



Projekt:

Trekkershut te Velden
t.b.v. 

Constructieberekening

Werknummer

Hoofdstuk

Onderdeel

Constructeur

Han



Telefoon

Fax

Datum 31-08-22

Aanvulling/Wijziging A

B

C

D



werk:				26-08-22			
Gordingen							
gording afm.bxh		150	150	Lt=		2260 mm	
w=		563 cm³		h.o.h.=		1140 mm	
I=		4219 cm4					
hoek alfa		35 graden					
sterkteklasse		c	18	Ed mean=		9000	Ed= 6923
bel.duur		50	jaar	Rd=		11,08	
wind		0,48 kn/m²					
				loodrecht op dakvlak			
belasting	G	dakpl.+gord+isol.		0,25 kn/m²		0,20 kn/m²	
m²	Q	sneeuw		0,47 kn/m²		0,31 kn/m²	
	Q	v.b	0<alfa<15=1,	0,00 kn/m²		0,00 kn/m²	
		v.b	alfa 16 =0,8	0,00 kn/m²		0,00 kn/m²	
		v.b	alfa 17 =0,6	0,00 kn/m²		0,00 kn/m²	
	Q	wind		0,48 kn/m²		0,48 kn/m²	
	Q	p		2 kn		1,64 kn	
belasting op gording			momenten				
	g eg+rb	0,23 kn/m1		0,15 knm			
	q sneeuw	0,36 kn/m1		0,23 knm			
	q wind	0,55 kn/m1		0,35 knm			
	q p	1,64 kn		0,93 knm			
	q v.b.	0,00 kn/m1		0,00 knm			
max tot.	1,08*g+1,35q =		1,41 knm				
	1,22*g+0,54q =		0,68 knm				
w ben. =	127 cm³		u.c.=	0,23			
I ben.=	424 cm4		u.c.=	0,10			
Indien dak niet hor. gekoppeld (onder)							
	L dak=	3700 mm					
	g=	0,53 kn/m1		0,34 knm			
	q=	0,81 kn/m1		0,52 knm			
max.tot	1,08*g+1.35q =		1,07 knm				
	1.22*g+0.54q =		0,69 knm				
w ben. =	96	cm³		1375	cm³	u.c.=	0,07
I ben.=	751	cm4	57 269	9246	cm4	u.c.=	0,08

werk: [REDACTED]		31-08-22	
sporen			
spoor afm.bxh	46 96	Lt=	1300 mm
w=	71 cm ³	h.o.h.=	600 mm
I=	339 cm ⁴		
hoek alfa	35 graden		
sterkteklasse	c 18	Ed mean=	9000 Ed= 6923
bel.duur	50 jaar	Rd=	11,08
wind	0,48 kn/m ²		
		loodrecht op dakvlak	
belasting	G dakpl.+gord+isol.	0,25 kn/m ²	0,20 kn/m ²
m ²			
Q	sneeuw	0,47 kn/m ²	0,31 kn/m ²
Q	v.b 0<alfa<15=1,	0,00 kn/m ²	0,00 kn/m ²
	v.b alfa 16 =0,8	0,00 kn/m ²	0,00 kn/m ²
	v.b alfa 17 =0,6	0,00 kn/m ²	0,00 kn/m ²
Q	wind	0,48 kn/m ²	0,48 kn/m ²
Q	p	2 kn	1,64 kn
belasting op gording		momenten	
	g eg+rb 0,12 kn/m1		0,03 knm
	q sneeuw 0,19 kn/m1		0,04 knm
	q wind 0,29 kn/m1		0,06 knm
	q p 1,64 kn		0,53 knm
	q v.b. 0,00 kn/m1		0,00 knm
max tot.	1,08*g+1,35q =	0,75 knm	
	1,22*g+0,54q =	0,32 knm	
w ben. =	67 cm ³	u.c.=	0,95
I ben.=	42 cm ⁴	u.c.=	0,13

H. Marissen

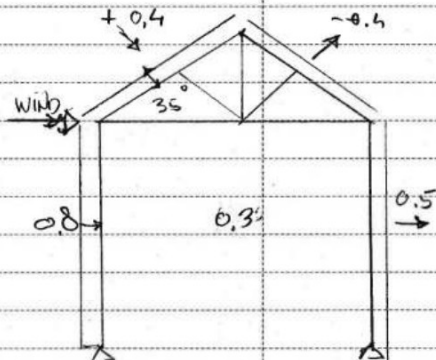
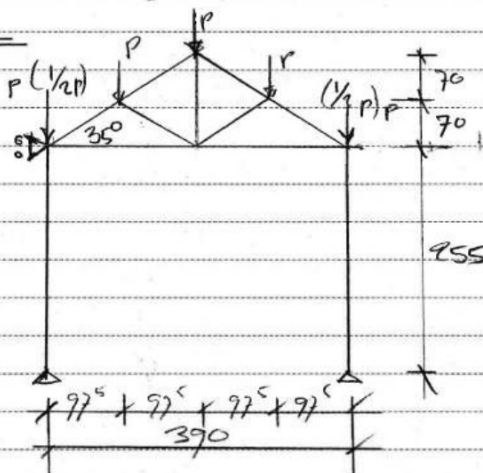
ALGEMENE BELASTINGEN

