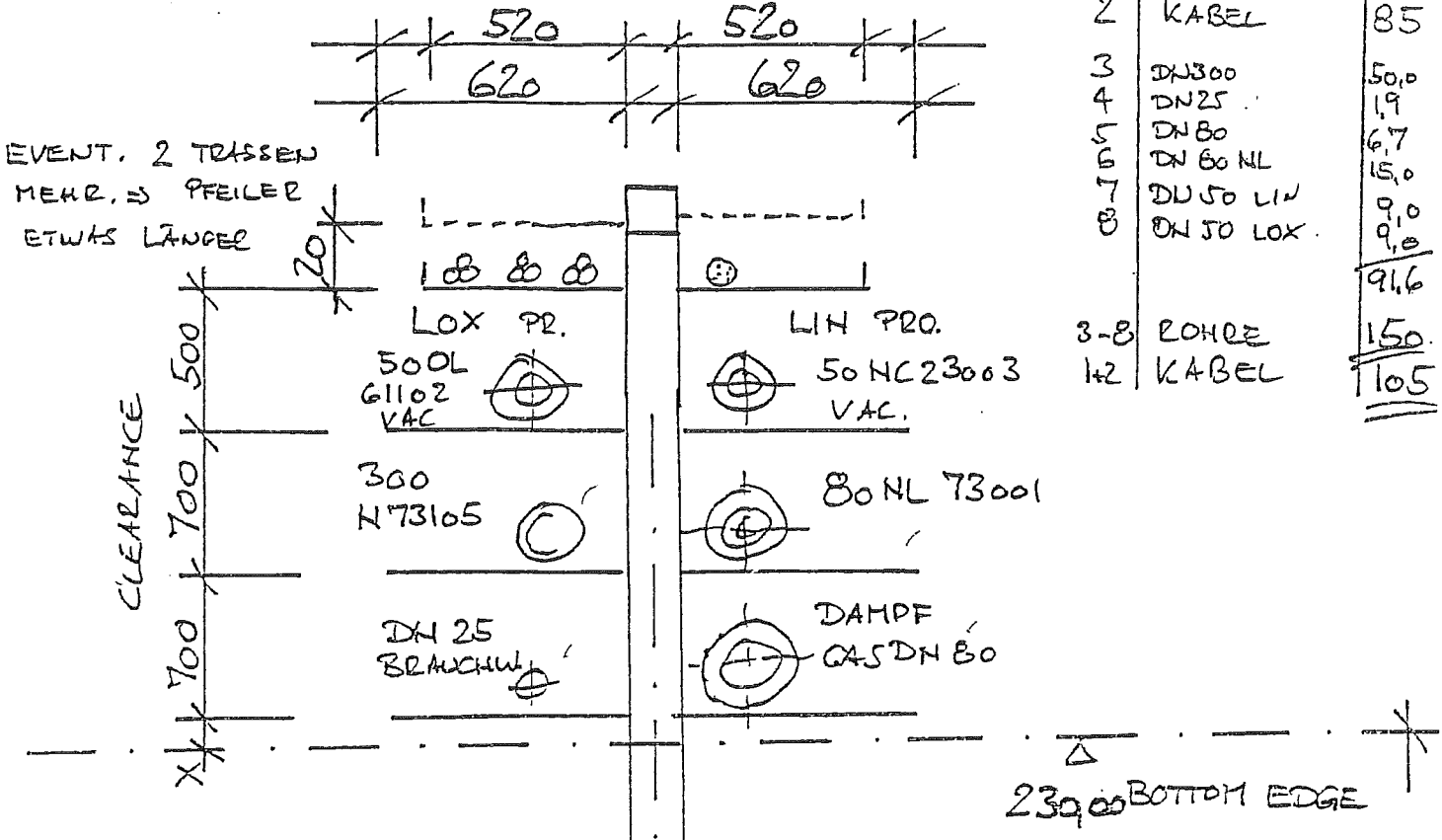
CLEARANCE

5.000 m



05.10.04 Bernoldt

SECTION II - II

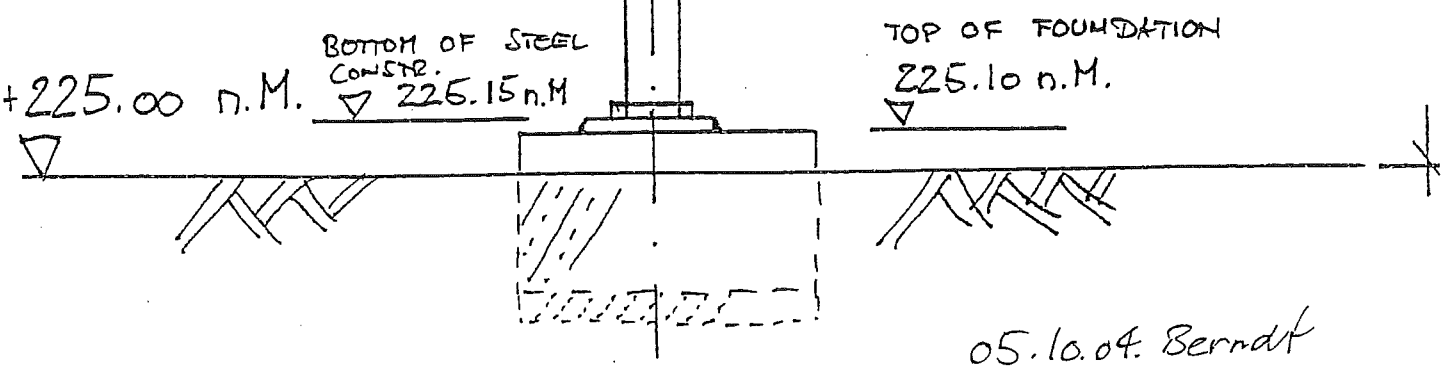


	WEIGHT.	kg/
1	KABELPR.	20
2	KABEL	85
3	DN300	50,0
4	DN25	1,9
5	DN80	6,7
6	DN 80 NL	15,0
7	DU 50 LIN	9,0
8	DN 50 LOX	9,0
		91,6
3-8	ROHRE	150
1+2	KABEL	105

AUFLAGER ABSTÄNDE:

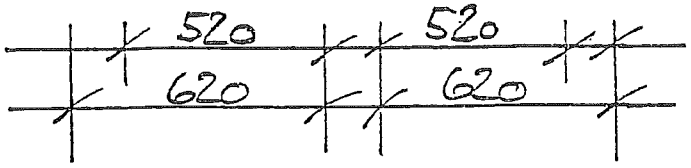
S. BLATT I-I

CLEARANCE

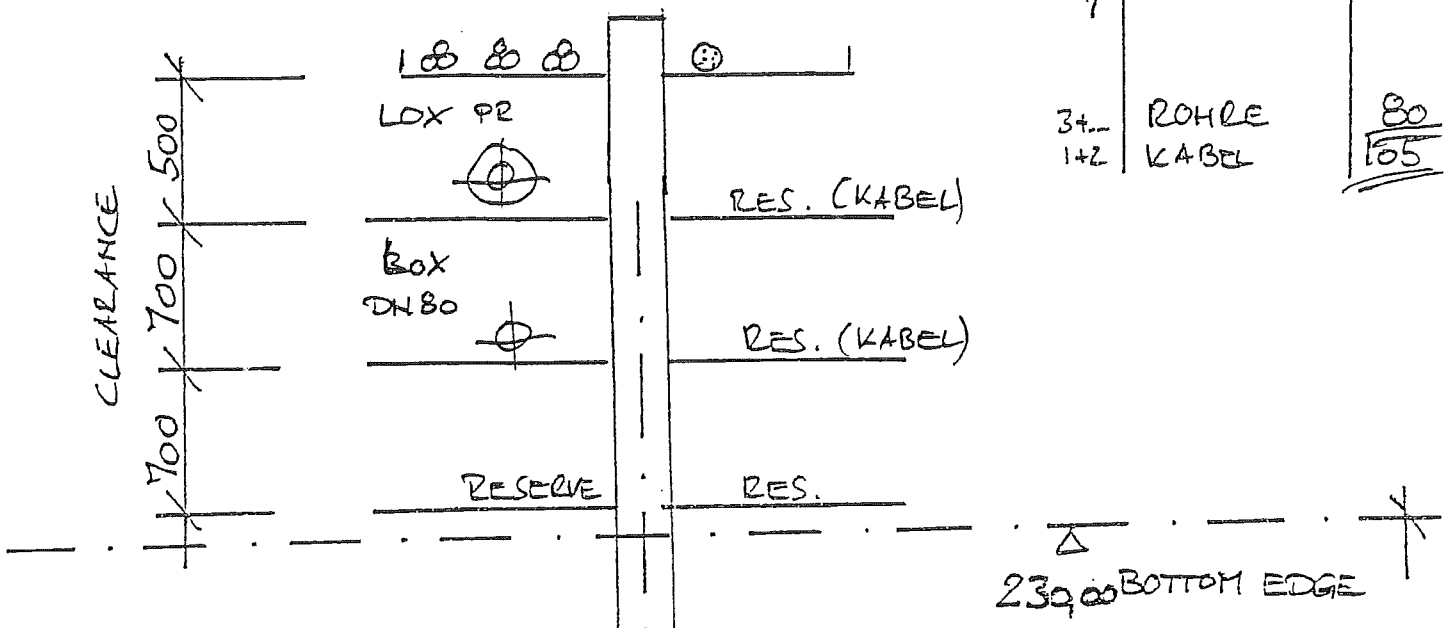


05.10.04 Berndt

SECTION III' - III



	WEIGHT	Kg/
1	KABELPR.	26
2	KABEL	85
3	LOX DN50	9,0
4		
5		
6		
7		
3+4	ROHRE	80
1+2	KABEL	105

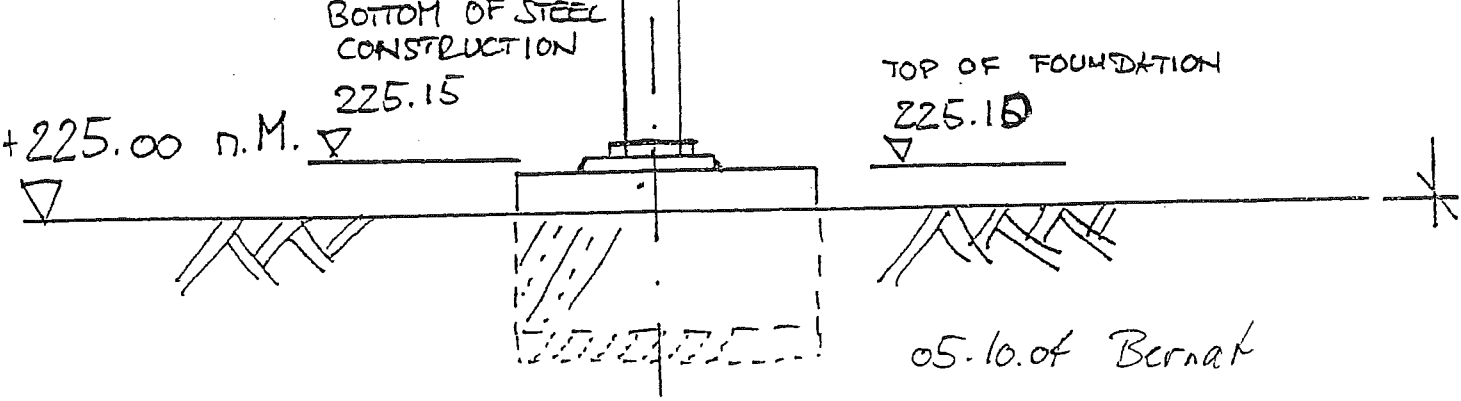


AUFLAGER ABSTÄNDE

S. BLATT I-I

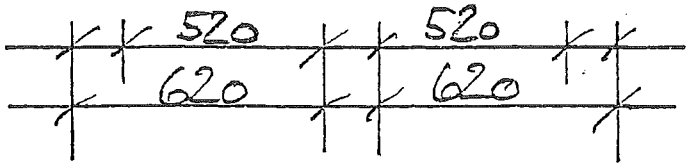
CLEARANCE

5.00 m

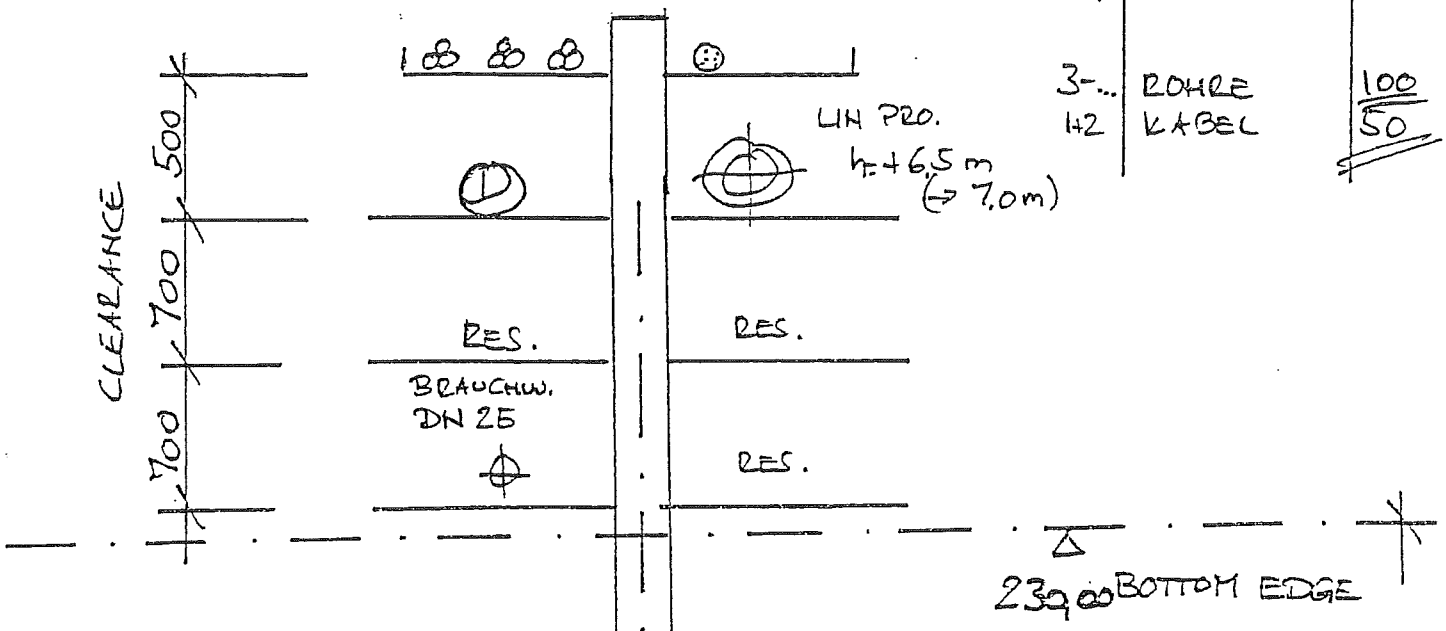


05.10.of Bernat

SECTION IV - IV



	WEIGHT	Kg/
1	KABEL DR.	20
2	KABEL	30
3	DN 25	1,9
4	DN 50	9,0
5		
6		
7		
3-..	ROHRE	100
1+2	KABEL	50

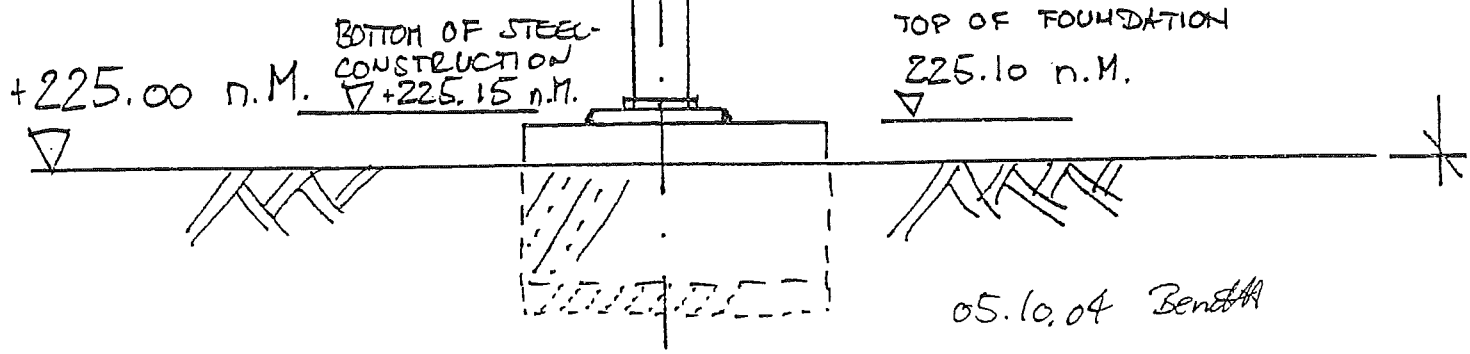


AUFLAGER ABSTÄNDE

S. BLATT I-I

CLEARANCE

5.000

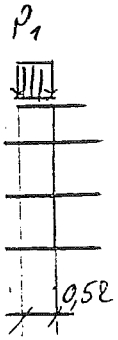


05.10.04 Benda

Loadcases:

LC1: Weight of the Structure

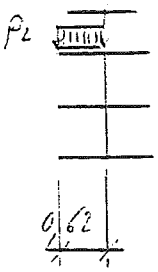
LC2: P_1



$$P_{1k} = (0{,}20 \text{ to } 0{,}85) \cdot 1{,}20 \cdot 1{,}5 \cdot \frac{1}{0{,}52} \approx 3{,}65 \text{ kN/m}$$

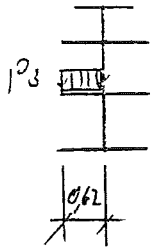
(20%)

LC3: P_2 (DN 50, Lox)



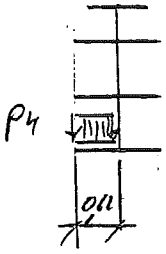
$$P_{2k} = 0{,}09 \cdot 1{,}20 \cdot 3{,}0 \cdot \frac{1}{0{,}62} \approx 0{,}55 \text{ kN/m}$$

LC4: P_3 (DN 300)



$$P_{3k} = 0{,}50 \cdot 1{,}20 \cdot 3{,}0 \cdot \frac{1}{0{,}62} \approx 3{,}0 \text{ kN/m}$$

LC5: P_4 (DN 25)



$$P_{4k} = 0{,}019 \cdot 1{,}20 \cdot 3{,}0 \cdot \frac{1}{0{,}62} = 0{,}11 \text{ kN/m}$$

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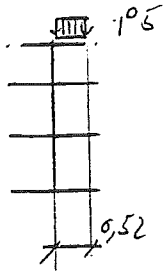
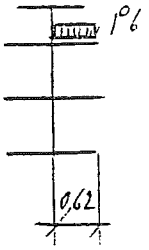
LC6 : p_5



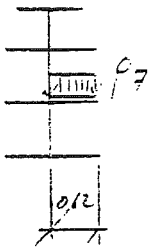
$$p_{5_K} = (0{,}20 + 0{,}85) \cdot 1{,}20 \cdot 1{,}5 \cdot \frac{1}{0{,}52} \approx \underline{3{,}66\ kN/m}$$

LC7 : p_6 (DN 50; LIN)



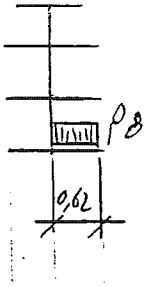
$$p_{6_K} = 0{,}09 \cdot 1{,}2 \cdot 3{,}0 \cdot \frac{1}{0{,}62} = \underline{0{,}53\ kN/m}$$

LC8 : p_7 (DN 80 NL)



$$p_{7_K} = 0{,}15 \cdot 1{,}2 \cdot 3{,}0 \cdot \frac{1}{0{,}62} = \underline{0{,}90\ kN/m}$$

LC9 : p_8 (DN 80)



$$p_{8_K} = 0{,}067 \cdot 1{,}2 \cdot 3{,}0 \cdot \frac{1}{0{,}62} = \underline{0{,}39\ kN/m}$$

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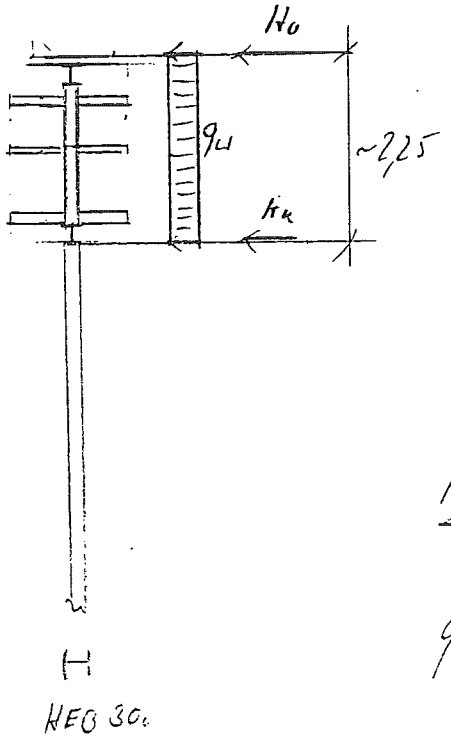
LC 10 + M: Wind + y

$H \leq 20\,m \rightarrow q_{w0} = 0{,}5\ kN/m^2$



$q_u = 1{,}3 \cdot 0{,}5 = \underline{0{,}65\ kN/m^2}$

$H_{0k} = H_{uk} = \dfrac{0{,}65 \cdot 2{,}25}{2} = \underline{0{,}73\ kN/m}$

HEA 300:

$q_u = \pm 1{,}7 \cdot 0{,}5 \cdot 0{,}30 = \underline{0{,}26\ kN/m}$

HEA 200:

$q_u = \pm 1{,}7 \cdot 0{,}6 \cdot 0{,}2 = \underline{0{,}17\ kN/m}$

HE B 100:

$q_u = \pm 1{,}7 \cdot 0{,}5 \cdot 0{,}1 \approx \underline{0{,}10\ kN/m}$

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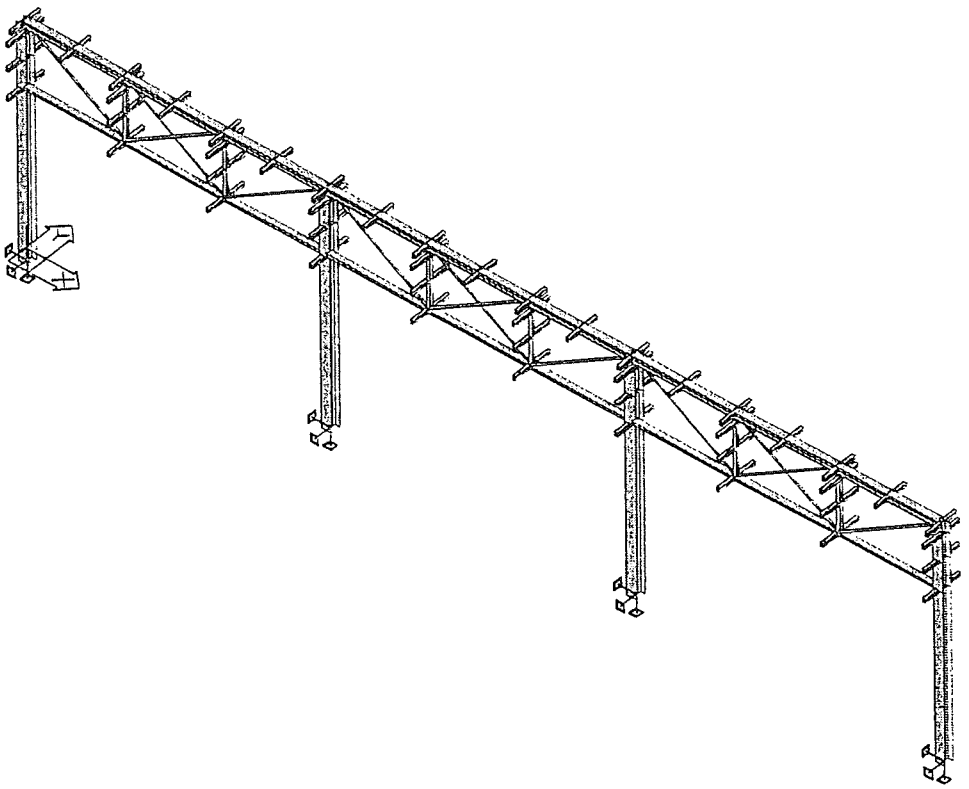
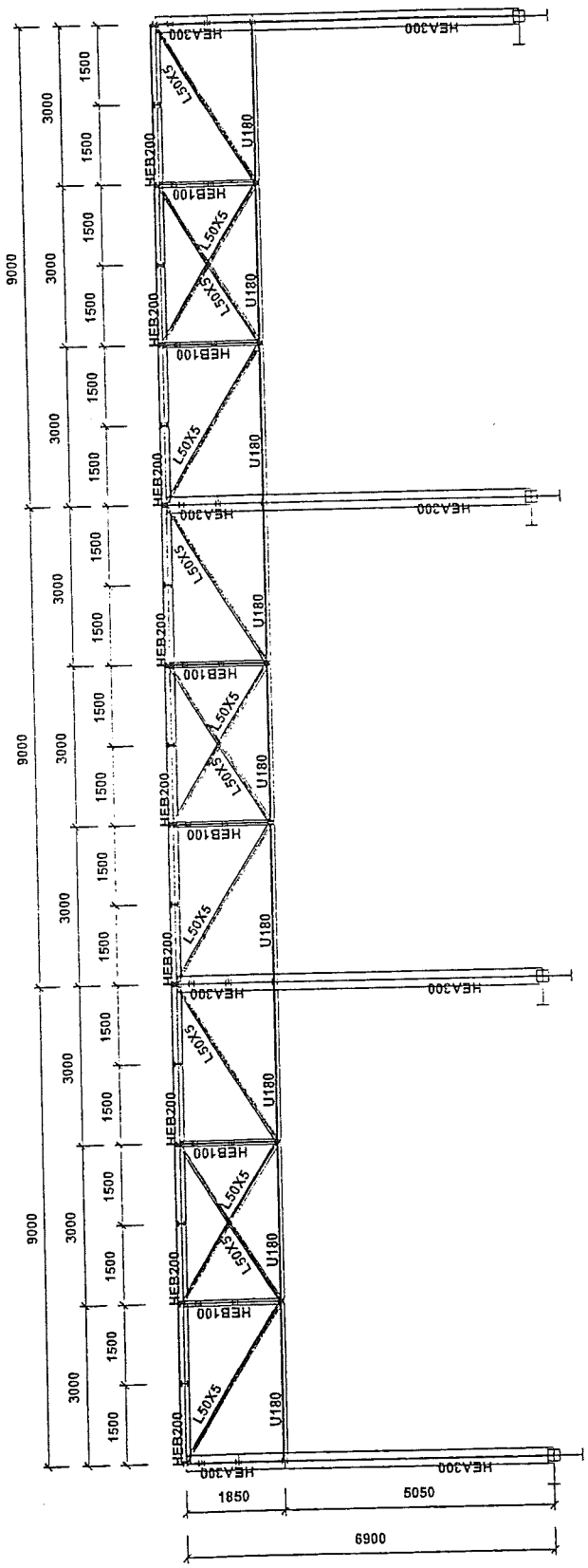
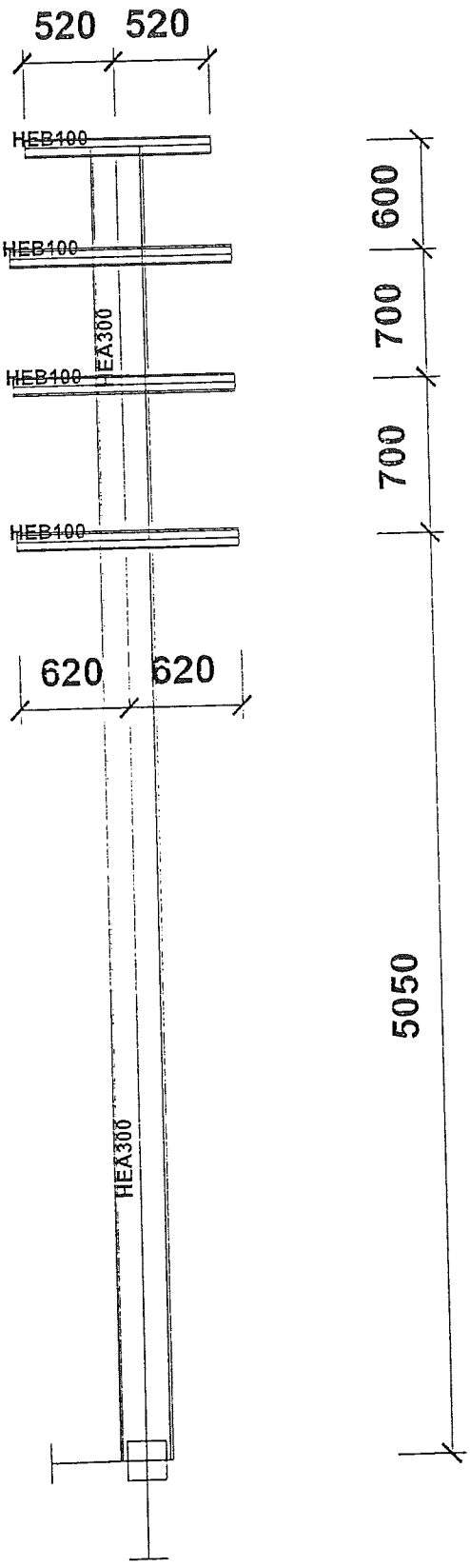
Inhalt




