

Statische berekeningen

Project: **Berekening hal 8 m x 13 m x 3 m te Lottum**

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Onderdeel:	Statische berekeningen staalconstructie
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Datum: 26-06-2017

Voorschriften:

NEN-EN 1991	belastingen op constructies
NEN-EN 1992	ontwerp en berekeningen van betonconstructies
NEN-EN 1993	ontwerp en berekeningen van staalconstructies
NEN-EN 1994	ontwerp en berekeningen van houtconstructies
NEN-EN 1996	ontwerp en berekeningen van metselwerkconstructies
NEN-EN 1997	Geotechnisch ontwerp



Alle opdrachten worden aanvaard, tenzij uitdrukkelijk anders is overeengekomen, volgens de bepalingen, genoemd in de 'regeling van de verhouding tussen opdrachtgever en adviserend ingenieur' (r.v.o.i. 2001) gedeponeerd ter griffie van de arrondissementsrechtbank te 's-Gravenhage.

Uitgangspunten berekening

gebruiksklasse	:	E		EN 1991-1-1 Tabel 6.1
ontwerplevensduurklasse	:	2 (15 jaar)		EN 1990/NB art. A1.1
gevolgklasse	:	CC1	geringe gevolgen	EN 1990/NB Tabel B1
betrouwbaarheidsklasse	:	RC1	normale veiligheid	EN 1990 Tabel B2
belastingsreductie door levensduur	:	0,87	$(\psi_0 = 0 \quad \psi_1 = 1,0)$	EN 1990 NB art. A1.1

belastingfactoren

γ_G	=	1,08	[permanent]
γ_Q	=	1,35	[veranderlijk]

belastingen**dak**

dakplaten	=	0,10 kN/m ²
onvoorzien	=	0,05 kN/m ²
permanente belasting	=	0,15 kN/m ²

sneeuwbelasting

$S = \mu_i S_k$	S_k	=	0,70	
	μ_1	=	0,8	
	S	=	0,56	kN/m ² $\psi_0 = 0 \quad \psi_1 = 0,2 \quad \psi_2 = 0$

windbelasting**windgebied III onbebouwd**

h	=	5,0	m	$\psi_0 = 0 \quad \psi_1 = 0,2 \quad \psi_2 = 0$
Q_k	=	0,54	kN/m ²	

**situatie****afmeting**

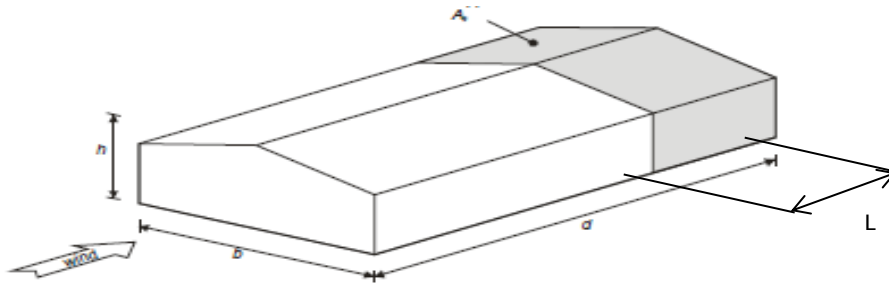
L	=	8,0	m
d	=	12,7	m
α	=	25	°
h_1	=	3,00	m
h_2	=	1,87	m
h	=	4,87	m
$1/2 L$	=	4,00	m
L_{ligger}	=	4,4	m

NEN EN 1991-14 table 7.1 $h/d = 4,87/12,7 = 0,38$

D $\rightarrow C_{pe,10} = 0,80$

E $\rightarrow C_{pe,10} = 0,50$

EN 1991-1-4 7.6



EN 1991-1-4 figure 7.22

$4h = 4 \cdot 4,87 = 19,5 \text{ m}$

$2b = 2 \cdot 8 = 16,0 \text{ m}$

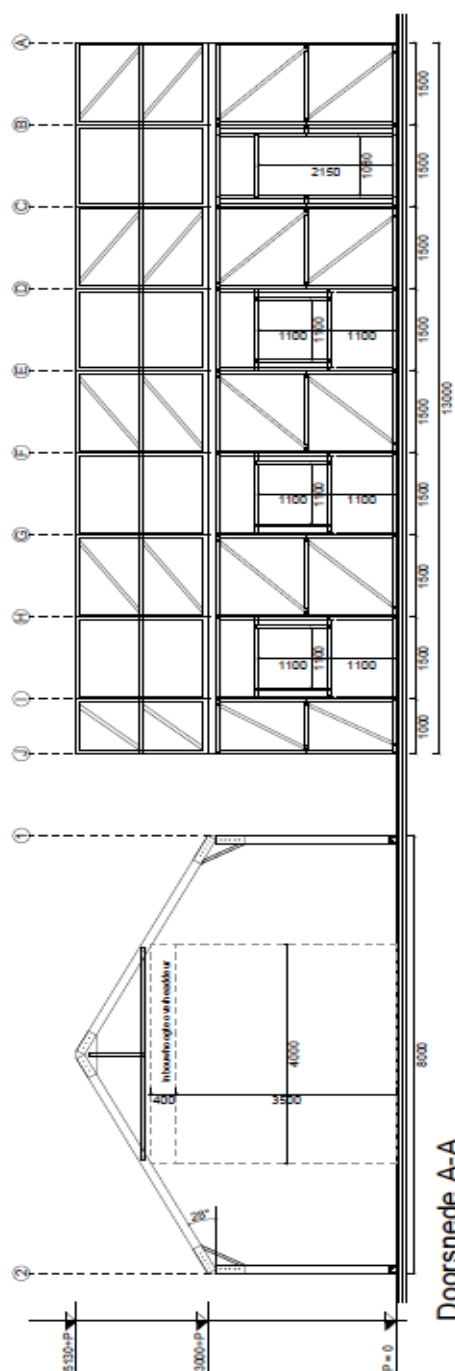
$L = 12,7 - 16 = -3,3 \text{ m}$

$\rightarrow$ geen wrijving bij wind loodrecht op de kopgevels

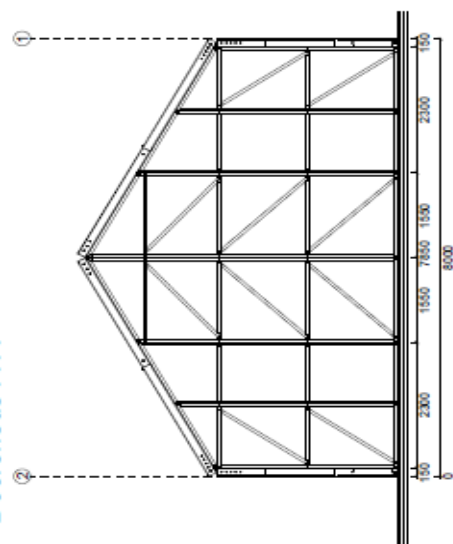
belastingcombinaties

6.10a $0,9 [1,35 + \sum 1,5 \psi_{0,i} Q_{k,i}] = 1,22 G_{kj;sup} + \sum 1,35 \psi_{0,i} Q_{k,i} \quad i \geq 1$

6.10b $0,9 [1,2G + 1,5 Q_{k,i} + \sum 1,5 \psi_{0,i} Q_{k,i}] = 1,08G + 1,35 Q_{k,i} + \sum 1,35 \psi_{0,i} Q_{k,i} \quad i > 1$



Doorsnede A-A

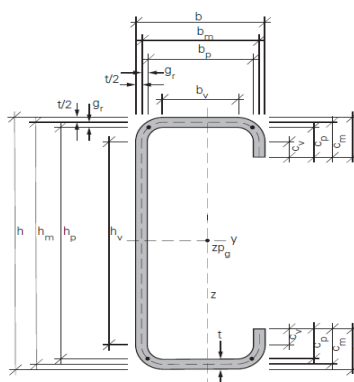
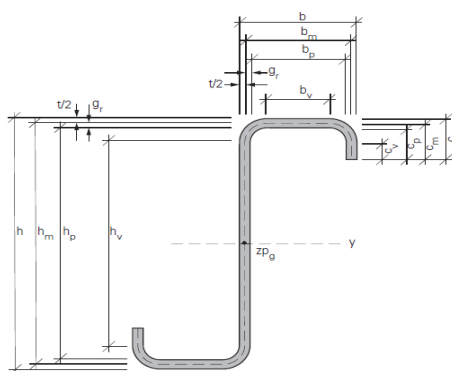


berekening gordingen**profiel afmetingen gordingen**

variabelen	symbol	waarde (mm)
hoogte lijf	h	150,0
breedte flens	b	45,0
breedte lip	c	15,0
profiel dikte	$t = t_{cor}$	1,5
inwendige afrondingstraal	r	3,0

afgeleide profielmaten gording

symbol	waarde (mm)	symbol	waarde (mm)
h_m	147	c_v	10,5
h_v	141	c_p	13,2
h_p	146	r_m	3,8
b_m	44	g_r	1,1
b_v	36	L_r	5,9
b_p	41	e_{rc}	2,39
c_m	14		

**materiaaleigenschappen gording**

variabelen	symbol	waarde	eenheid
staalkwaliteit	–	S320 GD = Z	–
vloeigrens	f_{yb}	320,00	N/mm ²
elasticiteitsmodulus	E	210000	N/mm ²
poisson factor	ν	0,30	–
materiaalfactoren	γ_{M0}, γ_{M1}	1,00	–

belasting op de ligger

$b = 2,6 \text{ m}$ *belastingbreedte (h.o.h. afstand gordingen)*

B.C. 1 perament + veranderlijk

$q_{G,k}$	$= 0,15 \cdot 2,6$	$= 0,39 \text{ kN/m}^1$	permanent
$q_{Q,k}$	$= 0,56 \cdot 2,6 \cdot 0,87$	$= 1,27 \text{ kN/m}^1$	veranderlijk
q_k	$=$	$= 1,657 \text{ kN/m}^1$	kenmerkend
q_{Ed}	$= 1,08 \cdot 0,39 + 1,35 \cdot 1,26672$	$= 2,32 \text{ kN/m}^1$	rekenwaarde

B.C. 2 permanent (gunstig werkend) + wind

$q_{G,k}$	$= 0,15 \cdot 2,6$	$= 0,39 \text{ kN/m}^1 \downarrow$	permanent
$q_{Q,k}$	$= 0,54 \cdot 2,6 \cdot 1,7$	$= 1,40 \text{ kN/m}^1 \uparrow$	wind, zuiging + overdruk
q_k	$=$	$= -1,014 \text{ kN/m}^1$	kenmerkend
q_{Ed}	$= 0,9 \cdot 0,39 - 1,35 \cdot 1,404$	$= -1,54 \text{ kN/m}^1$	rekenwaarde

overspanningen

L_1	$= 1500 \text{ mm}$	l_a	$= 1500 \text{ mm}$
L_2	$= 1500 \text{ mm}$	l_a	$= 1500 \text{ mm}$

afstand tussen de kipsteunen**roofcladding**

t_{nom}	$= 0,75 \text{ mm}$	a	$= 22,5 \text{ mm}$	
b_r	$= 100,0 \text{ mm}$	b_{mod}	$= 22,5 \text{ mm}$	drukkende belasting
		b_{mod}	$= 90,0 \text{ mm}$	trekkende belasting

geometrie maatgevende secties**eigenschappen niet gereduceerde doorsnede**

variabele	symbool	waarde	eenheid
traagheidsmoment t.o.v. y-as	$I_{q,y}$	1268032	mm ⁴
centrifugaal moment	$I_{q,vz}$	0	mm ⁴
afstand d.c. t.o.v. buitenkant lijf	e	25,0	mm

eigenschappen effectieve doorsnede bepaald

variabele	symbool	waarde	eenheid
effectief traagheidsmoment	$I_{eff,y}$	1248424	mm ⁴
effectief weerstandsmoment (drukzijde)	$W_{eff,y;com}$	16489,7	mm ³
effectief weerstandsmoment (trekzijde)	$W_{eff,y;ten}$	16804,6	mm ³

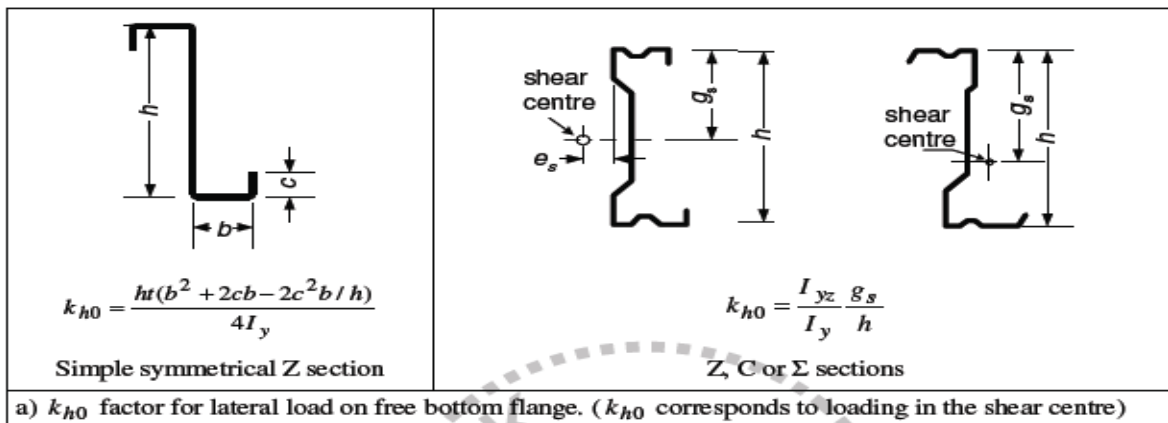
eigenschappen elastisch ondersteunde ligger

variabele	symbool	waarde	eenheid
oppervlak	A_{tz}	180,0	mm ²
afstand hartlijn lip tot zwaartepunt	Y_{tz}	20,0	mm
traagheidsmoment z-as	I_{tz}	143987,0	mm ⁴
weerstandsmoment betrokken op de lip	$W_{tz, lip}$	3246,0	mm ³
weerstandsmoment betrokken op lijf	$W_{tz, lijf}$	4661,0	mm ³
traagheidsstraal	i_{tz}	17,3	mm

Control perllins according EN 1993-1-3**Factor k_{h0}**

$$q_{hEd} = k_h q_{Ed} \quad \dots (10.4)$$

(4) The coefficient k_h should be obtained as indicated in figure 10.3 for common types of cross-section.