$$\text{DAK : EG GORDINGEN BESCHOT DAKPL.} = 0,25 \text{ kN/m}^2$$

$$\downarrow \frac{0,25}{\cos 30^\circ} = 0,31 \text{ " } \downarrow$$

$$\text{V.B. (SNEEUW)} = 0,47 \text{ "}$$

$$\text{WIND} = 0,49 \text{ kN/m}^2$$

SPANT

$$\text{BEL. P : } q = 2,26 \times 0,31 \times 0,98 = 0,69 \text{ kN}$$

$$q = 2,26 \times 0,47 \times 0,98 = 1,04 \text{ "}$$

$$\text{wind : } 2,26 \times 0,49 = 1,11 \text{ kN/m'}$$

$$0,8 \times 1,11 = 0,89 \text{ kN/m'}$$

$$0,5 \times \text{"} = 0,56 \text{ "}$$

$$0,1 \times \text{"} = 0,45 \text{ "}$$

$$0,3 \times \text{"} = 0,31 \text{ "}$$

CONTROLE BALK ZIJGEVEL OP H-KRACHT (2^{de} SPANT VAN VORREN)

$$\text{H : } q = 0$$

$$q = 3,11 \text{ kN} / 2 = 1,56 \text{ kN}$$

$$\text{L } 4,52 \text{ m}$$

TS/Raamwerken rel:3.73a

Project...:

Onderdeel: spant

Dimensies: kN;m;rad (tenzij anders aangegeven)

Datum....: 28-08-22

Bestand...: c:\documents and settings\jr\bureaublad\werken\ 18-08-22\spant.rww

Toegepaste norm...: Eurocode

Rekenmodel.....: 2e-orde-elastisch.

Theorieën voor de bepaling van de krachtsverdeling:

1) Uiterste grenstoestand:

Geometrisch niet lineair alle staven.

Fysisch lineair alle staven.

2) Gebruiksgrenstoestand:

Lineaire-elasticiteitstheorie

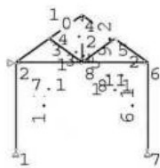
Maximum aantal iteraties.....: 50

Max.deellengte kolommen/wanden: 0.500 Max.deellengte balken/vloeren: 0.500

Max. X-verplaatsing in UGT....: 0.500 Max. Z-verplaatsing in UGT....: 0.250

Gunstige werking van de permanente belasting wordt automatisch verwerkt

GEOMETRIE



MATERIALEN

Mt Omschrijving E-modulus [N/mm²] S.M. Pois. Uitz. coëff

1 C18 9000 3.2 0.00 5.0000e-006

Bij de bepaling v.h. e.g. van houten staven is de S.M. met 5% verhoogd.

PROFIELEN [mm]

Prof. Omschrijving	Materiaal	Oppervlak	Traagheid	Vormf.
1 B*H 180*180	1:C18	3.2400e+004	8.7480e+007	0.00
2 B*H 100*100	1:C18	1.0000e+004	8.3333e+006	0.00

PROFIELEN vervolg [mm]

Prof. Staaftype	Breedte	Hoogte	e	Type	b1	h1	b2	h2
1 0:Normaal	180	180	90.0	0:RH				
2 0:Normaal	100	100	50.0	0:RH				

KNOPEN

Knoop	X	Z	Knoop	X	Z
1	0.000	0.000	6	3.900	2.550
2	0.000	2.550	7	3.900	0.000
3	0.975	3.250	8	1.950	2.550
4	1.950	3.950			
5	2.925	3.250			

STAVEN

St.	ki	kj	Profiel	Aansl.i	Aansl.j	Lengte Opm.
1	1	2	1:B*H 180*180	NDM	NDM	2.550
2	2	3	1:B*H 180*180	ND	NDM	1.200
3	3	4	1:B*H 180*180	ND	NDM	1.200
4	4	5	1:B*H 180*180	ND	NDM	1.200
5	5	6	1:B*H 180*180	ND	ND	1.200
6	6	7	1:B*H 180*180	NDM	NDM	2.550
7	7	8	1:B*H 180*180	ND	NDM	1.950
8	8	6	1:B*H 180*180	NDM	ND	1.950
9	8	4	2:B*H 100*100	ND	ND	1.400

TAVEN

St.	ki	kj	Profiel	Aansl.i	Aansl.j	Lengte Opm.
10	8	3	2:B*H 100*100	ND	ND	1.200
11	8	5	2:B*H 100*100	ND	ND	1.200

VASTE STEUNPUNTEN

Nr. knoop	Kode	XZR 1=vast 0=vrij	Hoek
1	1 110		0.00
2	2 100		0.00
3	7 110		0.00

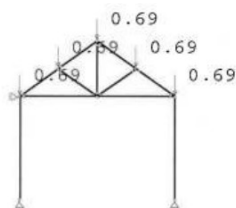
BELASTINGGEVALLEN

B.G. Omschrijving	Type	e.g.X	e.g.Z
1 Permanente belasting	1	0.00	-1.00
2 sneeuw	1	0.00	0.00
3 wind	1	0.00	0.00
4 o+o	1	0.00	0.00