HEA300
L50X5
U180
HEB200
HEB100
9000
3000
1500
1850
5050
6900


520 520
HEB100
HEB100
HEA300
HEB100
HEB100
620 620
HEA300
600
700
700
5050

Basic data
Type of structure : General XYZ

Number of nodes:	151
Number of members:	171
Number of 1D macros:	71
Number of bound. lines:	0
Number of 2D macros:	0
Number of profiles :	5
Number of cases:	11
Number of materials:	1

Material

Name:
S 235

Ultimate strength	36.0000 kN/cm^2
Yield design	24.0000 kN/cm^2
E modulus	210000.00 MPa
Poisson coeff.	0.30
Density	7850.000 kg/m^3
Extensibility	0.012 mm/m.K

List of material
Group of members : 1/171

no.	Name:	quality	unit weight kg/m	length m	weight kg
1	HEB200	S 235	61.29	27.00	1654.91
2	HEA300	S 235	88.71	27.60	2448.26
3	L50X5	S 235	3.77	42.29	159.37
4	HEB100	S 235	20.44	68.06	1391.24
5	U180	S 235	21.98	27.00	593.46

The total weight of the structure: 6247.23 kg
Surface for painting: 145.90 m^2

Nodes

node	X m	Y m	Z m
1	0.000	0.000	-0.300
2	1.500	0.000	-0.300
3	3.000	0.000	-0.300
4	4.500	0.000	-0.300
5	6.000	0.000	-0.300
6	7.500	0.000	-0.300
7	9.000	0.000	-0.300
8	0.000	0.000	-2.150
9	3.000	0.000	-2.150
10	6.000	0.000	-2.150
11	9.000	0.000	-2.150
12	0.000	-0.520	-0.300
13	0.000	0.520	-0.300
14	1.500	-0.520	-0.300

node	X m	Y m	Z m
15	1.500	0.520	-0.300
16	3.000	-0.520	-0.300
17	3.000	0.520	-0.300
18	4.500	-0.520	-0.300
19	4.500	0.520	-0.300
20	6.000	-0.520	-0.300
21	6.000	0.520	-0.300
22	7.500	-0.520	-0.300
23	7.500	0.520	-0.300
24	9.000	-0.520	-0.300
25	9.000	0.520	-0.300
26	3.000	0.000	-1.300
27	3.000	0.000	-0.600
28	6.000	0.000	-1.300
29	6.000	0.000	-0.600
30	0.000	0.000	-7.200
31	0.000	0.000	-1.300
32	0.000	0.000	-0.600
33	9.000	0.000	-7.200
34	9.000	0.000	-1.300
35	9.000	0.000	-0.600
36	0.000	-0.620	-2.150
37	0.000	0.620	-2.150
38	3.000	-0.620	-2.150
39	3.000	0.620	-2.150
40	-0.000	-0.620	-1.300
41	0.000	0.620	-1.300
42	-0.000	-0.620	-0.600
43	0.000	0.620	-0.600
44	3.000	-0.620	-1.300
45	3.000	0.620	-1.300
46	3.000	-0.620	-0.600
47	3.000	0.620	-0.600
48	6.000	-0.620	-2.150
49	6.000	0.620	-2.150
50	6.000	-0.620	-1.300
51	6.000	0.620	-1.300
52	6.000	-0.620	-0.600
53	6.000	0.620	-0.600
54	9.000	-0.620	-2.150
55	9.000	0.620	-2.150
56	9.000	-0.620	-1.300
57	9.000	0.620	-1.300
58	9.000	-0.620	-0.600
59	9.000	0.620	-0.600
60	10.500	0.000	-0.300
61	12.000	0.000	-0.300
62	13.500	0.000	-0.300
63	15.000	0.000	-0.300
64	16.500	0.000	-0.300
65	18.000	0.000	-0.300
66	12.000	0.000	-2.150
67	15.000	0.000	-2.150
68	18.000	0.000	-2.150
69	10.500	-0.520	-0.300
70	10.500	0.520	-0.300
71	12.000	-0.520	-0.300
72	12.000	0.520	-0.300
73	13.500	-0.520	-0.300
74	13.500	0.520	-0.300
75	15.000	-0.520	-0.300
76	15.000	0.520	-0.300
77	16.500	-0.520	-0.300
78	16.500	0.520	-0.300
79	18.000	-0.520	-0.300
80	18.000	0.520	-0.300
81	12.000	0.000	-1.300
82	12.000	0.000	-0.600
83	15.000	0.000	-1.300
84	15.000	0.000	-0.600
85	18.000	0.000	-7.200
86	18.000	0.000	-1.300
87	18.000	0.000	-0.600
88	12.000	-0.620	-2.150
89	12.000	0.620	-2.150
90	12.000	-0.620	-1.300
91	12.000	0.620	-1.300
92	12.000	-0.620	-0.600
93	12.000	0.620	-0.600
94	15.000	-0.620	-2.150
95	15.000	0.620	-2.150
96	15.000	-0.620	-1.300
97	15.000	0.620	-1.300
98	15.000	-0.620	-0.600
99	15.000	0.620	-0.600
100	18.000	-0.620	-2.150
101	18.000	0.620	-2.150
102	18.000	-0.620	-1.300
103	18.000	0.620	-1.300
104	18.000	-0.620	-0.600
105	18.000	0.620	-0.600
106	19.500	0.000	-0.300
107	21.000	0.000	-0.300
108	22.500	0.000	-0.300
109	24.000	0.000	-0.300
110	25.500	0.000	-0.300
111	27.000	0.000	-0.300
112	21.000	0.000	-2.150
113	24.000	0.000	-2.150
114	27.000	0.000	-2.150

node	X m	Y m	Z m
115	19.500	-0.520	-0.300
116	19.500	0.520	-0.300
117	21.000	-0.520	-0.300
118	21.000	0.520	-0.300
119	22.500	-0.520	-0.300
120	22.500	0.520	-0.300
121	24.000	-0.520	-0.300
122	24.000	0.520	-0.300
123	25.500	-0.520	-0.300
124	25.500	0.520	-0.300
125	27.000	-0.520	-0.300
126	27.000	0.520	-0.300
127	21.000	0.000	-1.300
128	21.000	0.000	-0.600
129	24.000	0.000	-1.300
130	24.000	0.000	-0.600
131	27.000	0.000	-7.200
132	27.000	0.000	-1.300
133	27.000	0.000	-0.600

node	X m	Y m	Z m
134	21.000	-0.620	-2.150
135	21.000	0.620	-2.150
136	21.000	-0.620	-1.300
137	21.000	0.620	-1.300
138	21.000	-0.620	-0.600
139	21.000	0.620	-0.600
140	24.000	-0.620	-2.150
141	24.000	0.620	-2.150
142	24.000	-0.620	-1.300
143	24.000	0.620	-1.300
144	24.000	-0.620	-0.600
145	24.000	0.620	-0.600
146	27.000	-0.620	-2.150
147	27.000	0.620	-2.150
148	27.000	-0.620	-1.300
149	27.000	0.620	-1.300
150	27.000	-0.620	-0.600
151	27.000	0.620	-0.600

Members

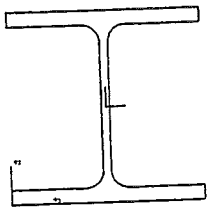
macro	memb	node 1	node 2	length m	R> deg	profile	quality
1	1	1	2	1.500	0.00	1 - HEB200	S 235
	2	2	3	1.500	0.00	1 - HEB200	S 235
	3	3	4	1.500	0.00	1 - HEB200	S 235
	4	4	5	1.500	0.00	1 - HEB200	S 235
	5	5	6	1.500	0.00	1 - HEB200	S 235
	6	6	7	1.500	0.00	1 - HEB200	S 235
2	7	8	9	3.000	270.00	5 - U180	S 235
	8	9	10	3.000	270.00	5 - U180	S 235
	9	10	11	3.000	270.00	5 - U180	S 235
3	10	12	1	0.520	0.00	4 - HEB100	S 235
	11	1	13	0.520	0.00	4 - HEB100	S 235
4	12	14	2	0.520	0.00	4 - HEB100	S 235
	13	2	15	0.520	0.00	4 - HEB100	S 235
5	14	16	3	0.520	0.00	4 - HEB100	S 235
	15	3	17	0.520	0.00	4 - HEB100	S 235
6	16	18	4	0.520	0.00	4 - HEB100	S 235
	17	4	19	0.520	0.00	4 - HEB100	S 235
7	18	20	5	0.520	0.00	4 - HEB100	S 235
	19	5	21	0.520	0.00	4 - HEB100	S 235
8	20	22	6	0.520	0.00	4 - HEB100	S 235
	21	6	23	0.520	0.00	4 - HEB100	S 235
9	22	24	7	0.520	0.00	4 - HEB100	S 235
	23	7	25	0.520	0.00	4 - HEB100	S 235
10	24	9	26	0.850	90.00	4 - HEB100	S 235
	25	26	27	0.700	90.00	4 - HEB100	S 235

macro	memb	node 1	node 2	length m	Rx deg	profile	quality
	26	27	3	0.300	90.00	4 - HEB100	S 235
11	27	10	28	0.850	90.00	4 - HEB100	S 235
	28	28	29	0.700	90.00	4 - HEB100	S 235
	29	29	5	0.300	90.00	4 - HEB100	S 235
12	30	30	8	5.050	90.00	2 - HEA300	S 235
	31	8	31	0.850	90.00	2 - HEA300	S 235
	32	31	32	0.700	90.00	2 - HEA300	S 235
	33	32	1	0.300	90.00	2 - HEA300	S 235
13	34	33	11	5.050	90.00	2 - HEA300	S 235
	35	11	34	0.850	90.00	2 - HEA300	S 235
	36	34	35	0.700	90.00	2 - HEA300	S 235
	37	35	7	0.300	90.00	2 - HEA300	S 235
14	38	1	9	3.525	0.00	3 - L50X5	S 235
	39	9	5	3.525	0.00	3 - L50X5	S 235
15	40	7	10	3.525	0.00	3 - L50X5	S 235
	41	10	3	3.525	0.00	3 - L50X5	S 235
16	42	36	8	0.620	0.00	4 - HEB100	S 235
	43	8	37	0.620	0.00	4 - HEB100	S 235
17	44	38	9	0.620	0.00	4 - HEB100	S 235
	45	9	39	0.620	0.00	4 - HEB100	S 235
18	46	40	31	0.620	0.00	4 - HEB100	S 235
	47	31	41	0.620	0.00	4 - HEB100	S 235
19	48	42	32	0.620	0.00	4 - HEB100	S 235
	49	32	43	0.620	0.00	4 - HEB100	S 235
20	50	44	26	0.620	0.00	4 - HEB100	S 235
	51	26	45	0.620	0.00	4 - HEB100	S 235
21	52	46	27	0.620	0.00	4 - HEB100	S 235
	53	27	47	0.620	0.00	4 - HEB100	S 235
22	54	48	10	0.620	0.00	4 - HEB100	S 235
	55	10	49	0.620	0.00	4 - HEB100	S 235
23	56	50	28	0.620	0.00	4 - HEB100	S 235
	57	28	51	0.620	0.00	4 - HEB100	S 235
24	58	52	29	0.620	0.00	4 - HEB100	S 235
	59	29	53	0.620	0.00	4 - HEB100	S 235
25	60	54	11	0.620	0.00	4 - HEB100	S 235
	61	11	55	0.620	0.00	4 - HEB100	S 235
26	62	56	34	0.620	0.00	4 - HEB100	S 235
	63	34	57	0.620	0.00	4 - HEB100	S 235
27	64	58	35	0.620	0.00	4 - HEB100	S 235
	65	35	59	0.620	0.00	4 - HEB100	S 235
28	66	7	60	1.500	0.00	1 - HEB200	S 235
	67	60	61	1.500	0.00	1 - HEB200	S 235
	68	61	62	1.500	0.00	1 - HEB200	S 235
	69	62	63	1.500	0.00	1 - HEB200	S 235
	70	63	64	1.500	0.00	1 - HEB200	S 235
	71	64	65	1.500	0.00	1 - HEB200	S 235
29	72	11	66	3.000	270.00	5 - U180	S 235
	73	66	67	3.000	270.00	5 - U180	S 235
	74	67	68	3.000	270.00	5 - U180	S 235
30	75	69	60	0.520	0.00	4 - HEB100	S 235

macro	memb	node 1	node 2	length m	Rx deg	profile	quality
	76	60	70	0.520	0.00	4 - HEB100	S 235
31	77	71	61	0.520	0.00	4 - HEB100	S 235
	78	61	72	0.520	0.00	4 - HEB100	S 235
32	79	73	62	0.520	0.00	4 - HEB100	S 235
	80	62	74	0.520	0.00	4 - HEB100	S 235
33	81	75	63	0.520	0.00	4 - HEB100	S 235
	82	63	76	0.520	0.00	4 - HEB100	S 235
34	83	77	64	0.520	0.00	4 - HEB100	S 235
	84	64	78	0.520	0.00	4 - HEB100	S 235
35	85	79	65	0.520	0.00	4 - HEB100	S 235
	86	65	80	0.520	0.00	4 - HEB100	S 235
36	87	66	81	0.850	90.00	4 - HEB100	S 235
	88	81	82	0.700	90.00	4 - HEB100	S 235
	89	82	61	0.300	90.00	4 - HEB100	S 235
37	90	67	83	0.850	90.00	4 - HEB100	S 235
	91	83	84	0.700	90.00	4 - HEB100	S 235
	92	84	63	0.300	90.00	4 - HEB100	S 235
38	93	85	68	5.050	90.00	2 - HEA300	S 235
	94	68	86	0.850	90.00	2 - HEA300	S 235
	95	86	87	0.700	90.00	2 - HEA300	S 235
	96	87	65	0.300	90.00	2 - HEA300	S 235
39	97	7	66	3.525	0.00	3 - L50X5	S 235
	98	66	63	3.525	0.00	3 - L50X5	S 235
40	99	65	67	3.525	0.00	3 - L50X5	S 235
	100	67	61	3.525	0.00	3 - L50X5	S 235
41	101	88	66	0.620	0.00	4 - HEB100	S 235
	102	66	89	0.620	0.00	4 - HEB100	S 235
42	103	90	81	0.620	0.00	4 - HEB100	S 235
	104	81	91	0.620	0.00	4 - HEB100	S 235
43	105	92	82	0.620	0.00	4 - HEB100	S 235
	106	82	93	0.620	0.00	4 - HEB100	S 235
44	107	94	67	0.620	0.00	4 - HEB100	S 235
	108	67	95	0.620	0.00	4 - HEB100	S 235
45	109	96	83	0.620	0.00	4 - HEB100	S 235
	110	83	97	0.620	0.00	4 - HEB100	S 235
46	111	98	84	0.620	0.00	4 - HEB100	S 235
	112	84	99	0.620	0.00	4 - HEB100	S 235
47	113	100	68	0.620	0.00	4 - HEB100	S 235
	114	68	101	0.620	0.00	4 - HEB100	S 235
48	115	102	86	0.620	0.00	4 - HEB100	S 235
	116	86	103	0.620	0.00	4 - HEB100	S 235
49	117	104	87	0.620	0.00	4 - HEB100	S 235
	118	87	105	0.620	0.00	4 - HEB100	S 235
50	119	65	106	1.500	0.00	1 - HEB200	S 235
	120	106	107	1.500	0.00	1 - HEB200	S 235
	121	107	108	1.500	0.00	1 - HEB200	S 235
	122	108	109	1.500	0.00	1 - HEB200	S 235
	123	109	110	1.500	0.00	1 - HEB200	S 235
	124	110	111	1.500	0.00	1 - HEB200	S 235
51	125	68	112	3.000	270.00	5 - U180	S 235

macro	memb	node 1	node 2	length m	Rx deg	profile	quality
	126	112	113	3.000	270.00	5 - U180	S 235
	127	113	114	3.000	270.00	5 - U180	S 235
52	128	115	106	0.520	0.00	4 - HEB100	S 235
	129	106	116	0.520	0.00	4 - HEB100	S 235
53	130	117	107	0.520	0.00	4 - HEB100	S 235
	131	107	118	0.520	0.00	4 - HEB100	S 235
54	132	119	108	0.520	0.00	4 - HEB100	S 235
	133	108	120	0.520	0.00	4 - HEB100	S 235
55	134	121	109	0.520	0.00	4 - HEB100	S 235
	135	109	122	0.520	0.00	4 - HEB100	S 235
56	136	123	110	0.520	0.00	4 - HEB100	S 235
	137	110	124	0.520	0.00	4 - HEB100	S 235
57	138	125	111	0.520	0.00	4 - HEB100	S 235
	139	111	126	0.520	0.00	4 - HEB100	S 235
58	140	112	127	0.850	90.00	4 - HEB100	S 235
	141	127	128	0.700	90.00	4 - HEB100	S 235
	142	128	107	0.300	90.00	4 - HEB100	S 235
59	143	113	129	0.850	90.00	4 - HEB100	S 235
	144	129	130	0.700	90.00	4 - HEB100	S 235
	145	130	109	0.300	90.00	4 - HEB100	S 235
60	146	131	114	5.050	90.00	2 - HEA300	S 235
	147	114	132	0.850	90.00	2 - HEA300	S 235
	148	132	133	0.700	90.00	2 - HEA300	S 235
	149	133	111	0.300	90.00	2 - HEA300	S 235
61	150	65	112	3.525	0.00	3 - L50X5	S 235
	151	112	109	3.525	0.00	3 - L50X5	S 235
62	152	111	113	3.525	0.00	3 - L50X5	S 235
	153	113	107	3.525	0.00	3 - L50X5	S 235
63	154	134	112	0.620	0.00	4 - HEB100	S 235
	155	112	135	0.620	0.00	4 - HEB100	S 235
64	156	136	127	0.620	0.00	4 - HEB100	S 235
	157	127	137	0.620	0.00	4 - HEB100	S 235
65	158	138	128	0.620	0.00	4 - HEB100	S 235
	159	128	139	0.620	0.00	4 - HEB100	S 235
66	160	140	113	0.620	0.00	4 - HEB100	S 235
	161	113	141	0.620	0.00	4 - HEB100	S 235
67	162	142	129	0.620	0.00	4 - HEB100	S 235
	163	129	143	0.620	0.00	4 - HEB100	S 235
68	164	144	130	0.620	0.00	4 - HEB100	S 235
	165	130	145	0.620	0.00	4 - HEB100	S 235
69	166	146	114	0.620	0.00	4 - HEB100	S 235
	167	114	147	0.620	0.00	4 - HEB100	S 235
70	168	148	132	0.620	0.00	4 - HEB100	S 235
	169	132	149	0.620	0.00	4 - HEB100	S 235
71	170	150	133	0.620	0.00	4 - HEB100	S 235
	171	133	151	0.620	0.00	4 - HEB100	S 235

Profiles



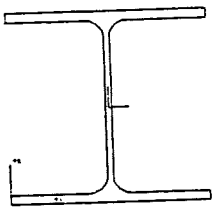
HEB200

Profile no. 1 - HEB200
Material : 12 - S 235

A:	7.808000e+001 cm^2		
Ay/A:	0.656	Az/A:	0.199
Iy:	5.696000e+003 cm^4	Iz:	2.003000e+003 cm^4
Iyz:	0.000000e+000 cm^4	It:	5.928000e+001 cm^4
Iw:	1.716313e+005 cm^6		
Wely:	5.696000e+002 cm^3	Welz:	2.003000e+002 cm^3
Wply:	6.420000e+002 cm^3	Wplz:	3.060000e+002 cm^3
cy:	10.00 cm	cz:	10.00 cm
iy:	8.54 cm	iz:	5.06 cm
dy:	-0.00 cm	dz:	0.00 cm
Outline :			118.20 cm

Type for check: I section

Height	20.00 cm	Width	20.00 cm
Thickness of flange	1.50 cm	Thickness of web	0.90 cm
Radius	1.80 cm		



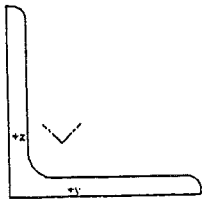
HEA300

Profile no. 2 - HEA300
Material : 12 - S 235

A:	1.130000e+002 cm^2		
Ay/A:	0.655	Az/A:	0.200
Iy:	1.830000e+004 cm^4	Iz:	6.310000e+003 cm^4
Iyz:	1.355253e-012 cm^4	It:	8.520000e+001 cm^4
Iw:	1.203322e+006 cm^6		
Wely:	1.260000e+003 cm^3	Welz:	4.210000e+002 cm^3
Wply:	1.384000e+003 cm^3	Wplz:	6.420000e+002 cm^3
cy:	15.00 cm	cz:	14.50 cm
iy:	12.73 cm	iz:	7.47 cm
dy:	-0.00 cm	dz:	-0.00 cm
Outline :			176.30 cm

Type for check: I section

Height	29.00 cm	Width	30.00 cm
Thickness of flange	1.40 cm	Thickness of web	0.85 cm
Radius	2.70 cm		



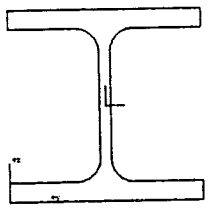
L50X5

Profile no. 3 - L50X5
Material : 12 - S 235

A:	4.800000e+000 cm^2		
Ay/A:	0.419	Az/A:	0.417
Iy:	1.740000e+001 cm^4	Iz:	4.590000e+000 cm^4
Iy0:	1.100000e+001 cm^4	Iz0:	1.100000e+001 cm^4
alpha:	45.000 deg		
Iyz:	-6.416260e+000 cm^4	It:	4.170000e-001 cm^4
Iw:	0.000000e+000 cm^6		
Wely:	4.921463e+000 cm^3	Welz:	2.312529e+000 cm^3
Wply:	7.825653e+000 cm^3	Wplz:	4.043261e+000 cm^3
cy:	1.40 cm	cz:	1.40 cm
iy:	1.90 cm	iz:	0.98 cm
dy:	-1.68 cm	dz:	0.00 cm
Outline :			20.00 cm

Type for check: Angle section

Height	5.00 cm	Width	5.00 cm
Thickness of flange	0.50 cm	Radius	0.35 cm



HEB100

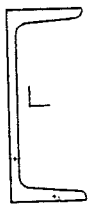
Profile no. 4 - HEB100
Material : 12 - S 235

A:	2.604000e+001 cm^2		
Ay/A:	0.660	Az/A:	0.194
Iy:	4.495000e+002 cm^4	Iz:	1.673000e+002 cm^4
Iyz:	1.629903e-009 cm^4	It:	9.250000e+000 cm^4

A:	2.604000e+001 cm^2		
Iw:	3.384985e+003 cm^6		
Wely:	8.991000e+001 cm^3	Welz:	3.345000e+001 cm^3
Wply:	1.040000e+002 cm^3	Wplz:	5.100000e+001 cm^3
cy:	5.00 cm	cz:	5.00 cm
iy:	4.15 cm	iz:	2.53 cm
dy:	0.00 cm	dz:	-0.00 cm
Outline :			58.80 cm

Type for check: I section

Height	10.00 cm	Width	10.00 cm
Thickness of flange	1.00 cm	Thickness of web	0.60 cm
Radius	1.20 cm		



U180

Profile no. 5 - U180
Material : 12 - S 235

A:	2.800000e+001 cm^2		
Ay/A:	0.267	Az/A:	0.431
Iy:	1.350000e+003 cm^4	Iz:	1.140000e+002 cm^4
Iyz:	-1.185846e-012 cm^4	It:	9.550000e+000 cm^4
Iw:	5.570000e+003 cm^6		
Wely:	1.500000e+002 cm^3	Welz:	2.240000e+001 cm^3
Wply:	1.792000e+002 cm^3	Wplz:	4.820000e+001 cm^3
cy:	1.96 cm	cz:	9.00 cm
iy:	6.94 cm	iz:	2.02 cm
dy:	-4.23 cm	dz:	0.00 cm
Outline :			62.40 cm

Type for check: Channel section

Height	18.00 cm	Width	7.00 cm
Thickness of flange	1.10 cm	Thickness of web	0.80 cm
Radius	1.10 cm		

Nontypical elements

memb	type	memb	type	memb	type
38	X	39	X	40	X
41	X	97	X	98	X
99	X	100	X	150	X

memb	type	memb	type	memb	type
151	X	152	X	153	X

Hinges
The stiffeness values of line hinges are stated in 1 m´ of length

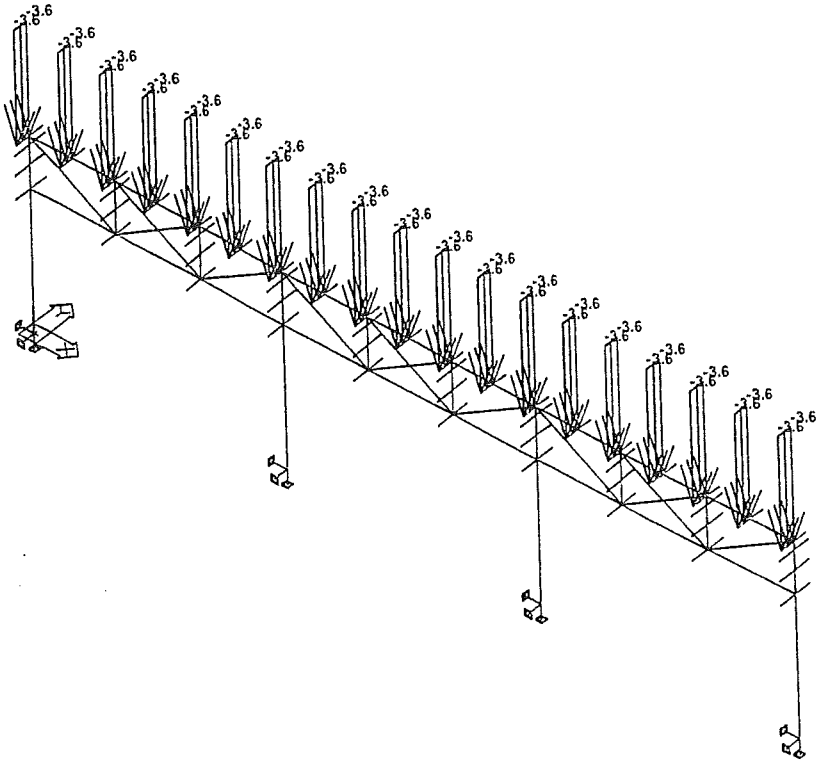
macro	type	pos
1	fiyfiz	beg
1	fiyfiz	end
2	fiyfiz	beg
2	fiyfiz	end
28	fiyfiz	beg
28	fiyfiz	end
29	fiyfiz	beg
29	fiyfiz	end
50	fiyfiz	beg
50	fiyfiz	end
51	fiyfiz	beg
51	fiyfiz	end