$$\begin{aligned}
 k_{h0} &= 0,0 \\
 k_h &= k_{h0} + (e/h) = 0 + (25/150) = 0,167 \text{ bij drukkende belasting} \\
 k_h &= k_{h0} + (e + a/h) = 0 + [(25+22,5)/150] = 0,317 \text{ bij trekkende belasting}
 \end{aligned}$$

rotation stiffness C_d (EN 1993-1-3 10.1.5.2)

$$\begin{aligned}
 C_D &= 1 / [1/C_{D,A} + 1/C_{D,C}] \\
 C_{D,A} &= C_{100} k_{ba} k_t k_{bR} k_A k_{bT}
 \end{aligned}$$

NEN-EN 1993-1-3

$$\begin{aligned}
 C_{100} &= 5200 \text{ Nmm/mm} && \text{presioir} \\
 C_{100} &= 2600 \text{ Nmm/mm} && \text{tension}
 \end{aligned}$$

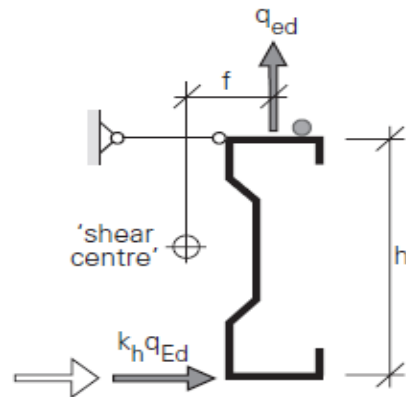
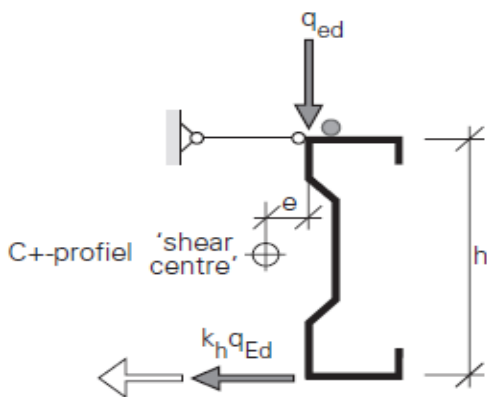
$$\begin{aligned}
 k_{ba} &= [b_a / 100]^2 = (45/100)^2 = 0,203 \\
 t_{nom} &= 0,75 \text{ mm} \\
 k_t &= (t_{nom}/0,75)^{1,1} = (0,75/0,75)^{1,1} = 1,0 \\
 k_b &= 100,0 \text{ mm} \\
 k_{br} &= 185/b_r = 185/250 = 0,74 \\
 K_A &= 1,0 \quad \text{trekkende belasting} \\
 K_A &= 1+(A-1)*0,08 = 1+(1,5-1)*0,08 = 1,04 \quad \text{dukkende belasting} \\
 b_T &= b_{T,max} = \sqrt{(b_{t,max} / b_t)} = 0,632
 \end{aligned}$$

dukkende belasting

$$\begin{aligned}
 C_{D,A} &= C_{100} k_{ba} k_t k_{br} K_A k_{bT} = 5200*0,203*1*0,74*1,04*0,632 = 513 \text{ Nmm/mm} \\
 b_{mod} &= 22,5 \text{ mm} \\
 1/K &= 4 [1-v^2] h^2 [h_d+b_{mod}] / (E_t^3) + h^2/C_D \\
 1/K &= 4[1-0,3^2]*150^2*[150+22,5]/(210000*1,5^3)+150^2/513 = 63,793 \text{ mm}^2/\text{N} \\
 K &= 0,01568 \text{ N/mm}^2 \\
 I_a &= 1500 \text{ mm} \\
 R &= K I_a^4 / [\pi^4 E I_{fz}] = 0,0270
 \end{aligned}$$

trekkende belasting

$$\begin{aligned}
 C_{D,A} &= C_{100} k_{ba} k_t k_{br} K_A k_{bT} = 2600*0,203*1*0,74*1*5200,632 = 247 \text{ Nmm/mm} \\
 b_{mod} &= 90,0 \text{ mm} \\
 1/K &= 4 [1-v^2] h^2 [h_d+b_{mod}] / (E_t^3) + h^2/C_D \\
 1/K &= 4[1-0,3^2]*150^2*[150+90]/(210000*1,5^3)+150^2/247 = 118,8 \text{ mm}^2/\text{N} \\
 K &= 0,00842 \text{ N/mm}^2 \\
 I_a &= 1500 \text{ mm} \\
 R &= K I_a^4 / [\pi^4 E I_{fz}] = 0,0145
 \end{aligned}$$

**dukkende belasting**

$$\begin{aligned}
 q_{v,Ed} &= 2,32 \text{ kN/m}^1 \\
 k_h &= 0,1667 \\
 q_{h,Ed} &= k_h q_{v,Ed} = 2,32*0,1667 = 0,3867 \\
 l &= 1,5 \text{ m} \\
 I_a &= 1,5 \text{ m}
 \end{aligned}$$

trekkende belasting

$$\begin{aligned}
 q_{v,Ed} &= -1,00 \text{ kN/m}^1 \\
 k_h &= 0,3167 \\
 q_{h,Ed} &= k_h q_{v,Ed} = -1*0,3167 = -0,317 \\
 l &= 1,5 \text{ m} \\
 I_a &= 1,5 \text{ m}
 \end{aligned}$$

section	$M_{y,Ed}$ [kNm]	$M_{0,fz,Ed}$ [kNm]	κ_R	$M_{fz,Ed}$ [kNm]
A	0,653	-	-	-

section	$M_{y,Ed}$ [kNm]	$M_{0,fz,Ed}$ [kNm]	κ_R	$M_{fz,Ed}$ [kNm]
A	-0,281	-0,089	0,9942	-0,089

$$I_{fz} = \eta_1 I_a [1 + \eta_2 R \eta_3] \eta_4$$

pressure			tensile		
	intermediate span	endspan		endspan	intermediate span
η_1	= 0,694	0,515	η_1	= 0,800	0,515
η_2	= 5,450	1,260	η_2	= 6,750	1,260
η_3	= 1,270	0,868	η_3	= 1,490	0,868
η_4	= -0,168	-0,242	η_4	= -0,155	-0,242
I_a	= 1500	1500	I_a	= 1500	1500
R	= 0,027	0,027	R	= 0,014	0,014
I_{fz} (mm)	= 1031,6	762,6	I_{fz} (mm)	= 1197,7	766,7
λ_1	= 80,48	80,48		80,48	80,48
i_{fz}	= 17,3	17,3		17,3	17,3
λ_{fz}	= 0,741	0,548		0,860	0,551
α_{Lt}	= 0,34	0,34		0,34	0,34
$\lambda_{LT,0}$	= 0,40	0,40		0,40	0,40
β	= 0,75	0,75		0,75	0,75
Φ_{LT}	= 0,764	0,638		0,856	0,639
χ_{LT}	= 0,849	0,940		0,783	0,939
$1 / \lambda_{fz}^2$	= 1,821	3,333		1,351	3,298

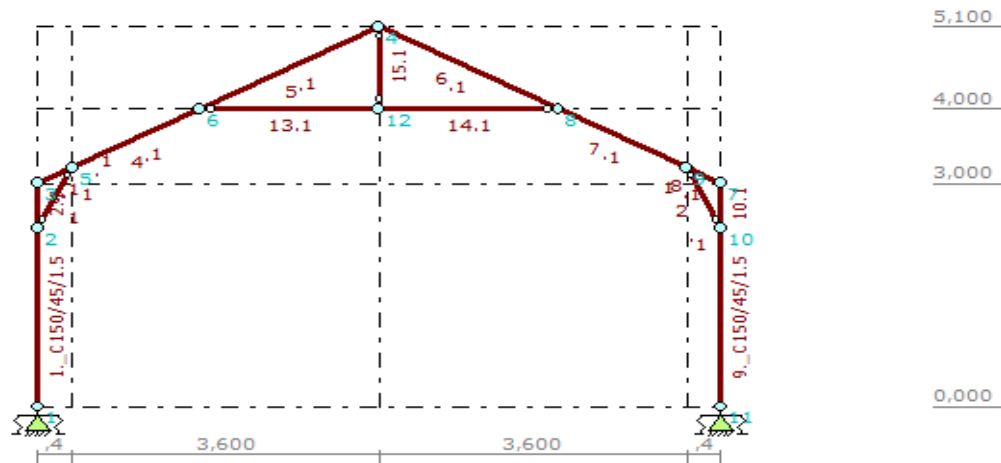
controle spanning in de gording

dukkende belasting

$$\begin{aligned}
 M_{y,Ed} &= 0,653 \text{ kNm} \\
 W_{eff,Y,com} &= 16490 \text{ mm}^3 \\
 \sigma_{max,Ed} &= M_{y,Ed} / W_{eff,Y,com} = 0,653 \cdot 10^6 / 16489,7 \\
 \sigma_{max,Ed} &= 39,6 \text{ N/mm}^2 < 320,0 \text{ N/mm}^2 \text{ u.c.} = 0,12
 \end{aligned}$$

trekende belasting

$$\begin{aligned}
 M_{y,Ed} &= 0,281 \text{ kNm} & W_{eff,Y,com} &= 16490 \text{ mm}^3 \\
 M_{fz,Ed} &= 0,089 \text{ kNm} & W_{fz,lijf} &= 4661 \text{ mm}^3 \\
 & & \chi_{LT} &= 0,940 \\
 \sigma_{max,Ed} &= 1 / \chi_{LT} [M_{y,Ed} / W_{eff,Y,com}] + M_{fz,Ed} / W_{fz,lijf} \\
 \sigma_{max,Ed} &= 1 / 0,940 \cdot [0,281 \cdot 10^6 / 16489,7] + 0,089 \cdot 10^6 / 4661 \\
 \sigma_{max,Ed} &= 37,3 \text{ N/mm}^2 < 320,0 \text{ N/mm}^2 \text{ u.c.} = 0,12
 \end{aligned}$$

Berekening frame's**berekening tussen spanten****geometrie**

-belasting breedte $b=0,75$ m

-belasting op de constructie:

$$q_{G,k} = 0,15 \cdot 0,75 = 0,11 \text{ kN/m}^1 \quad \text{permanent belasting}$$

Wind en sneeuwbelasting wordt door het raamwerkprogramma gegenereerd.

Zie voor berekening bijlage A 1 blad 1 t/m 24

staafkrachten

diagonalen in de knie

$$\begin{aligned} N_{tEd} &= 6,2 \text{ kN} \quad \text{trek} \\ N_{Ed} &= 10,6 \text{ kN} \quad \text{druk} \end{aligned}$$

kolommen

$$\begin{aligned} M_{Ed} &= 1,90 \text{ kNm} \\ N_{Ed} &= 2,6 \text{ kN} \end{aligned}$$

dakliggers

$$\begin{aligned} M_{Ed} &= 2,1 \text{ kNm} \\ N_{Ed} &= 5,2 \text{ kN} \end{aligned}$$

trekstang boven de knie verbinding

$$N_{tEd} = 2,3 \text{ kN}$$

zie bijlage B voor controle staven op knikinstabiliteit

kolommen, controle druk + buiging

profiel eigenschappen					
h	=	150,0 mm	f_{yb}	=	320 N/mm ²
b	=	45,00 mm	E	=	$2,10 \cdot 10^5$ N/mm ²
c	=	15,00 mm	v	=	0,30
t_{nom}	=	1,50 mm	G	=	81000 N/mm ²
t	=	1,50 mm	γ_M	=	1,0
A	=	396 mm ²	$A_{eff,c}$	=	382 mm ²
i_y	=	58 mm ²	I_y	=	124 10 ⁴ mm ⁴
i_z	=	16 mm ²	I_z	=	93 10 ⁴ mm ⁴
			$I_{eff,y}$	=	124,0 10 ⁴ mm ⁴
			e	=	15 mm
			$W_{eff,y,com}$	=	16489 mm ³
			$W_{eff,y,ten}$	=	16804,6 mm ³
			$W_{eff,y,min}$	=	16489,0 mm ³
			I_t	=	303,8 mm ⁴
			I_w	=	1116 10 ⁶ mm ⁶

$$\begin{aligned}
 M_{Ed} &= 2,10 \text{ kNm} \\
 N_{Ed} &= 5,20 \text{ kN} \\
 L_{cr,y} &= 4100 \text{ mm} & L_{cr,z} &= 2000 \text{ mm} \\
 \Delta M_{yEd} &= e_{Ny} N_{Ed} & \text{dubble symmetric} \rightarrow e_{Ny} &= 0 \\
 e_{Ny} &= 0 \text{ mm} & \Delta M_{yEd} &= 0 \text{ kNm} \\
 N_{Ed} / N_{cRd} + [M_{yEd} + \Delta M_{yEd}] M_{cyRd,com} &= 0,441 < 1 \rightarrow \text{OK}
 \end{aligned}$$