BELASTINGEN

B.G:1 Permanente belasting

Eigengewicht alle staven. Richting: ↓



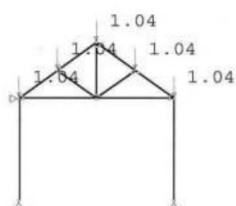
KNOOPBELASTINGEN

B.G:1 Permanente belasting

Last	Knoop	Richting	waarde
1	2	Z	-0.690
2	3	Z	-0.690
3	4	Z	-0.690
4	5	Z	-0.690
5	6	Z	-0.690

BELASTINGEN

B.G:2 sneeuw



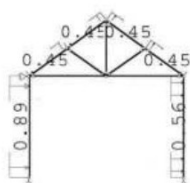
KNOOPBELASTINGEN

B.G:2 sneeuw

Last	Knoop	Richting	waarde
1	2	Z	-1.040
2	3	Z	-1.040
3	4	Z	-1.040
4	5	Z	-1.040
5	6	Z	-1.040

BELASTINGEN

B.G:3 wind



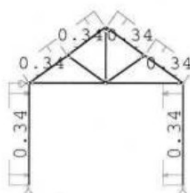
STAAFBELASTINGEN

B.G:3 wind

Last	Staat	Type	q1/p/m	q2	A	B	psi	psi-t	Opm
1	1	1:QZLokaal	-0.890	-0.890	0.000	0.000			
2	2	1:QZLokaal	-0.450	-0.450	0.000	0.000			
3	3	1:QZLokaal	-0.450	-0.450	0.000	0.000			
4	4	1:QZLokaal	0.450	0.450	0.000	0.000			
5	5	1:QZLokaal	0.450	0.450	0.000	0.000			
6	6	1:QZLokaal	0.560	0.560	0.000	0.000			

BELASTINGEN

B.G:4 o+o



STAAFBELASTINGEN

B.G:4 o+o

Last	Staat	Type	q1/p/m	q2	A	B	psi	psi-t	Opm
1	1	1:QZLokaal	-0.340	-0.340	0.000	0.000			
2	2	1:QZLokaal	-0.340	-0.340	0.000	0.000			
3	3	1:QZLokaal	-0.340	-0.340	0.000	0.000			
4	4	1:QZLokaal	-0.340	-0.340	0.000	0.000			
5	5	1:QZLokaal	-0.340	-0.340	0.000	0.000			

6 6 1:QZLokaal -0.340 -0.340 0.000 0.000

BEREKENINGSTATUS

B.C. Iteratie Status

1	2	Nauwkeurigheid bereikt
2	2	Nauwkeurigheid bereikt
3	3	Nauwkeurigheid bereikt
4	3	Nauwkeurigheid bereikt
5	1	Lineaire berekening
6	1	Lineaire berekening
7	1	Lineaire berekening

BELASTINGCOMBINATIES

BC Type	BG Gen. Factor	BG Gen. Factor	BG Gen. Factor	BG Gen. Factor
1 Fund.	1 Perm 1.08	2 Perm 1.35		
2 Fund.	1 Perm 1.22	2 Perm 0.54		
3 Fund.	1 Perm 1.08	3 Perm 1.35	4 Perm 1.35	
4 Fund.	1 Perm 1.08	3 Perm 1.35	4 Perm -1.35	
5 Inc.	1 Perm 1.00	2 Perm 1.00		
6 Inc.	1 Perm 1.00	3 Perm 1.00		
7 Perm.	1 Perm 1.00			

GUNSTIGE WERKING PERMANENTE BELASTINGEN

BC Staven met gunstige werking

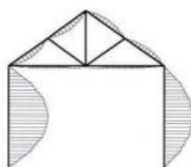
- 1 Geen
- 2 Alle staven de factor:1.22, 0.54
- 3 Geen
- 4 Alle staven de factor:1.08, 1.35, -1.35