Supports

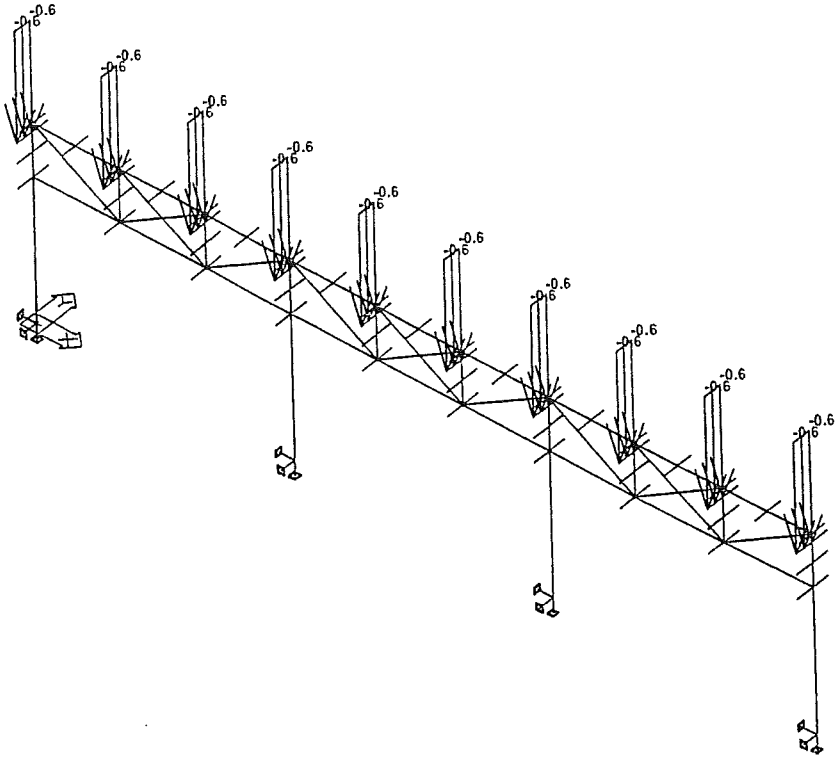
support	node	type	Size m
1	30	XYZRxRyRz	0.20
2	33	XYZRxRyRz	0.20
3	85	XYZRxRyRz	0.20
4	131	XYZRxRyRz	0.20

Loadcases

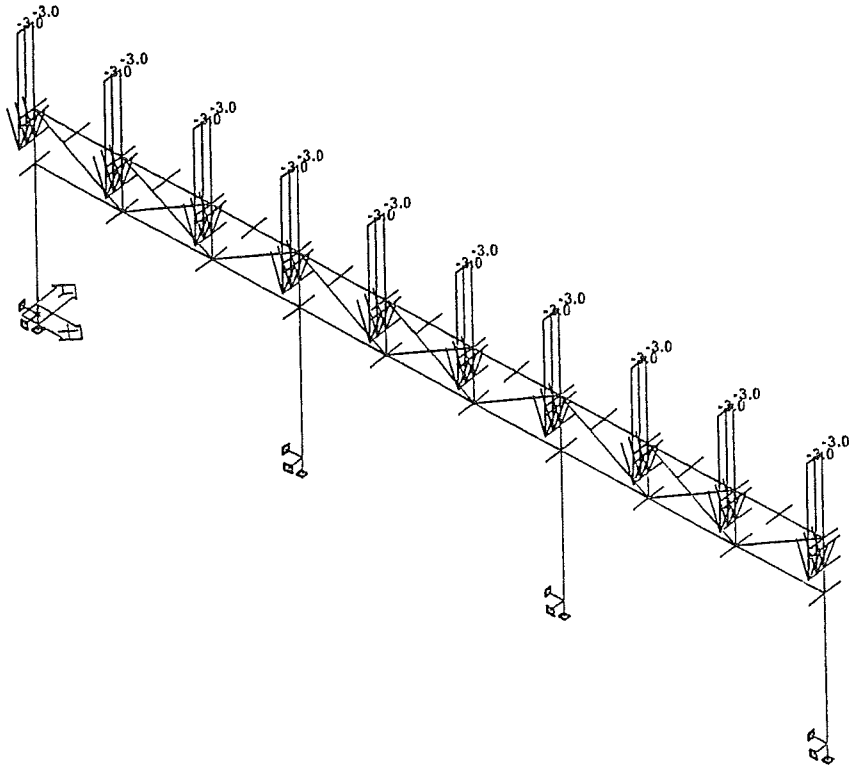
Case	Name:	Description
1	weight of the structural steelwork	Self weight. Direction -Z
2	p1	Variable - P
3	p2	Variable - P
4	p3	Variable - P
5	p4	Variable - P
6	p5	Variable - P
7	p6	Variable - P
8	p7	Variable - P
9	p8	Variable - P
10	Wind +Y	Variable - Wind Excl.
11	Wind -Y	Variable - Wind Excl.



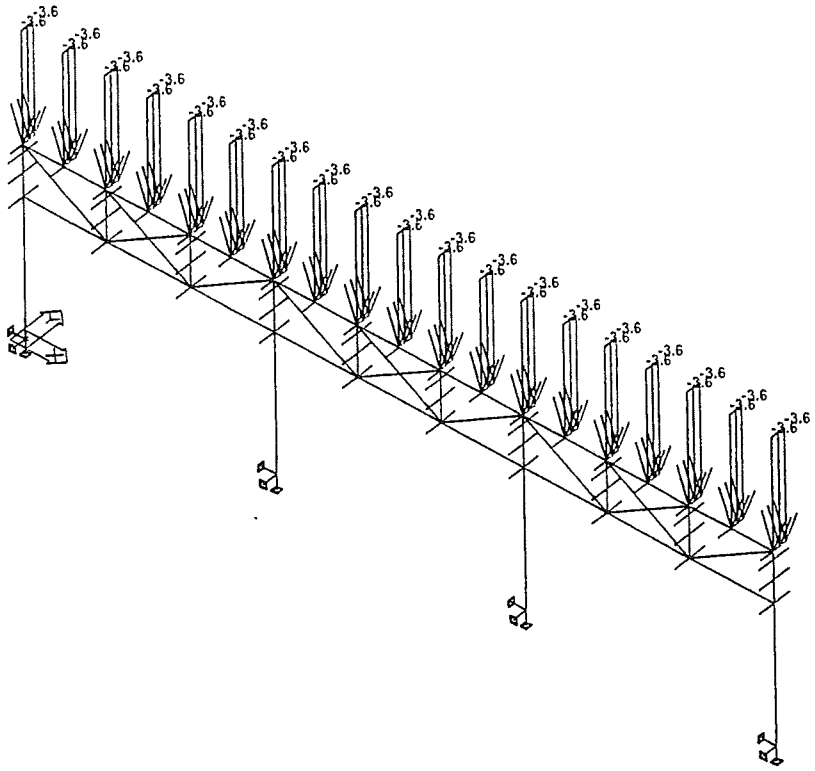
2. p1



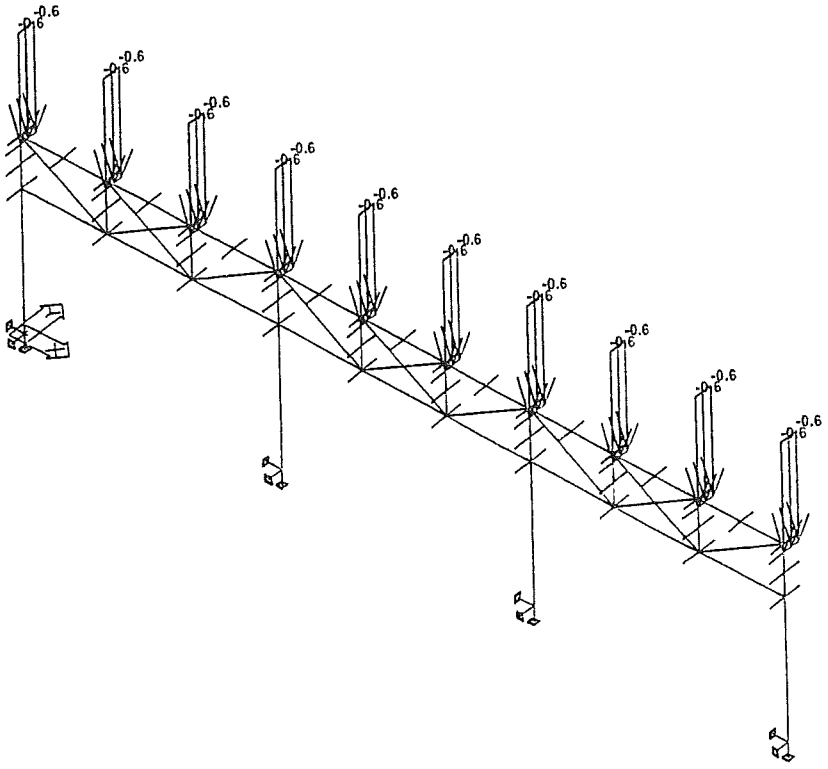
3. p2



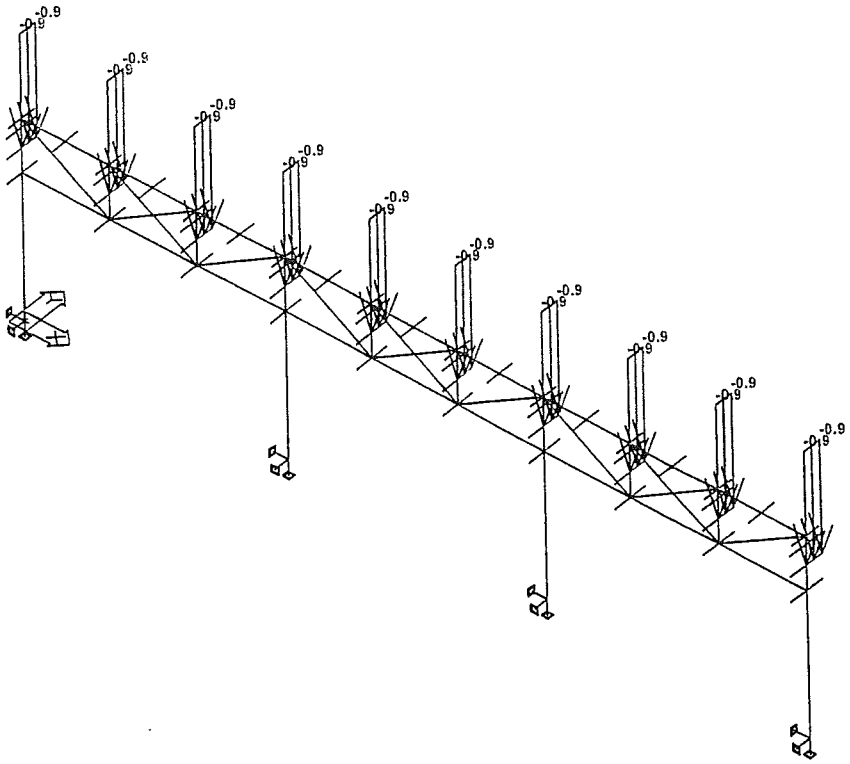
4. p3



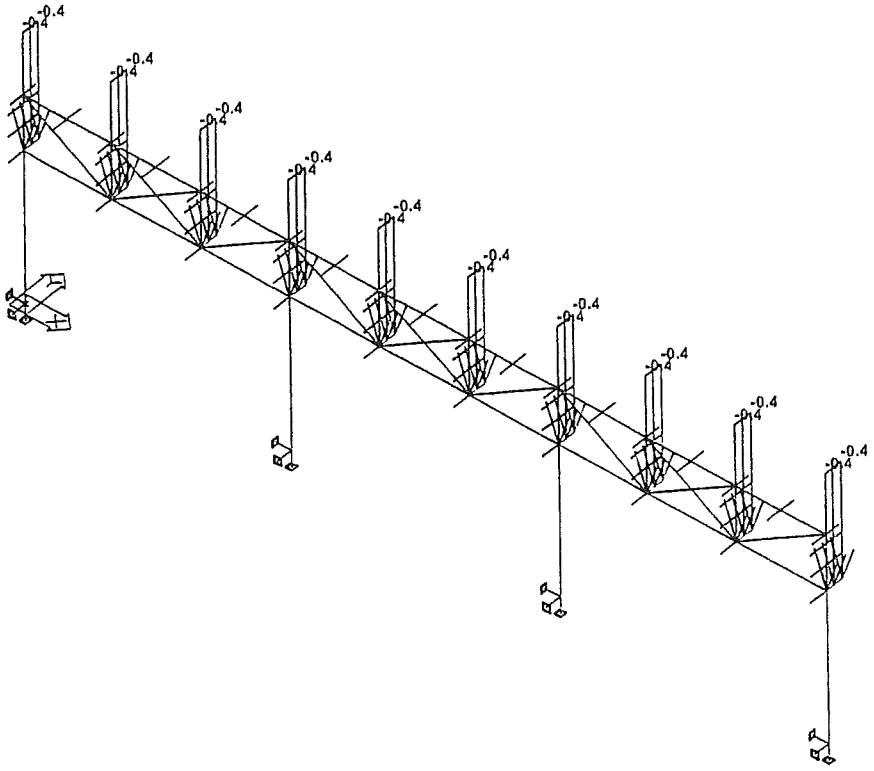
6. p5



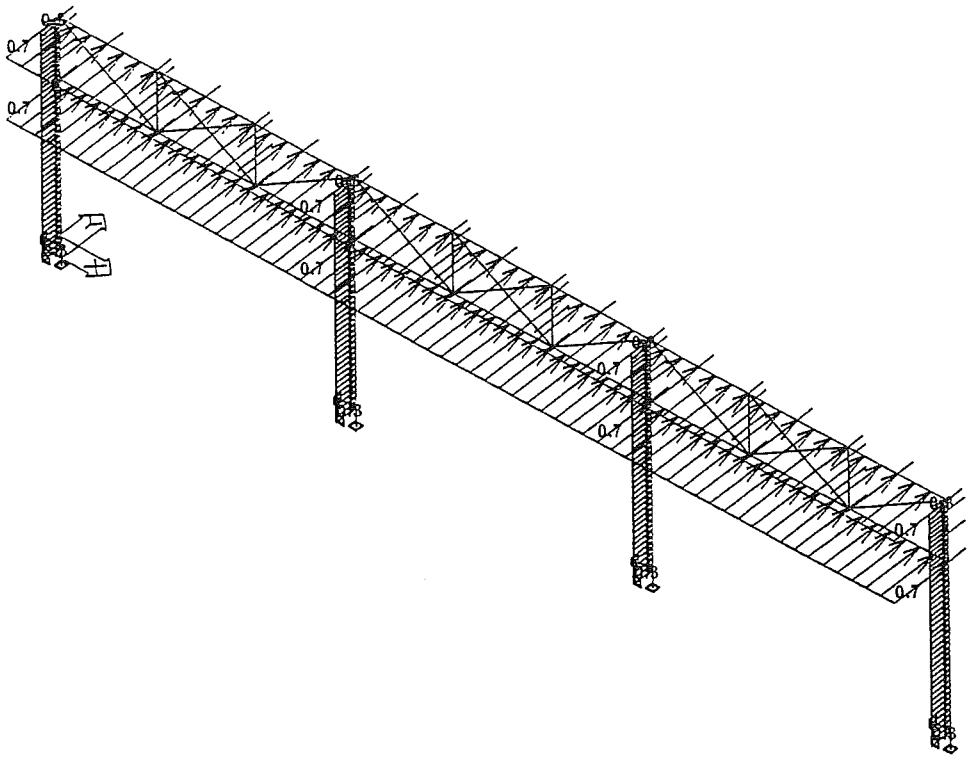
7. p6



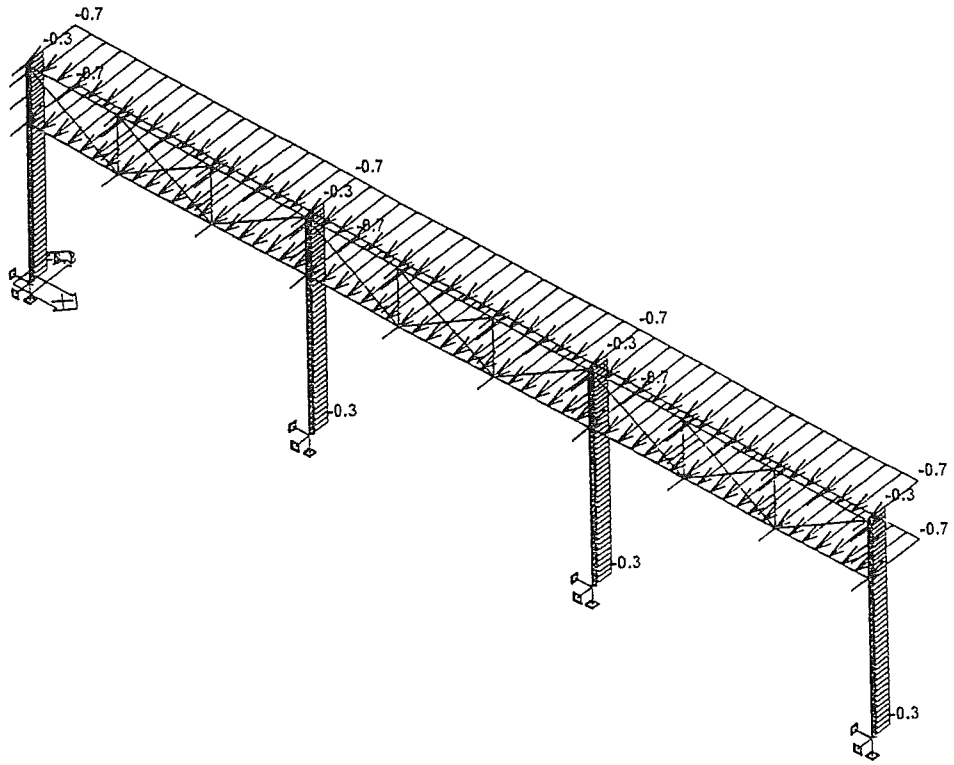
8. p7



9. p8



10. Wind +Y



11. Wind -Y

Loadcase no. 2 - distributed loads

memb	type	dx m	exY m	exZ m		X beg end	Y beg end	Z beg end
10	force kN/m	0.00 rel 1.00	0.00	0.00	glo len	0.00 0.00	0.00 0.00	-3.65 -3.65
12	force kN/m	0.00 rel 1.00	0.00	0.00	glo len	0.00 0.00	0.00 0.00	-3.65 -3.65
14	force kN/m	0.00 rel 1.00	0.00	0.00	glo len	0.00 0.00	0.00 0.00	-3.65 -3.65
16	force kN/m	0.00 rel 1.00	0.00	0.00	glo len	0.00 0.00	0.00 0.00	-3.65 -3.65
18	force kN/m	0.00 rel 1.00	0.00	0.00	glo len	0.00 0.00	0.00 0.00	-3.65 -3.65
20	force kN/m	0.00 rel 1.00	0.00	0.00	glo len	0.00 0.00	0.00 0.00	-3.65 -3.65
22	force kN/m	0.00 rel 1.00	0.00	0.00	glo len	0.00 0.00	0.00 0.00	-3.65 -3.65
75	force kN/m	0.00 rel 1.00	0.00	0.00	glo len	0.00 0.00	0.00 0.00	-3.65 -3.65
77	force kN/m	0.00 rel 1.00	0.00	0.00	glo len	0.00 0.00	0.00 0.00	-3.65 -3.65
79	force kN/m	0.00 rel 1.00	0.00	0.00	glo len	0.00 0.00	0.00 0.00	-3.65 -3.65
81	force kN/m	0.00 rel 1.00	0.00	0.00	glo len	0.00 0.00	0.00 0.00	-3.65 -3.65
83	force kN/m	0.00 rel 1.00	0.00	0.00	glo len	0.00 0.00	0.00 0.00	-3.65 -3.65

memb	type	dx m	exY m	exZ m		X beg end	Y beg end	Z beg end
85	force kN/m	0.00 rel 1.00	0.00	0.00	glo len	0.00 0.00	0.00 0.00	-3.65 -3.65
128	force kN/m	0.00 rel 1.00	0.00	0.00	glo len	0.00 0.00	0.00 0.00	-3.65 -3.65
130	force kN/m	0.00 rel 1.00	0.00	0.00	glo len	0.00 0.00	0.00 0.00	-3.65 -3.65
132	force kN/m	0.00 rel 1.00	0.00	0.00	glo len	0.00 0.00	0.00 0.00	-3.65 -3.65
134	force kN/m	0.00 rel 1.00	0.00	0.00	glo len	0.00 0.00	0.00 0.00	-3.65 -3.65
136	force kN/m	0.00 rel 1.00	0.00	0.00	glo len	0.00 0.00	0.00 0.00	-3.65 -3.65
138	force kN/m	0.00 rel 1.00	0.00	0.00	glo len	0.00 0.00	0.00 0.00	-3.65 -3.65

Loadcase no. 3 - distributed loads

memb	type	dx m	exY m	exZ m		X beg end	Y beg end	Z beg end
48	force kN/m	0.00 rel 1.00	0.00	0.00	glo len	0.00 0.00	0.00 0.00	-0.55 -0.55
52	force kN/m	0.00 rel 1.00	0.00	0.00	glo len	0.00 0.00	0.00 0.00	-0.55 -0.55
58	force kN/m	0.00 rel 1.00	0.00	0.00	glo len	0.00 0.00	0.00 0.00	-0.55 -0.55
64	force kN/m	0.00 rel 1.00	0.00	0.00	glo len	0.00 0.00	0.00 0.00	-0.55 -0.55
105	force kN/m	0.00 rel 1.00	0.00	0.00	glo len	0.00 0.00	0.00 0.00	-0.55 -0.55
111	force kN/m	0.00 rel 1.00	0.00	0.00	glo len	0.00 0.00	0.00 0.00	-0.55 -0.55
117	force kN/m	0.00 rel 1.00	0.00	0.00	glo len	0.00 0.00	0.00 0.00	-0.55 -0.55
158	force kN/m	0.00 rel 1.00	0.00	0.00	glo len	0.00 0.00	0.00 0.00	-0.55 -0.55
164	force kN/m	0.00 rel 1.00	0.00	0.00	glo len	0.00 0.00	0.00 0.00	-0.55 -0.55
170	force kN/m	0.00 rel 1.00	0.00	0.00	glo len	0.00 0.00	0.00 0.00	-0.55 -0.55

Loadcase no. 4 - distributed loads

memb	type	dx m	exY m	exZ m		X beg end	Y beg end	Z beg end
46	force kN/m	0.00 rel 1.00	0.00	0.00	glo len	0.00 0.00	0.00 0.00	-3.00 -3.00
50	force kN/m	0.00 rel 1.00	0.00	0.00	glo len	0.00 0.00	0.00 0.00	-3.00 -3.00
56	force kN/m	0.00 rel 1.00	0.00	0.00	glo len	0.00 0.00	0.00 0.00	-3.00 -3.00
62	force kN/m	0.00 rel 1.00	0.00	0.00	glo len	0.00 0.00	0.00 0.00	-3.00 -3.00
103	force kN/m	0.00 rel 1.00	0.00	0.00	glo len	0.00 0.00	0.00 0.00	-3.00 -3.00

memb	type	dx m	exY m	exZ m		X beg end	Y beg end	Z beg end
109	force kN/m	0.00 rel 1.00	0.00	0.00	glo len	0.00 0.00	0.00 0.00	-3.00 -3.00
115	force kN/m	0.00 rel 1.00	0.00	0.00	glo len	0.00 0.00	0.00 0.00	-3.00 -3.00
156	force kN/m	0.00 rel 1.00	0.00	0.00	glo len	0.00 0.00	0.00 0.00	-3.00 -3.00
162	force kN/m	0.00 rel 1.00	0.00	0.00	glo len	0.00 0.00	0.00 0.00	-3.00 -3.00
168	force kN/m	0.00 rel 1.00	0.00	0.00	glo len	0.00 0.00	0.00 0.00	-3.00 -3.00

Loadcase no. 5 - distributed loads

memb	type	dx m	exY m	exZ m		X beg end	Y beg end	Z beg end
42	force kN/m	0.00 rel 1.00	0.00	0.00	glo len	0.00 0.00	0.00 0.00	-0.11 -0.11
44	force kN/m	0.00 rel 1.00	0.00	0.00	glo len	0.00 0.00	0.00 0.00	-0.11 -0.11
54	force kN/m	0.00 rel 1.00	0.00	0.00	glo len	0.00 0.00	0.00 0.00	-0.11 -0.11
60	force kN/m	0.00 rel 1.00	0.00	0.00	glo len	0.00 0.00	0.00 0.00	-0.11 -0.11
101	force kN/m	0.00 rel 1.00	0.00	0.00	glo len	0.00 0.00	0.00 0.00	-0.11 -0.11
107	force kN/m	0.00 rel 1.00	0.00	0.00	glo len	0.00 0.00	0.00 0.00	-0.11 -0.11
113	force kN/m	0.00 rel 1.00	0.00	0.00	glo len	0.00 0.00	0.00 0.00	-0.11 -0.11
154	force kN/m	0.00 rel 1.00	0.00	0.00	glo len	0.00 0.00	0.00 0.00	-0.11 -0.11
160	force kN/m	0.00 rel 1.00	0.00	0.00	glo len	0.00 0.00	0.00 0.00	-0.11 -0.11
166	force kN/m	0.00 rel 1.00	0.00	0.00	glo len	0.00 0.00	0.00 0.00	-0.11 -0.11

Loadcase no. 6 - distributed loads

memb	type	dx m	exY m	exZ m		X beg end	Y beg end	Z beg end
11	force kN/m	0.00 rel 1.00	0.00	0.00	glo len	0.00 0.00	0.00 0.00	-3.65 -3.65
13	force kN/m	0.00 rel 1.00	0.00	0.00	glo len	0.00 0.00	0.00 0.00	-3.65 -3.65
15	force kN/m	0.00 rel 1.00	0.00	0.00	glo len	0.00 0.00	0.00 0.00	-3.65 -3.65
17	force kN/m	0.00 rel 1.00	0.00	0.00	glo len	0.00 0.00	0.00 0.00	-3.65 -3.65
19	force kN/m	0.00 rel 1.00	0.00	0.00	glo len	0.00 0.00	0.00 0.00	-3.65 -3.65
21	force kN/m	0.00 rel 1.00	0.00	0.00	glo len	0.00 0.00	0.00 0.00	-3.65 -3.65
23	force kN/m	0.00 rel 1.00	0.00	0.00	glo len	0.00 0.00	0.00 0.00	-3.65 -3.65

memb	type	dx m	exY m	exZ m		X beg end	Y beg end	Z beg end
76	force kN/m	0.00 rel 1.00	0.00	0.00	glo len	0.00 0.00	0.00 0.00	-3.65 -3.65
78	force kN/m	0.00 rel 1.00	0.00	0.00	glo len	0.00 0.00	0.00 0.00	-3.65 -3.65
80	force kN/m	0.00 rel 1.00	0.00	0.00	glo len	0.00 0.00	0.00 0.00	-3.65 -3.65
82	force kN/m	0.00 rel 1.00	0.00	0.00	glo len	0.00 0.00	0.00 0.00	-3.65 -3.65
84	force kN/m	0.00 rel 1.00	0.00	0.00	glo len	0.00 0.00	0.00 0.00	-3.65 -3.65
86	force kN/m	0.00 rel 1.00	0.00	0.00	glo len	0.00 0.00	0.00 0.00	-3.65 -3.65
129	force kN/m	0.00 rel 1.00	0.00	0.00	glo len	0.00 0.00	0.00 0.00	-3.65 -3.65
131	force kN/m	0.00 rel 1.00	0.00	0.00	glo len	0.00 0.00	0.00 0.00	-3.65 -3.65
133	force kN/m	0.00 rel 1.00	0.00	0.00	glo len	0.00 0.00	0.00 0.00	-3.65 -3.65
135	force kN/m	0.00 rel 1.00	0.00	0.00	glo len	0.00 0.00	0.00 0.00	-3.65 -3.65
137	force kN/m	0.00 rel 1.00	0.00	0.00	glo len	0.00 0.00	0.00 0.00	-3.65 -3.65
139	force kN/m	0.00 rel 1.00	0.00	0.00	glo len	0.00 0.00	0.00 0.00	-3.65 -3.65