Buckling resistance check

$$N_{Ed} / [\chi_y (N_{rk} / \gamma_{M1})] + k_{vv} [M_{yEd} + \Delta M_{yEd}] / [\chi_{Lt} (M_{yRk} / \gamma_{M1})]$$

$$\text{met } \gamma_{M1} = 1,0 \rightarrow$$

$$N_{Ed} / [\chi_y N_{rk}] + k_{vv} [M_{yEd} + \Delta M_{yEd}] / [\chi_{Lt} M_{yRk}]$$

$$\begin{aligned}
 N_{rk} &= f_{yb} A_{eff} = 122,2 \text{ kN} \\
 M_{yRk} &= f_{yb} W_{eff,y,min} = 5,3 \text{ kNm}
 \end{aligned}$$

$$\begin{aligned}
 \Delta M_{yEd} &= 0 \text{ kNm} \\
 \alpha_y &= 0,21 \\
 \alpha_z &= 0,34 \\
 \bar{\lambda} &= \sqrt{A_{eff} f_{yb} / N_{cr}} = L_{cr} / i \sqrt{[(A_{eff} / A) / \lambda_1]}
 \end{aligned}$$

$$\begin{aligned}
 \chi &= 1 / [\phi + \sqrt{(\phi - \bar{\lambda}^2)}] \\
 \phi &= 0,5 [1 + \alpha (\bar{\lambda} - 0,2) + \bar{\lambda}^2]
 \end{aligned}$$

$$\lambda_1 = \pi \sqrt{E / f_{yb}} = 80,48$$

$$\begin{aligned}
 \bar{\lambda}_y &= L_{cr,y} / i_y \sqrt{[A_{eff} / A] / \lambda_1} & \bar{\lambda}_y &= 0,863 \\
 \bar{\lambda}_z &= L_{cr,z} / i_z \sqrt{[A_{eff} / A] / \lambda_1} & \bar{\lambda}_z &= 1,525
 \end{aligned}$$

$$\begin{aligned}
 \phi_y &= 0,942 & \chi_y &= 0,758 \\
 \phi_z &= 1,889 & \chi_z &= 0,333
 \end{aligned}$$

$$N_{crT} = 1 / i_o^2 [G I_t + \pi^2 E I_w / L_T^2] \quad L_T = 4100 \text{ mm}$$

$$\begin{aligned}
 i_o^2 &= i_y^2 + i_z^2 + y_o^2 + z_o^2 & y_o^2 &= 0 \text{ mm} \\
 & & z_o^2 &= 0 \text{ mm}
 \end{aligned}$$

$$\begin{aligned}
 i_o^2 &= 3620,0 \text{ mm}^2 \\
 N_{crT} &= 44,80 \text{ kN} \\
 \bar{\lambda}_T &= \sqrt{[A_{eff} f_{yb} / N_{crT}]} = 1,652 & \alpha_T &= 0,34 \\
 & & \phi_T &= 2,111 \\
 & & \chi_T &= 0,292
 \end{aligned}$$

$$\begin{aligned}
 \bar{\lambda}_{LT} &= \sqrt{e_{eff,y,min} f_{yb} / M_{cr}} = 0,831 \\
 C_1 &= 1,77 \\
 M_{cr} &= \pi^2 E I_z / [L_w / I_z + L^2 G I_t / (\pi^2 E I_2)] = 7,63 \text{ kNm} \\
 & & \alpha_{LT} &= 0,34 \\
 & & \phi_T &= 0,953 \\
 & & \chi_{LT} &= 0,705
 \end{aligned}$$

determination of interaction factors k_{yy} and k_{zy} 4.4.2 table 4.7 and 4.8

$N_{cr,y}$	=	643	kN	μ_y	=	0,998
$N_{cr,z}$	=	482	kN	μ_z	=	0,993
$C_{my,0}$	=	1,00024				
ε_y	=	9,36		α_{LT}	=	1,000
C_{my}	=	1,00006				
C_{mLT}	=	1,069		k_{yy}	=	1,076
				k_{zy}	=	1,070

Buckling resistance check

$$N_{Ed} / [\chi_y (N_{rk} / \gamma_{M1})] + k_{yy} [M_{yEd} + \Delta M_{yEd}] / [\chi_{Lt} (M_{yRk} / \gamma_{M1})] = 0,661 < 1,0 \quad oke$$

$$N_{Ed} / [\chi_z (N_{rk} / \gamma_{M1})] + k_{zy} [M_{yEd} + \Delta M_{yEd}] / [\chi_{Lt} (M_{yRk} / \gamma_{M1})] = 0,729 < 1,0 \quad oke$$

Controle diagonalen

trekstang boven de knie

$$N_{Ed} = 6,2 \text{ kN}$$

axiale trek EN 1993-1-1 6.2.3

d_o	=	6,30	mm	$f_{y,d}$	=	320	N/mm ²
t	=	1,50	mm	f_u	=	360	N/mm ²
b	=	50,0	mm	γ_{M0}	=	1,0	
				γ_{M2}	=	1,25	

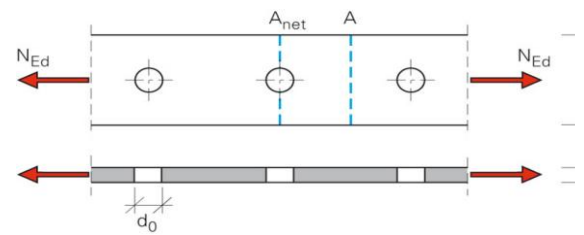
A	=	50*1,5		=	75,00	mm ²
A_{net}	=	(50-6,3)*1,5		=	65,55	mm ²

$$N_{pl,Rd} = 75*320/1,0*10^{-3} = 24,0 \text{ kN} \quad (6.6)$$

$$N_{u,Rd} = 0,9*65,55*360/1,25*10^{-3} = 17,0 \text{ kN} \quad (6.7)$$

$$N_{u,Rd} = 17,0 \text{ kN}$$

$$u.c. = 6,2/16,99056 = 0,36 < 1,0$$



maatgevende belasting per zijde

boutverbinding bouten M12

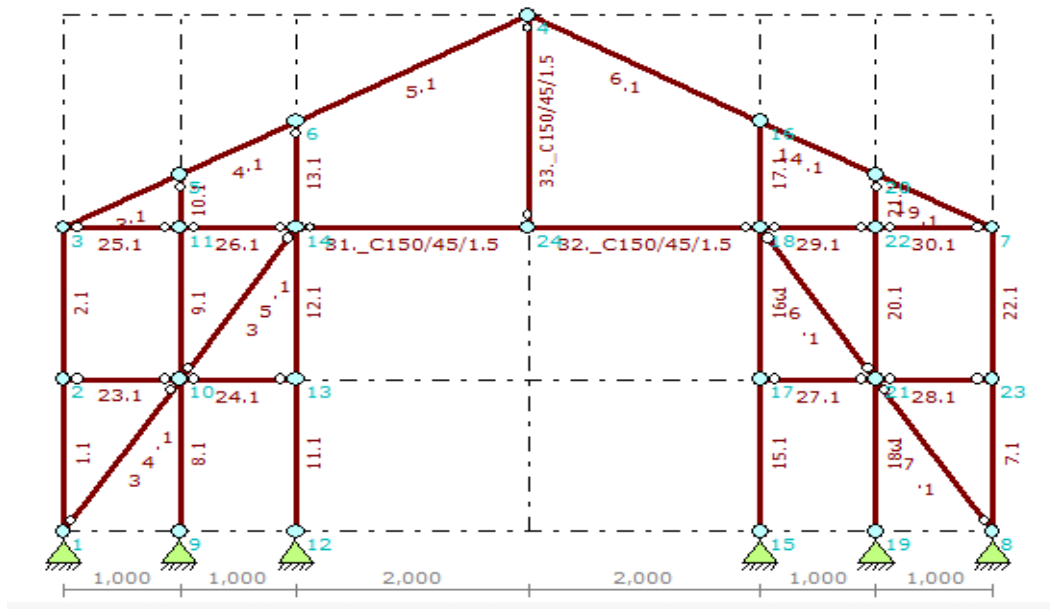
e_1	=	20	mm
e_2	=	20	mm
k_1	=	2,5	
d	=	12,0	mm
a_b	=	0,51	
t	=	1,5	mm
γ_{M2}	=	1,25	

$$F_{bRd} = 2,5 \cdot 0,51 \cdot 360 \cdot 12 \cdot 1,5 \cdot 10^{-3} / 1,25 = 6,6 \text{ kN}$$

$$F_{VRd} = \quad \quad \quad = 32,2 \text{ kN}$$

$$F_{tRd} = 6,6 \text{ kN}$$

$$u.c. = 6,6 / (2 \cdot 6,6) = 0,50 < 1,0$$

Berekening frame kopgevel**geometrie**

-belasting breedte $b=0,75 \text{ m}$

-belasting op de constructie:

$$q_{G,k} = 0,15 \cdot 0,75 = 0,11 \text{ kN/m}^1 \quad \text{permanent belasting}$$

Wind en sneeuwbelasting wordt door het raamwerkprogramma gegenereerd.

Zie voor berekening bijlage A 1 blad 22 t/m 25

controle gevelkolommen

belastingbreedte gevel	b	=	2,50 m	kolom naast overheaddeur maatgevend
belasting oppervlak dak	b	=	0,8 m	
	L	=	2,0 m	
kolomhoogte	h	=	4,0 m	

EN 1991-4 7.2.9

$$c_{pi} = 0,20 \begin{matrix} \uparrow \\ \leftarrow \rightarrow \end{matrix} \text{overdruk}$$

$$c_{pi} = -0,30 \begin{matrix} \downarrow \\ \rightarrow \leftarrow \end{matrix} \text{onderdruk}$$

B.G. 1: wind loodrecht op langsgewel ($\theta = 0^\circ$)

$$c_{pe,10} = -1,2 \quad \text{windzuiging dak, tabel 7.3a zone H}$$

$$c_{pe,10} = -1,1 \quad \text{windzuiging gevel, tabel 7.1 zone B}$$

winddruk + overdruk maatgevend

$$c_{pe} = -1,4 \uparrow \quad \text{windvormfactor dak}$$

$$c_{pe} = -1,3 \leftarrow \quad \text{windvormfactor gevel}$$

B.G. 2: wind loodrecht op kopgevel ($\theta = 90^\circ$)

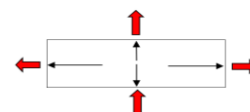
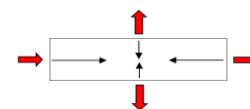
$$c_{pe,10} = -1,2 \uparrow \quad \text{windzuiging dak, tabel 7.3b}$$

$$c_{pe,10} = 1,0 \rightarrow \quad \text{winddruk gevel, tabel 7.1 zone D}$$

winddruk + onderdruk maatgevend

$$c_{pe} = -1,5 \uparrow \quad \text{windvormfactor dak}$$

$$c_{pe} = 1,3 \leftarrow \quad \text{windvormfactor gevel}$$

wind $\theta = 0^\circ$ wind $\theta = 90^\circ$

geometrie

B.C.1; permanent + wind loodrecht op de langsgewel, belasting op de constructie:

$$\begin{aligned} F_{G,k} &= 0,15 \cdot 0,75 \cdot 2 &= 0,2 \text{ kN} &\text{dak} \\ F_{G,k} &= 0,15 \cdot 2,5 \cdot 4 &= 1,5 \text{ kN} &\text{gevel} \\ F_{G,k} &= &= 1,7 \text{ kN} &\text{totaal permanent} \end{aligned}$$

$$\begin{aligned} F_{Q,k} &= 0,54 \cdot -1,4 \cdot 0,75 \cdot 2 &= -1,1 \text{ kN} &\text{windzuiging dak} \\ F_{Q,k} &= &= 2,1 \text{ kN} &\text{reactie kracht uit windverband of schijfwerking} \\ F_{Q,k} &= &= 1,0 \text{ kN} &\text{totaal veranderlijk} \end{aligned}$$

$$F_{Ed} = 1,08 \cdot 1,7 + 1,35 \cdot 1,0 = 3,2 \text{ kN}$$

$$q_{Q,k} = 0,54 \cdot 0,87 \cdot 1,3 \cdot 2,5 = 1,5 \text{ kN/m}^1$$

$$q_{Ed} = 1,35 \cdot 1,5 = 2,03 \text{ kN/m}^1$$

$$M_{Ed} = 1/8 \cdot 2,025 \cdot 4^2 = 4,1 \text{ kNm}$$

B.C.2; permanent + wind loodrecht op de kopgevel, belasting op de constructie:

$$\begin{aligned} F_{G,k} &= 0,15 \cdot 0,75 \cdot 2 &= 0,2 \text{ kN} &\text{dak} \\ F_{G,k} &= 0,15 \cdot 2,5 \cdot 4 &= 1,5 \text{ kN} &\text{gevel} \\ F_{G,k} &= &= 1,7 \text{ kN} &\text{totaal permanent} \end{aligned}$$

$$\begin{aligned} F_{Q,k} &= 0,54 \cdot -1,5 \cdot 0,75 \cdot 2 &= -1,2 \text{ kN} &\text{windzuiging dak} \\ F_{Q,k} &= &= 0,0 \text{ kN} &\text{reactie kracht uit windverband of schijfwerking} \\ F_{Q,k} &= &= -1,2 \text{ kN} &\text{totaal veranderlijk} \end{aligned}$$

$$F_{Ed} = 0,9 \cdot 1,7 + 1,35 \cdot -1,2 = -0,1 \text{ kN}$$

$$q_{Q,k} = 0,54 \cdot 0,87 \cdot 1,3 \cdot 2,5 = 1,5 \text{ kN/m}^1$$

$$q_{Ed} = 1,35 \cdot 1,5 = 2,03 \text{ kN/m}^1$$

$$M_{Ed} = 1/8 \cdot 2,025 \cdot 4^2 = 4,1 \text{ kNm}$$

profiel 2 x C150/45/25 t = 1,5 mm

$$I_{eff,y} = 248 \cdot 10^4 \text{ mm}^4$$

$$W_{eff,y} = 32978 \text{ mm}^3 \quad \text{weerstandsmoment op basis van de effectieve doorsnede}$$

$$\sigma_{Ed} = M_{Ed} / W_{eff,y} = 4,1 \cdot 10^6 / (32978 \cdot 10^3) = 124,3 \text{ N/mm}^2 < 320 \text{ N/mm}^2$$

$$\text{doorbuiging } W_{max} < 0,004 L$$

$$W_2 + W_3 < 0,004 L$$

$$W_1 = 5 q_{G,k} l^4 / (384 E I_y = 5 \cdot 0 \cdot (4 \cdot 10^3)^4 / (384 \cdot 210000 \cdot 248 \cdot 10^4) = 0,00 \text{ mm}$$

$$W_2 = 0,00 \text{ mm}$$

$$W_3 = 5 q_{q,k} l^4 / (384 E I_y = 5 \cdot 1,5 \cdot (4 \cdot 10^3)^4 / (384 \cdot 210000 \cdot 248 \cdot 10^4) = 9,60 \text{ mm} \quad \text{veranderlijk}$$

$$W_c = 0,0 \text{ mm} \quad \text{zeeg}$$

$$W_{tot} = W_1 + W_2 + 0,00 + 0,00 + 9,60 = 9,6 \text{ mm}$$

$$W_2 + W_3 = 9,6 - 0,00 = 9,6 \text{ mm} < 0,004 \cdot 4 \cdot 10^3 = 16,0 \text{ mm}$$

$$W_{max} = W_{tot} - W_c = 9,6 - 0 = 9,6 \text{ mm} < 0,004 \cdot 4 \cdot 10^3 = 16,0 \text{ mm}$$

profiel eigenschappen

h	=	150,0 mm	f _{yb}	=	320 N/mm ²	I _{eff,y}	=	124,0 10 ⁴ mm ⁴
b	=	45,00 mm	E	=	2,10 · 10 ⁵ N/mm ²	e	=	15 mm
c	=	15,00 mm	v	=	0,30	W _{eff,y,com}	=	16489 mm ³
t _{nom}	=	1,50 mm	G	=	81000 N/mm ²	W _{eff,y,ten}	=	16804,6 mm ³
t	=	1,50 mm	γ _M	=	1,0	W _{eff,y,min}	=	16489,0 mm ³
A	=	396 mm ²	A _{eff,c}	=	382 mm ²	I _t	=	303,8 mm ⁴
i _y	=	58 mm	I _y	=	124 10 ⁴ mm ⁴	I _w	=	1116 · 10 ⁶ mm ⁶
i _z	=	16 mm	I _z	=	93 10 ⁴ mm ⁴			

$$M_{Ed} = 2,05 \text{ kNm} \quad \text{moment per stijl}$$

$$N_{Ed} = 1,59 \text{ kN} \quad \text{normaalkracht per stijl}$$

$$L_{cr,y} = 4100 \text{ mm} \quad L_{cr,z} = 1500 \text{ mm}$$

$$\Delta M_{yEd} = e_{Ny} N_{Ed} \quad \text{dubble symmetric} \rightarrow e_{Ny} = 0$$

$$e_{Ny} = 0 \text{ mm} \quad \Delta M_{yEd} = 0 \text{ kNm}$$

$$N_{Ed} / N_{cRd} + [M_{yEd} + \Delta M_{yEd}] / M_{cVRd,com} = 0,402 < 1 \rightarrow \text{OK}$$