OMHULLENDE VAN DE FUNDAMENTELE COMBINATIES

MOMENTEN

2de orde

Fundamentele combinatie



STAAFKRACHTEN

2de orde

Fundamentele combinatie

St.	Kn.	Pos.	NXi/NXj			DZi/DZj			MYi/MYj		
			Min BC	Max BC		Min BC	Max BC		Min BC	Max BC	
1	1		-6.25	1	-2.13 4	-2.13 3	0.00 1	0.00 1	0.00 1	0.00 1	
1	1.275		-6.10	1	-1.98 4	-0.00 3	0.00 1	-1.36 3	0.00 1	0.00 1	
1	2		-5.95	1	-1.83 4	0.00 1	2.13 3	-0.00 3	0.00 1	0.00 1	
2	2		-6.21	1	-1.49 4	-0.70 3	-0.06 1	0.00 1	0.00 1	0.00 1	
2	0.600		-6.17	1	-1.44 4	-0.00 3	-0.00 1	-0.21 3	-0.02 1	0.00 1	
2	3		-6.13	1	-1.40 4	0.06 1	0.70 3	0.00 3	0.00 1	0.00 1	
3	3		-4.23	1	-0.65 4	-0.70 3	-0.06 1	0.00 1	0.00 1	0.00 1	
3	0.600		-4.19	1	-0.61 4	-0.00 3	-0.00 1	-0.21 3	-0.02 1	0.00 1	
3	4		-4.14	1	-0.56 4	0.06 1	0.70 3	0.00 3	0.00 1	0.00 1	
4	4		-4.14	1	-1.09 4	-0.06 2	0.58 4	0.00 1	0.00 1	0.00 1	
4	0.600		-4.19	1	-1.13 4	-0.00 2	0.00 4	-0.02 2	0.17 4	0.00 1	
4	5		-4.23	1	-1.17 4	-0.58 4	0.06 2	-0.00 2	0.00 4	0.00 1	
5	5		-6.13	1	-1.43 4	-0.06 2	0.58 4	0.00 1	0.00 1	0.00 1	
5	0.600		-6.17	1	-1.48 4	-0.00 2	0.00 4	-0.02 2	0.17 4	0.00 1	
5	6		-6.21	1	-1.52 4	-0.58 4	0.06 2	-0.00 2	0.00 4	0.00 1	
6	6		-5.95	1	-1.26 4	0.00 2	1.55 4	0.00 1	0.00 1	0.00 1	
6	1.275		-6.10	1	-1.41 4	-0.00 2	0.00 4	0.00 2	0.99 4	0.00 1	
6	7		-6.25	1	-1.56 4	-1.55 4	-0.00 2	-0.00 2	-0.00 4	0.00 1	
7	2		3.55	2	5.01 1	-0.14 1	-0.10 4	0.00 1	0.00 1	0.00 1	
7	0.975		3.55	2	5.01 1	-0.02 1	0.01 4	-0.08 1	-0.05 4	0.00 1	
7	1.755		3.55	2	5.01 1	0.07 1	0.10 4	-0.06 1	0.00 4	0.00 1	
7	8		3.55	2	5.01 1	0.09 1	0.12 4	-0.04 1	0.02 4	0.00 1	
8	8		3.12	4	5.01 1	-0.12 2	-0.09 1	-0.04 1	0.02 4	0.00 1	
8	0.195		3.12	4	5.01 1	-0.10 2	-0.07 1	-0.06 1	0.00 4	0.00 1	
8	0.975		3.12	4	5.01 1	-0.01 4	0.02 1	-0.08 1	-0.05 4	0.00 1	
8	6		3.12	4	5.01 1	0.10 4	0.14 1	-0.00 1	0.00 4	0.00 1	
9	8		0.52	4	2.54 1	-0.00 1	0.00 3	0.00 1	0.00 1	0.00 1	
9	4		0.57	4	2.59 1	-0.00 3	-0.00 2	0.00 1	0.00 3	0.00 1	

10	8	-2.14	3	-0.98	4	0.02	4	0.02	2	0.00	1	0.00	1
10	0.600	-2.13	3	-0.97	4	0.00	4	0.00	2	0.01	4	0.01	2
10	3	-2.12	3	-0.95	4	-0.02	2	-0.02	4	-0.00	4	0.00	2

STAAFKRACHTEN 2de orde

Fundamentele combinatie

		NXi/NXj				DZi/DZj				MYi/MYj				
St.	Kn.	Pos.	Min	BC	Max	BC	Min	BC	Max	BC	Min	BC	Max	BC
11	8		-2.00	1	0.56	4	-0.02	2	-0.02	4	0.00	1	0.00	1
11	0.600		-1.98	1	0.57	4	-0.00	2	0.00	4	-0.01	2	-0.01	4
11	5		-1.97	1	0.59	4	0.02	4	0.02	2	-0.00	2	0.00	4