Loadcase no. 7 - distributed loads

memb	type	dx m	exY m	exZ m		X beg end	Y beg end	Z beg end
49	force kN/m	0.00 rel 1.00	0.00	0.00	glo len	0.00 0.00	0.00 0.00	-0.55 -0.55
53	force kN/m	0.00 rel 1.00	0.00	0.00	glo len	0.00 0.00	0.00 0.00	-0.55 -0.55
59	force kN/m	0.00 rel 1.00	0.00	0.00	glo len	0.00 0.00	0.00 0.00	-0.55 -0.55
65	force kN/m	0.00 rel 1.00	0.00	0.00	glo len	0.00 0.00	0.00 0.00	-0.55 -0.55
106	force kN/m	0.00 rel 1.00	0.00	0.00	glo len	0.00 0.00	0.00 0.00	-0.55 -0.55
112	force kN/m	0.00 rel 1.00	0.00	0.00	glo len	0.00 0.00	0.00 0.00	-0.55 -0.55
118	force kN/m	0.00 rel 1.00	0.00	0.00	glo len	0.00 0.00	0.00 0.00	-0.55 -0.55
159	force kN/m	0.00 rel 1.00	0.00	0.00	glo len	0.00 0.00	0.00 0.00	-0.55 -0.55
165	force kN/m	0.00 rel 1.00	0.00	0.00	glo len	0.00 0.00	0.00 0.00	-0.55 -0.55
171	force kN/m	0.00 rel 1.00	0.00	0.00	glo len	0.00 0.00	0.00 0.00	-0.55 -0.55

Loadcase no. 8 - distributed loads

memb	type	dx m	exY m	exZ m		X beg end	Y beg end	Z beg end
47	force kN/m	0.00 rel 1.00	0.00	0.00	glo len	0.00 0.00	0.00 0.00	-0.90 -0.90
51	force kN/m	0.00 rel 1.00	0.00	0.00	glo len	0.00 0.00	0.00 0.00	-0.90 -0.90
57	force kN/m	0.00 rel 1.00	0.00	0.00	glo len	0.00 0.00	0.00 0.00	-0.90 -0.90
63	force kN/m	0.00 rel 1.00	0.00	0.00	glo len	0.00 0.00	0.00 0.00	-0.90 -0.90
104	force kN/m	0.00 rel 1.00	0.00	0.00	glo len	0.00 0.00	0.00 0.00	-0.90 -0.90
110	force kN/m	0.00 rel 1.00	0.00	0.00	glo len	0.00 0.00	0.00 0.00	-0.90 -0.90
116	force kN/m	0.00 rel 1.00	0.00	0.00	glo len	0.00 0.00	0.00 0.00	-0.90 -0.90
157	force kN/m	0.00 rel 1.00	0.00	0.00	glo len	0.00 0.00	0.00 0.00	-0.90 -0.90
163	force kN/m	0.00 rel 1.00	0.00	0.00	glo len	0.00 0.00	0.00 0.00	-0.90 -0.90
169	force kN/m	0.00 rel 1.00	0.00	0.00	glo len	0.00 0.00	0.00 0.00	-0.90 -0.90

Loadcase no. 9 - distributed loads

memb	type	dx m	exY m	exZ m		X beg end	Y beg end	Z beg end
43	force kN/m	0.00 rel 1.00	0.00	0.00	glo len	0.00 0.00	0.00 0.00	-0.39 -0.39
45	force kN/m	0.00 rel 1.00	0.00	0.00	glo len	0.00 0.00	0.00 0.00	-0.39 -0.39
55	force kN/m	0.00 rel 1.00	0.00	0.00	glo len	0.00 0.00	0.00 0.00	-0.39 -0.39
61	force kN/m	0.00 rel 1.00	0.00	0.00	glo len	0.00 0.00	0.00 0.00	-0.39 -0.39
102	force kN/m	0.00 rel 1.00	0.00	0.00	glo len	0.00 0.00	0.00 0.00	-0.39 -0.39
108	force kN/m	0.00 rel 1.00	0.00	0.00	glo len	0.00 0.00	0.00 0.00	-0.39 -0.39
114	force kN/m	0.00 rel 1.00	0.00	0.00	glo len	0.00 0.00	0.00 0.00	-0.39 -0.39
155	force kN/m	0.00 rel 1.00	0.00	0.00	glo len	0.00 0.00	0.00 0.00	-0.39 -0.39
161	force kN/m	0.00 rel 1.00	0.00	0.00	glo len	0.00 0.00	0.00 0.00	-0.39 -0.39
167	force kN/m	0.00 rel 1.00	0.00	0.00	glo len	0.00 0.00	0.00 0.00	-0.39 -0.39

Loadcase no. 10 - distributed loads

macro	type	dx m	exY m	exZ m		X beg end	Y beg end	Z beg end
1	force kN/m	0.00 rel 1.00	0.00	0.00	glo len	0.00 0.00	0.73 0.73	0.00 0.00

macro	type	dx m	exY m	exZ m		X beg end	Y beg end	Z beg end
2	force kN/m	0.00 rel 1.00	0.00	0.00	glo len	0.00 0.00	0.73 0.73	0.00 0.00
12	force kN/m	0.00 rel 1.00	0.00	0.00	glo len	0.00 0.00	0.26 0.26	0.00 0.00
13	force kN/m	0.00 rel 1.00	0.00	0.00	glo len	0.00 0.00	0.26 0.26	0.00 0.00
28	force kN/m	0.00 rel 1.00	0.00	0.00	glo len	0.00 0.00	0.73 0.73	0.00 0.00
29	force kN/m	0.00 rel 1.00	0.00	0.00	glo len	0.00 0.00	0.73 0.73	0.00 0.00
38	force kN/m	0.00 rel 1.00	0.00	0.00	glo len	0.00 0.00	0.26 0.26	0.00 0.00
50	force kN/m	0.00 rel 1.00	0.00	0.00	glo len	0.00 0.00	0.73 0.73	0.00 0.00
51	force kN/m	0.00 rel 1.00	0.00	0.00	glo len	0.00 0.00	0.73 0.73	0.00 0.00
60	force kN/m	0.00 rel 1.00	0.00	0.00	glo len	0.00 0.00	0.26 0.26	0.00 0.00

Loadcase no. 11 - distributed loads

macro	type	dx m	exY m	exZ m		X beg end	Y beg end	Z beg end
1	force kN/m	0.00 rel 1.00	0.00	0.00	glo len	0.00 0.00	-0.73 -0.73	0.00 0.00
2	force kN/m	0.00 rel 1.00	0.00	0.00	glo len	0.00 0.00	-0.73 -0.73	0.00 0.00
12	force kN/m	0.00 rel 1.00	0.00	0.00	glo len	0.00 0.00	-0.26 -0.26	0.00 0.00
13	force kN/m	0.00 rel 1.00	0.00	0.00	glo len	0.00 0.00	-0.26 -0.26	0.00 0.00
28	force kN/m	0.00 rel 1.00	0.00	0.00	glo len	0.00 0.00	-0.73 -0.73	0.00 0.00
29	force kN/m	0.00 rel 1.00	0.00	0.00	glo len	0.00 0.00	-0.73 -0.73	0.00 0.00
38	force kN/m	0.00 rel 1.00	0.00	0.00	glo len	0.00 0.00	-0.26 -0.26	0.00 0.00
50	force kN/m	0.00 rel 1.00	0.00	0.00	glo len	0.00 0.00	-0.73 -0.73	0.00 0.00
51	force kN/m	0.00 rel 1.00	0.00	0.00	glo len	0.00 0.00	-0.73 -0.73	0.00 0.00
60	force kN/m	0.00 rel 1.00	0.00	0.00	glo len	0.00 0.00	-0.26 -0.26	0.00 0.00

Combinations

Combi	Norm	Case	coeff
1.	DIN-ultimate	1 weight of the structural steelwork	1.00
		2 p1	1.00
		3 p2	1.00
		4 p3	1.00
		5 p4	1.00
		6 p5	1.00

Combi	Norm	Case	coeff
		7 p6	1.00
		8 p7	1.00
		9 p8	1.00
		10 Wind +Y	1.10
		11 Wind -Y	1.10
2.	DIN-serviceability	1 weight of the structural steelwork	1.00
		2 p1	1.00
		3 p2	1.00
		4 p3	1.00
		5 p4	1.00
		6 p5	1.00
		7 p6	1.00
		8 p7	1.00
		9 p8	1.00
		10 Wind +Y	1.00
		11 Wind -Y	1.00

$K = 1,1 \hat{=} 10\,\%$

Basic rules for generation of ultimate load combinations:
1 : 1.35*LC1
2 : 1.35*LC1 / 1.50*LC2 / 1.50*LC3 / 1.50*LC4 / 1.50*LC5 / 1.50*LC6 / 1.50*LC7 / 1.50*LC8 / 1.50*LC9
3 : 1.00*LC1 / 1.50*LC2 / 1.50*LC3 / 1.50*LC4 / 1.50*LC5 / 1.50*LC6 / 1.50*LC7 / 1.50*LC8 / 1.50*LC9 → $1,1 \cdot 1,5 = 1,65$
4 : 1.35*LC1 / 1.65*LC10 / 1.65*LC11
5 : 1.00*LC1 / 1.65*LC10 / 1.65*LC11
6 : 1.35*LC1 / 1.35*LC2 / 1.35*LC3 / 1.35*LC4 / 1.35*LC5 / 1.35*LC6 / 1.35*LC7 / 1.35*LC8 / 1.35*LC9 / 1.49*LC10 / 1.49*LC11
7 : 1.00*LC1 / 1.35*LC2 / 1.35*LC3 / 1.35*LC4 / 1.35*LC5 / 1.35*LC6 / 1.35*LC7 / 1.35*LC8 / 1.35*LC9 / 1.49*LC10 / 1.49*LC11 → $1,1 \cdot 1,35 = 1,49$

Basic rules for generation of serviceability load combinations:
1 : 1.00*LC1
2 : 1.00*LC1 / 1.00*LC2 / 1.00*LC3 / 1.00*LC4 / 1.00*LC5 / 1.00*LC6 / 1.00*LC7 / 1.00*LC8 / 1.00*LC9
3 : 1.00*LC1 / 1.00*LC10 / 1.00*LC11
4 : 1.00*LC1 / 0.90*LC2 / 0.90*LC3 / 0.90*LC4 / 0.90*LC5 / 0.90*LC6 / 0.90*LC7 / 0.90*LC8 / 0.90*LC9 / 0.90*LC10 / 0.90*LC11

List of extreme ultimate load combinations
1/ 3 : +1.00*LC1
2/ 1 : +1.35*LC1
3/ 5 : +1.00*LC1+1.65*LC10
4/ 5 : +1.00*LC1+1.65*LC11
5/ 2 : +1.35*LC1+1.50*LC2
6/ 2 : +1.35*LC1+1.50*LC3
7/ 2 : +1.35*LC1+1.50*LC4
8/ 2 : +1.35*LC1+1.50*LC5
9/ 2 : +1.35*LC1+1.50*LC6
10/ 2 : +1.35*LC1+1.50*LC7
11/ 2 : +1.35*LC1+1.50*LC8
12/ 2 : +1.35*LC1+1.50*LC9
13/ 4 : +1.35*LC1+1.65*LC10
14/ 4 : +1.35*LC1+1.65*LC11
15/ 3 : +1.00*LC1+1.50*LC2+1.50*LC6
16/ 2 : +1.35*LC1+1.50*LC2+1.50*LC6
17/ 2 : +1.35*LC1+1.50*LC2+1.50*LC3+1.50*LC4
18/ 2 : +1.35*LC1+1.50*LC3+1.50*LC4+1.50*LC6
19/ 2 : +1.35*LC1+1.50*LC2+1.50*LC7+1.50*LC8
20/ 2 : +1.35*LC1+1.50*LC6+1.50*LC7+1.50*LC8
21/ 2 : +1.35*LC1+1.50*LC2+1.50*LC3+1.50*LC4+1.50*LC5
22/ 2 : +1.35*LC1+1.50*LC2+1.50*LC3+1.50*LC4+1.50*LC9

23/ 2 : +1.35*LC1+1.50*LC2+1.50*LC3+1.50*LC6+1.50*LC7
24/ 2 : +1.35*LC1+1.50*LC3+1.50*LC4+1.50*LC5+1.50*LC6
25/ 2 : +1.35*LC1+1.50*LC2+1.50*LC4+1.50*LC6+1.50*LC8
26/ 2 : +1.35*LC1+1.50*LC3+1.50*LC4+1.50*LC7+1.50*LC8
27/ 2 : +1.35*LC1+1.50*LC2+1.50*LC3+1.50*LC8+1.50*LC9
28/ 2 : +1.35*LC1+1.50*LC4+1.50*LC5+1.50*LC6+1.50*LC7
29/ 2 : +1.35*LC1+1.50*LC5+1.50*LC6+1.50*LC7+1.50*LC8
30/ 2 : +1.35*LC1+1.50*LC2+1.50*LC7+1.50*LC8+1.50*LC9
31/ 2 : +1.35*LC1+1.50*LC6+1.50*LC7+1.50*LC8+1.50*LC9
32/ 7 : +1.00*LC1+1.35*LC2+1.35*LC3+1.35*LC4+1.35*LC5+1.49*LC10
33/ 7 : +1.00*LC1+1.35*LC5+1.35*LC6+1.35*LC7+1.35*LC8+1.49*LC11
34/ 6 : +1.35*LC1+1.35*LC2+1.35*LC3+1.35*LC4+1.35*LC5+1.49*LC10
35/ 6 : +1.35*LC1+1.35*LC2+1.35*LC3+1.35*LC4+1.35*LC5+1.49*LC11
36/ 6 : +1.35*LC1+1.35*LC3+1.35*LC4+1.35*LC5+1.35*LC6+1.49*LC10
37/ 6 : +1.35*LC1+1.35*LC2+1.35*LC7+1.35*LC8+1.35*LC9+1.49*LC11
38/ 6 : +1.35*LC1+1.35*LC5+1.35*LC6+1.35*LC7+1.35*LC8+1.49*LC11
39/ 6 : +1.35*LC1+1.35*LC6+1.35*LC7+1.35*LC8+1.35*LC9+1.49*LC10
40/ 6 : +1.35*LC1+1.35*LC6+1.35*LC7+1.35*LC8+1.35*LC9+1.49*LC11
41/ 3 : +1.00*LC1+1.50*LC3+1.50*LC4+1.50*LC5+1.50*LC7+1.50*LC8+1.50*LC9
42/ 2 : +1.35*LC1+1.50*LC2+1.50*LC3+1.50*LC4+1.50*LC6+1.50*LC7+1.50*LC8
43/ 2 : +1.35*LC1+1.50*LC3+1.50*LC4+1.50*LC5+1.50*LC7+1.50*LC8+1.50*LC9
44/ 2 : +1.35*LC1+1.50*LC2+1.50*LC3+1.50*LC4+1.50*LC6+1.50*LC7+1.50*LC8
+1.50*LC9
45/ 3 : +1.00*LC1+1.50*LC2+1.50*LC3+1.50*LC4+1.50*LC5+1.50*LC6+1.50*LC7
+1.50*LC8+1.50*LC9
46/ 2 : +1.35*LC1+1.50*LC2+1.50*LC3+1.50*LC4+1.50*LC5+1.50*LC6+1.50*LC7
+1.50*LC8+1.50*LC9
47/ 6 : +1.35*LC1+1.35*LC2+1.35*LC3+1.35*LC4+1.35*LC5+1.35*LC6+1.35*LC7
+1.35*LC8+1.35*LC9+1.49*LC10

List of extreme serviceability load combinations
1/ 1 : +1.00*LC1
2/ 2 : +1.00*LC1+1.00*LC2
3/ 2 : +1.00*LC1+1.00*LC3
4/ 2 : +1.00*LC1+1.00*LC4
5/ 2 : +1.00*LC1+1.00*LC5
6/ 2 : +1.00*LC1+1.00*LC6
7/ 2 : +1.00*LC1+1.00*LC7
8/ 2 : +1.00*LC1+1.00*LC8
9/ 2 : +1.00*LC1+1.00*LC9
10/ 3 : +1.00*LC1+1.00*LC10
11/ 3 : +1.00*LC1+1.00*LC11
12/ 2 : +1.00*LC1+1.00*LC4+1.00*LC8
13/ 2 : +1.00*LC1+1.00*LC2+1.00*LC4+1.00*LC6
14/ 4 : +1.00*LC1+0.90*LC2+0.90*LC3+0.90*LC4+0.90*LC10
15/ 4 : +1.00*LC1+0.90*LC2+0.90*LC3+0.90*LC4+0.90*LC11
16/ 2 : +1.00*LC1+1.00*LC2+1.00*LC3+1.00*LC4+1.00*LC5
17/ 2 : +1.00*LC1+1.00*LC2+1.00*LC3+1.00*LC4+1.00*LC9
18/ 2 : +1.00*LC1+1.00*LC3+1.00*LC4+1.00*LC5+1.00*LC6
19/ 2 : +1.00*LC1+1.00*LC2+1.00*LC4+1.00*LC6+1.00*LC8
20/ 2 : +1.00*LC1+1.00*LC2+1.00*LC3+1.00*LC8+1.00*LC9
21/ 2 : +1.00*LC1+1.00*LC4+1.00*LC5+1.00*LC6+1.00*LC7
22/ 2 : +1.00*LC1+1.00*LC5+1.00*LC6+1.00*LC7+1.00*LC8
23/ 2 : +1.00*LC1+1.00*LC2+1.00*LC7+1.00*LC8+1.00*LC9
24/ 2 : +1.00*LC1+1.00*LC6+1.00*LC7+1.00*LC8+1.00*LC9
25/ 4 : +1.00*LC1+0.90*LC2+0.90*LC3+0.90*LC4+0.90*LC5+0.90*LC10
26/ 4 : +1.00*LC1+0.90*LC2+0.90*LC3+0.90*LC4+0.90*LC5+0.90*LC11
27/ 4 : +1.00*LC1+0.90*LC2+0.90*LC3+0.90*LC4+0.90*LC6+0.90*LC11
28/ 4 : +1.00*LC1+0.90*LC5+0.90*LC6+0.90*LC7+0.90*LC8+0.90*LC11
29/ 4 : +1.00*LC1+0.90*LC6+0.90*LC7+0.90*LC8+0.90*LC9+0.90*LC10
30/ 4 : +1.00*LC1+0.90*LC6+0.90*LC7+0.90*LC8+0.90*LC9+0.90*LC11
31/ 2 : +1.00*LC1+1.00*LC2+1.00*LC3+1.00*LC4+1.00*LC6+1.00*LC7+1.00*LC8
32/ 2 : +1.00*LC1+1.00*LC3+1.00*LC4+1.00*LC5+1.00*LC7+1.00*LC8+1.00*LC9
33/ 4 : +1.00*LC1+0.90*LC2+0.90*LC4+0.90*LC6+0.90*LC7+0.90*LC8+0.90*LC9
+0.90*LC10
34/ 2 : +1.00*LC1+1.00*LC2+1.00*LC3+1.00*LC4+1.00*LC6+1.00*LC7+1.00*LC8
+1.00*LC9
35/ 2 : +1.00*LC1+1.00*LC2+1.00*LC3+1.00*LC4+1.00*LC5+1.00*LC6+1.00*LC7

+1.00*LC8+1.00*LC9

Calculation protocol.

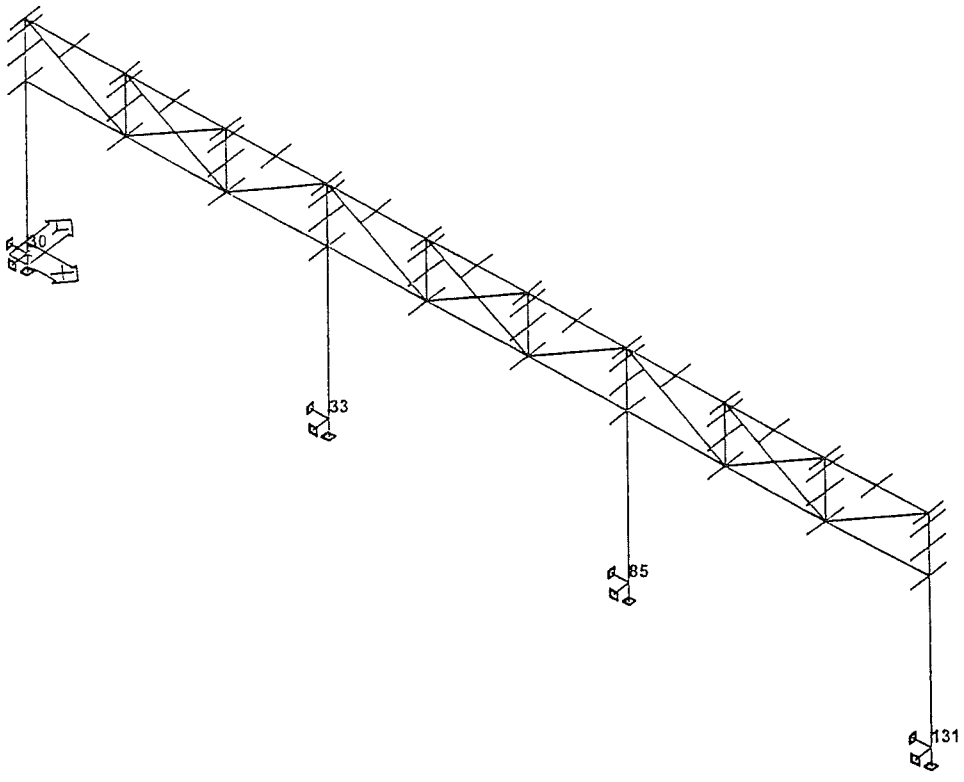
Linear calculation

Number of 2D elements	0
Number of 1D elements	171
Number of mesh nodes	151
Number of equations	906
Loadcases	LC 1 weight of the structural steelwork
	LC 2 p1
	LC 3 p2
	LC 4 p3
	LC 5 p4
	LC 6 p5
	LC 7 p6
	LC 8 p7
	LC 9 p8
	LC 10 Wind +Y
	LC 11 Wind -Y
Bending theory	Mindlin
Start of calculation	18.10.2004 09:43
End of calculation	18.10.2004 09:43

Sum of loads and reactions.

			X	Y	Z
loadcase	1	loads	0.0	-0.0	-62.5
		reactions	-0.0	0.0	62.5
		contact	0.0	0.0	0.0
loadcase	2	loads	0.0	0.0	-36.1
		reactions	-0.0	-0.0	36.1
		contact	0.0	0.0	0.0
loadcase	3	loads	0.0	0.0	-3.4
		reactions	-0.0	-0.0	3.4
		contact	0.0	0.0	0.0
loadcase	4	loads	0.0	0.0	-18.6
		reactions	-0.0	-0.0	18.6
		contact	0.0	0.0	0.0
loadcase	5	loads	0.0	0.0	-0.7
		reactions	-0.0	-0.0	0.7
		contact	0.0	0.0	0.0
loadcase	6	loads	0.0	0.0	-36.1
		reactions	-0.0	0.0	36.1
		contact	0.0	0.0	0.0
loadcase	7	loads	0.0	0.0	-3.4
		reactions	-0.0	0.0	3.4
		contact	0.0	0.0	0.0
loadcase	8	loads	0.0	0.0	-5.6
		reactions	-0.0	0.0	5.6

			X	Y	Z
		contact	0.0	0.0	0.0
loadcase	9	loads	0.0	0.0	-2.4
		reactions	-0.0	0.0	2.4
		contact	0.0	0.0	0.0
loadcase	10	loads	0.0	46.6	-0.0
		reactions	-0.0	-46.6	0.0
		contact	0.0	0.0	0.0
loadcase	11	loads	-0.0	-46.6	0.0
		reactions	0.0	46.6	-0.0
		contact	0.0	0.0	0.0



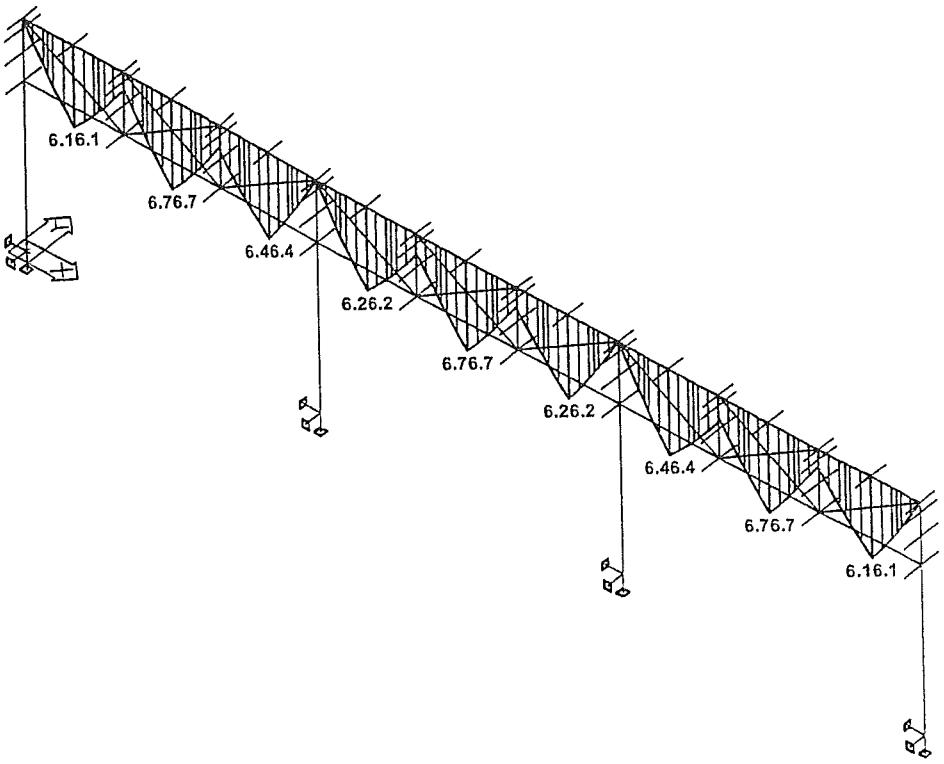
Reactions. Load case(s) : 1/11

Reactions in support(s) - nodal values.