Buckling resistance check

$$N_{Ed} / [\chi_y (N_{rk} / \gamma_{M1})] + k_{yy} [M_{yEd} + \Delta M_{yEd}] / [\chi_{Lt} (M_{yRk} / \gamma_{M1})]$$

$$\text{met } \gamma_{M1} = 1,0 \rightarrow$$

$$N_{Ed} / [\chi_y N_{rk}] + k_{yy} [M_{yEd} + \Delta M_{yEd}] / [\chi_{Lt} M_{yRk}]$$

$$N_{rk} = f_{yb} A_{eff} = 122,2 \text{ kN}$$

$$M_{yRk} = f_{yb} W_{eff,y,min} = 5,3 \text{ kNm}$$

$$\Delta M_{yEd} = 0 \text{ kNm}$$

$$\alpha_y = 0,21$$

$$\alpha_z = 0,34$$

$$\bar{\lambda} = \sqrt{A_{eff} f_{yb} / N_{cr}} = L_{cr} / i \sqrt{[(A_{eff} / A) / \lambda_1]}$$

$$\chi = 1 / [\phi + \sqrt{(\phi - \bar{\lambda}^2)}]$$

$$\phi = 0,5 [1 + \alpha (\bar{\lambda} - 0,2) + \bar{\lambda}^2]$$

$$\lambda_1 = \pi \sqrt{E / f_{yb}} = 80,48$$

$$\bar{\lambda}_y = L_{cr,y} / i_y \sqrt{[A_{eff} / A]} / \lambda_1 \quad \bar{\lambda}_y = 0,863$$

$$\bar{\lambda}_z = L_{cr,z} / i_z \sqrt{[A_{eff} / A]} / \lambda_1 \quad \bar{\lambda}_z = 1,144$$

$$\begin{aligned}\phi_v &= 0,942 & \chi_v &= 0,758 \\ \phi_z &= 1,315 & \chi_z &= 0,509\end{aligned}$$

$$N_{crT} = 1 / i_o^2 [G I_t + \pi^2 E I_w / L_T^2] \quad L_T = 4100 \text{ mm}$$

$$\begin{aligned}i_o^2 &= i_y^2 + i_z^2 + y_o^2 + z_o^2 & y_o^2 &= 0 \text{ mm} \\ & & z_o^2 &= 0 \text{ mm}\end{aligned}$$

$$i_o^2 = 3620,0 \text{ mm}^2$$

$$N_{crT} = 44,80 \text{ kN}$$

$$\lambda_T = \sqrt{[A_{eff} f_{yb} / N_{crT}]} = 1,652$$

$$\alpha_T = 0,34$$

$$\phi_T = 2,111$$

$$\chi_T = 0,292$$

$$\lambda_{LT} = \sqrt{f_{y, min} / M_{cr}} = 0,831$$

$$C_1 = 1,77$$

$$M_{cr} = \pi^2 E I_z / L^2 [I_w + I_z + L^2 G I_t / (\pi^2 E I_z)] = 7,63 \text{ kNm}$$

$$\alpha_{LT} = 0,34$$

$$\phi_T = 0,953$$

$$\chi_{LT} = 0,705$$

determination of interaction factors k_{yy} and k_{zy} 4.4.2 table 4.7 and 4.8

$$N_{cr,y} = 1142 \text{ kN} \quad \mu_y = 1,000$$

$$N_{cr,z} = 857 \text{ kN} \quad \mu_z = 0,999$$

$$C_{my,o} = 1,00004$$

$$\varepsilon_y = 29,81 \quad \alpha_{LT} = 1,000$$

$$C_{my} = 1,00001$$

$$C_{mLT} = 1,019 \quad k_{yy} = 1,020$$

$$k_{zy} = 1,019$$

Buckling resistance check

$$N_{Ed} / [\chi_y (N_{rk} / \gamma_{M1})] + k_{yy} [M_{yEd} + \Delta M_{yEd}] / [\chi_{LT} (M_{yRk} / \gamma_{M1})] = 0,577 < 1,0 \quad oke$$

$$N_{Ed} / [\chi_z (N_{rk} / \gamma_{M1})] + k_{zy} [M_{yEd} + \Delta M_{yEd}] / [\chi_{LT} (M_{yRk} / \gamma_{M1})] = 0,585 < 1,0 \quad oke$$

Verankering kolommen

kolommen bij de tussenspannten maatgevend
belasting op de voet

$$M_{Ed} = 1,60 \text{ kN}$$

$$F_{VEd} = 2,40 \text{ kN}$$

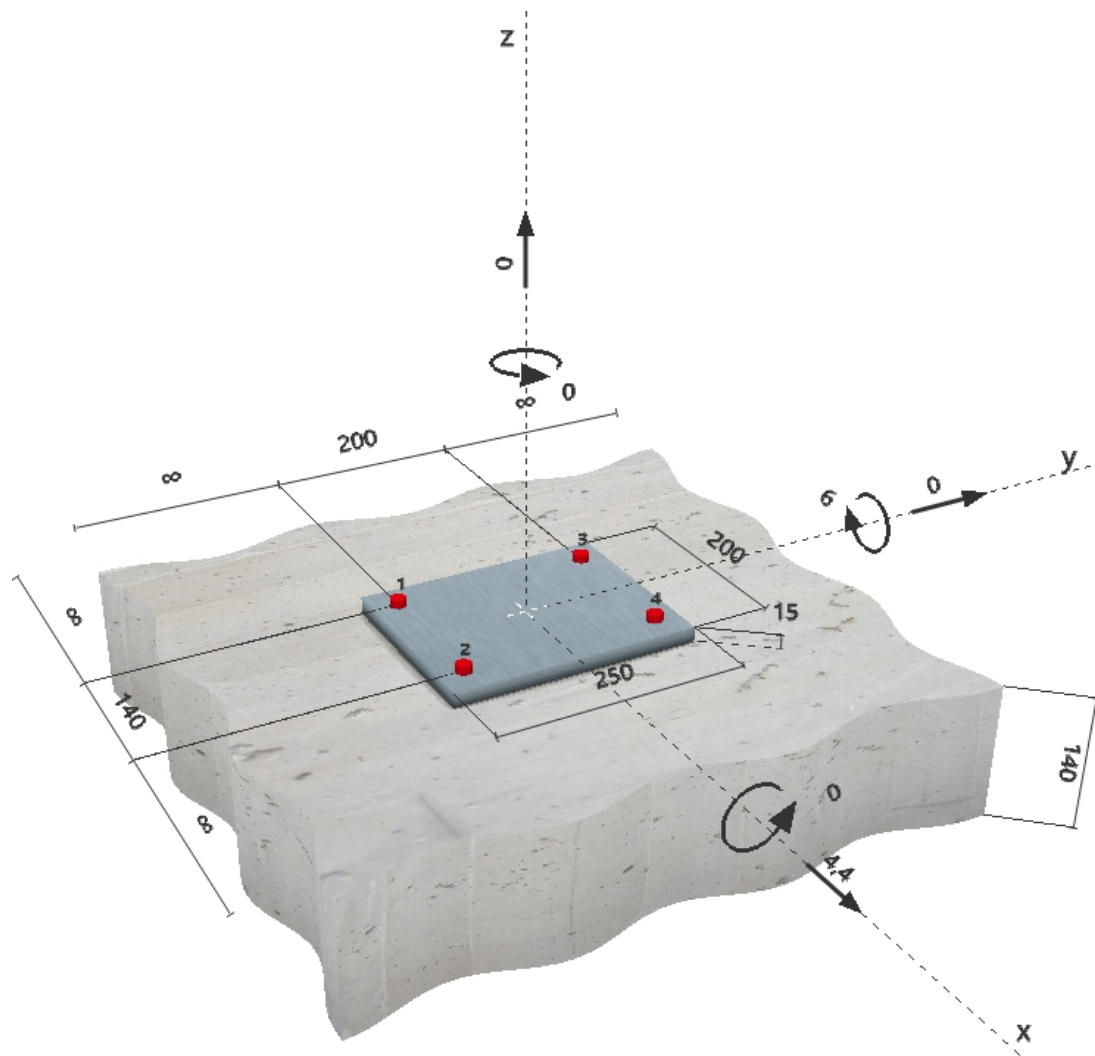
$$F_{tEd} = 0,74 \text{ kN}$$

zie voor berekening akers report Ficher

Specifier's comments:

1 Input data

Anchor type and size:	HIT-HY 200-A + Rebar 16mm
Effective embedment depth:	$h_{ef, opti} = 100 \text{ mm}$ ($h_{ef, limit} = 100 \text{ mm}$)
Material:	BSt 500 S
Approval No.:	ETA 11/0493
Issued Valid:	8-8-2012 23-12-2016
Proof:	design method ETAG BOND (EOTA TR 029)
Stand-off installation:	$e_b = 0 \text{ mm}$ (no stand-off); $t = 15 \text{ mm}$
Baseplate:	$l_x \times l_y \times t = 200 \text{ mm} \times 250 \text{ mm} \times 15 \text{ mm}$; (Recommended plate thickness: not calculated)
Profile:	no profile
Base material:	cracked concrete, C20/25, $f_{cc} = 25,00 \text{ N/mm}^2$; $h = 140 \text{ mm}$, Temp. short/long: 40/24 °C
Installation:	hammer drilled hole, installation condition: dry
Reinforcement:	No reinforcement or Reinforcement spacing $\geq 150 \text{ mm}$ (any $\emptyset$) or $\geq 100 \text{ mm}$ ($\emptyset \leq 10 \text{ mm}$) no longitudinal edge reinforcement Reinforcement to control splitting according to EOTA TR 029, 5.2.2.6 present.


Geometry [mm] & Loading [kN, kNm]


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2 Load case/Resulting anchor forces

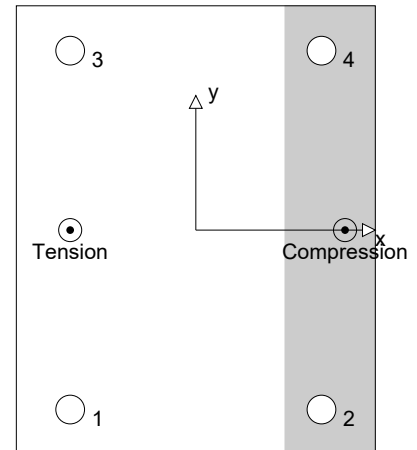
Load case: Design loads

Anchor reactions [kN]

Tension force: (+Tension, -Compression)

Anchor	Tension force	Shear force	Shear force x	Shear force y
1	19,591	1,100	1,100	0,000
2	0,000	1,100	1,100	0,000
3	19,591	1,100	1,100	0,000
4	0,000	1,100	1,100	0,000

max. concrete compressive strain: 0,21 [%]
 max. concrete compressive stress: 6,19 [N/mm²]
 resulting tension force in (x/y)=(-70/0): 39,182 [kN]
 resulting compression force in (x/y)=(83/0): 39,182 [kN]



3 Tension load (EOTA TR 029, Section 5.2.2)

	Load [kN]	Capacity [kN]	Utilisation β_N [%]	Status
Steel failure*	19,591	79,286	25	OK
Combined pullout-concrete cone failure**	39,182	39,251	100	OK
Concrete cone failure**	39,182	40,000	98	OK
Splitting failure**	N/A	N/A	N/A	N/A

* most unfavourable anchor **anchor group (anchors in tension)

3.1 Steel failure

$N_{Rk,s}$ [kN]	$\gamma_{M,s}$	$N_{Rd,s}$ [kN]	N_{Sd} [kN]
111,000	1,400	79,286	19,591

3.2 Combined pullout-concrete cone failure

$A_{p,N}$ [mm ²]	$A_{p,N}^0$ [mm ²]	$\tau_{Rk,ucr,25}$ [N/mm ²]	$s_{cr,Np}$ [mm]	$c_{cr,Np}$ [mm]	c_{min} [mm]
150000	90000	12,00	300	150	∞
ψ_c	$\tau_{Rk,cr}$ [N/mm ²]	k	$\psi_{g,Np}^0$	$\psi_{g,Np}$	
1,000	7,00	2,300	1,016	1,004	
$e_{c1,N}$ [mm]	$\psi_{ec1,Np}$	$e_{c2,N}$ [mm]	$\psi_{ec2,Np}$	$\psi_{s,Np}$	$\psi_{re,Np}$
0	1,000	0	1,000	1,000	1,000
$N_{Rk,p}^0$ [kN]	$N_{Rk,p}$ [kN]	$\gamma_{M,p}$	$N_{Rd,p}$ [kN]	N_{Sd} [kN]	
35,186	58,877	1,500	39,251	39,182	

3.3 Concrete cone failure

$A_{c,N}$ [mm ²]	$A_{c,N}^0$ [mm ²]	$c_{cr,N}$ [mm]	$s_{cr,N}$ [mm]			
150000	90000	150	300			
$e_{c1,N}$ [mm]	$\psi_{ec1,N}$	$e_{c2,N}$ [mm]	$\psi_{ec2,N}$	$\psi_{s,N}$	$\psi_{re,N}$	k_1
0	1,000	0	1,000	1,000	1,000	7,200
$N_{Rk,c}^0$ [kN]	$\gamma_{M,c}$	$N_{Rd,c}$ [kN]	N_{Sd} [kN]			
36,000	1,500	40,000	39,182			

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4 Shear load (EOTA TR 029, Section 5.2.3)

	Load [kN]	Capacity [kN]	Utilisation β_v [%]	Status
Steel failure (without lever arm)*	1,100	36,667	4	OK
Steel failure (with lever arm)*	N/A	N/A	N/A	N/A
Pryout failure**	4,400	115,782	4	OK
Concrete edge failure in direction **	N/A	N/A	N/A	N/A