STAAFSPANNINGEN 2de orde

Fundamentele combinatie

St.	Kn.	Pos.	NXi/NXj	DZi/DZj	MYi/MYj	σ	τ	σ_1
						[N/mm ²]	[N/mm ²]	[N/mm ²]
1	1		-6.25	-2.13	0.00	0.2	0.1	0.2
1	1.275		-6.10	0.00	-1.36	1.6	0.0	1.6
1	2		-5.95	2.13	-0.00	0.2	0.1	0.2
2	2		-6.21	-0.70	0.00	0.2	0.0	0.2
2	0.600		-6.17	-0.00	-0.21	0.4	0.0	0.4
2	3		-6.13	0.70	0.00	0.2	0.0	0.2
3	3		-4.23	-0.70	0.00	0.1	0.0	0.1
3	0.600		-4.19	-0.00	-0.21	0.3	0.0	0.3
3	4		-4.14	0.70	0.00	0.1	0.0	0.1
4	4		-4.14	-0.06	0.00	0.1	0.0	0.1
4	0.600		-4.19	0.00	0.17	0.3	0.0	0.3
4	5		-4.23	-0.58	-0.00	0.1	0.0	0.1
5	5		-6.13	-0.06	0.00	0.2	0.0	0.2
5	0.600		-6.17	0.00	0.17	0.4	0.0	0.4
5	6		-6.21	-0.58	-0.00	0.2	0.0	0.2
6	6		-5.95	0.00	0.00	0.2	0.0	0.2
6	1.275		-6.10	-0.00	0.99	1.2	0.0	1.2
6	7		-6.25	-0.38	0.00	0.2	0.0	0.2
7	2		5.01	-0.14	0.00	0.2	0.0	0.2
7	0.975		5.01	-0.02	-0.08	0.2	0.0	0.2
7	1.755		5.01	0.07	-0.06	0.2	0.0	0.2
7	8		5.01	0.09	-0.04	0.2	0.0	0.2
8	8		5.01	-0.09	-0.04	0.2	0.0	0.2
8	0.195		5.01	-0.07	-0.06	0.2	0.0	0.2
8	0.975		5.01	0.02	-0.08	0.2	0.0	0.2
8	6		5.01	0.14	0.00	0.2	0.0	0.2
9	8		2.54	-0.00	0.00	0.3	0.0	0.3
9	4		2.59	-0.00	0.00	0.3	0.0	0.3
10	8		-2.14	0.02	0.00	0.2	0.0	0.2
10	0.600		-2.13	0.00	0.01	0.2	0.0	0.2
10	3		-2.12	-0.02	-0.00	0.2	0.0	0.2
11	8		-2.00	-0.02	0.00	0.2	0.0	0.2
11	0.600		-1.98	-0.00	-0.01	0.2	0.0	0.2
11	5		-1.97	0.02	0.00	0.2	0.0	0.2

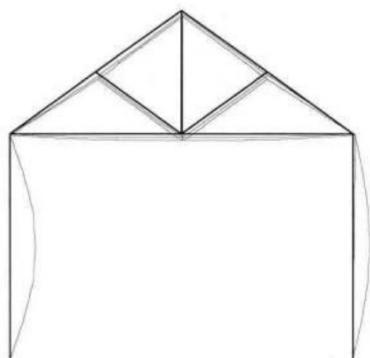
REACTIES 2de orde

Fundamentele combinatie

Kn.	X-min	X-max	Z-min	Z-max	M-min	M-max
1	-2.12	0.00	2.14	6.25		
2	-4.20	-0.00				
7	-1.55	0.00	1.56	6.25		

OMHULLENDE VAN DE INCIDENTELE COMBINATIES

VERPLAATSINGEN 1ste orde [mm] Incidentele combinatie



VERPLAATSINGEN		1ste orde [mm;rad]				Incidentele combinatie			
Kn.		X-verpl.		Z-verpl.		Rotatie			
		Min	Max	Min	Max	Min	Max		
1		0.00	0.00	0.00	0.00	0.00000	0.00 078		
2		0.00	0.00	-0.04	-0.02	-0.00078	-0.00000		
3		0.04	0.06	-0.16	-0.10	0.00003	0.00 010		
4		0.02	0.03	-0.14	-0.08	-0.00007	-0.00004		
5		-0.01	0.01	-0.16	-0.08	0.00002	0.00 004		
6		0.04	0.05	-0.04	-0.02	-0.00047	0.00 002		
7		0.00	0.00	0.00	0.00	0.00002	0.00 051		
8		0.03	0.03	-0.17	-0.10	-0.00000	0.00 000		
STAAFKRACHTEN		1ste orde				Incidentele combinatie			
St.	Kn.	Pos.	NXi/NXj		DZi/DZj		MYi/MYj		
			Min BC	Max BC	Min BC	Max BC	Min BC	Max BC	
1	1		-5.14	5	-2.75	6	-1.13	6	0.00 5
1	1.275		-5.00	5	-2.61	6	0.00	6	0.00 5
1	2		-4.86	5	-2.48	6	0.00	5	1.13 6
2	2		-5.09	5	-2.43	6	-0.32	6	-0.05 5
2	0.600		-5.05	5	-2.39	6	0.00	6	0.00 5
2	3		-5.01	5	-2.36	6	0.05	5	0.32 6
3	3		-3.48	5	-1.53	6	-0.32	6	-0.05 5
3	0.600		-3.44	5	-1.49	6	0.00	6	0.00 5
3	4		-3.40	5	-1.45	6	0.05	5	0.32 6
4	4		-3.40	5	-1.84	6	-0.05	5	0.22 6
4	0.600		-3.44	5	-1.88	6	-0.00	5	0.00 6
4	5		-3.48	5	-1.92	6	-0.22	6	0.05 5
5	5		-5.01	5	-2.38	6	-0.05	5	0.22 6
5	0.600		-5.05	5	-2.42	6	0.00	5	0.00 6
5	6		-5.09	5	-2.46	6	-0.22	6	0.05 5
6	6		-4.86	5	-2.05	6	0.00	5	0.71 6
6	1.275		-5.00	5	-2.19	6	0.00	5	0.00 6
6	7		-5.14	5	-2.33	6	-0.71	6	0.00 5
7	2		3.76	6	4.10	5	-0.12	5	-0.10 6
7	0.975		3.76	6	4.10	5	-0.02	5	0.00 6
7	1.902		3.76	6	4.10	5	0.09	5	0.10 6
7	8		3.76	6	4.10	5	0.09	5	0.11 6
STAAFKRACHTEN		1ste orde				Incidentele combinatie			
St.	Kn.	Pos.	NXi/NXj		DZi/DZj		MYi/MYj		
			Min BC	Max BC	Min BC	Max BC	Min BC	Max BC	
8	8		2.84	6	4.10	5	-0.11	6	-0.09 5
8	0.048		2.84	6	4.10	5	-0.10	6	-0.09 5
8	0.975		2.84	6	4.10	5	-0.00	6	0.02 5
8	6		2.84	6	4.10	5	0.10	6	0.12 5
9	8		1.10	6	2.10	5	0.00	5	0.00 5
9	4		1.14	6	2.15	5	0.00	5	0.00 5
10	8		-1.62	5	-1.30	6	0.02	5	0.02 6
10	0.600		-1.61	5	-1.29	6	-0.00	6	0.00 5
10	3		-1.60	5	-1.28	6	-0.02	6	-0.02 5
11	8		-1.62	5	-0.16	6	-0.02	6	-0.02 5
11	0.600		-1.61	5	-0.15	6	0.00	5	0.00 6