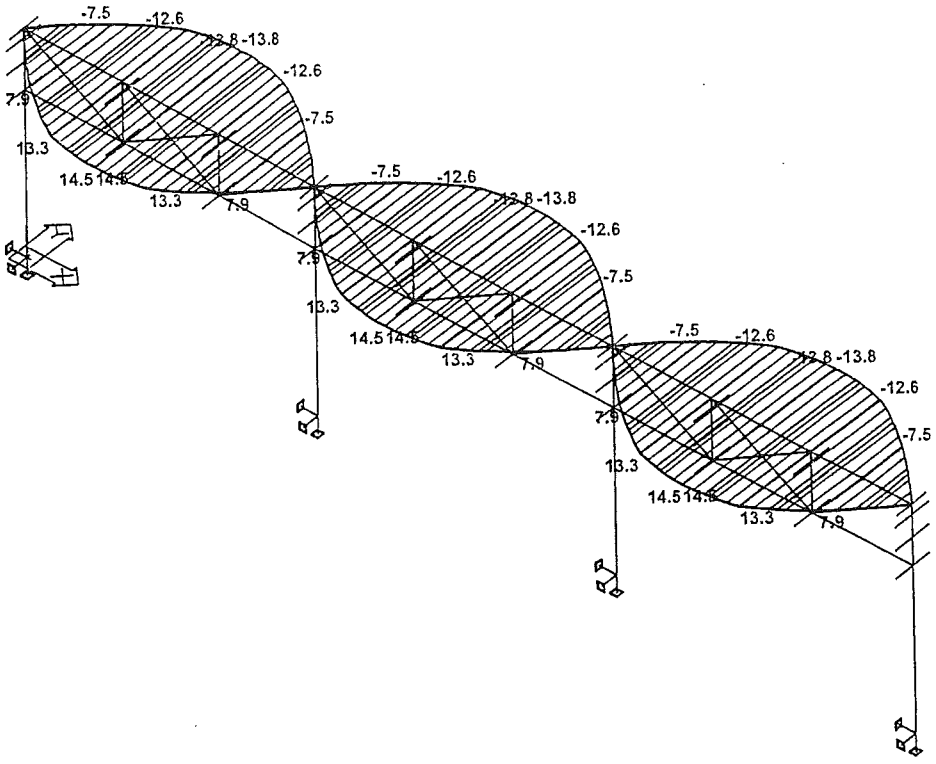
Group of node(s) :1/151
Group of load case(s) :1/11
Foundation table:

Loadcase/Node		30	33	85	131
Permanent loads					
LC: 1	Rx [kN]	0.08	0.01	-0.01	-0.08
	Ry [kN]	0.00	0.00	0.00	0.00
	Rz [kN]	12.36	18.88	18.88	12.36
	Mx [kNm]	-0.00	-0.00	-0.00	-0.00
	My [kNm]	0.15	0.02	-0.02	-0.15
	Mz [kNm]	0.00	0.00	-0.00	-0.00
Variable loads - not exclusive					
LC2: p1	Rx [kN]	0.07	0.01	-0.01	-0.07
	Ry [kN]	0.00	-0.00	-0.00	0.00
	Rz [kN]	6.26	11.77	11.77	6.26
	Mx [kNm]	-1.73	-2.96	-2.96	-1.73
	My [kNm]	0.14	0.02	-0.02	-0.14
	Mz [kNm]	-0.00	0.00	-0.00	0.00
Variable loads - not exclusive					
LC3: p2	Rx [kN]	0.01	0.00	-0.00	-0.01
	Ry [kN]	0.00	-0.00	-0.00	0.00
	Rz [kN]	0.65	1.05	1.05	0.65
	Mx [kNm]	-0.21	-0.32	-0.32	-0.21
	My [kNm]	0.01	0.00	-0.00	-0.01
	Mz [kNm]	-0.00	0.00	-0.00	0.00
Variable loads - not exclusive					
LC4: p3	Rx [kN]	0.03	0.01	-0.01	-0.03
	Ry [kN]	0.00	-0.00	-0.00	0.00
	Rz [kN]	3.55	5.75	5.75	3.55
	Mx [kNm]	-1.15	-1.73	-1.73	-1.15
	My [kNm]	0.06	0.01	-0.01	-0.06
	Mz [kNm]	-0.00	0.00	-0.00	0.00
Variable loads - not exclusive					
LC5: p4	Rx [kN]	0.00	0.00	-0.00	-0.00
	Ry [kN]	0.00	-0.00	-0.00	0.00
	Rz [kN]	0.13	0.21	0.21	0.13
	Mx [kNm]	-0.04	-0.06	-0.06	-0.04
	My [kNm]	0.00	0.00	-0.00	-0.00
	Mz [kNm]	0.00	0.00	-0.00	-0.00
Variable loads - not exclusive					
LC6: p5	Rx [kN]	0.07	0.01	-0.01	-0.07
	Ry [kN]	-0.00	0.00	0.00	-0.00
	Rz [kN]	6.26	11.77	11.77	6.26
	Mx [kNm]	1.73	2.96	2.96	1.73
	My [kNm]	0.14	0.02	-0.02	-0.14
	Mz [kNm]	0.00	-0.00	0.00	-0.00
Variable loads - not exclusive					
LC7: p6	Rx [kN]	0.01	0.00	-0.00	-0.01
	Ry [kN]	-0.00	0.00	0.00	-0.00
	Rz [kN]	0.65	1.05	1.05	0.65
	Mx [kNm]	0.21	0.32	0.32	0.21

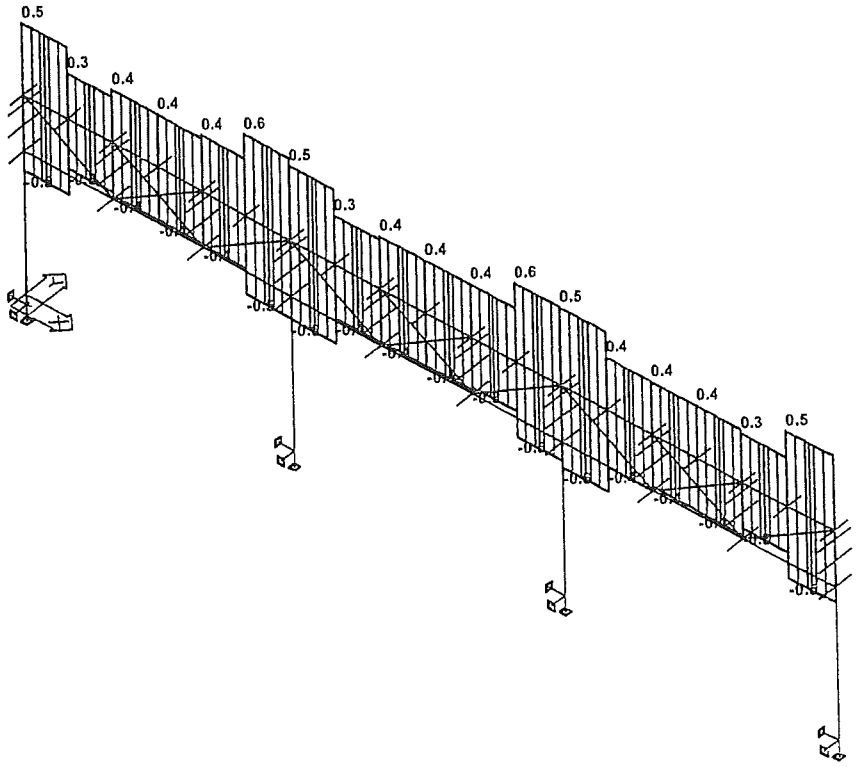
Loadcase/Node		30	33	85	131
	My [kNm]	0.01	0.00	-0.00	-0.01
	Mz [kNm]	0.00	-0.00	0.00	-0.00
Variable loads - not exclusive					
LC8: p7	Rx [kN]	0.01	0.00	-0.00	-0.01
	Ry [kN]	-0.00	0.00	0.00	-0.00
	Rz [kN]	1.06	1.73	1.73	1.06
	Mx [kNm]	0.35	0.52	0.52	0.35
	My [kNm]	0.02	0.00	-0.00	-0.02
	Mz [kNm]	0.00	-0.00	0.00	-0.00
Variable loads - not exclusive					
LC9: p8	Rx [kN]	0.00	0.00	-0.00	-0.00
	Ry [kN]	-0.00	0.00	0.00	-0.00
	Rz [kN]	0.46	0.75	0.75	0.46
	Mx [kNm]	0.15	0.22	0.22	0.15
	My [kNm]	0.01	0.00	-0.00	-0.01
	Mz [kNm]	-0.00	-0.00	0.00	0.00
Variable loads - exclusive - 10: Wind +Y					
	Rx [kN]	0.00	-0.00	-0.00	0.00
	Ry [kN]	-8.36	-14.93	-14.93	-8.36
	Rz [kN]	0.00	0.00	0.00	0.00
	Mx [kNm]	45.47	84.68	84.68	45.47
	My [kNm]	-0.00	-0.00	-0.00	-0.00
	Mz [kNm]	-0.00	-0.00	0.00	0.00
Variable loads - exclusive - 11: Wind -Y					
	Rx [kN]	-0.00	0.00	0.00	-0.00
	Ry [kN]	8.36	14.93	14.93	8.36
	Rz [kN]	-0.00	-0.00	-0.00	-0.00
	Mx [kNm]	-45.47	-84.68	-84.68	-45.47
	My [kNm]	0.00	0.00	0.00	0.00
	Mz [kNm]	0.00	0.00	-0.00	-0.00
Extremes					
	Max Rz [kN]	31.39	52.96	52.96	31.39
	Min Rz [kN]	12.36	18.88	18.88	12.36
	Max Rx [kN]	0.29	0.05	-0.01	-0.08
	Min Rx [kN]	0.08	0.01	-0.05	-0.29
	Max Ry [kN]	8.36	14.93	14.93	8.36
	Min Ry [kN]	-8.36	-14.93	-14.93	-8.36
	Max Mx [kNm]	47.90	88.70	88.70	47.90
	Min Mx [kNm]	-48.60	-89.75	-89.75	-48.60
	Max My [kNm]	0.54	0.08	-0.02	-0.15
	Min My [kNm]	0.15	0.02	-0.08	-0.54
	Max Mz [kNm]	0.00	0.00	-0.00	-0.00
	Min Mz [kNm]	0.00	0.00	-0.00	-0.00



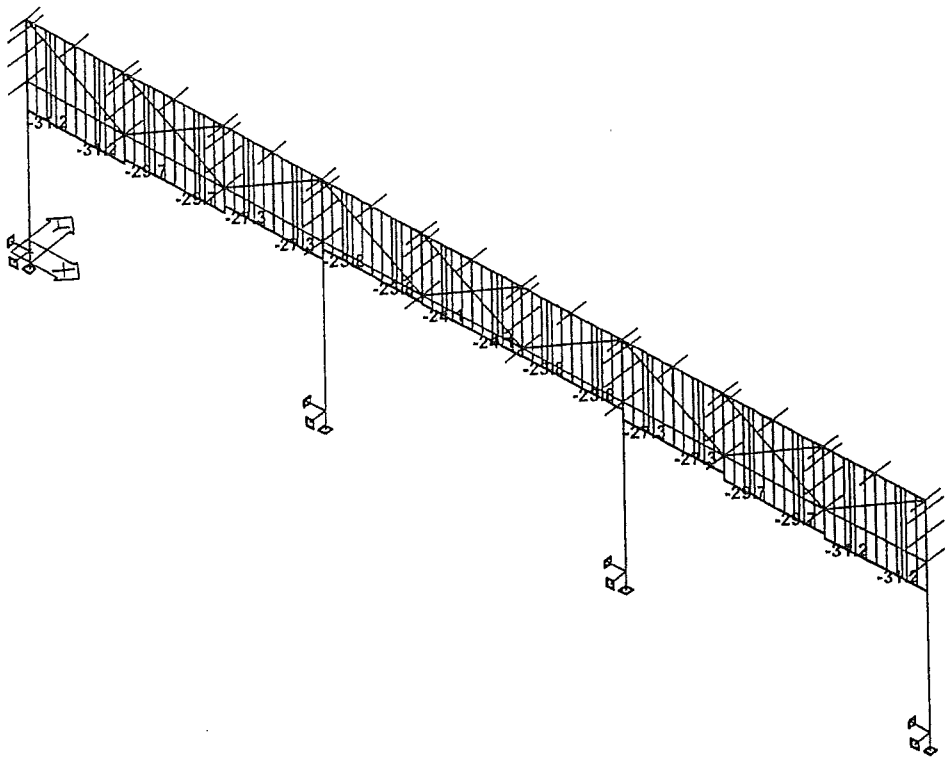
Internal forces - My on member(s). Ult. combi : 1/47



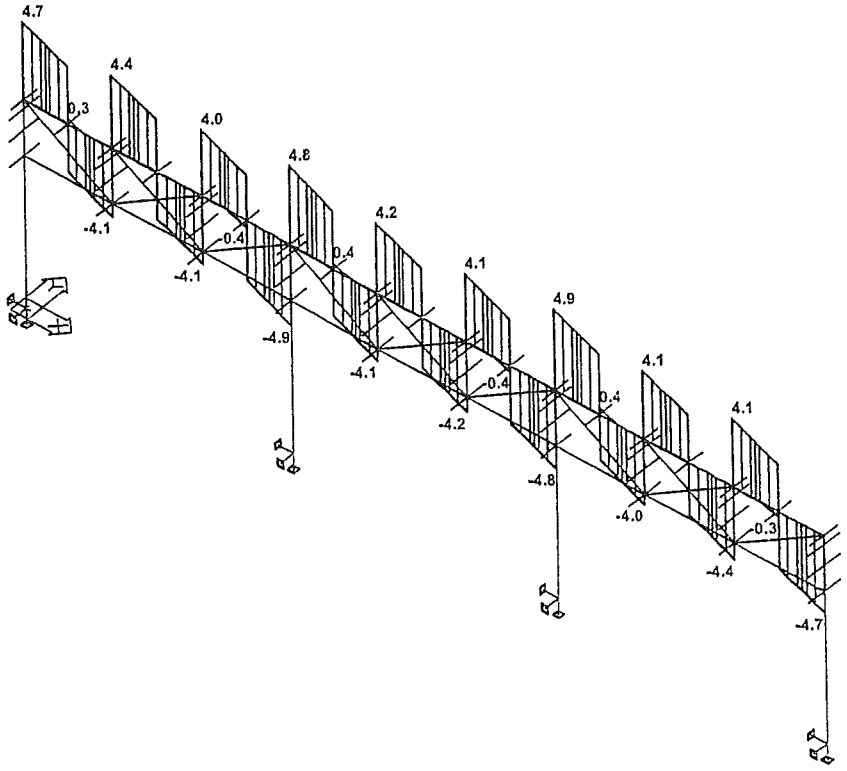
Internal forces - Mz on member(s). Ult. combi : 1/47



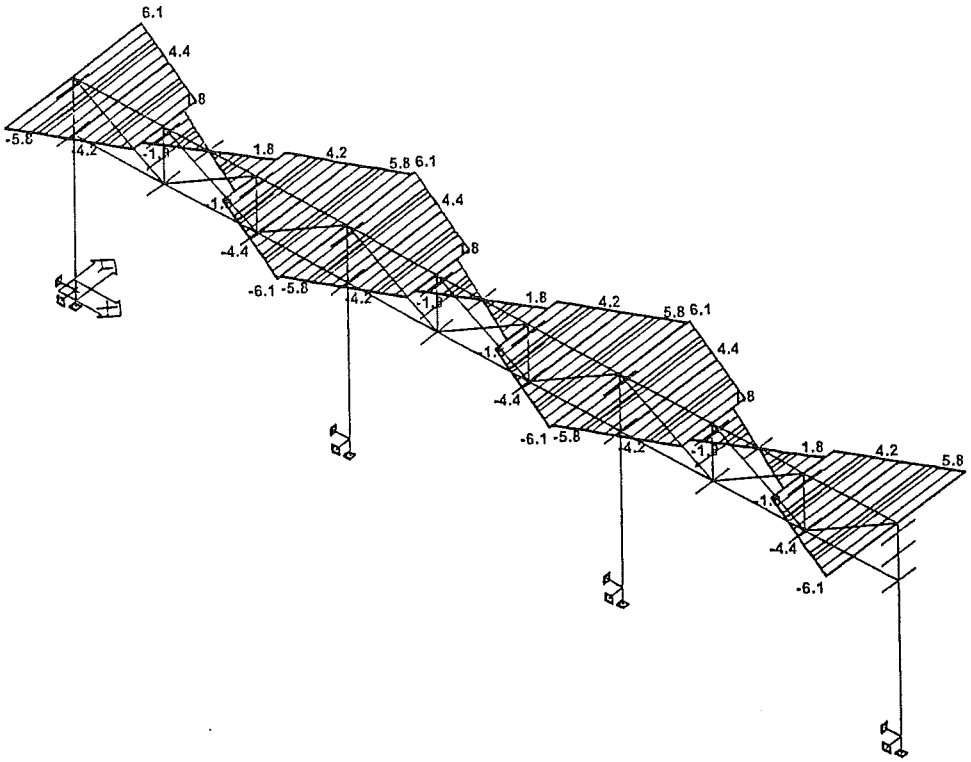
Internal forces - Mx on member(s). Ult. combi : 1/47



Internal forces - N on member(s). Ult. combi : 1/47



Internal forces - Vz on member(s). Ult. combi : 1/47

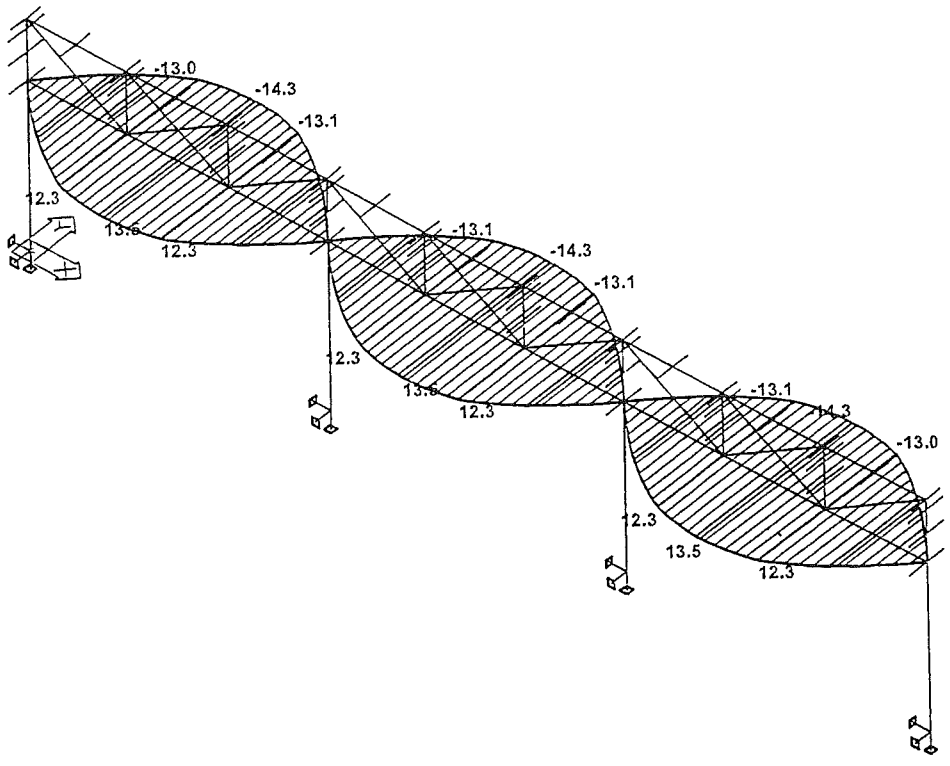


Internal forces - Vy on member(s). Ult. combi : 1/47

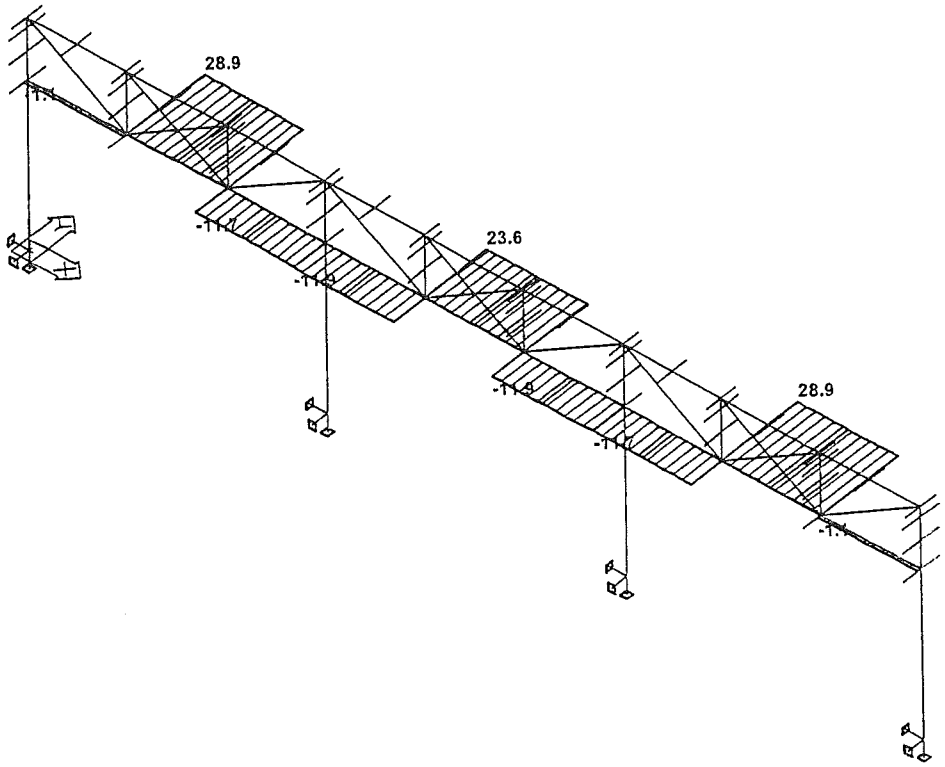
Internal forces on member(s). Global extreme

Linear static - extreme or all combinations
Group of member(s) :1/171
Group of ultimate combi :1/47
Cross-section : 1 - HEB200

memb	combi	dx [m]	N [kN]	Vy [kN]	Vz [kN]	Mx [kNm]	My [kNm]	Mz [kNm]
1	46	0.000	**-31.18**	0.27	4.67	-0.03	-0.00	-0.00
	35		-19.53	**6.07**	2.98	-0.43	-0.00	-0.00
124		1.500	-19.53	**-6.07**	-2.98	0.43	-0.00	-0.00
119	46	0.000	-27.29	0.27	**4.88**	-0.03	-0.00	-0.00
6		1.500	-27.29	-0.27	**-4.88**	0.03	-0.00	-0.00
	34	0.000	-17.10	2.15	-1.87	**0.57**	3.73	-4.45
119			-17.10	-3.78	3.11	**-0.57**	-0.00	0.00
3	46	1.500	-29.70	0.00	3.16	-0.00	**6.72**	0.79
124			-31.18	-0.27	-4.67	0.03	**-0.00**	-0.00
68	35		-15.13	-0.00	1.42	-0.33	3.97	**14.55**
	39		-13.55	0.00	1.42	0.33	3.67	**-13.83**



Internal forces - My on member(s). Ult. combi : 1/47

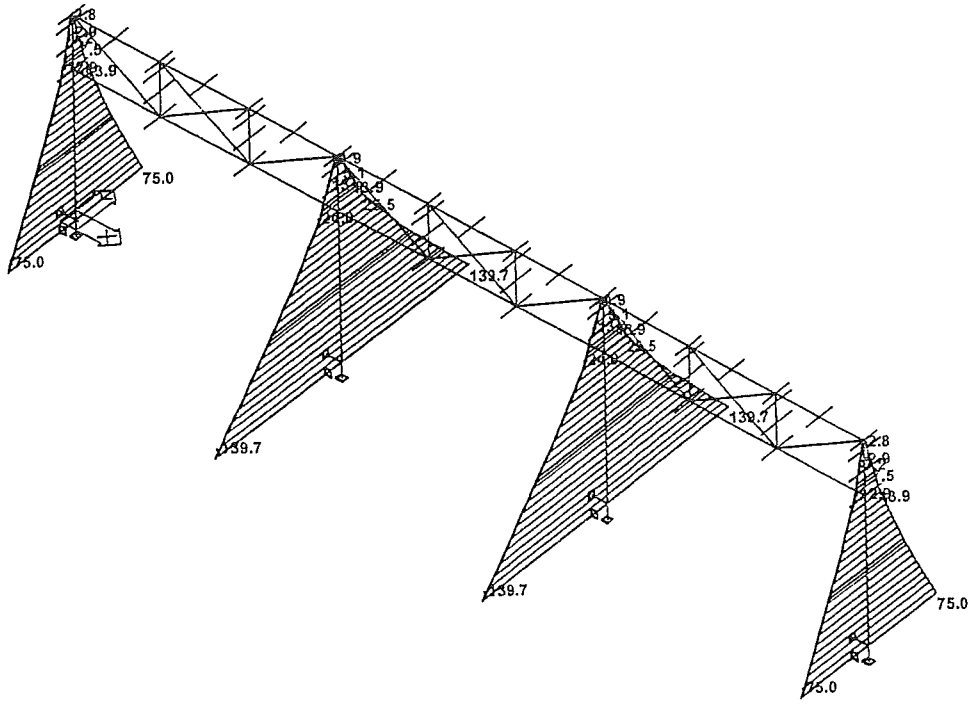


Internal forces - N on member(s). Ult. combi : 1/47

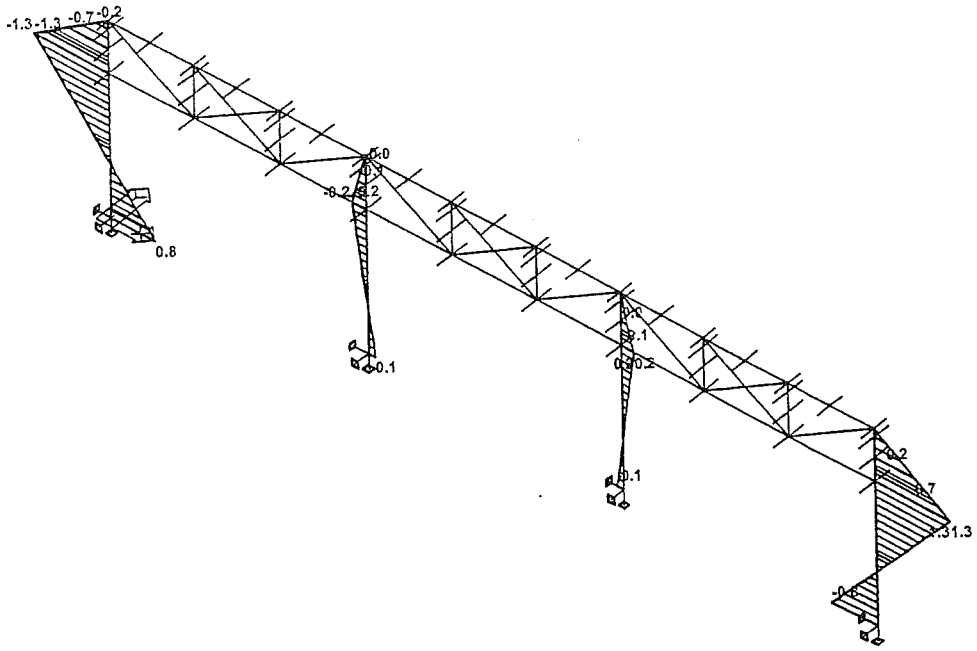
Internal forces on member(s). Global extreme

Linear static - extreme or all combinations
Group of member(s) :1/171
Group of ultimate combi :1/47
Cross-section : 5 - U180

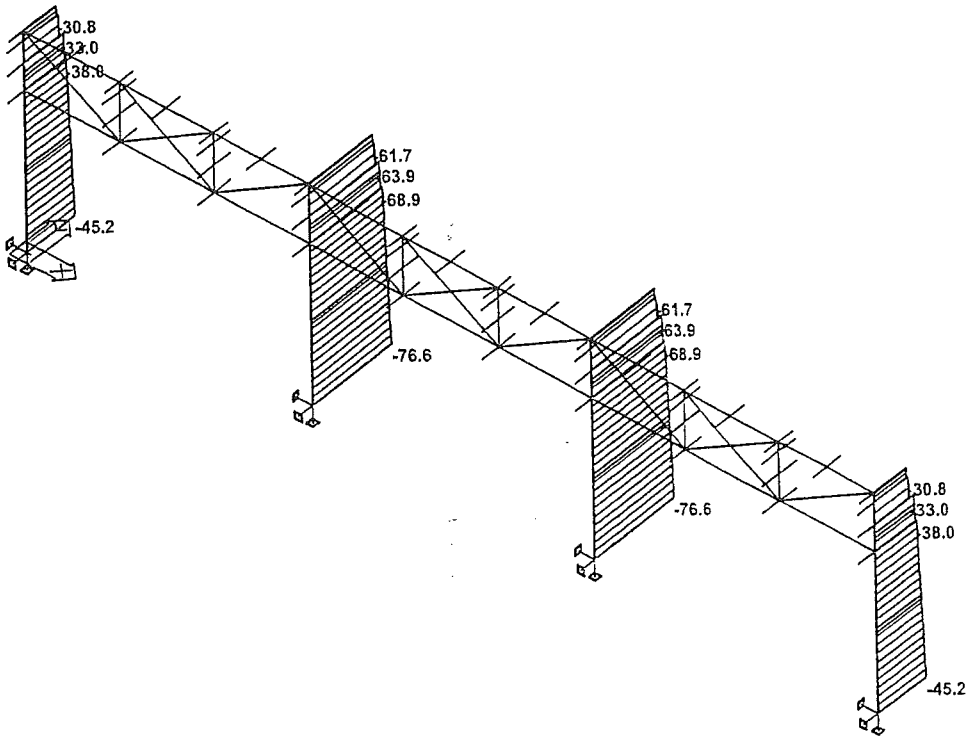
memb	combi	dx [m]	N [kN]	Vy [kN]	Vz [kN]	Mx [kNm]	My [kNm]	Mz [kNm]
8	46	0.000	**-28.85**	-0.43	-0.00	-0.00	-0.79	0.21
72			**-11.95**	-0.42	-0.27	-0.00	0.00	0.00
7	2	3.000	-0.30	**0.53**	0.00	0.00	0.00	**0.26**
127		0.000	-0.30	**-0.53**	-0.00	-0.00	0.00	0.26
9	32	3.000	-6.55	0.30	**5.98**	0.04	0.00	0.00
125		0.000	-6.55	-0.30	**-5.98**	**-0.04**	0.00	0.00
9			-6.55	-0.36	2.73	**0.04**	-13.05	0.10
8	40	1.500	16.18	0.01	-0.00	-0.00	**13.54**	-0.10
	34		18.03	0.01	0.00	0.00	**-14.25**	-0.11
9	46	1.636	-11.74	0.02	0.27	0.00	-0.36	**-0.30**