* most unfavourable anchor ** anchor group (relevant anchors)

4.1 Steel failure (without lever arm)

$V_{Rk,s}$ [kN]	$\gamma_{M,s}$	$V_{Rd,s}$ [kN]	V_{Sd} [kN]
55,000	1,500	36,667	1,100

4.2 Pryout failure (bond relevant)

$A_{p,N}$ [mm ²]	$A_{p,N}^0$ [mm ²]	$\tau_{Rk,ucr,25}$ [N/mm ²]	$c_{cr,Np}$ [mm]	$s_{cr,Np}$ [mm]	c_{min} [mm]
220000	90000	12,00	150	300	∞
ψ_c	$\tau_{Rk,cr}$ [N/mm ²]	k	k-factor	$\psi_{g,Np}^0$	$\psi_{g,Np}$
1,000	7,00	2,300	2,000	1,039	1,010
$\psi_{s,Np}$	$e_{c1,v}$ [mm]	$\psi_{ec1,Np}$	$e_{c2,v}$ [mm]	$\psi_{ec2,Np}$	$\psi_{re,Np}$
1,000	0	1,000	0	1,000	1,000
$N_{Rk,p}^0$ [kN]	$N_{Rk,p}$ [kN]	$\gamma_{M,c,p}$	$V_{Rd,c1}$ [kN]	V_{Sd} [kN]	
35,186	86,836	1,500	115,782	4,400	

5 Combined tension and shear loads (EOTA TR 029, Section 5.2.4)

β_N	β_V	α	Utilisation $\beta_{N,v}$ [%]	Status
0,998	0,038	1,000	87	OK

$$(\beta_N + \beta_V) / 1.2 \leq 1$$

6 Displacements (highest loaded anchor)

Short term loading:

N_{Sk}	=	14,512 [kN]	δ_N	=	0,318 [mm]
V_{Sk}	=	0,815 [kN]	δ_V	=	0,033 [mm]
			δ_{NV}	=	0,319 [mm]

Long term loading:

N_{Sk}	=	14,512 [kN]	δ_N	=	0,462 [mm]
V_{Sk}	=	0,815 [kN]	δ_V	=	0,049 [mm]
			δ_{NV}	=	0,465 [mm]

Comments: Tension displacements are valid with half of the required installation torque moment for uncracked concrete! Shear displacements are valid without friction between the concrete and the baseplate! The gap due to the drilled hole and clearance hole tolerances are not included in this calculation!

The acceptable anchor displacements depend on the fastened construction and must be defined by the designer!

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7 Warnings

- To avoid failure of the baseplate the required thickness can be calculated in PROFIS Anchor. Load re-distributions on the anchors due to elastic deformations of the baseplate are not considered. The baseplate is assumed to be sufficiently stiff, in order not to be deformed when subjected to the loading!
- Checking the transfer of loads into the base material is required in accordance with EOTA TR 029, Section 7!
- The design is only valid if the clearance hole in the fixture is not larger than the value given in Table 4.1 of EOTA TR029! For larger diameters of the clearance hole see Chapter 1.1. of EOTA TR029!
- The accessory list in this report is for the information of the user only. In any case, the instructions for use provided with the product have to be followed to ensure a proper installation.
- Drilled hole cleaning must be performed according to instructions for use (blow twice with oil-free compressed air (min. 6 bar), brush twice, blow twice with oil-free compressed air (min. 6 bar)).
- Characteristic bond resistances depend on short- and long-term temperatures.
- Edge reinforcement is not required to avoid splitting failure

Fastening meets the design criteria!

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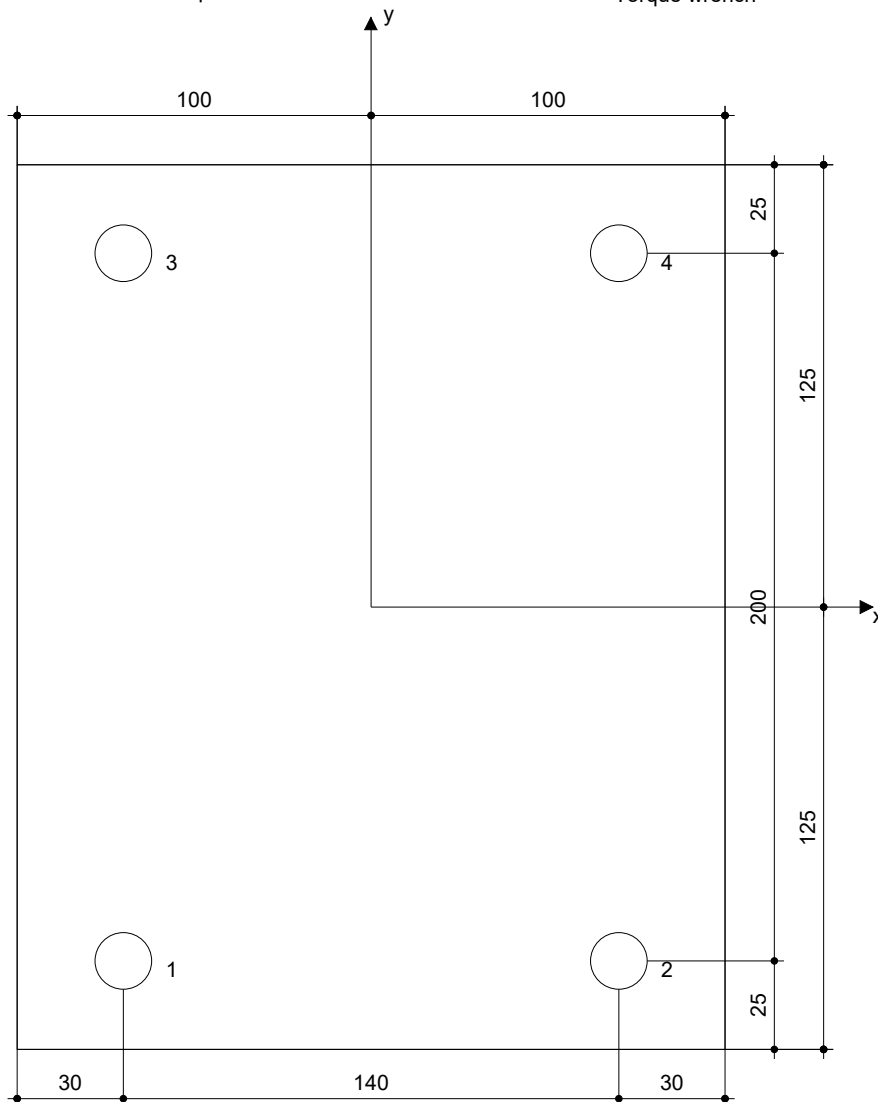
8 Installation data

Baseplate, steel: -
 Profile: no profile; 0 x 0 x 0 mm
 Hole diameter in the fixture: $d_f = 16$ mm
 Plate thickness (input): 15 mm
 Recommended plate thickness: not calculated
 Cleaning: Premium cleaning of the drilled hole is required

Anchor type and size: HIT-HY 200-A + Rebar, 16mm
 Installation torque: 0,000 kNm
 Hole diameter in the base material: 20 mm
 Hole depth in the base material: 100 mm
 Minimum thickness of the base material: 140 mm

8.1 Required accessories

Drilling	Cleaning	Setting
- Suitable Rotary Hammer - Properly sized drill bit	- Compressed air with required accessories to blow from the bottom of the hole - Proper diameter wire brush	- Dispenser including cassette and mixer - For deep installations, a piston plug is necessary - Torque wrench



Coordinates Anchor [mm]

Anchor	x	y	C _{-x}	C _{+x}	C _{-y}	C _{+y}
1	-70	-100	-	-	-	-
2	70	-100	-	-	-	-
3	-70	100	-	-	-	-
4	70	100	-	-	-	-

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9 Remarks; Your Cooperation Duties

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TS/Raamwerken**berekening tussenspanten**

Project...: bedrijfshal te Lottum
 Onderdeel: tussenspanten
 Dimensies: kN;m;rad (tenzij anders aangegeven)

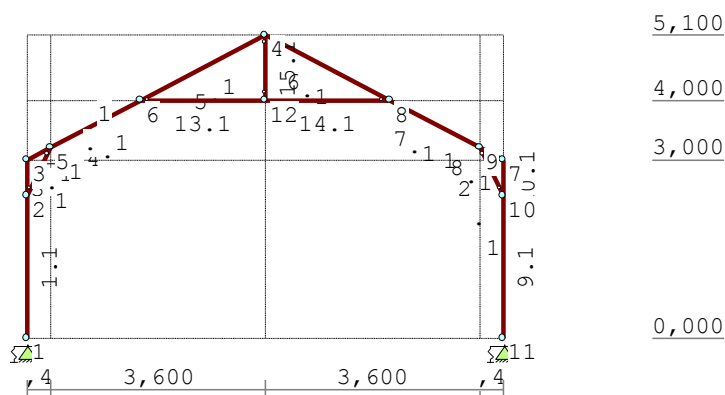
Belastingbreedte.: 0.750
 Rekenmodel.....: 2e-orde-elastisch.
 Theorieën voor de bepaling van de krachtsverdeling:
 1) Uiterste grenstoestand:
 Geometrisch niet lineair alle staven.
 Fysisch lineair alle staven.
 2) Gebruiksgrenstoestand:
 Geometrisch niet lineair alle staven.
 Fysisch lineair alle staven.

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.

Toegepaste normen volgens Eurocode met Nederlandse NB

Belastingen	NEN-EN 1990:2002	C2:2010	NB:2011 (nl)
	NEN-EN 1991-1-1:2002	C1:2009	NB:2011 (nl)
	NEN-EN 1991-1-3:2003	C1:2009	NB:2011 (nl)
	NEN-EN 1991-1-4:2005	C2:2011	NB:2011 (nl)

GEOMETRIE**STRAMIENLIJNEN**

Nr.	X	Z-min	Z-max
1	0.000	0.000	5.100
2	4.000	0.000	5.100
3	8.000	0.000	5.100
4	0.400	0.000	5.100
5	7.600	0.000	5.100

Project...: bedrijfshal te Lottum
Onderdeel: tussenspanen

NIVEAUS

Nr.	Z	X-min	X-max
1	0.000	0.000	8.000
2	4.000	0.000	8.000
3	5.100	0.000	8.000
4	3.000	0.000	8.000

MATERIALEN

Mt	Omschrijving	E-modulus[N/mm2]	S.M.	Pois.	Uitz. coëff
1	S235	210000	78.5	0.30	1.2000e-005

PROFIELEN [mm]

Prof.	Omschrijving	Materiaal	Oppervlak	Traagheid	Vormf.
1	_C150/45/1.5	1:S235	3.8700e+002	1.2883e+006	0.00

PROFIELEN vervolg [mm]

Prof.	Staaftype	Breedte	Hoogte	e	Type	b1	h1	b2	h2
1	0:Normaal	45	150	75.0					

KNOPEN

Knoop	X	Z	Knoop	X	Z
1	0.000	0.000	6	1.905	4.000
2	0.000	2.400	7	8.000	3.000
3	0.000	3.000	8	6.095	4.000
4	4.000	5.100	9	7.600	3.210
5	0.400	3.210	10	8.000	2.400
11	8.000	0.000			
12	4.000	4.000			

STAVEN

St.	ki	kj	Profiel	Aansl.i	Aansl.j	Lengte	Opm.
1	1	2	1:_C150/45/1.5	NDM	NDM	2.400	
2	2	3	1:_C150/45/1.5	NDM	NDM	0.600	
3	3	5	1:_C150/45/1.5	NDM	NDM	0.452	
4	5	6	1:_C150/45/1.5	NDM	NDM	1.700	
5	6	4	1:_C150/45/1.5	NDM	NDM	2.366	
6	4	8	1:_C150/45/1.5	NDM	NDM	2.366	
7	8	9	1:_C150/45/1.5	NDM	NDM	1.700	
8	9	7	1:_C150/45/1.5	NDM	NDM	0.452	
9	11	10	1:_C150/45/1.5	NDM	NDM	2.400	
10	10	7	1:_C150/45/1.5	NDM	NDM	0.600	
11	2	5	1:_C150/45/1.5	ND	ND	0.903	
12	9	10	1:_C150/45/1.5	ND	ND	0.903	
13	6	12	1:_C150/45/1.5	ND	NDM	2.095	
14	12	8	1:_C150/45/1.5	NDM	ND	2.095	
15	12	4	1:_C150/45/1.5	ND	ND	1.100	

Project...: bedrijfshal te Lottum
Onderdeel: tussenspanten

VASTE STEUNPUNTEN

Nr.	knoop	Kode	XZR 1=vast 0=vrij	Hoek
1	1	110		0.00
2	11	110		0.00

VEREN

Veer	Knoop	Richting	Hoek	Veerwaarde	Type	Ondergrens	Bovengrens
1	1	3:Rotatie	0.00	5.000e+001	Normaal	-1.000e+010	1.000e+010
2	11	3:Rotatie	0.00	5.000e+001	Normaal	-1.000e+010	1.000e+010

BELASTINGGENERATIE ALGEMEEN.