11 5 -1.60 5 -0.14 6 0.02 5 0.02 6 0.00 5 0.00 6
STAAFSPANNINGEN 1ste orde Incidentele combinatie

St.	Kn.	Pos.	N_{Xi}/N_{Xj}	D_{Zi}/D_{Zj}	M_{Yi}/M_{Yj}	σ [N/mm ²]	τ [N/mm ²]	σ_i [N/mm ²]
1	1		-5.14	-1.13	0.00	0.2	0.0	0.2
1	1.275		-5.00	-0.00	-0.72	0.9	0.0	0.9
1	2		-4.86	0.00	-0.00	0.2	0.0	0.2
2	2		-5.09	-0.32	0.00	0.2	0.0	0.2
2	0.600		-5.05	0.00	-0.10	0.3	0.0	0.3
2	3		-5.01	0.32	0.00	0.2	0.0	0.2
3	3		-3.48	-0.32	0.00	0.1	0.0	0.1
3	0.600		-3.44	0.00	-0.10	0.2	0.0	0.2
3	4		-3.40	0.32	0.00	0.1	0.0	0.1
4	4		-3.40	-0.05	0.00	0.1	0.0	0.1
4	0.600		-3.44	0.00	0.07	0.2	0.0	0.2
4	5		-3.48	-0.22	-0.00	0.1	0.0	0.1
5	5		-5.01	-0.05	0.00	0.2	0.0	0.2
5	0.600		-5.05	0.00	0.07	0.2	0.0	0.2
5	6		-5.09	-0.22	-0.00	0.2	0.0	0.2
6	6		-4.86	0.00	0.00	0.2	0.0	0.2
6	1.275		-5.00	0.00	0.46	0.6	0.0	0.6
6	7		-5.14	-0.00	0.00	0.2	0.0	0.2
7	2		4.10	-0.12	0.00	0.1	0.0	0.1
7	0.975		4.10	-0.02	-0.07	0.2	0.0	0.2
7	1.902		4.10	0.09	-0.03	0.2	0.0	0.2
7	8		4.10	0.09	-0.03	0.2	0.0	0.2
8	8		4.10	-0.09	-0.03	0.2	0.0	0.2
8	0.048		4.10	-0.09	-0.03	0.2	0.0	0.2
8	0.975		4.10	0.02	-0.07	0.2	0.0	0.2
8	6		4.10	0.12	0.00	0.1	0.0	0.1
9	8		2.10	0.00	0.00	0.2	0.0	0.2
9	4		2.15	0.00	0.00	0.2	0.0	0.2
10	8		-1.62	0.02	0.00	0.2	0.0	0.2
10	0.600		-1.61	-0.00	0.00	0.2	0.0	0.2
10	3		-1.60	-0.02	-0.00	0.2	0.0	0.2
11	8		-1.62	-0.02	0.00	0.2	0.0	0.2
11	0.600		-1.61	0.00	-0.00	0.2	0.0	0.2

STAAFSPANNINGEN 1ste orde Incidentele combinatie

St.	Kn.	Pos.	N_{Xi}/N_{Xj}	D_{Zi}/D_{Zj}	M_{Yi}/M_{Yj}	σ [N/mm ²]	τ [N/mm ²]	σ_i [N/mm ²]
11	5		-1.60	0.02	0.00	0.2	0.0	0.2
REACTIES 1ste orde Incidentele combinatie								
Kn.	X-min	X-max	Z-min	Z-max	M-min	M-max		
1	-1.13	-0.00	2.75	5.14				
2	-3.11	0.00						
7	-0.71	-0.00	2.33	5.14				

OMHULLENDE VAN DE PERMANENTE BELASTINGEN

Kn.	X	Z	M				
1	-0.00	2.54					
2	0.00						
7	-0.00	2.54					

MATERIAALGEGEVENS

Materiaal	$f_{m,0;rep}$ [N/mm ²]	ρ_{rep} [kg/m ³]	$E_{0;ser;rep}$ [N/mm ²]	$f_{t,0;rep}$ [N/mm ²]	$f_{t,90;rep}$ [N/mm ²]	$f_{c,0;rep}$ [N/mm ²]
C18	18	320	9000	11	0.5	18