Internal forces - My on member(s). Ult. combi : 1/47



Internal forces - Mz on member(s). Ult. combi : 1/47

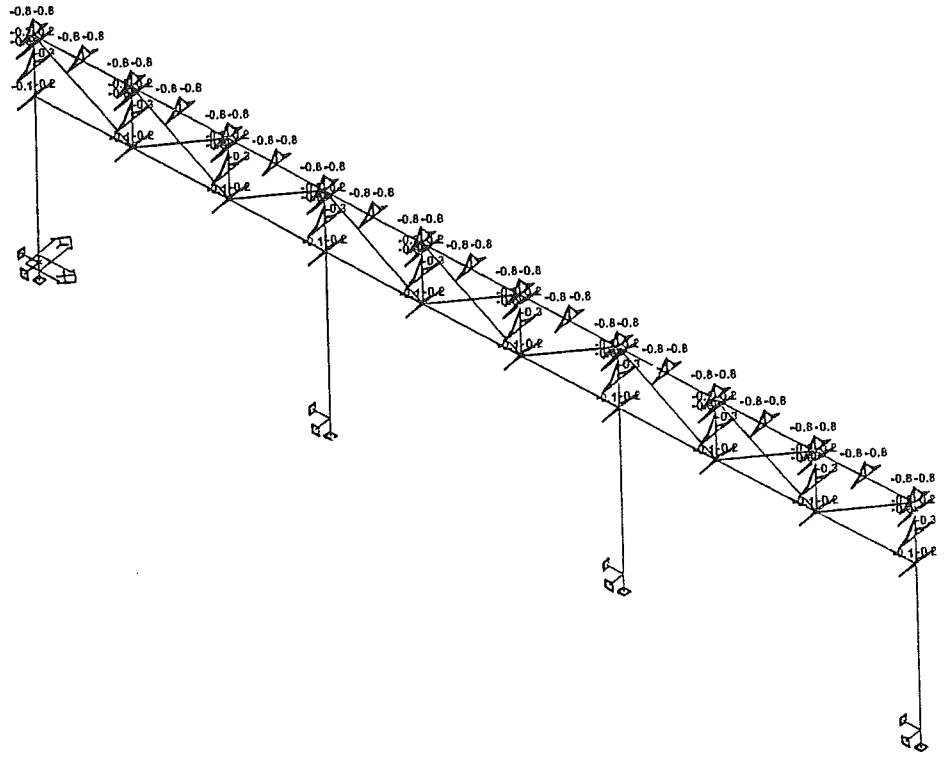


Internal forces - N on member(s). Ult. combi : 1/47

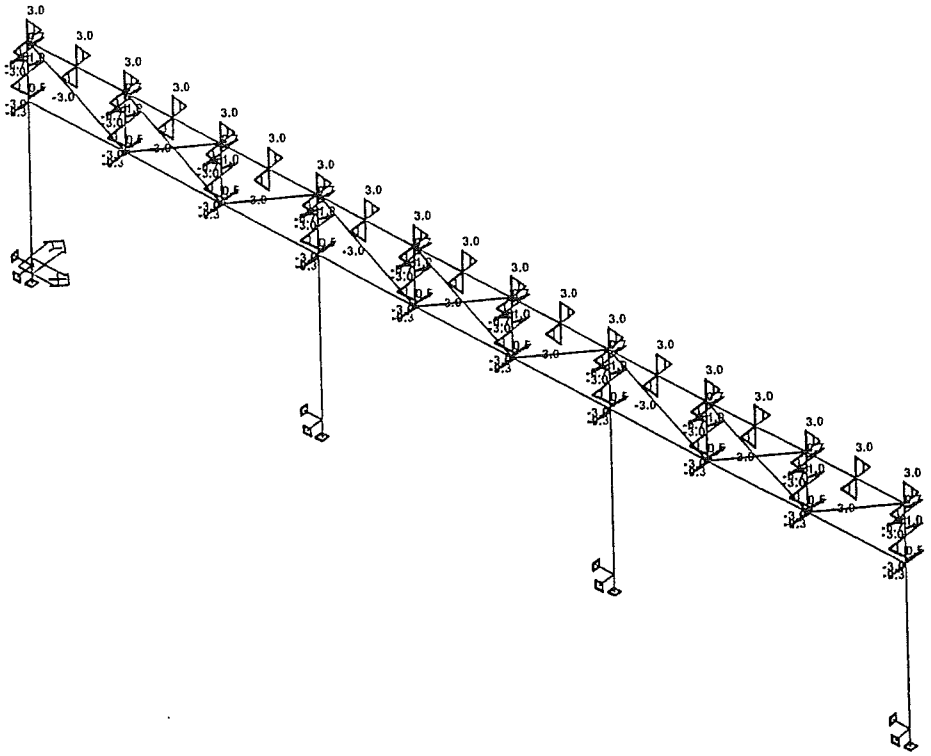
Internal forces on member(s). Global extreme

Linear static - extreme or all combinations
Group of member(s) :1/171
Group of ultimate combi :1/47
Cross-section : 2 - HEA300

memb	combi	dx [m]	N [kN]	Vy [kN]	Vz [kN]	Mx [kNm]	My [kNm]	Mz [kNm]
34	46	0.000	**-76.61**	-0.07	0.00	0.00	1.57	0.12
31			-37.96	**0.72**	-0.27	-0.00	1.13	-1.33
147			-37.96	**-0.72**	-0.27	0.00	1.13	1.33
34	13		-25.49	-0.02	**24.64**	-0.00	**-139.72**	0.03
	14		-25.49	-0.02	**-24.64**	0.00	**139.72**	0.03
30			-16.68	-0.11	-13.80	**0.00**	75.02	0.20
146			-16.68	0.11	-13.80	**-0.00**	75.02	-0.20
	46	5.050	-39.18	0.42	-0.00	0.00	1.05	**1.33**
30			-39.18	-0.42	-0.00	-0.00	1.05	**-1.33**



Internal forces - My on member(s). Ult. combi : 1/47

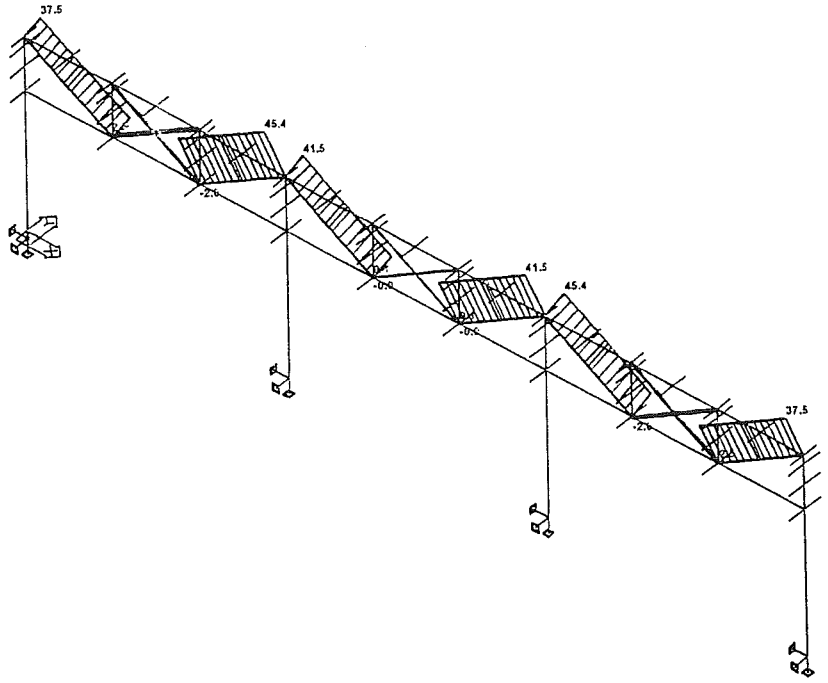


Internal forces - Vz on member(s). Ult. combi : 1/47

Internal forces on member(s). Global extreme

Linear static - extreme or all combinations
Group of member(s) :1/171
Group of ultimate combi :1/47
Cross-section : 4 - HEB100

memb	combi	dx [m]	N [kN]	Vy [kN]	Vz [kN]	Mx [kNm]	My [kNm]	Mz [kNm]
27	42	0.000	**-20.87**	0.29	0.31	-0.00	0.01	-0.16
	46		-20.86	**0.30**	0.27	-0.00	0.09	-0.17
140			-20.86	**-0.30**	0.27	0.00	0.09	0.17
11	9		0.00	-0.00	**2.99**	0.00	-0.78	0.00
10	5	0.520	0.00	0.00	**2.99**	-0.00	-0.78	0.00
140	34	0.000	-12.72	-0.17	1.10	**0.02**	0.00	0.08
27			-12.72	0.17	1.10	**-0.02**	0.00	-0.08
29	30	0.300	-9.17	0.15	0.47	-0.00	**1.41**	0.21
28	28	0.700	-10.07	0.18	-0.37	0.00	**-1.47**	0.19
29	46	0.300	-15.02	0.30	0.27	-0.00	-0.03	**0.38**
142			-15.02	-0.30	0.27	0.00	-0.03	**-0.38**



Internal forces - N on member(s). Ult. combi : 1/47

Internal forces on member(s). Global extreme

Linear static - extreme or all combinations
Group of member(s) :1/171
Group of ultimate combi :1/47
Cross-section : 3 - L50X5

memb	combi	dx [m]	N [kN]	Vy [kN]	Vz [kN]	Mx [kNm]	My [kNm]	Mz [kNm]
40	46	0.000	**45.37**	0.00	0.00	0.00	0.00	0.00
41			**-1.98**	0.00	0.00	0.00	0.00	0.00

DIN. Profile - 1 all. UC all.

Cross-section : 1 - HEB200

Macro 1 Member 1 HEB200 S 235 Ult. comb 47 0.25

N [kN]	Vy [kN]	Vz [kN]	Mt [kNm]	My [kNm]	Mz [kNm]
-28.88	-3.06	3.12	-0.08	5.61	-5.81

The critical check is on position 1.50 m

Buckling parameters	yy	zz	
type	sway	non-sway	
Slenderness	35.12	177.69	
Reduced slenderness	0.38	1.91	
Buckling curve	b	c	
Imperfection	0.34	0.49	
Reduction factor	0.93	0.21	
Length	3.00	9.00	m
Buckling factor	1.00	1.00	
Buckling length	3.00	9.00	m
Critical Euler load	13117.36	512.52	kN

LTB

LTB length	9.00	m
Betaz	1.00	
Beta0	1.00	
Ksi	1.35	

negative influence of load position

SECTION CHECK

N	0.02 < 1
Vy	0.00 < 1
Vz	0.01 < 1
M	0.11 < 1

STABILITY CHECK

Buckling	0.08 < 1
LTB	0.05 < 1
Compression + Moment	0.22 < 1
Compression + LTB	0.25 < 1

Macro 1 Member 2 HEB200 S 235 Ult. comb 35 0.34

N [kN]	Vy [kN]	Vz [kN]	Mt [kNm]	My [kNm]	Mz [kNm]
-19.53	2.82	-2.35	0.24	0.95	13.34

The critical check is on position 1.50 m

Buckling parameters	yy	zz	
type	sway	non-sway	
Slenderness	35.12	177.69	
Reduced slenderness	0.38	1.91	
Buckling curve	b	c	
Imperfection	0.34	0.49	
Reduction factor	0.93	0.21	
Length	3.00	9.00	m
Buckling factor	1.00	1.00	
Buckling length	3.00	9.00	m
Critical Euler load	13117.36	512.52	kN

LTB

LTB length	9.00	m
Betaz	1.00	
Beta0	1.00	
Ksi	1.12	

negative influence of load position

SECTION CHECK

N	0.01 < 1
Vy	0.00 < 1
Vz	0.01 < 1
M	0.24 < 1

STABILITY CHECK

Buckling	0.05 < 1
LTB	0.01 < 1
Compression + Moment	0.28 < 1
Compression + LTB	0.34 < 1

Macro 1 Member 3 HEB200 S 235 Ult. comb 35 0.38

N [kN]	Vy [kN]	Vz [kN]	Mt [kNm]	My [kNm]	Mz [kNm]
-18.61	0.00	1.53	-0.36	4.01	14.55

The critical check is on position 1.50 m

Buckling parameters	yy	zz	
type	sway	non-sway	
Slenderness	35.12	177.69	
Reduced slenderness	0.38	1.91	
Buckling curve	b	c	
Imperfection	0.34	0.49	
Reduction factor	0.93	0.21	
Length	3.00	9.00	m
Buckling factor	1.00	1.00	
Buckling length	3.00	9.00	m
Critical Euler load	13117.36	512.52	kN

LTB

LTB length	9.00	m
Betaz	1.00	
Beta0	1.00	
Ksi	1.12	

negative influence of load position

SECTION CHECK

N	0.01 < 1
Vy	0.00 < 1
Vz	0.01 < 1
M	0.27 < 1

STABILITY CHECK

Buckling	0.05 < 1
LTB	0.04 < 1
Compression + Moment	0.32 < 1
Compression + LTB	0.38 < 1

Macro 1 Member 4 HEB200 S 235 Ult. comb 35 0.38

N [kN]	Vy [kN]	Vz [kN]	Mt [kNm]	My [kNm]	Mz [kNm]
-18.61	0.00	-1.32	0.31	4.01	14.55

The critical check is on position 0.00 m

Buckling parameters	yy	zz	
type	sway	non-sway	
Slenderness	35.12	177.69	
Reduced slenderness	0.38	1.91	
Buckling curve	b	c	
Imperfection	0.34	0.49	
Reduction factor	0.93	0.21	
Length	3.00	9.00	m

Buckling parameters	yy	zz	
Buckling factor	1.00	1.00	
Buckling length	3.00	9.00	m
Critical Euler load	13117.36	512.52	kN

LTB

LTB length	9.00	m
Betaz	1.00	
Beta0	1.00	
Ksi	1.12	

negative influence of load position

SECTION CHECK

N	0.01 < 1
Vy	0.00 < 1
Vz	0.01 < 1
M	0.27 < 1

STABILITY CHECK

Buckling	0.05 < 1
LTB	0.04 < 1
Compression + Moment	0.32 < 1
Compression + LTB	0.38 < 1

Macro 1 Member 5 HEB200 S 235 Ult. comb 35 0.33

N [kN]	Vy [kN]	Vz [kN]	Mt [kNm]	My [kNm]	Mz [kNm]
-17.10	-2.82	2.22	-0.29	1.33	13.33

The critical check is on position 0.00 m

Buckling parameters	yy	zz	
type	sway	non-sway	
Slenderness	35.12	177.69	
Reduced slenderness	0.38	1.91	
Buckling curve	b	c	
Imperfection	0.34	0.49	
Reduction factor	0.93	0.21	
Length	3.00	9.00	m
Buckling factor	1.00	1.00	
Buckling length	3.00	9.00	m
Critical Euler load	13117.36	512.52	kN

LTB

LTB length	9.00	m

LTB

Betaz	1.00
Beta0	1.00
Ksi	1.12

negative influence of load position

SECTION CHECK

N	0.01 < 1
Vy	0.00 < 1
Vz	0.01 < 1
M	0.24 < 1

STABILITY CHECK

Buckling	0.05 < 1
LTB	0.01 < 1
Compression + Moment	0.28 < 1
Compression + LTB	0.33 < 1

Macro 1 Member 6 HEB200 S 235 Ult. comb 47 0.24

N [kN]	Vy [kN]	Vz [kN]	Mt [kNm]	My [kNm]	Mz [kNm]
-25.28	3.06	-3.31	0.13	5.89	-5.81

The critical check is on position 0.00 m

Buckling parameters	yy	zz	
type	sway	non-sway	
Slenderness	35.12	177.69	
Reduced slenderness	0.38	1.91	
Buckling curve	b	c	
Imperfection	0.34	0.49	
Reduction factor	0.93	0.21	
Length	3.00	9.00	m
Buckling factor	1.00	1.00	
Buckling length	3.00	9.00	m
Critical Euler load	13117.36	512.52	kN

LTB

LTB length	9.00	m
Betaz	1.00	
Beta0	1.00	
Ksi	1.35	

negative influence of load position

SECTION CHECK

N	0.01 < 1
Vy	0.00 < 1
Vz	0.02 < 1
M	0.11 < 1

STABILITY CHECK

Buckling	0.07 < 1
LTB	0.05 < 1
Compression + Moment	0.21 < 1
Compression + LTB	0.24 < 1

Macro 28 Member 66 HEB200 S 235 Ult. comb 47 0.23

N [kN]	Vy [kN]	Vz [kN]	Mt [kNm]	My [kNm]	Mz [kNm]
-22.08	-3.06	3.19	-0.10	5.72	-5.81

The critical check is on position 1.50 m

Buckling parameters	yy	zz	
type	sway	non-sway	
Slenderness	35.12	177.69	
Reduced slenderness	0.38	1.91	
Buckling curve	b	c	
Imperfection	0.34	0.49	
Reduction factor	0.93	0.21	
Length	3.00	9.00	m
Buckling factor	1.00	1.00	
Buckling length	3.00	9.00	m
Critical Euler load	13117.36	512.52	kN

LTB

LTB length	9.00	m
Betaz	1.00	
Beta0	1.00	
Ksi	1.12	

negative influence of load position

SECTION CHECK

N	0.01 < 1
Vy	0.00 < 1
Vz	0.02 < 1
M	0.11 < 1

STABILITY CHECK

Buckling	0.06 < 1
LTB	0.05 < 1
Compression + Moment	0.20 < 1
Compression + LTB	0.23 < 1

Macro 28 Member 67 HEB200 S 235 Ult. comb 35 0.32

N [kN]	Vy [kN]	Vz [kN]	Mt [kNm]	My [kNm]	Mz [kNm]
-14.94	2.82	-2.30	0.27	1.10	13.33

The critical check is on position 1.50 m

Buckling parameters	yy	zz	
type	sway	non-sway	
Slenderness	35.12	177.69	
Reduced slenderness	0.38	1.91	
Buckling curve	b	c	
Imperfection	0.34	0.49	
Reduction factor	0.93	0.21	
Length	3.00	9.00	m
Buckling factor	1.00	1.00	
Buckling length	3.00	9.00	m
Critical Euler load	13117.36	512.52	kN

LTB

LTB length	9.00	m
Betaz	1.00	
Beta0	1.00	
Ksi	1.12	

negative influence of load position

SECTION CHECK

N	0.01 < 1
Vy	0.00 < 1
Vz	0.01 < 1
M	0.24 < 1

STABILITY CHECK

Buckling	0.04 < 1
LTB	0.01 < 1
Compression + Moment	0.27 < 1
Compression + LTB	0.32 < 1

Macro 28 Member 68 HEB200 S 235 Ult. comb 35 0.37

N [kN]	Vy [kN]	Vz [kN]	Mt [kNm]	My [kNm]	Mz [kNm]
-15.13	-0.00	1.42	-0.33	3.97	14.55

The critical check is on position 1.50 m

Buckling parameters	yy	zz	
type	sway	non-sway	
Slenderness	35.12	177.69	
Reduced slenderness	0.38	1.91	
Buckling curve	b	c	
Imperfection	0.34	0.49	
Reduction factor	0.93	0.21	
Length	3.00	9.00	m
Buckling factor	1.00	1.00	
Buckling length	3.00	9.00	m
Critical Euler load	13117.36	512.52	kN

LTB

LTB length	9.00	m
Betaz	1.00	
Beta0	1.00	
Ksi	1.12	

negative influence of load position

SECTION CHECK

N	0.01 < 1
Vz	0.01 < 1
M	0.27 < 1

STABILITY CHECK

Buckling	0.04 < 1
LTB	0.04 < 1
Compression + Moment	0.31 < 1
Compression + LTB	0.37 < 1

Macro 28 Member 69 HEB200 S 235 Ult. comb 35 0.37

N [kN]	Vy [kN]	Vz [kN]	Mt [kNm]	My [kNm]	Mz [kNm]
-15.13	-0.00	-1.42	0.33	3.97	14.55

The critical check is on position 0.00 m

Buckling parameters	yy	zz	
type	sway	non-sway	
Slenderness	35.12	177.69	
Reduced slenderness	0.38	1.91	
Buckling curve	b	c	
Imperfection	0.34	0.49	
Reduction factor	0.93	0.21	
Length	3.00	9.00	m
Buckling factor	1.00	1.00	
Buckling length	3.00	9.00	m
Critical Euler load	13117.36	512.52	kN

LTB

LTB length	9.00	m
Betaz	1.00	
Beta0	1.00	
Ksi	1.12	

negative influence of load position

SECTION CHECK

N	0.01 < 1
Vz	0.01 < 1
M	0.27 < 1

STABILITY CHECK

Buckling	0.04 < 1
LTB	0.04 < 1
Compression + Moment	0.31 < 1
Compression + LTB	0.37 < 1

Macro 28 Member 70 HEB200 S 235 Ult. comb 35 0.32

N [kN]	Vy [kN]	Vz [kN]	Mt [kNm]	My [kNm]	Mz [kNm]
-14.94	-2.82	2.30	-0.27	1.10	13.33

The critical check is on position 0.00 m

Buckling parameters	yy	zz	
type	sway	non-sway	
Slenderness	35.12	177.69	
Reduced slenderness	0.38	1.91	
Buckling curve	b	c	
Imperfection	0.34	0.49	
Reduction factor	0.93	0.21	
Length	3.00	9.00	m
Buckling factor	1.00	1.00	

Buckling parameters	yy	zz	
Buckling length	3.00	9.00	m
Critical Euler load	13117.36	512.52	kN

LTB

LTB length	9.00	m
Betaz	1.00	
Beta0	1.00	
Ksi	1.12	

negative influence of load position

SECTION CHECK

N	0.01 < 1
Vy	0.00 < 1
Vz	0.01 < 1
M	0.24 < 1

STABILITY CHECK

Buckling	0.04 < 1
LTB	0.01 < 1
Compression + Moment	0.27 < 1
Compression + LTB	0.32 < 1

Macro 28 Member 71 HEB200 S 235 Ult. comb 47 0.23

N [kN]	Vy [kN]	Vz [kN]	Mt [kNm]	My [kNm]	Mz [kNm]
-22.08	3.06	-3.19	0.10	5.72	-5.81

The critical check is on position 0.00 m

Buckling parameters	yy	zz	
type	sway	non-sway	
Slenderness	35.12	177.69	
Reduced slenderness	0.38	1.91	
Buckling curve	b	c	
Imperfection	0.34	0.49	
Reduction factor	0.93	0.21	
Length	3.00	9.00	m
Buckling factor	1.00	1.00	
Buckling length	3.00	9.00	m
Critical Euler load	13117.36	512.52	kN

LTB

LTB length	9.00	m
Betaz	1.00	

LTB

Beta0	1.00
Ksi	1.12

negative influence of load position

SECTION CHECK

N	0.01 < 1
Vy	0.00 < 1
Vz	0.02 < 1
M	0.11 < 1

STABILITY CHECK

Buckling	0.06 < 1
LTB	0.05 < 1
Compression + Moment	0.20 < 1
Compression + LTB	0.23 < 1

Macro 50 Member 119 HEB200 S 235 Ult. comb 47 0.24

N [kN]	Vy [kN]	Vz [kN]	Mt [kNm]	My [kNm]	Mz [kNm]
-25.28	-3.06	3.31	-0.13	5.89	-5.81

The critical check is on position 1.50 m

Buckling parameters	yy	zz	
type	sway	non-sway	
Slenderness	35.12	177.69	
Reduced slenderness	0.38	1.91	
Buckling curve	b	c	
Imperfection	0.34	0.49	
Reduction factor	0.93	0.21	
Length	3.00	9.00	m
Buckling factor	1.00	1.00	
Buckling length	3.00	9.00	m
Critical Euler load	13117.36	512.55	kN

LTB

LTB length	9.00	m
Betaz	1.00	
Beta0	1.00	
Ksi	1.35	

negative influence of load position

SECTION CHECK

N	0.01 < 1

SECTION CHECK

Vy	0.00 < 1
Vz	0.02 < 1
M	0.11 < 1

STABILITY CHECK

Buckling	0.07 < 1
LTB	0.05 < 1
Compression + Moment	0.21 < 1
Compression + LTB	0.24 < 1

Macro 50 Member 120 HEB200 S 235 Ult. comb 35 0.33

N [kN]	Vy [kN]	Vz [kN]	Mt [kNm]	My [kNm]	Mz [kNm]
-17.10	2.82	-2.22	0.29	1.33	13.33

The critical check is on position 1.50 m

Buckling parameters	yy	zz	
type	sway	non-sway	
Slenderness	35.12	177.69	
Reduced slenderness	0.38	1.91	
Buckling curve	b	c	
Imperfection	0.34	0.49	
Reduction factor	0.93	0.21	
Length	3.00	9.00	m
Buckling factor	1.00	1.00	
Buckling length	3.00	9.00	m
Critical Euler load	13117.36	512.55	kN

LTB

LTB length	9.00	m
Betaz	1.00	
Beta0	1.00	
Ksi	1.12	

negative influence of load position

SECTION CHECK

N	0.01 < 1
Vy	0.00 < 1
Vz	0.01 < 1
M	0.24 < 1

STABILITY CHECK

Buckling	0.05 < 1

STABILITY CHECK

LTB	0.01 < 1
Compression + Moment	0.28 < 1
Compression + LTB	0.33 < 1

Macro 50 Member 121 HEB200 S 235 Ult. comb 35 0.38

N [kN]	Vy [kN]	Vz [kN]	Mt [kNm]	My [kNm]	Mz [kNm]
-18.61	-0.00	1.32	-0.31	4.01	14.55

The critical check is on position 1.50 m

Buckling parameters	yy	zz	
type	sway	non-sway	
Slenderness	35.12	177.69	
Reduced slenderness	0.38	1.91	
Buckling curve	b	c	
Imperfection	0.34	0.49	
Reduction factor	0.93	0.21	
Length	3.00	9.00	m
Buckling factor	1.00	1.00	
Buckling length	3.00	9.00	m
Critical Euler load	13117.36	512.55	kN

LTB

LTB length	9.00	m
Betaz	1.00	
Beta0	1.00	
Ksi	1.12	

negative influence of load position

SECTION CHECK

N	0.01 < 1
Vy	0.00 < 1
Vz	0.01 < 1
M	0.27 < 1

STABILITY CHECK

Buckling	0.05 < 1
LTB	0.04 < 1
Compression + Moment	0.32 < 1
Compression + LTB	0.38 < 1

Macro 50 Member 122 HEB200 S 235 Ult. comb 35 0.38

N [kN]	Vy [kN]	Vz [kN]	Mt [kNm]	My [kNm]	Mz [kNm]
-18.61	-0.00	-1.53	0.36	4.01	14.55

The critical check is on position 0.00 m

Buckling parameters	yy	zz	
type	sway	non-sway	
Slenderness	35.12	177.69	
Reduced slenderness	0.38	1.91	
Buckling curve	b	c	
Imperfection	0.34	0.49	
Reduction factor	0.93	0.21	
Length	3.00	9.00	m
Buckling factor	1.00	1.00	
Buckling length	3.00	9.00	m
Critical Euler load	13117.36	512.55	kN

LTB

LTB length	9.00	m
Betaz	1.00	
Beta0	1.00	
Ksi	1.12	

negative influence of load position

SECTION CHECK

N	0.01 < 1
Vy	0.00 < 1
Vz	0.01 < 1
M	0.27 < 1

STABILITY CHECK

Buckling	0.05 < 1
LTB	0.04 < 1
Compression + Moment	0.32 < 1
Compression + LTB	0.38 < 1

Macro 50 Member 123 HEB200 S 235 Ult. comb 35 0.34

N [kN]	Vy [kN]	Vz [kN]	Mt [kNm]	My [kNm]	Mz [kNm]
-19.53	-2.82	2.35	-0.24	0.95	13.34

The critical check is on position 0.00 m

Buckling parameters	yy	zz	
type	sway	non-sway	
Slenderness	35.12	177.69	
Reduced slenderness	0.38	1.91	
Buckling curve	b	c	
Imperfection	0.34	0.49	
Reduction factor	0.93	0.21	
Length	3.00	9.00	m
Buckling factor	1.00	1.00	
Buckling length	3.00	9.00	m
Critical Euler load	13117.36	512.55	kN

LTB

LTB length	9.00	m
Betaz	1.00	
Beta0	1.00	
Ksi	1.12	

negative influence of load position

SECTION CHECK

N	0.01 < 1
Vy	0.00 < 1
Vz	0.01 < 1
M	0.24 < 1

STABILITY CHECK

Buckling	0.05 < 1
LTB	0.01 < 1
Compression + Moment	0.28 < 1
Compression + LTB	0.34 < 1

Macro 50 Member 124 HEB200 S 235 Ult. comb 47 0.25

N [kN]	Vy [kN]	Vz [kN]	Mt [kNm]	My [kNm]	Mz [kNm]
-28.88	3.06	-3.12	0.08	5.61	-5.81

The critical check is on position 0.00 m

Buckling parameters	yy	zz	
type	sway	non-sway	
Slenderness	35.12	177.69	
Reduced slenderness	0.38	1.91	
Buckling curve	b	c	
Imperfection	0.34	0.49	
Reduction factor	0.93	0.21	
Length	3.00	9.00	m

Buckling parameters	yy	zz	
Buckling factor	1.00	1.00	
Buckling length	3.00	9.00	m
Critical Euler load	13117.36	512.55	kN

LTB		
LTB length	9.00	m
Betaz	1.00	
Beta0	1.00	
Ksi	1.35	

negative influence of load position

SECTION CHECK	
N	0.02 < 1
Vy	0.00 < 1
Vz	0.01 < 1
M	0.11 < 1

STABILITY CHECK	
Buckling	0.08 < 1
LTB	0.05 < 1
Compression + Moment	0.22 < 1
Compression + LTB	0.25 < 1

DIN. Profile - 5 all. UC all.