Betrouwbaarheidsklasse.....	1	Referentieperiode.....	15
Gebouwdiepte.....	6.00	Gebouwhoogte.....	3.30
Niveau aansl.terrein.....	0.00	E.g. scheid.w. [kN/m2]:	0.00

WIND

Terrein categorie ...[4.3.2]....	Onbebouwd
Windgebied	3 Vb,0 ..[4.2].....: 24.500
Referentie periode wind.....	15.00 Vb(p) ..[4.2].....: 22.397
K	0.280 n[4.2].....: 0.500
Positie spant in het gebouw....	0.750 Kr[4.3.2].....: 0.209
z0	0.200 Zmin ..[4.3.2].....: 4.000
Co wind van links ..[4.3.3]....	1.000 Co wind van rechts....: 1.000
Co wind loodrecht ..[4.3.3]....	1.000
Cpi wind van links ..[7.2.9]....	0.200 -0.300
Cpi windloodrecht ...[7.2.9]....	0.200 -0.300
Cpi wind van rechts .[7.2.9]....	0.200 -0.300
Cfr windwrijving[7.5].....	0.040

SNEEUW

Sneeuwbelasting (sk) 50 jaar :	0.70
Sneeuwbelasting (sn) n jaar :	0.53

STAFTYPEN

Type	staven
1:Vloer.	: 13,14
4:Wand / kolom.	: 15
5:Linker gevel.	: 1,2
6:Rechter gevel.	: 9,10
7:Dak.	: 3-8
9:Open.	: 11,12

LASTVELDEN

Project...: bedrijfshal te Lottum
Onderdeel: tussenspanten

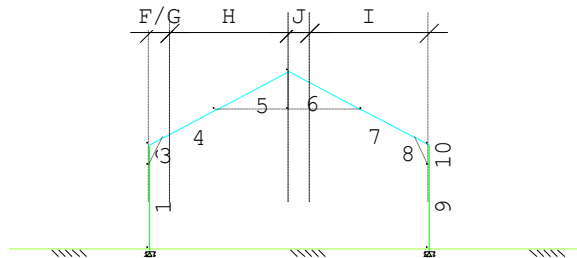
WIND DAKTYPES

Nr.	Staaft Type	reductie bij wind van links	reductie bij wind van Rechts	Cpe volgens art:
1	1-2 Gevel	1.000	1.000	7.2.2
2	3-5 Zadeldak	1.000	1.000	7.2.5
3	6-8 Zadeldak	1.000	1.000	7.2.5
4	10-9 Gevel	1.000	1.000	7.2.2

WIND ZONES

Wind van links

Wind van rechts

**WIND VAN LINKS ZONES**

Nr.	Staaft	Positie	Lengte	Zone
1	1-2	0.000	3.000	D
2	3-5	0.000	0.600	F/G
3	3-5	0.600	3.400	H
4	6-8	0.000	0.600	J
5	6-8	0.600	3.400	I
6	10-9	0.000	3.000	E

Wind indexen

Index	CsCd	Cpe/Cpi	qp	breedte	reductie	Qw	Zone	Hoek(en)
Qw1		0.300	0.410	0.750		-0.092		
Qw2		-0.300	0.410	0.750		0.092		
Qw3	1.00	0.800	0.410	0.750		-0.246	D	
Qw4	1.00	0.623	0.410	0.750		-0.192	F	27.7
Qw5	1.00	0.369	0.410	0.750		-0.114	H	27.7
Qw6	1.00	-0.577	0.410	0.750		0.177	J	27.7
Qw7	1.00	-0.400	0.410	0.750		0.123	I	27.7
Qw8	1.00	0.500	0.410	0.750		-0.154	E	
Qw9		-0.200	0.410	0.750		0.062		
Qw10		0.200	0.410	0.750		-0.062		
Qw11	1.00	-0.561	0.410	0.750		0.173	F	27.7
Qw12	1.00	-0.215	0.410	0.750		0.066	H	27.7

SNEEUW DAKTYPEN

Staaft	artikel
3-5	5.3.3 Zadeldak
6-8	5.3.3 Zadeldak

Project...: bedrijfshal te Lottum
Onderdeel: tussenspanen

Sneeuw indexen

Index	art	μ	s_k	red. posfac	breedte	Q_s	hoek
Qs1	5.3.3	0.800	0.53	1.00	0.750	0.316	27.7
Qs2	5.3.3	0.400	0.53	1.00	0.750	0.158	27.7

BELASTINGGEVALLEN

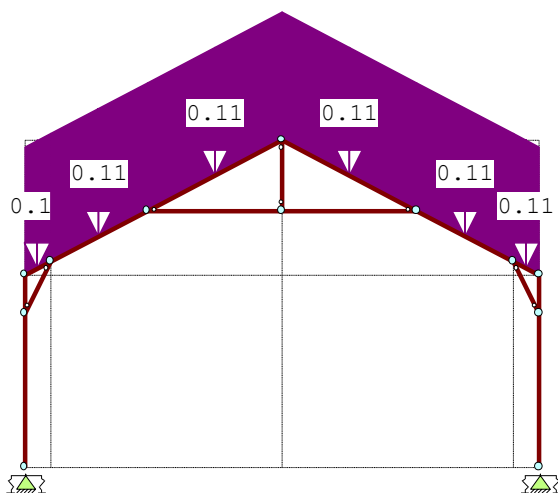
B.G.	Omschrijving	Type
	1 permanent EGZ=-1.00	1 Permanente belasting
g	2 Wind van links onderdruk A	7
g	3 Wind van links overdruk A	8
g	4 Wind van links onderdruk B	9
g	5 Wind van links overdruk B	10
g	6 Wind van links onderdruk C	37
g	7 Wind van links overdruk C	38
g	8 Wind van links onderdruk D	39
g	9 Wind van links overdruk D	40
g	10 Sneeuw A	22
g	11 Sneeuw B	23
g	12 Sneeuw C	33

g = gegenereerd belastinggeval

BELASTINGEN

B.G:1 permanent

Eigen gewicht van alle staven is meegenomen in berekening. Richting:↓

**STAAFBELASTINGEN**

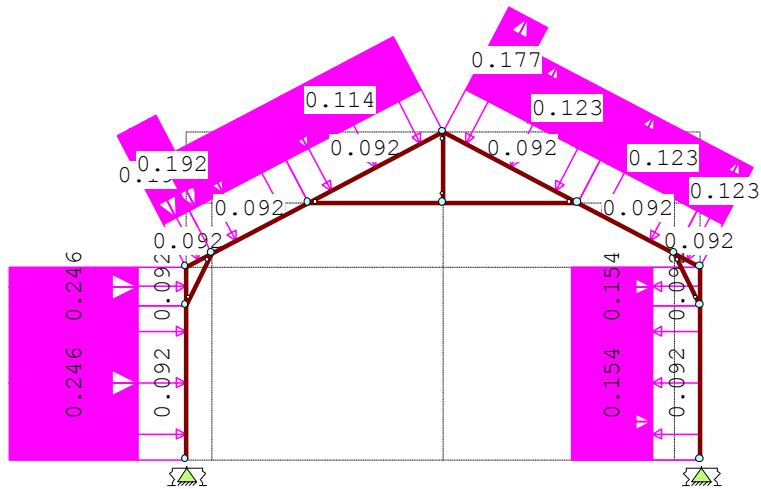
B.G:1 permanent

Staafl	Type	$q_1/p/m$	q_2	A	B	ψ_0	ψ_1	ψ_2
3	5:QZGloobaal	-0.11	-0.11	0.000	0.000			
4	5:QZGloobaal	-0.11	-0.11	0.000	0.000			
5	5:QZGloobaal	-0.11	-0.11	0.000	0.000			
6	5:QZGloobaal	-0.11	-0.11	0.000	0.000			
7	5:QZGloobaal	-0.11	-0.11	0.000	0.000			
8	5:QZGloobaal	-0.11	-0.11	0.000	0.000			

Project...: bedrijfshal te Lottum
Onderdeel: tussenspanten

BELASTINGEN

B.G:2 Wind van links onderdruk A

**STAAFBELASTINGEN**

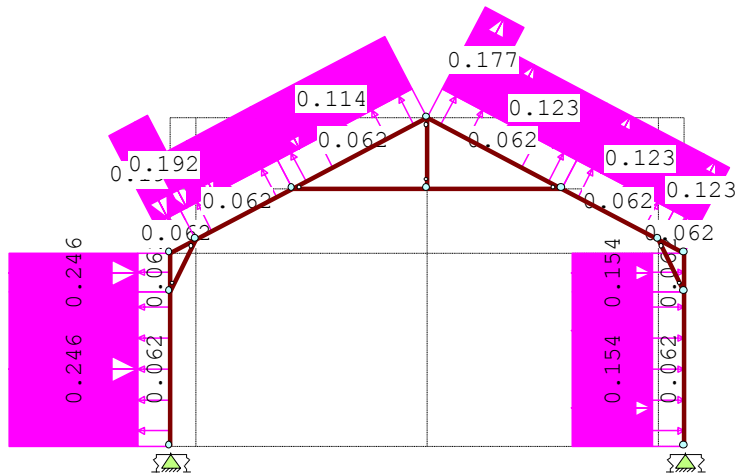
B.G:2 Wind van links onderdruk A

Staat	Type	Index	q1/p/m	q2	A	B	ψ_0	ψ_1	ψ_2
1	1:QZLokaal	Qw1	-0.09	-0.09	0.000	0.000	0.0	0.2	0.0
2	1:QZLokaal	Qw1	-0.09	-0.09	0.000	0.000	0.0	0.2	0.0
3	1:QZLokaal	Qw1	-0.09	-0.09	0.000	0.000	0.0	0.2	0.0
4	1:QZLokaal	Qw1	-0.09	-0.09	0.000	0.000	0.0	0.2	0.0
5	1:QZLokaal	Qw1	-0.09	-0.09	0.000	0.000	0.0	0.2	0.0
6	1:QZLokaal	Qw1	-0.09	-0.09	0.000	0.000	0.0	0.2	0.0
7	1:QZLokaal	Qw1	-0.09	-0.09	0.000	0.000	0.0	0.2	0.0
8	1:QZLokaal	Qw1	-0.09	-0.09	0.000	0.000	0.0	0.2	0.0
10	1:QZLokaal	Qw2	0.09	0.09	0.000	0.000	0.0	0.2	0.0
9	1:QZLokaal	Qw2	0.09	0.09	0.000	0.000	0.0	0.2	0.0
1	1:QZLokaal	Qw3	-0.25	-0.25	0.000	0.000	0.0	0.2	0.0
2	1:QZLokaal	Qw3	-0.25	-0.25	0.000	0.000	0.0	0.2	0.0
3	1:QZLokaal	Qw4	-0.19	-0.19	0.000	0.000	0.0	0.2	0.0
4	1:QZLokaal	Qw4	-0.19	-0.19	0.000	1.474	0.0	0.2	0.0
4	1:QZLokaal	Qw5	-0.11	-0.11	0.226	0.000	0.0	0.2	0.0
5	1:QZLokaal	Qw5	-0.11	-0.11	0.000	0.000	0.0	0.2	0.0
6	1:QZLokaal	Qw6	0.18	0.18	0.000	1.689	0.0	0.2	0.0
6	1:QZLokaal	Qw7	0.12	0.12	0.678	0.000	0.0	0.2	0.0
7	1:QZLokaal	Qw7	0.12	0.12	0.000	0.000	0.0	0.2	0.0
8	1:QZLokaal	Qw7	0.12	0.12	0.000	0.000	0.0	0.2	0.0
10	1:QZLokaal	Qw8	-0.15	-0.15	0.000	0.000	0.0	0.2	0.0
9	1:QZLokaal	Qw8	-0.15	-0.15	0.000	0.000	0.0	0.2	0.0

Project...: bedrijfshal te Lottum
 Onderdeel: tussenspanten

BELASTINGEN

B.G:3 Wind van links overdruk A

**STAAFBELASTINGEN**

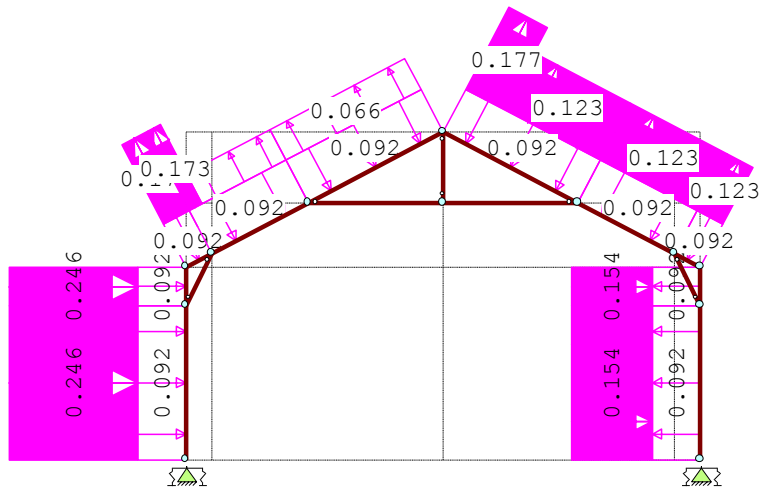
B.G:3 Wind van links overdruk A

Staafl	Type	Index	q1/p/m	q2	A	B	ψ_0	ψ_1	ψ_2
1	1:QZLokaal	Qw9	0.06	0.06	0.000	0.000	0.0	0.2	0.0
2	1:QZLokaal	Qw9	0.06	0.06	0.000	0.000	0.0	0.2	0.0
3	1:QZLokaal	Qw9	0.06	0.06	0.000	0.000	0.0	0.2	0.0
4	1:QZLokaal	Qw9	0.06	0.06	0.000	0.000	0.0	0.2	0.0
5	1:QZLokaal	Qw9	0.06	0.06	0.000	0.000	0.0	0.2	0.0
6	1:QZLokaal	Qw9	0.06	0.06	0.000	0.000	0.0	0.2	0.0
7	1:QZLokaal	Qw9	0.06	0.06	0.000	0.000	0.0	0.2	0.0
8	1:QZLokaal	Qw9	0.06	0.06	0.000	0.000	0.0	0.2	0.0
10	1:QZLokaal	Qw10	-0.06	-0.06	0.000	0.000	0.0	0.2	0.0
9	1:QZLokaal	Qw10	-0.06	-0.06	0.000	0.000	0.0	0.2	0.0
1	1:QZLokaal	Qw3	-0.25	-0.25	0.000	0.000	0.0	0.2	0.0
2	1:QZLokaal	Qw3	-0.25	-0.25	0.000	0.000	0.0	0.2	0.0
3	1:QZLokaal	Qw4	-0.19	-0.19	0.000	0.000	0.0	0.2	0.0
4	1:QZLokaal	Qw4	-0.19	-0.19	0.000	1.474	0.0	0.2	0.0
4	1:QZLokaal	Qw5	-0.11	-0.11	0.226	0.000	0.0	0.2	0.0
5	1:QZLokaal	Qw5	-0.11	-0.11	0.000	0.000	0.0	0.2	0.0
6	1:QZLokaal	Qw6	0.18	0.18	0.000	1.689	0.0	0.2	0.0
6	1:QZLokaal	Qw7	0.12	0.12	0.678	0.000	0.0	0.2	0.0
7	1:QZLokaal	Qw7	0.12	0.12	0.000	0.000	0.0	0.2	0.0
8	1:QZLokaal	Qw7	0.12	0.12	0.000	0.000	0.0	0.2	0.0
10	1:QZLokaal	Qw8	-0.15	-0.15	0.000	0.000	0.0	0.2	0.0
9	1:QZLokaal	Qw8	-0.15	-0.15	0.000	0.000	0.0	0.2	0.0