MATERIAALGEGEVENS (vervolg)

Materiaal	$f_{c,90;rep}$ [N/mm ²]	$f_{v,0;rep}$ [N/mm ²]	$E_{0,u;rep}$ [N/mm ²]	$E_{90;ser;rep}$ [N/mm ²]	$G_{ser;rep}$ [N/mm ²]	Klimaatklasse
C18	2.2	2.0	6000	300	560	I

STABILITEIT

Staafl	b_{gem} [mm]	h_{gem} [mm]	l_{ays} [mm]	$l_{knik;z}$ [mm]	λ_z	$k_{E;z}$	$\sigma_{m;cr}$ [N/mm ²]	k_m	k_{ins}
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1	180.0	180.0	2550	2550	49.1	1.366	652.32	31.825	1.000
2	180.0	180.0	1200	2400	46.2	1.542	655.17	31.964	1.000
3	180.0	180.0	1200	2400	46.2	1.542	655.17	31.964	1.000
4	180.0	180.0	1200	2400	46.2	1.542	655.17	31.964	1.000
5	180.0	180.0	1200	2400	46.2	1.542	655.17	31.964	1.000
6	180.0	180.0	2550	2550	49.1	1.366	652.32	31.825	1.000
7	180.0	180.0	1950	3900	75.1	0.584	639.65	31.207	1.000
8	180.0	180.0	1950	3900	75.1	0.584	639.65	31.207	1.000
9	100.0	100.0	1400	1400	48.5	1.399	652.85	31.851	1.000
10	100.0	100.0	1200	1200	41.6	1.904	661.03	32.250	1.000
11	100.0	100.0	1200	1200	41.6	1.904	661.03	32.250	1.000

STABILITEIT (vervolg)

Staal	η_z	ξ_z	$k_{com,z}$	$k_{c,z}$	$k_{mc,z}$
1	0.005774	2.612	0.683	0.500	0.500
2	0.005774	2.794	0.717	0.465	0.500
3	0.005774	2.794	0.717	0.465	0.500
4	0.005774	2.794	0.717	0.465	0.500
5	0.005774	2.794	0.717	0.465	0.500
6	0.005774	2.612	0.683	0.500	0.500
7	0.005774	1.777	0.416	0.712	0.500
8	0.005774	1.777	0.416	0.712	0.500
9	0.005774	2.646	0.690	0.493	0.500
10	0.005774	3.164	0.770	0.404	0.500
11	0.005774	3.164	0.770	0.404	0.500

TOETSING SPANNINGEN

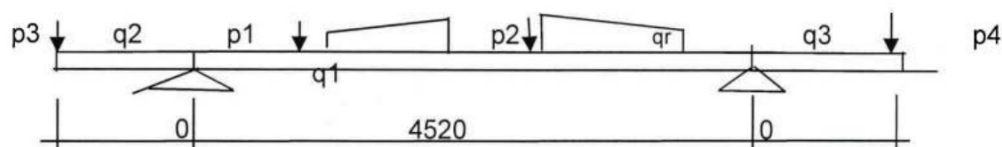
Staal		BC / Sit.	3 / 1	UC frm (61)	0.14
Staal	2	BC / Sit.	3 / 1	UC frm (61)	0.03
Staal	3	BC / Sit.	3 / 1	UC frm (61)	0.03
Staal	4	BC / Sit.	4 / 1	UC frm (54)	0.02
Staal	5	BC / Sit.	1 / 1	UC frm (73)	0.03
Staal	6	BC / Sit.	4 / 1	UC frm (61)	0.10
Staal	7	BC / Sit.	1 / 1	UC frm (60)	0.03
Staal	8	BC / Sit.	1 / 1	UC frm (60)	0.03
Staal	9	BC / Sit.	1 / 1	UC frm (60)	0.04
Staal	10	BC / Sit.	3 / 1	UC frm (73)	0.03
Staal	11	BC / Sit.	1 / 1	UC frm (73)	0.03

TOETSING DOORBUIGING

Stf	Soort	l_{sys} [mm]	Overstek i j	BC Sit	w_{bij} [mm]	Toelaatbaar [mm]	w_{eind} [mm]	Toelaatbaar [mm]
2	Dak	1200	Nee Nee	5 1	-0.1	-7.2	-0.1	-9.6
3	Dak	1200	Nee Nee	6 1	-0.0	-3.6	-0.0	-4.8
4	Dak	1200	Nee Nee	6 1	0.0	3.6	0.0	4.8
5	Dak	1200	Nee Nee	5 1	-0.1	-7.2	-0.1	-9.6
7	Vloer	1950	Nee Nee	5 1	-0.1	-7.8	-0.1	-15.6
8	Vloer	1950	Nee Nee	5 1	-0.1	-7.8	-0.1	-15.6