Cross-section : 5 - U180

Macro 2 Member 7 U180 S 235 Ult. comb 34 0.45

N [kN]	Vy [kN]	Vz [kN]	Mt [kNm]	My [kNm]	Mz [kNm]
-0.71	0.51	-2.72	-0.03	-13.05	0.18

The critical check is on position 3.00 m

Buckling parameters	yy	zz	
type	sway	non-sway	
Slenderness	129.61	125.08	
Reduced slenderness	1.39	1.35	
Buckling curve	c	c	
Imperfection	0.49	0.49	
Reduction factor	0.35	0.37	
Length	9.00	3.00	m
Buckling factor	1.00	0.84	

Buckling parameters	yy	zz	
Buckling length	9.00	2.52	m
Critical Euler load	345.44	370.97	kN

LTB

LTB length 3.00 m

SECTION CHECK

Sigma	0.44 < 1
tau	0.04 < 1

STABILITY CHECK

Buckling	0.00 < 1
LTB	0.42 < 1
Compression + Moment	0.36 < 1
Compression + LTB	0.45 < 1

Macro 2 Member 8 U180 S 235 Ult. comb 34 0.50

N [kN]	Vy [kN]	Vz [kN]	Mt [kNm]	My [kNm]	Mz [kNm]
18.03	0.01	0.00	0.00	-14.25	-0.11

The critical check is on position 1.50 m

LTB

LTB length 3.00 m

SECTION CHECK

Sigma	0.49 < 1
tau	0.00 < 1

STABILITY CHECK

LTB	0.49 < 1
Compression + Moment	0.37 < 1
Compression + LTB	0.50 < 1

Macro 2 Member 9 U180 S 235 Ult. comb 34 0.48

N [kN]	Vy [kN]	Vz [kN]	Mt [kNm]	My [kNm]	Mz [kNm]
-7.35	-0.50	2.73	0.04	-13.05	0.16

The critical check is on position 0.00 m

Buckling parameters	yy	zz	
type	sway	non-sway	
Slenderness	129.61	124.61	
Reduced slenderness	1.39	1.34	
Buckling curve	c	c	
Imperfection	0.49	0.49	
Reduction factor	0.35	0.37	
Length	9.00	3.00	m
Buckling factor	1.00	0.84	
Buckling length	9.00	2.51	m
Critical Euler load	345.44	373.77	kN

LTB

LTB length 3.00 m

SECTION CHECK

Sigma	0.44 < 1
tau	0.04 < 1

STABILITY CHECK

Buckling	0.03 < 1
LTB	0.42 < 1
Compression + Moment	0.40 < 1
Compression + LTB	0.48 < 1

Macro 29 Member 72 U180 S 235 Ult. comb 34 0.48

N [kN]	Vy [kN]	Vz [kN]	Mt [kNm]	My [kNm]	Mz [kNm]
-7.47	0.50	-2.72	-0.03	-13.05	0.17

The critical check is on position 3.00 m

Buckling parameters	yy	zz	
type	sway	non-sway	
Slenderness	129.61	124.85	
Reduced slenderness	1.39	1.34	
Buckling curve	c	c	
Imperfection	0.49	0.49	
Reduction factor	0.35	0.37	
Length	9.00	3.00	m
Buckling factor	1.00	0.84	
Buckling length	9.00	2.52	m
Critical Euler load	345.44	372.28	kN

LTB

LTB length 3.00 m

SECTION CHECK

Sigma	0.45 < 1
tau	0.04 < 1

STABILITY CHECK

Buckling	0.03 < 1
LTB	0.42 < 1
Compression + Moment	0.41 < 1
Compression + LTB	0.48 < 1

Macro 29 Member 73 U180 S 235 Ult. comb 34 0.48

N [kN]	Vy [kN]	Vz [kN]	Mt [kNm]	My [kNm]	Mz [kNm]
14.72	-0.00	-0.00	-0.00	-14.25	-0.10

The critical check is on position 1.50 m

LTB

LTB length 3.00 m

SECTION CHECK

Sigma	0.48 < 1

STABILITY CHECK

LTB	0.45 < 1
Compression + Moment	0.37 < 1
Compression + LTB	0.47 < 1

Macro 29 Member 74 U180 S 235 Ult. comb 34 0.48

N [kN]	Vy [kN]	Vz [kN]	Mt [kNm]	My [kNm]	Mz [kNm]
-7.47	-0.50	2.72	0.03	-13.05	0.17

The critical check is on position 0.00 m

Buckling parameters	yy	zz	
type	sway	non-sway	
Slenderness	129.61	124.89	
Reduced slenderness	1.39	1.34	
Buckling curve	c	c	
Imperfection	0.49	0.49	
Reduction factor	0.35	0.37	
Length	9.00	3.00	m
Buckling factor	1.00	0.84	
Buckling length	9.00	2.52	m
Critical Euler load	345.44	372.09	kN

LTB

LTB length 3.00 m

SECTION CHECK

Sigma	0.45 < 1
tau	0.04 < 1

STABILITY CHECK

Buckling	0.03 < 1
LTB	0.42 < 1
Compression + Moment	0.41 < 1
Compression + LTB	0.48 < 1

Macro 51 Member 125 U180 S 235 Ult. comb 34 0.48

N [kN]	Vy [kN]	Vz [kN]	Mt [kNm]	My [kNm]	Mz [kNm]
-7.35	0.50	-2.73	-0.04	-13.05	0.16

The critical check is on position 3.00 m

Buckling parameters	yy	zz	
type	sway	non-sway	
Slenderness	129.61	124.57	
Reduced slenderness	1.39	1.34	
Buckling curve	c	c	
Imperfection	0.49	0.49	
Reduction factor	0.35	0.37	
Length	9.00	3.00	m
Buckling factor	1.00	0.84	
Buckling length	9.00	2.51	m
Critical Euler load	345.44	373.96	kN

LTB

LTB length 3.00 m

SECTION CHECK

Sigma	0.44 < 1
tau	0.04 < 1

STABILITY CHECK

Buckling	0.03 < 1
LTB	0.42 < 1
Compression + Moment	0.40 < 1
Compression + LTB	0.48 < 1

Macro 51 Member 126 U180 S 235 Ult. comb 34 0.50

N [kN]	Vy [kN]	Vz [kN]	Mt [kNm]	My [kNm]	Mz [kNm]
18.03	-0.01	-0.00	-0.00	-14.25	-0.11

The critical check is on position 1.50 m

LTB

LTB length 3.00 m

SECTION CHECK

Sigma	0.49 < 1
tau	0.00 < 1

STABILITY CHECK

LTB	0.49 < 1
Compression + Moment	0.37 < 1
Compression + LTB	0.50 < 1

Macro 51 Member 127 U180 S 235 Ult. comb 34 0.45

N [kN]	Vy [kN]	Vz [kN]	Mt [kNm]	My [kNm]	Mz [kNm]
-0.71	-0.51	2.72	0.03	-13.05	0.18

The critical check is on position 0.00 m

Buckling parameters	yy	zz
type	sway	non-sway

Buckling parameters	yy	zz	
Slenderness	129.61	125.11	
Reduced slenderness	1.39	1.35	
Buckling curve	c	c	
Imperfection	0.49	0.49	
Reduction factor	0.35	0.37	
Length	9.00	3.00	m
Buckling factor	1.00	0.84	
Buckling length	9.00	2.52	m
Critical Euler load	345.44	370.78	kN

LTB

LTB length 3.00 m

SECTION CHECK

Sigma	0.44 < 1
tau	0.04 < 1

STABILITY CHECK

Buckling	0.00 < 1
LTB	0.42 < 1
Compression + Moment	0.36 < 1
Compression + LTB	0.45 < 1

DIN. Profile - 4 all. UC all.

Cross-section : 4 - HEB100

Macro 36 Member 87 HEB100 S 235 Ult. comb 44 0.14

N [kN]	Vy [kN]	Vz [kN]	Mt [kNm]	My [kNm]	Mz [kNm]
-19.65	-0.25	0.25	0.00	0.33	-0.08

The critical check is on position 0.85 m

Buckling parameters	yy	zz	
type	sway	non-sway	
Slenderness	149.92	23.87	
Reduced slenderness	1.61	0.26	
Buckling curve	b	c	
Imperfection	0.34	0.49	
Reduction factor	0.30	0.97	
Length	0.85	0.85	m
Buckling factor	7.33	0.71	

Buckling parameters	yy	zz	
Buckling length	6.23	0.60	m
Critical Euler load	240.12	9476.20	kN

LTB

LTB length	0.85	m
Betaz	1.00	
Beta0	1.00	
Ksi	1.50	

load in center of gravity

SECTION CHECK

N	0.03 < 1
Vy	0.00 < 1
Vz	0.00 < 1
M	0.01 < 1

STABILITY CHECK

Buckling	0.11 < 1
LTB	0.01 < 1
Compression + Moment	0.14 < 1
Compression + LTB	0.06 < 1

DIN. Profile - 3 all. UC all.

Cross-section : 3 - L50X5

Macro 15 Member 40 L50X5 S 235 Ult. comb 46 0.43

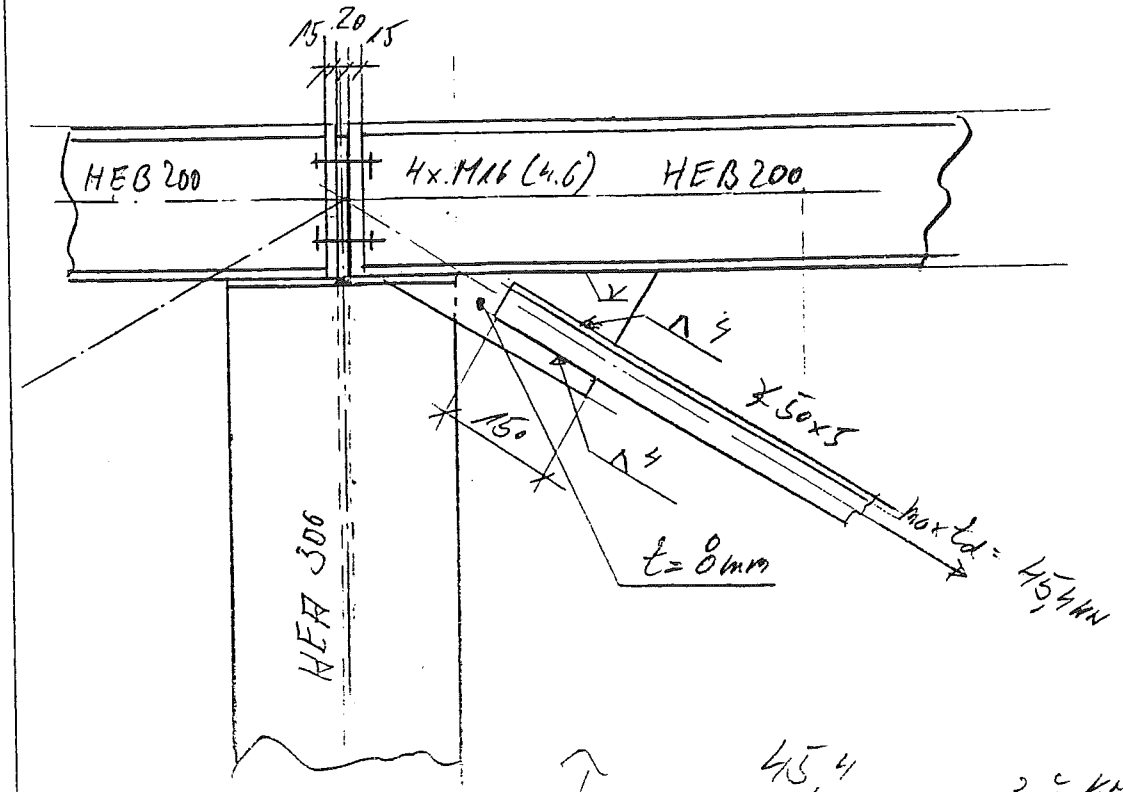
N [kN]	Vy [kN]	Vz [kN]	Mt [kNm]	My [kNm]	Mz [kNm]
45.37	0.00	0.00	0.00	0.00	0.00

The critical check is on position 0.00 m

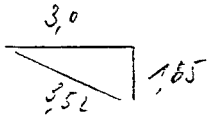
SECTION CHECK

Sigma	0.43 < 1

STABILITY CHECK



$$\tau_{wd} = \frac{45,4}{15 \cdot 2 \cdot 0,4} = \underline{3,8\ kN/cm^2 < 20}$$



4 x M16 (4.6)

$$\max V_{2d} = 2 \cdot \frac{45,4 \cdot 1,65}{3,52} = \underline{47,72\ kN}$$

$$\text{zul } V_{a,R,d} = 4 \cdot 43,9 = \underline{175,6\ kN}$$

$$\text{zu } V_{l,R,d} = 4 \cdot 46,0 \cdot 2,0 = 368\ kN$$

$$\frac{47,72}{175,6} = \underline{0,27 < 1,0}$$

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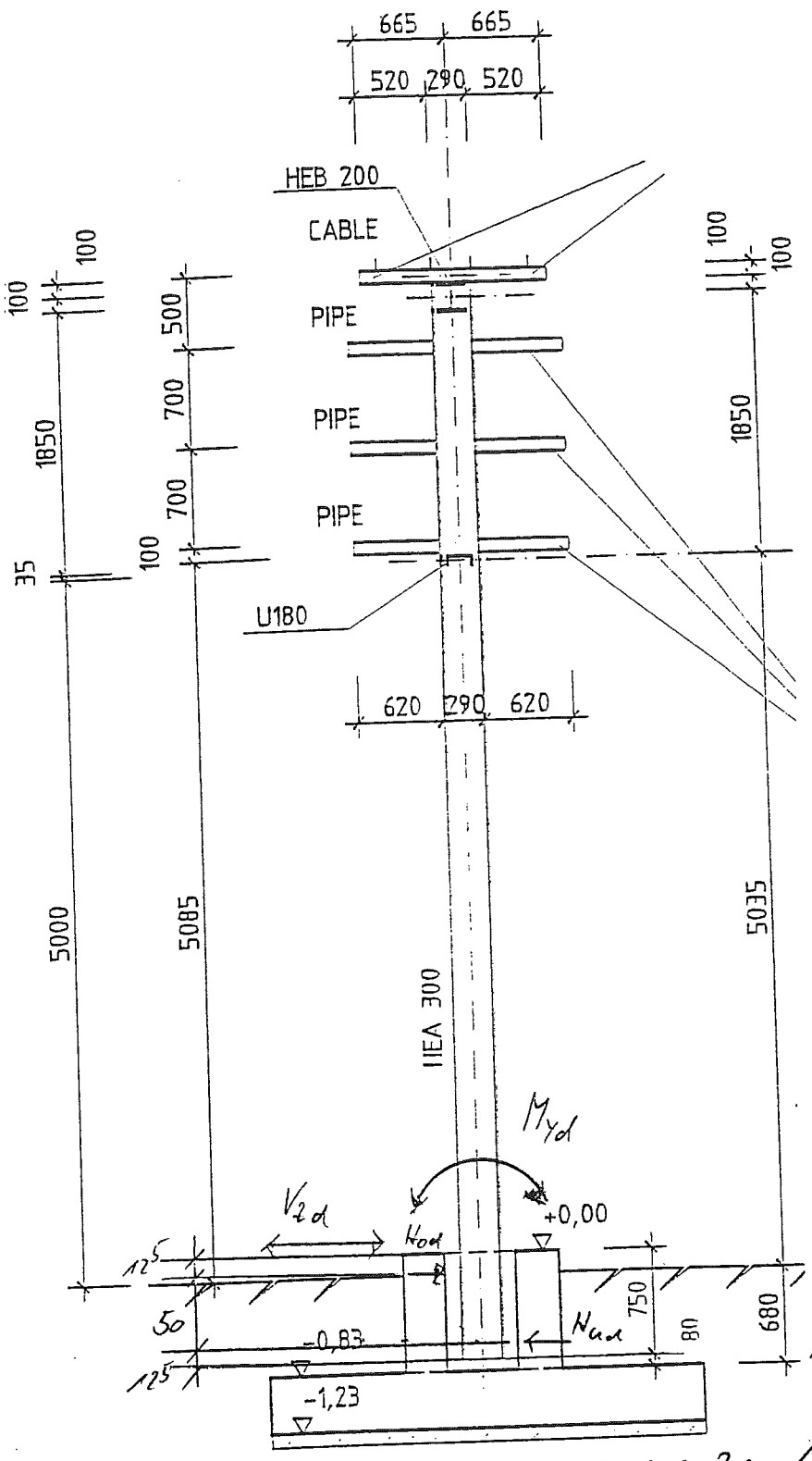

$\max M_{yd} = \pm 139{,}7$ kNm

$\gamma_g V_{zd} = \pm 24{,}64$ kN

$\gamma_g N_{Hd} = -25{,}49$ kN

$\max V_{zd} = \frac{139{,}7}{0{,}50} = 279{,}4$ kN

HEA 300 (S235 JR)

$\max \sigma_d = \frac{279{,}4}{23{,}5} = 11{,}88$ kN/cm² < 12

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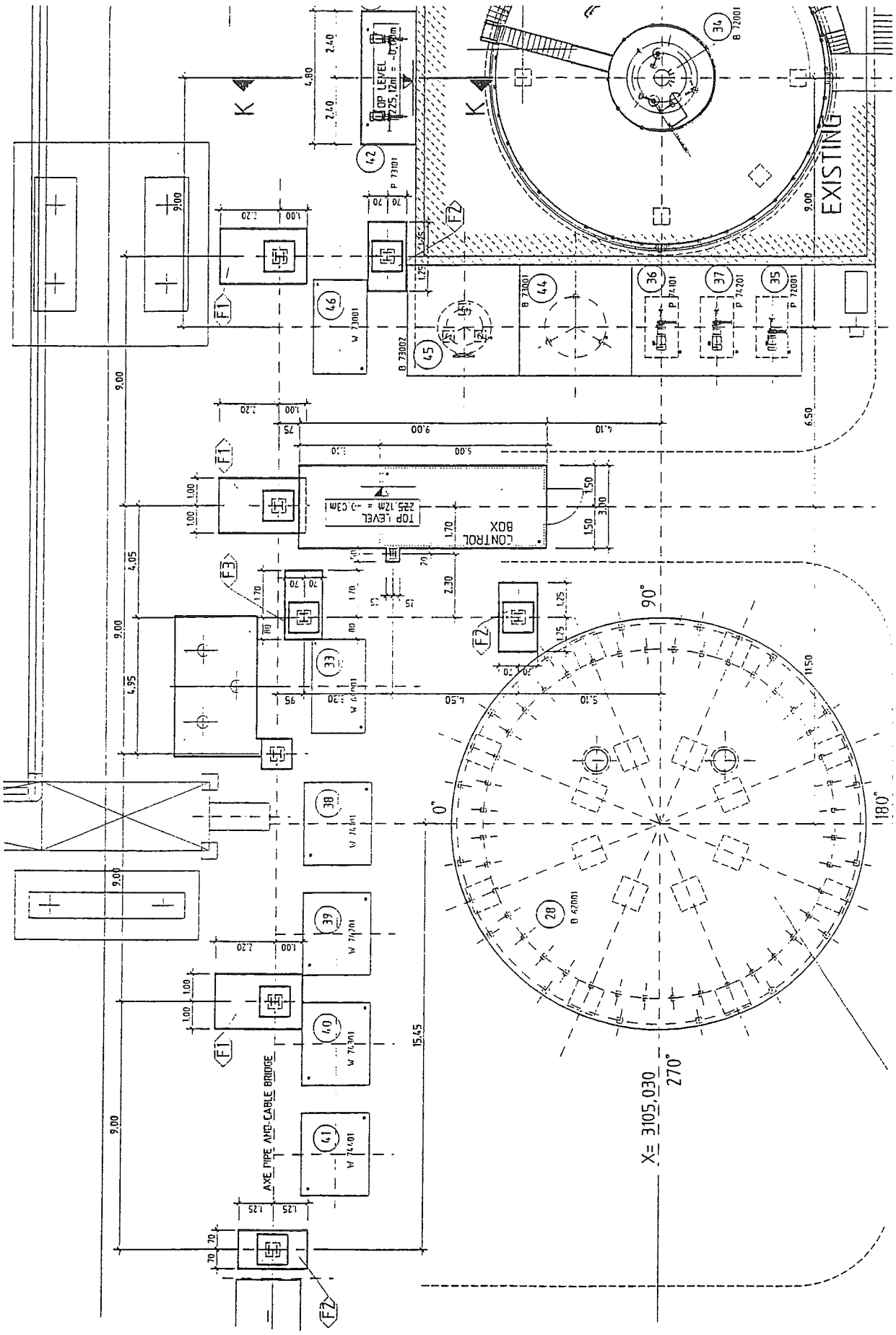

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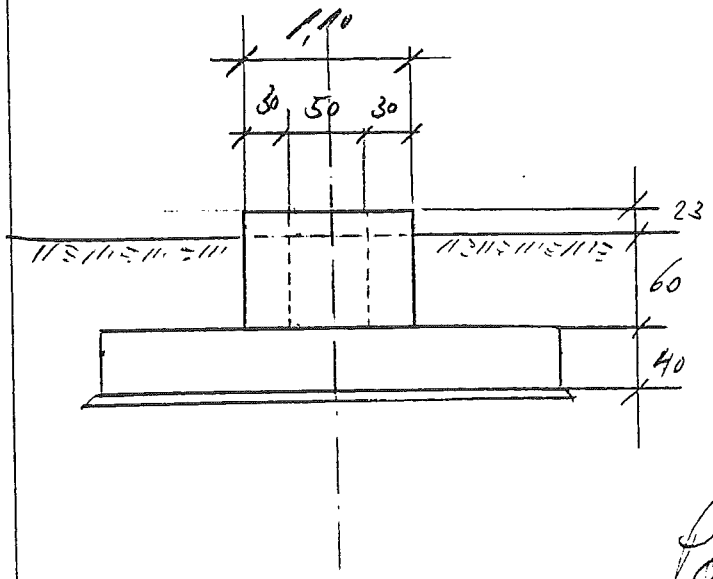
Foundation Pipe Bridge



$g_E = 0{,}60 \cdot 19{,}0 = \underline{11{,}40\ kN/m'}$

Los F1:

(Lage 30; Node 33+85)

LC1: max M_y + zug V_{min}

max M_y = $\pm$ 89,75 kNm · 1,1 (10 %) = $\underline{100\ kNm}$

zug V_{min} = $\underline{10\,000\ kN}$

zug R_y = 14,93 · 1,1 = $\pm$ $\underline{16{,}42\ kN}$

LC2: max M_y + max N

max M_y = $\pm$ 89,75 · 1,1 (10 %) = $\underline{100\ kNm}$

zug V_{max} = $\underline{52{,}96\ kN}$

zug R_y = 14,93 · 1,1 = $\pm$ $\underline{16{,}42\ kN}$

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Los F2:

(Page 38; Node 30 + 131)

LC1: max M_y + zug N_{min}

max M_y = ± 40,6 · 1,1 · 10 = ± 536 kNm

zug N_{min} = 1236 kN

zug R_y = 0,86 · 1,1 = ± 920 kN

LC2: max M_y + zug N_{max}

max M_y = ± 40,6 · 1,1 · 10 = ± 536 kNm

zug N_{max} = 3139 kN

zug R_y = 0,86 · 1,1 = ± 920 kN

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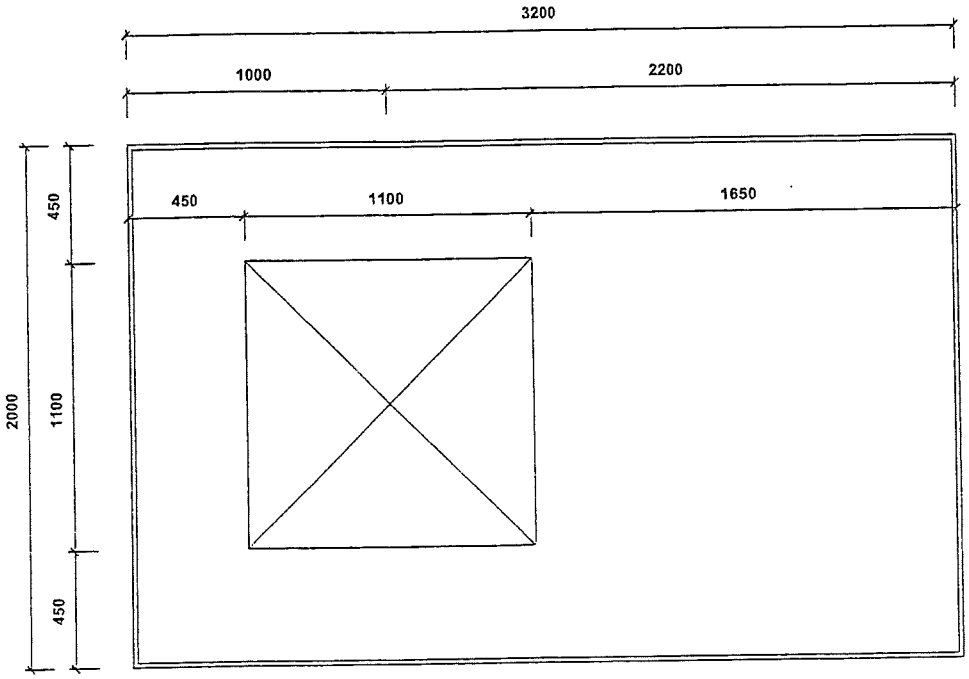
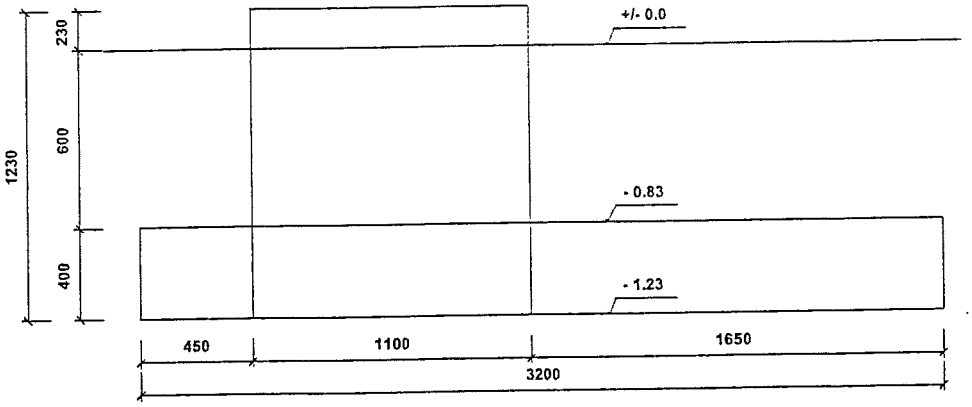

3200
1000
2200
450
1100
1650
2000
450
1100
450

h = 40 cm, B25


230
600
400
1230
+/- 0.0
- 0.83
- 1.23
450
1100
1650
3200

Basic data
Type of structure : General XYZ

Number of nodes:	13
Number of members:	16
Number of 1D macros:	11
Number of bound. lines:	8
Number of 2D macros:	1
Number of profiles :	1
Number of cases:	6
Number of materials:	2

Material

Name:

B 25		
	E modulus	30000.00 MPa
	Poisson coeff.	0.20
	Density	2500.000 kg/m^3
	Extensibility	0.01 mm/m.K
B 25 gewichtslos		
	E modulus	30000.00 MPa
	Poisson coeff.	0.20
	Density	0.000 kg/m^3
	Extensibility	0.01 mm/m.K

List of material
Group of members :
1/16

no.	Name:	quality	unit weight kg/m	length m	weight kg

List of material - Macro2D
Group of members :
1/2

no.	Name:	quality	unit volume weight kgm^3	volume m^3	weight kg
4	B 25	B 25	2500.00	2.56	6400.00

The total weight of the structure: 6400.00 kg

Nodes

node	X m	Y m	Z m	node	X m	Y m	Z m
1	0.000	0.000	0.000	2	3.200	0.000	0.000

node	X m	Y m	Z m
3	3.200	2.000	0.000
4	0.000	2.000	0.000
5	0.450	0.450	0.000
6	1.550	0.450	0.000
7	1.550	1.550	0.000
8	0.450	1.550	0.000
9	0.450	0.450	1.230
10	1.550	0.450	1.230
11	0.450	1.550	1.230
12	1.550	1.550	1.230
13	1.000	1.000	1.230

Members

macro	memb	node 1	node 2	length m	Rx deg	profile	quality
1	1	5	9	1.230	0.00	1 - REC (55.0,55.0)	B 25 gewichtslos
2	2	6	10	1.230	0.00	1 - REC (55.0,55.0)	B 25 gewichtslos
3	3	8	11	1.230	0.00	1 - REC (55.0,55.0)	B 25 gewichtslos
4	4	7	12	1.230	0.00	1 - REC (55.0,55.0)	B 25 gewichtslos
5	5	9	10	1.100	0.00	1 - REC (55.0,55.0)	B 25 gewichtslos
	6	10	12	1.100	0.00	1 - REC (55.0,55.0)	B 25 gewichtslos
	7	12	11	1.100	0.00	1 - REC (55.0,55.0)	B 25 gewichtslos
	8	11	9	1.100	0.00	1 - REC (55.0,55.0)	B 25 gewichtslos
6	9	9	6	1.650	0.00	1 - REC (55.0,55.0)	B 25 gewichtslos
7	10	11	7	1.650	0.00	1 - REC (55.0,55.0)	B 25 gewichtslos
8	11	5	11	1.650	0.00	1 - REC (55.0,55.0)	B 25 gewichtslos
9	12	6	12	1.650	0.00	1 - REC (55.0,55.0)	B 25 gewichtslos
10	13	9	13	0.778	0.00	1 - REC (55.0,55.0)	B 25 gewichtslos
	14	13	12	0.778	0.00	1 - REC (55.0,55.0)	B 25 gewichtslos
11	15	10	13	0.778	0.00	1 - REC (55.0,55.0)	B 25 gewichtslos
	16	13	11	0.778	0.00	1 - REC (55.0,55.0)	B 25 gewichtslos

Boundaries

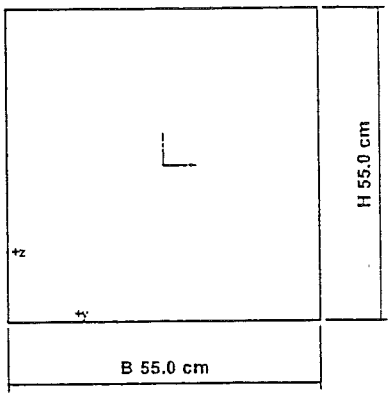
bound. line	type	node
1	Line	1,2
2	Line	2,3
3	Line	3,4
4	Line	4,1
5	Line	5,6
6	Line	6,7
7	Line	7,8
8	Line	8,5

2D Macros

num	type	
1		
	B 25	Thickness 0.40 m

num	type	
	Boundary:	1,2,3,4
	Nodes :	5,6,7,8
1	Inner line:	5,6,7,8

Profiles



REC (55.0,55.0)

Profile no. 1 - REC (55.0,55.0)
Material : 8 - B 25 gewichtslos

A:	3.025000e+003 cm^2		
Ay/A:	0.833	Az/A:	0.833
Iy:	7.625521e+005 cm^4	Iz:	7.625521e+005 cm^4
Iyz:	0.000000e+000 cm^4	It:	1.286578e+006 cm^4
Iw:	0.000000e+000 cm^6		
Wely:	2.772917e+004 cm^3	Welz:	2.772917e+004 cm^3
Wply:	4.159375e+004 cm^3	Wplz:	4.159375e+004 cm^3
cy:	27.50 cm	cz:	27.50 cm
iy:	15.88 cm	iz:	15.88 cm
dy:	0.00 cm	dz:	0.00 cm
Outline :		220.00 cm	

Type for check: Untypical section

Nontypical elements

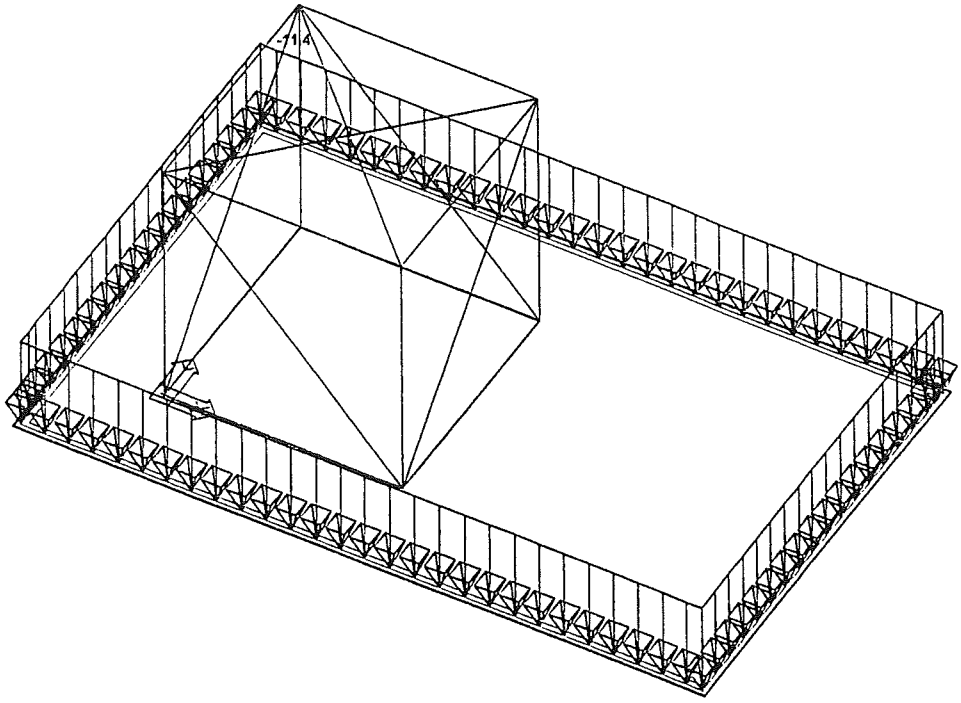
memb	type	memb	type	memb	type
1	X	2	X	3	X
4	X	5	X	6	X
7	X	8	X	9	X
10	X	11	X	12	X

Soil - 2D macro

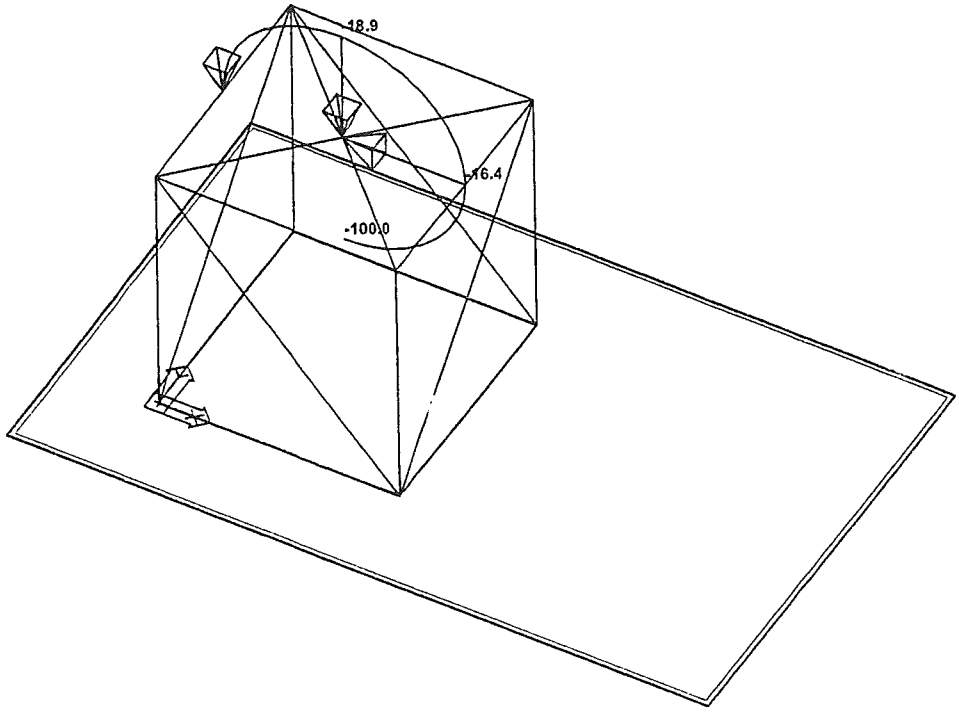
Index	2D macro	Name of subsoil
1	1	gemischtkörniger Sand

Loadcases

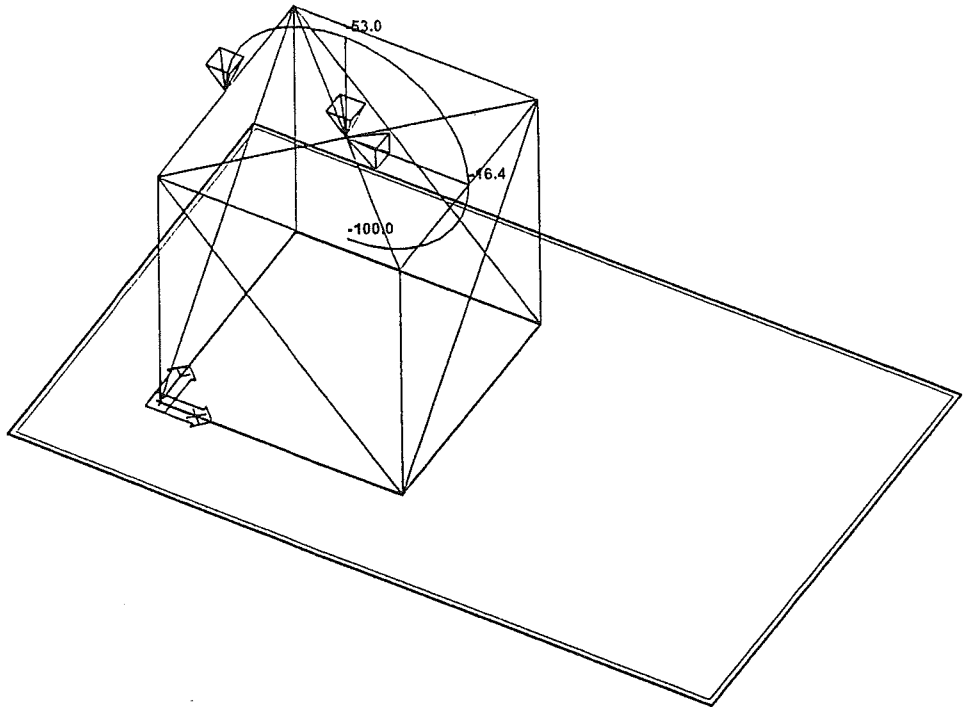
Case	Name:	Description
1	weight	Self weight. Direction -Z
2	G	Permanent - Loads
3	LC1	Variable - p Excl.
4	LC2	Variable - p Excl.
5	LC1(-)	Variable - p Excl.
6	LC2(-)	Variable - p Excl.



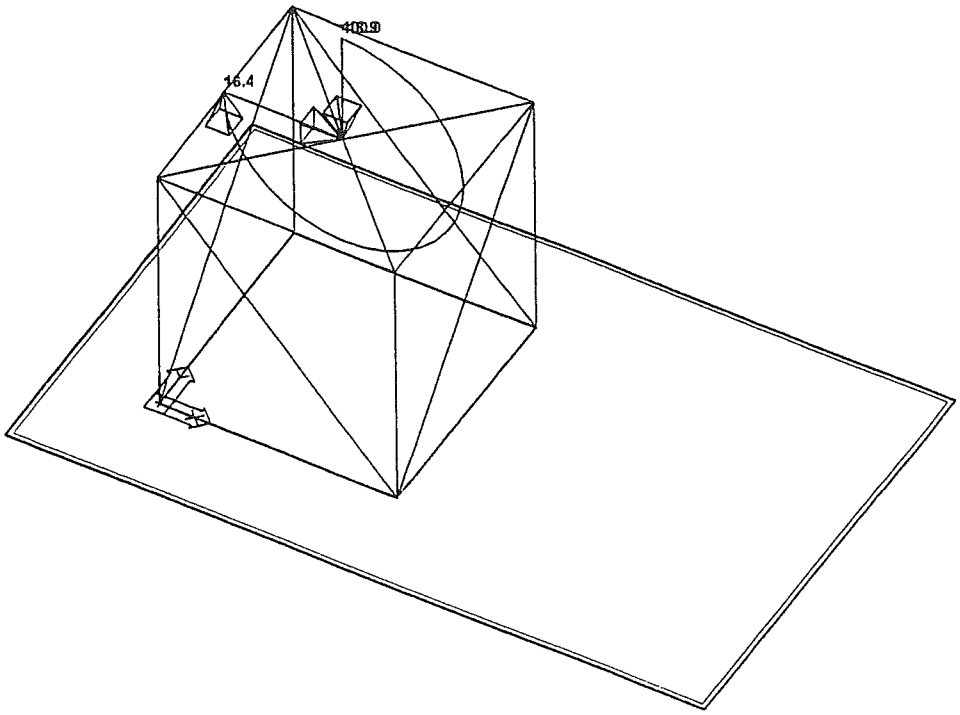
2. G



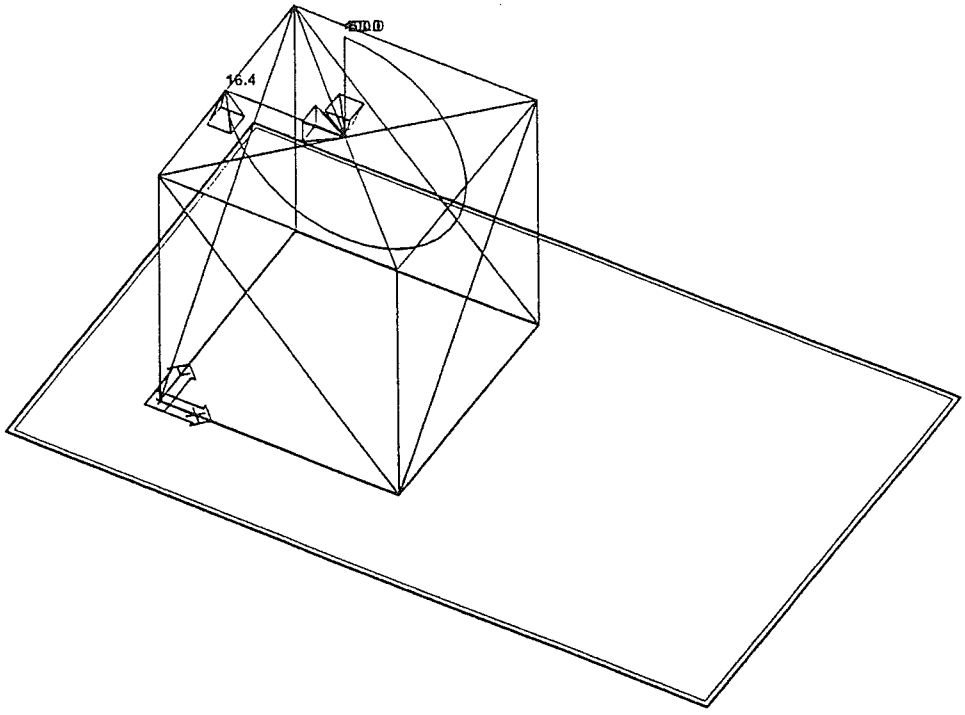
3. LC1



4. LC2



5. LC1(-)



6. LC2(-)

Variable loads group

Name:

p Excl.

Loadcase no. 3 - nodal loads

node	Fx kN	Fy kN	Fz kN	Mx kNm	My kNm	Mz kNm
13	-16.42	0.00	-18.88	0.00	-100.00	0.00

Loadcase no. 4 - nodal loads

node	Fx kN	Fy kN	Fz kN	Mx kNm	My kNm	Mz kNm
13	-16.42	0.00	-52.96	0.00	-100.00	0.00

Loadcase no. 5 - nodal loads

node	Fx kN	Fy kN	Fz kN	Mx kNm	My kNm	Mz kNm
13	16.42	0.00	-18.88	0.00	100.00	0.00

Loadcase no. 6 - nodal loads

node	Fx kN	Fy kN	Fz kN	Mx kNm	My kNm	Mz kNm
13	16.42	0.00	-52.96	0.00	100.00	0.00

Loadcase no. 2 - Distributed loads 2D

macro	qx kN/m^2	qy kN/m^2	qz kN/m^2
1	0.00	0.00	-11.40

Combinations

Combi	Norm	Case	coeff
1.	User-ultimate	1 weight	1.00
		2 G	1.00
		3 LC1	1.00
		4 LC2	1.00
		5 LC1(-)	1.00
		6 LC2(-)	1.00

Basic rules for generation of ultimate load combinations:
1 : 1.00*LC1 / 1.00*LC2 / 1.00*LC3 / 1.00*LC4 / 1.00*LC5 / 1.00*LC6

List of extreme ultimate load combinations
1/ 1 : +1.00*LC1+1.00*LC2+1.00*LC3
2/ 1 : +1.00*LC1+1.00*LC2+1.00*LC4
3/ 1 : +1.00*LC1+1.00*LC2+1.00*LC5
4/ 1 : +1.00*LC1+1.00*LC2+1.00*LC6

Nonlinear combination

Combi	Group of init. deformations	dx mm/m	dy mm/m	Group of init. curvatures	Case	coeff
C 1	0	0.00	0.00	0	1 weight	1.00
	0	0.00	0.00	0	2 G	1.00
	0	0.00	0.00	0	3 LC1	1.00
C 2	0	0.00	0.00	0	1 weight	1.00
	0	0.00	0.00	0	2 G	1.00
	0	0.00	0.00	0	4 LC2	1.00
C 3	0	0.00	0.00	0	1 weight	1.00
	0	0.00	0.00	0	2 G	1.00
	0	0.00	0.00	0	5 LC1(-)	1.00
C 4	0	0.00	0.00	0	1 weight	1.00
	0	0.00	0.00	0	2 G	1.00
	0	0.00	0.00	0	6 LC2(-)	1.00

Subsoils

Name:	Type of position	C1x kN/m^3	C1y kN/m^3	C1z kN/m^3	C2x kN/m	C2y kN/m	SigZpl kN/m^2
gemischtkörniger Sand	Under plate, block	1000.000	1000.000	30000.000	0.000	0.000	0.000

Calculation protocol.

Linear calculation

Number of 2D elements	92
Number of 1D elements	16
Number of mesh nodes	110
Number of equations	660
Loadcases	LC 1 weight
	LC 2 G
	LC 3 LC1
	LC 4 LC2
	LC 5 LC1(-)

Number of 2D elements	92
Number of 1D elements	16
Number of mesh nodes	110
Number of equations	660
	LC 6 LC2(-)
Bending theory	Mindlin
Start of calculation	19.10.2004 09:44
End of calculation	19.10.2004 09:44

Sum of loads and reactions.

		X	Y	Z
loadcase 1	loads	0.0	0.0	-64.0
	reactions	0.0	0.0	0.0
	contact	-0.0	-0.0	64.0
loadcase 2	loads	0.0	0.0	-73.0
	reactions	0.0	0.0	0.0
	contact	-0.0	-0.0	73.0

		X	Y	Z
loadcase 3	loads	-16.4	0.0	-18.9
	reactions	0.0	0.0	0.0
	contact	16.4	0.0	18.9
loadcase 4	loads	-16.4	0.0	-53.0
	reactions	0.0	0.0	0.0
	contact	16.4	0.0	53.0

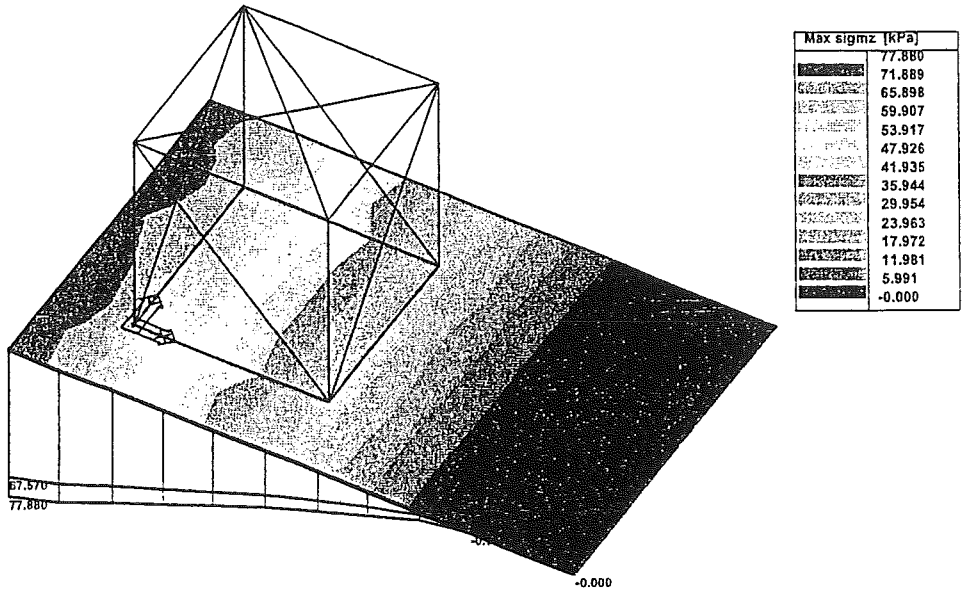
			X	Y	Z
loadcase	5	loads	16.4	0.0	-18.9
		reactions	0.0	0.0	0.0
		contact	-16.4	-0.0	18.9

			X	Y	Z
loadcase	6	loads	16.4	0.0	-53.0
		reactions	0.0	0.0	0.0
		contact	-16.4	-0.0	53.0

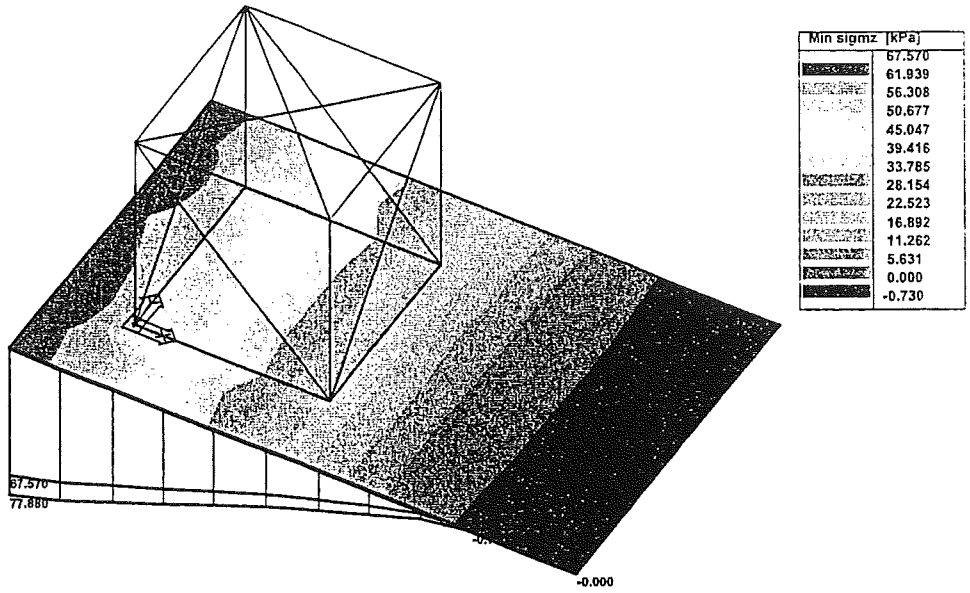
Nonlinear calculation

Number of 2D elements	92
Number of 1D elements	16
Number of mesh nodes	110
Number of equations	660
Maximum iterations	50
Bending theory	Mindlin

Number Combi	Start	End	NoOfIteration
NC 1	19.10.2004 09:44	19.10.2004 09:45	3
NC 2	19.10.2004 09:45	19.10.2004 09:45	2
NC 3	19.10.2004 09:45	19.10.2004 09:45	3
NC 4	19.10.2004 09:45	19.10.2004 09:45	1



Contact stress - max sigmz - Nonl. Combi : 1/2



Contact stress - min sigmz - Nonl. Combi : 1/2

RESULTS : CONTACT STRESSES

Nonl. Combi:
NC1
NC2

Global extremes

node	tauzx [kPa]	tauzy [kPa]	sigmz [kPa]
6	**3.583**	-0.000	26.200
76	**0.000**	0.000	-0.000
52	3.582	**0.000**	69.725
62	3.185	**-0.000**	15.473
1	3.582	0.000	**77.880**
66	0.000	-0.000	**-0.730**

Selection was done for macros: 1

Code for calculation: DIN 1045 7/88

Explanation of concrete symbols

Abbreviation	Explanation
betaWN	Concrete cube compression strength.
betaR	Design concrete compression strength.
Tau01	1st shear stress limit according Table 13.
Tau02	2nd shear stress limit according Table 13.
Tau03	3rd shear stress limit according Table 13.

Concrete characteristics

	B 25
betaWN	25000.000 kPa
betaR	17500.000 kPa
Tau011_1 plates	350.000 kPa
Tau011_2 plates	500.000 kPa
Tau02 plates	1800.000 kPa
Tau012 beams	750.000 kPa
Tau02 beams	1800.000 kPa
Tau03 beams	3000.000 kPa

Explanation of reinforcement steel symbols

Abbreviation	Explanation
betaS	Characteristic yield strength of reinforcement

Steel characteristics

	BSt 420
betaS	420000.000 kPa
E modulus	200000000.000 kPa

Input parameters

Description	Percentage
Maximum % of reinforcement	9.00
Minimum % of net reinforcement	0.00
Minimum % of pressure reinforcement	0.50
Minimum % of tension reinforcement	0.00
Minimum % of transverse reinforcement	20.00

Shear mode
Tension reinforcement is partially anchored in the field.

Description	Value
height < 7 cm represents increase of internal forces (§ 17.2.1 (6))	ON
Structural reinforcement of deep beam	OFF

Global extremes

Necessary areas

node	As1+ [cm^2/m]	As2+ [cm^2/m]	As3+ [cm^2/m]	As3- [cm^2/m]	As2- [cm^2/m]	As1- [cm^2/m]	Ass [cm^2/m^2]	tau [MPa]	tau0 [MPa]
6	**3.625**	0.941	~	~	1.244	4.516	0.000	0.00	0.21
2	**0.001**	0.022	~	~	0.009	0.000	0.000	0.00	0.01
5	0.316	**0.964**	~	~	1.241	0.529	0.000	0.00	0.23
54	0.019	**0.006**	~	~	0.028	0.142	0.000	0.00	0.07
6	3.625	0.941	~	~	**1.244**	4.516	0.000	0.00	0.21
98	0.052	0.084	~	~	**0.000**	0.046	0.000	0.00	0.02
6	3.625	0.941	~	~	1.244	**4.516**	0.000	0.00	0.21
2	0.001	0.022	~	~	0.009	**0.000**	0.000	0.00	0.01
1	0.155	0.090	~	~	0.122	0.160	**0.000**	0.00	0.00
	0.155	0.090	~	~	0.122	0.160	**0.000**	0.00	0.00
	0.155	0.090	~	~	0.122	0.160	0.000	**0.00**	0.00
	0.155	0.090	~	~	0.122	0.160	0.000	**0.00**	0.00
5	0.316	0.964	~	~	1.241	0.529	0.000	0.00	**0.23**
1	0.155	0.090	~	~	0.122	0.160	0.000	0.00	**0.00**

Selection was done for macros: 1