Project...: bedrijfshal te Lottum
Onderdeel: tussenspanten

BELASTINGEN

B.G:4 Wind van links onderdruk B

**STAAFBELASTINGEN**

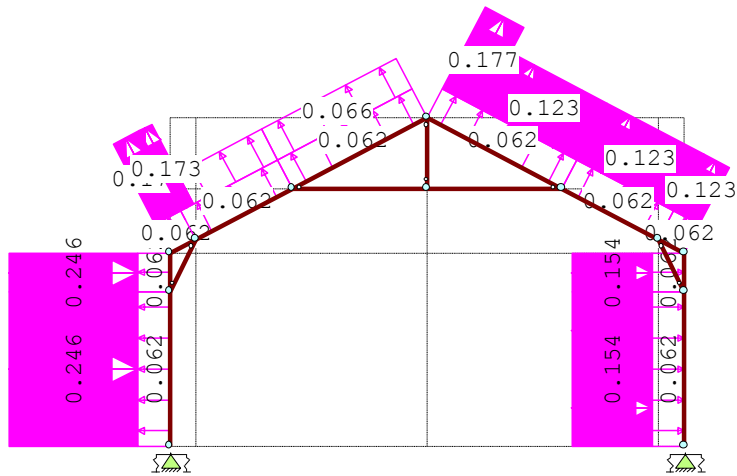
B.G:4 Wind van links onderdruk B

Staal	Type	Index	q1/p/m	q2	A	B	ψ_0	ψ_1	ψ_2
1	1:QZLokaal	Qw1	-0.09	-0.09	0.000	0.000	0.0	0.2	0.0
2	1:QZLokaal	Qw1	-0.09	-0.09	0.000	0.000	0.0	0.2	0.0
3	1:QZLokaal	Qw1	-0.09	-0.09	0.000	0.000	0.0	0.2	0.0
4	1:QZLokaal	Qw1	-0.09	-0.09	0.000	0.000	0.0	0.2	0.0
5	1:QZLokaal	Qw1	-0.09	-0.09	0.000	0.000	0.0	0.2	0.0
6	1:QZLokaal	Qw1	-0.09	-0.09	0.000	0.000	0.0	0.2	0.0
7	1:QZLokaal	Qw1	-0.09	-0.09	0.000	0.000	0.0	0.2	0.0
8	1:QZLokaal	Qw1	-0.09	-0.09	0.000	0.000	0.0	0.2	0.0
10	1:QZLokaal	Qw2	0.09	0.09	0.000	0.000	0.0	0.2	0.0
9	1:QZLokaal	Qw2	0.09	0.09	0.000	0.000	0.0	0.2	0.0
1	1:QZLokaal	Qw3	-0.25	-0.25	0.000	0.000	0.0	0.2	0.0
2	1:QZLokaal	Qw3	-0.25	-0.25	0.000	0.000	0.0	0.2	0.0
3	1:QZLokaal	Qw11	0.17	0.17	0.000	0.000	0.0	0.2	0.0
4	1:QZLokaal	Qw11	0.17	0.17	0.000	1.474	0.0	0.2	0.0
4	1:QZLokaal	Qw12	0.07	0.07	0.226	0.000	0.0	0.2	0.0
5	1:QZLokaal	Qw12	0.07	0.07	0.000	0.000	0.0	0.2	0.0
6	1:QZLokaal	Qw6	0.18	0.18	0.000	1.689	0.0	0.2	0.0
6	1:QZLokaal	Qw7	0.12	0.12	0.678	0.000	0.0	0.2	0.0
7	1:QZLokaal	Qw7	0.12	0.12	0.000	0.000	0.0	0.2	0.0
8	1:QZLokaal	Qw7	0.12	0.12	0.000	0.000	0.0	0.2	0.0
10	1:QZLokaal	Qw8	-0.15	-0.15	0.000	0.000	0.0	0.2	0.0
9	1:QZLokaal	Qw8	-0.15	-0.15	0.000	0.000	0.0	0.2	0.0

Project...: bedrijfshal te Lottum
 Onderdeel: tussenspanten

BELASTINGEN

B.G:5 Wind van links overdruk B

**STAAFBELASTINGEN**

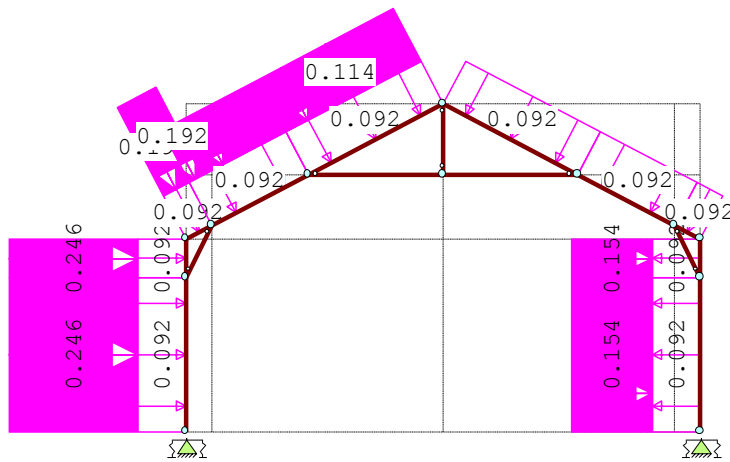
B.G:5 Wind van links overdruk B

Staafl	Type	Index	q1/p/m	q2	A	B	ψ_0	ψ_1	ψ_2
1	1:QZLokaal	Qw9	0.06	0.06	0.000	0.000	0.0	0.2	0.0
2	1:QZLokaal	Qw9	0.06	0.06	0.000	0.000	0.0	0.2	0.0
3	1:QZLokaal	Qw9	0.06	0.06	0.000	0.000	0.0	0.2	0.0
4	1:QZLokaal	Qw9	0.06	0.06	0.000	0.000	0.0	0.2	0.0
5	1:QZLokaal	Qw9	0.06	0.06	0.000	0.000	0.0	0.2	0.0
6	1:QZLokaal	Qw9	0.06	0.06	0.000	0.000	0.0	0.2	0.0
7	1:QZLokaal	Qw9	0.06	0.06	0.000	0.000	0.0	0.2	0.0
8	1:QZLokaal	Qw9	0.06	0.06	0.000	0.000	0.0	0.2	0.0
10	1:QZLokaal	Qw10	-0.06	-0.06	0.000	0.000	0.0	0.2	0.0
9	1:QZLokaal	Qw10	-0.06	-0.06	0.000	0.000	0.0	0.2	0.0
1	1:QZLokaal	Qw3	-0.25	-0.25	0.000	0.000	0.0	0.2	0.0
2	1:QZLokaal	Qw3	-0.25	-0.25	0.000	0.000	0.0	0.2	0.0
3	1:QZLokaal	Qw11	0.17	0.17	0.000	0.000	0.0	0.2	0.0
4	1:QZLokaal	Qw11	0.17	0.17	0.000	1.474	0.0	0.2	0.0
4	1:QZLokaal	Qw12	0.07	0.07	0.226	0.000	0.0	0.2	0.0
5	1:QZLokaal	Qw12	0.07	0.07	0.000	0.000	0.0	0.2	0.0
6	1:QZLokaal	Qw6	0.18	0.18	0.000	1.689	0.0	0.2	0.0
6	1:QZLokaal	Qw7	0.12	0.12	0.678	0.000	0.0	0.2	0.0
7	1:QZLokaal	Qw7	0.12	0.12	0.000	0.000	0.0	0.2	0.0
8	1:QZLokaal	Qw7	0.12	0.12	0.000	0.000	0.0	0.2	0.0
10	1:QZLokaal	Qw8	-0.15	-0.15	0.000	0.000	0.0	0.2	0.0
9	1:QZLokaal	Qw8	-0.15	-0.15	0.000	0.000	0.0	0.2	0.0

Project...: bedrijfshal te Lottum
Onderdeel: tussenspananten

BELASTINGEN

B.G:6 Wind van links onderdruk C

**STAAFBELASTINGEN**

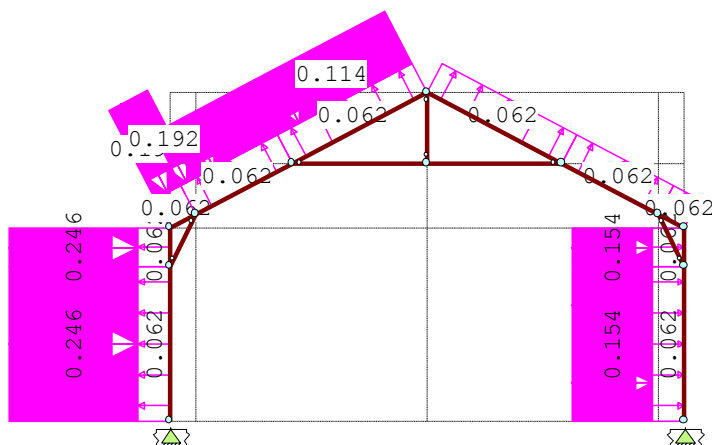
B.G:6 Wind van links onderdruk C

Staal	Type	Index	q1/p/m	q2	A	B	Ψ_0	Ψ_1	Ψ_2
1	1:QZLokaal	Qw1	-0.09	-0.09	0.000	0.000	0.0	0.2	0.0
2	1:QZLokaal	Qw1	-0.09	-0.09	0.000	0.000	0.0	0.2	0.0
3	1:QZLokaal	Qw1	-0.09	-0.09	0.000	0.000	0.0	0.2	0.0
4	1:QZLokaal	Qw1	-0.09	-0.09	0.000	0.000	0.0	0.2	0.0
5	1:QZLokaal	Qw1	-0.09	-0.09	0.000	0.000	0.0	0.2	0.0
6	1:QZLokaal	Qw1	-0.09	-0.09	0.000	0.000	0.0	0.2	0.0
7	1:QZLokaal	Qw1	-0.09	-0.09	0.000	0.000	0.0	0.2	0.0
8	1:QZLokaal	Qw1	-0.09	-0.09	0.000	0.000	0.0	0.2	0.0
10	1:QZLokaal	Qw2	0.09	0.09	0.000	0.000	0.0	0.2	0.0
9	1:QZLokaal	Qw2	0.09	0.09	0.000	0.000	0.0	0.2	0.0
1	1:QZLokaal	Qw3	-0.25	-0.25	0.000	0.000	0.0	0.2	0.0
2	1:QZLokaal	Qw3	-0.25	-0.25	0.000	0.000	0.0	0.2	0.0
3	1:QZLokaal	Qw4	-0.19	-0.19	0.000	0.000	0.0	0.2	0.0
4	1:QZLokaal	Qw4	-0.19	-0.19	0.000	1.474	0.0	0.2	0.0
4	1:QZLokaal	Qw5	-0.11	-0.11	0.226	0.000	0.0	0.2	0.0
5	1:QZLokaal	Qw5	-0.11	-0.11	0.000	0.000	0.0	0.2	0.0
10	1:QZLokaal	Qw8	-0.15	-0.15	0.000	0.000	0.0	0.2	0.0
9	1:QZLokaal	Qw8	-0.15	-0.15	0.000	0.000	0.0	0.2	0.0

Project...: bedrijfshal te Lottum
Onderdeel: tussenspananten

BELASTINGEN

B.G:7 Wind van links overdruk C

**STAAFBELASTINGEN**

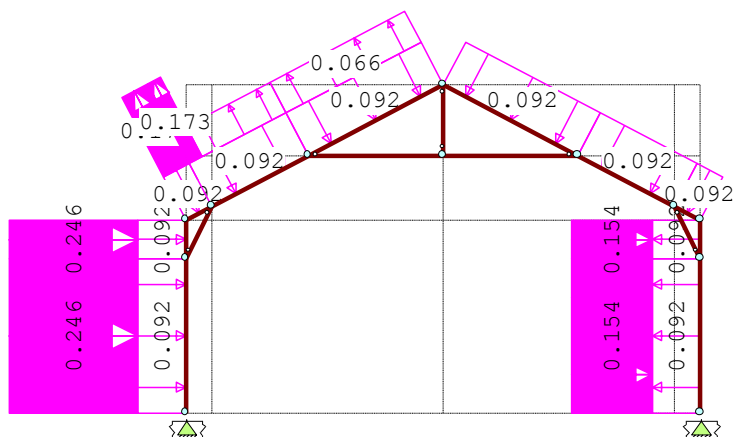
B.G:7 Wind van links overdruk C

Staaft	Type	Index	q1/p/m	q2	A	B	Ψ_0	Ψ_1	Ψ_2
1	1:QZLokaal	Qw9	0.06	0.06	0.000	0.000	0.0	0.2	0.0
2	1:QZLokaal	Qw9	0.06	0.06	0.000	0.000	0.0	0.2	0.0
3	1:QZLokaal	Qw9	0.06	0.06	0.000	0.000	0.0	0.2	0.0
4	1:QZLokaal	Qw9	0.06	0.06	0.000	0.000	0.0	0.2	0.0
5	1:QZLokaal	Qw9	0.06	0.06	0.000	0.000	0.0	0.2	0.0
6	1:QZLokaal	Qw9	0.06	0.06	0.000	0.000	0.0	0.2	0.0
7	1:QZLokaal	Qw9	0.06	0.06	0.000	0.000	0.0	0.2	0.0
8	1:QZLokaal	Qw9	0.06	0.06	0.000	0.000	0.0	0.2	0.0
10	1:QZLokaal	Qw10	-0.06	-0.06	0.000	0.000	0.0	0.2	0.0
9	1:QZLokaal	Qw10	-0.06	-0.06	0.000	0.000	0.0	0.2	0.0
1	1:QZLokaal	Qw3	-0.25	-0.25	0.000	0.000	0.0	0.2	0.0
2	1:QZLokaal	Qw3	-0.25	-0.25	0.000	0.000	0.0	0.2	0.0
3	1:QZLokaal	Qw4	-0.19	-0.19	0.000	0.000	0.0	0.2	0.0
4	1:QZLokaal	Qw4	-0.19	-0.19	0.000	1.474	0.0	0.2	0.0
4	1:QZLokaal	Qw5	-0.11	-0.11	0.226	0.000	0.0	0.2	0.0
5	1:QZLokaal	Qw5	-0.11	-0.11	0.000	0.000	0.0	0.2	0.0
10	1:QZLokaal	Qw8	-0.15	-0.15	0.000	0.000	0.0	0.2	0.0
9	1:QZLokaal	Qw8	-0.15	-0.15	0.000	0.000	0.0	0.2	0.0