TOETSING HORIZONTALE VERPLAATSING

Staal	l_{sys} [mm]	BC Sit	w_{tot} [mm]	Toelaatbaar [mm]
1	2550	6 1	-0.6	-8.5
6	2550	6 1	0.4	8.5
9	1400	6 1	-0.0	-9.3



balkbreedte=	180 mm	sterkteklasse	c 18
balkhoogte=	180 mm	ref.periode	50 jaar
w=	972 cm ³	beplating	18 mm
I=	8748 cm ⁴	Ed mean	9000 n/mm ²
		Rd=	11,08 n/mm ²

M max 10,77 Knm

E*I

787,32 (KN /M)

78.732.000,00 n/cm

Q puntlast v.a. links

2,00 2260,00

indien ql < qr

indien ql > qr

g q

 $\delta = 0,00$ 0,00 $\delta = 0,00$ 0,00 $\delta = 0,00$ 0,00 $\delta = 0,00$ 0,00

Mv eg Mv vb

0,00 1,76

0,00 1,23

0,00 1,76

opm.

sneeuw norm.of v.b

 $\delta = (1/1,71) * 29.22 = 17\text{mm}$

uc=.0.94

	g		q		l v.a links	lastlengte
q-last	0,00		0,00		mm	mm
p-last 1	0,00		1,56		2260	
p-last 2	0,00		0,00		0	
bloklast 1	0,00	0,00	0,00	0,00	0	2000
bloklast 2	0,00	0,00	0,00	0,00	2000	2000
M (L-R)	0	0	0	0		
overstek					q puntl	v.a links
L q-last	0,00		0,00			
p 3	0,00		0,00		1	2 0
R q-last	0,00		0,00			
p 4	0,00		0,00		1500	0 0
1,08	1,35	Msd l =	0,00	Msd r =	0,00	
1,22	0,54	Msd l =	0,00	Msd r =	0,00	
bel.factore		Md	Rd links	Rd rechts		
1,08	1,35	2,38	1,05	1,05		
1,22	0,54		0,42	0,42		
		Rg	0,00	0,00		
		Rq	0,78	0,78		

	g	q	Med	δ tot=	4,50 mm	Uc=	0,25
M l;	0,00	0,00	0,00	δ =	0,00 mm	Uc=	#DEEL/0!
M r	0,00	0,00	0,00	δ =	0,00 mm	Uc=	#DEEL/0!
			Med l =	0,00 knm	Uc=	0,00	
			Med =	2,4 knm	Uc=	0,22	
			Med r =	0,00 knm	Uc=	0,00	

WAND

$$\text{VANDAK } q \pm 1,0 \times 0,31 \times 0,61 = 0,19 \text{ kN}$$

$$q \pm 1,0 \times 0,49 \times 0,61 = 0,29 \text{ kN}$$

$$\text{WIND } 0,49 \times 0,61 \times (0,8 + 0,3) = 0,33 \text{ kN}$$

$$M = \frac{1}{8} \times 0,33 \times 2,7^2 = 0,30 \text{ kNm}$$

$$\text{Mm. BEL } 1,00 \times 0,19 + 1,35 \times 0,29 = 0,6 \text{ kN}$$

$$M = 1,35 \times 0,30 = 0,4 \text{ kNm}$$

FUNDERING

AANGENOMEN MAX TOEL. GRONDDRUK 120 kN/m²

$$\text{MAX } q \cdot \frac{p/n}{\text{WAND}} \pm 3,3 \times 0,35 = 1,15 \text{ kN/}$$

$$\text{DAK } \frac{2,26}{2} \times 0,25 = 0,28 \text{ "}$$

$$\text{EG } 0,7 \times 0,3 \times 24 = 5,04 \text{ "}$$

$$6,47 \text{ "}$$

$$q \cdot \text{DAK } \frac{2,26}{2} \times 0,47 = 0,53 \text{ kN/}$$

$$\text{Mm BEL } 1,22 \times 6,47 + 1,35 \times 0,53 = 8,60 \text{ kN/}$$

$$\sigma = \frac{8,6}{0,3 \times 1,0} = 29 \text{ kN/m}^2 \quad \text{ver' = } 0,25$$

Werk

31-8-2022

wanden

afm. $b = 46$ $h = 146$
 $L_c = 2700$

$f_{ck} = 18$ $f_{cd} = 12,46$
 $E_{0,05} = 6000$ $f_{myd} = 12,46$
 $B_c = 0,2$ $km = 0,7$

$A = 6716$
 $I_y = 11929855$ $W_y = 163422,667$ $i_y = 42,14657$
 $I_z = 1184255$ $W_z = 51489,3333$ $i_z = 13,279056$
 $\lambda_y = 64,06215$ $\lambda_{rel.y} = 1,11746135$
 $\lambda_z = 203,3277$ $\lambda_{rel.z} = 3,54672515$

$k_y = 1,206106$ $k_{cy} = 0,602429$
 $k_z = 7,114302$ $k_{cz} = 0,075293$

Ned = 0,6 kn $\sigma_{cd} = 0,089339$

Med = 0,4 knm $\sigma_{myd} = 2,447641$

6.23 $0,0119 +$ $0,196416$ UC = 0,21
 6.24 $0,095217 +$ $0,137491$ UC = 0,23