Project...: bedrijfshal te Lottum
Onderdeel: tussenspananten

BELASTINGEN

B.G:8 Wind van links onderdruk D

**STAAFBELASTINGEN**

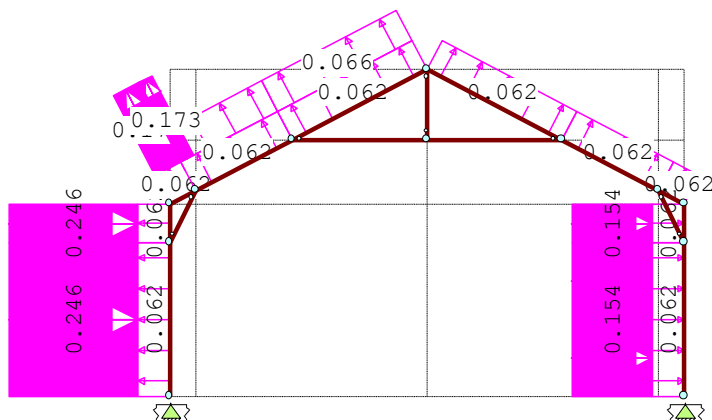
B.G:8 Wind van links onderdruk D

Staafl	Type	Index	q1/p/m	q2	A	B	ψ_0	ψ_1	ψ_2
1	1:QZLokaal	Qw1	-0.09	-0.09	0.000	0.000	0.0	0.2	0.0
2	1:QZLokaal	Qw1	-0.09	-0.09	0.000	0.000	0.0	0.2	0.0
3	1:QZLokaal	Qw1	-0.09	-0.09	0.000	0.000	0.0	0.2	0.0
4	1:QZLokaal	Qw1	-0.09	-0.09	0.000	0.000	0.0	0.2	0.0
5	1:QZLokaal	Qw1	-0.09	-0.09	0.000	0.000	0.0	0.2	0.0
6	1:QZLokaal	Qw1	-0.09	-0.09	0.000	0.000	0.0	0.2	0.0
7	1:QZLokaal	Qw1	-0.09	-0.09	0.000	0.000	0.0	0.2	0.0
8	1:QZLokaal	Qw1	-0.09	-0.09	0.000	0.000	0.0	0.2	0.0
10	1:QZLokaal	Qw2	0.09	0.09	0.000	0.000	0.0	0.2	0.0
9	1:QZLokaal	Qw2	0.09	0.09	0.000	0.000	0.0	0.2	0.0
1	1:QZLokaal	Qw3	-0.25	-0.25	0.000	0.000	0.0	0.2	0.0
2	1:QZLokaal	Qw3	-0.25	-0.25	0.000	0.000	0.0	0.2	0.0
3	1:QZLokaal	Qw11	0.17	0.17	0.000	0.000	0.0	0.2	0.0
4	1:QZLokaal	Qw11	0.17	0.17	0.000	1.474	0.0	0.2	0.0
4	1:QZLokaal	Qw12	0.07	0.07	0.226	0.000	0.0	0.2	0.0
5	1:QZLokaal	Qw12	0.07	0.07	0.000	0.000	0.0	0.2	0.0
10	1:QZLokaal	Qw8	-0.15	-0.15	0.000	0.000	0.0	0.2	0.0
9	1:QZLokaal	Qw8	-0.15	-0.15	0.000	0.000	0.0	0.2	0.0

Project...: bedrijfshal te Lottum
Onderdeel: tussenspananten

BELASTINGEN

B.G:9 Wind van links overdruk D

**STAAFBELASTINGEN**

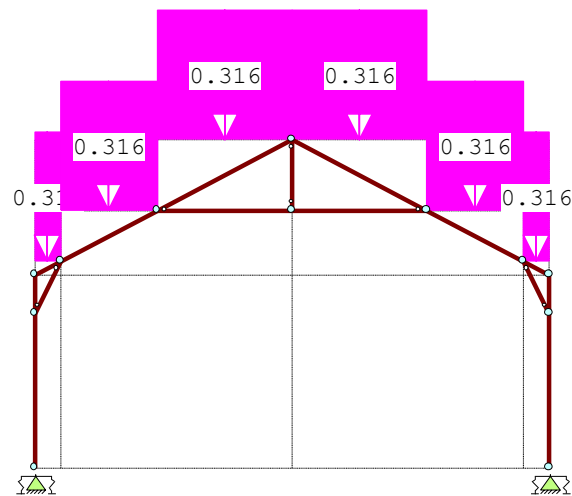
B.G:9 Wind van links overdruk D

Staafl	Type	Index	q1/p/m	q2	A	B	ψ_0	ψ_1	ψ_2
1	1:QZLokaal	Qw9	0.06	0.06	0.000	0.000	0.0	0.2	0.0
2	1:QZLokaal	Qw9	0.06	0.06	0.000	0.000	0.0	0.2	0.0
3	1:QZLokaal	Qw9	0.06	0.06	0.000	0.000	0.0	0.2	0.0
4	1:QZLokaal	Qw9	0.06	0.06	0.000	0.000	0.0	0.2	0.0
5	1:QZLokaal	Qw9	0.06	0.06	0.000	0.000	0.0	0.2	0.0
6	1:QZLokaal	Qw9	0.06	0.06	0.000	0.000	0.0	0.2	0.0
7	1:QZLokaal	Qw9	0.06	0.06	0.000	0.000	0.0	0.2	0.0
8	1:QZLokaal	Qw9	0.06	0.06	0.000	0.000	0.0	0.2	0.0
10	1:QZLokaal	Qw10	-0.06	-0.06	0.000	0.000	0.0	0.2	0.0
9	1:QZLokaal	Qw10	-0.06	-0.06	0.000	0.000	0.0	0.2	0.0
1	1:QZLokaal	Qw3	-0.25	-0.25	0.000	0.000	0.0	0.2	0.0
2	1:QZLokaal	Qw3	-0.25	-0.25	0.000	0.000	0.0	0.2	0.0
3	1:QZLokaal	Qw11	0.17	0.17	0.000	0.000	0.0	0.2	0.0
4	1:QZLokaal	Qw11	0.17	0.17	0.000	1.474	0.0	0.2	0.0
4	1:QZLokaal	Qw12	0.07	0.07	0.226	0.000	0.0	0.2	0.0
5	1:QZLokaal	Qw12	0.07	0.07	0.000	0.000	0.0	0.2	0.0
10	1:QZLokaal	Qw8	-0.15	-0.15	0.000	0.000	0.0	0.2	0.0
9	1:QZLokaal	Qw8	-0.15	-0.15	0.000	0.000	0.0	0.2	0.0

Project...: bedrijfshal te Lottum
Onderdeel: tussenspanten

BELASTINGEN

B.G:10 Sneeuw A



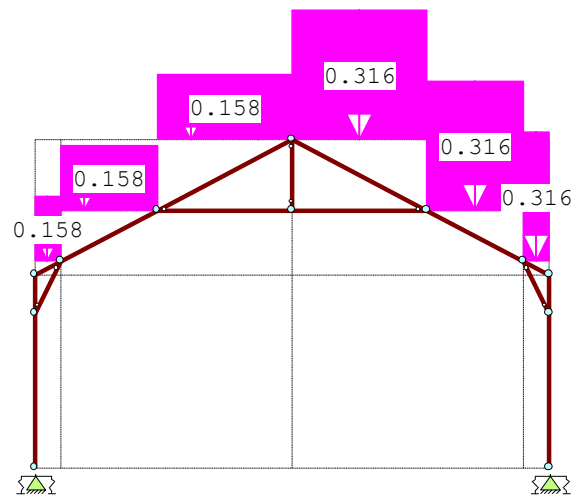
STAAFBELASTINGEN

B.G:10 Sneeuw A

Staafl	Type	Index	q1/p/m	q2	A	B	Ψ_0	Ψ_1	Ψ_2
3	3:QZgeProj.	Qs1	-0.32	-0.32	0.000	0.000	0.0	0.2	0.0
4	3:QZgeProj.	Qs1	-0.32	-0.32	0.000	0.000	0.0	0.2	0.0
5	3:QZgeProj.	Qs1	-0.32	-0.32	0.000	0.000	0.0	0.2	0.0
6	3:QZgeProj.	Qs1	-0.32	-0.32	0.000	0.000	0.0	0.2	0.0
7	3:QZgeProj.	Qs1	-0.32	-0.32	0.000	0.000	0.0	0.2	0.0
8	3:QZgeProj.	Qs1	-0.32	-0.32	0.000	0.000	0.0	0.2	0.0

BELASTINGEN

B.G:11 Sneeuw B



Project...: bedrijfshal te Lottum
Onderdeel: tussenspanten

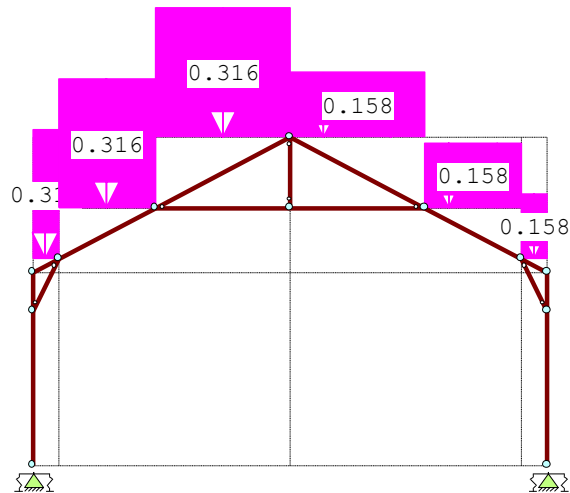
STAAFBELASTINGEN

B.G:11 Sneeuw B

Staafl	Type	Index	q1/p/m	q2	A	B	Ψ_0	Ψ_1	Ψ_2
3	3:QZgeProj.	Qs2	-0.16	-0.16	0.000	0.000	0.0	0.2	0.0
4	3:QZgeProj.	Qs2	-0.16	-0.16	0.000	0.000	0.0	0.2	0.0
5	3:QZgeProj.	Qs2	-0.16	-0.16	0.000	0.000	0.0	0.2	0.0
6	3:QZgeProj.	Qs1	-0.32	-0.32	0.000	0.000	0.0	0.2	0.0
7	3:QZgeProj.	Qs1	-0.32	-0.32	0.000	0.000	0.0	0.2	0.0
8	3:QZgeProj.	Qs1	-0.32	-0.32	0.000	0.000	0.0	0.2	0.0

BELASTINGEN

B.G:12 Sneeuw C

**STAAFBELASTINGEN**

B.G:12 Sneeuw C

Staafl	Type	Index	q1/p/m	q2	A	B	Ψ_0	Ψ_1	Ψ_2
3	3:QZgeProj.	Qs1	-0.32	-0.32	0.000	0.000	0.0	0.2	0.0
4	3:QZgeProj.	Qs1	-0.32	-0.32	0.000	0.000	0.0	0.2	0.0
5	3:QZgeProj.	Qs1	-0.32	-0.32	0.000	0.000	0.0	0.2	0.0
6	3:QZgeProj.	Qs2	-0.16	-0.16	0.000	0.000	0.0	0.2	0.0
7	3:QZgeProj.	Qs2	-0.16	-0.16	0.000	0.000	0.0	0.2	0.0
8	3:QZgeProj.	Qs2	-0.16	-0.16	0.000	0.000	0.0	0.2	0.0

BEREKENINGSTATUS

Controlerende berekening

B.C.	Iteratie	Status
1	3	Nauwkeurigheid bereikt
2	3	Nauwkeurigheid bereikt
3	3	Nauwkeurigheid bereikt
4	3	Nauwkeurigheid bereikt
5	3	Nauwkeurigheid bereikt
6	3	Nauwkeurigheid bereikt
7	3	Nauwkeurigheid bereikt
8	3	Nauwkeurigheid bereikt
9	3	Nauwkeurigheid bereikt
10	3	Nauwkeurigheid bereikt
11	3	Nauwkeurigheid bereikt
12	3	Nauwkeurigheid bereikt

Project...: bedrijfshal te Lottum
Onderdeel: tussenspanten

BEREKENINGSTATUS

Controlerende berekening

B.C. Iteratie Status

13	3	Nauwkeurigheid bereikt
14	3	Nauwkeurigheid bereikt
15	3	Nauwkeurigheid bereikt
16	3	Nauwkeurigheid bereikt
17	3	Nauwkeurigheid bereikt
18	3	Nauwkeurigheid bereikt
19	3	Nauwkeurigheid bereikt
20	3	Nauwkeurigheid bereikt
21	3	Nauwkeurigheid bereikt
22	3	Nauwkeurigheid bereikt
23	3	Nauwkeurigheid bereikt
24	3	Nauwkeurigheid bereikt
25	3	Nauwkeurigheid bereikt
26	3	Nauwkeurigheid bereikt
27	3	Nauwkeurigheid bereikt
28	3	Nauwkeurigheid bereikt
29	3	Nauwkeurigheid bereikt
30	3	Nauwkeurigheid bereikt
31	3	Nauwkeurigheid bereikt
32	3	Nauwkeurigheid bereikt
33	3	Nauwkeurigheid bereikt
34	3	Nauwkeurigheid bereikt
35	3	Nauwkeurigheid bereikt
36	3	Nauwkeurigheid bereikt
37	3	Nauwkeurigheid bereikt
38	3	Nauwkeurigheid bereikt
39	3	Nauwkeurigheid bereikt
40	3	Nauwkeurigheid bereikt
41	3	Nauwkeurigheid bereikt
42	3	Nauwkeurigheid bereikt
43	3	Nauwkeurigheid bereikt
44	3	Nauwkeurigheid bereikt
45	3	Nauwkeurigheid bereikt
46	3	Nauwkeurigheid bereikt
47	3	Nauwkeurigheid bereikt
48	3	Nauwkeurigheid bereikt
49	3	Nauwkeurigheid bereikt

BELASTINGCOMBINATIES

BC	Type				
1	Fund.	1.22	$G_{k,1}$		
2	Fund.	0.90	$G_{k,1}$		
3	Fund.	1.08	$G_{k,1}$	+	1.35 $Q_{k,2}$
4	Fund.	1.08	$G_{k,1}$	+	1.35 $Q_{k,3}$
5	Fund.	1.08	$G_{k,1}$	+	1.35 $Q_{k,4}$
6	Fund.	1.08	$G_{k,1}$	+	1.35 $Q_{k,5}$
7	Fund.	1.08	$G_{k,1}$	+	1.35 $Q_{k,6}$

Project...: bedrijfshal te Lottum
 Onderdeel: tussenspanten

BELASTINGCOMBINATIES

BC Type					
8	Fund.	1.08	$G_{k,1}$	+	1.35 $Q_{k,7}$
9	Fund.	1.08	$G_{k,1}$	+	1.35 $Q_{k,8}$
10	Fund.	1.08	$G_{k,1}$	+	1.35 $Q_{k,9}$
11	Fund.	1.08	$G_{k,1}$	+	1.35 $Q_{k,10}$
12	Fund.	1.08	$G_{k,1}$	+	1.35 $Q_{k,11}$
13	Fund.	1.08	$G_{k,1}$	+	1.35 $Q_{k,12}$
14	Fund.	0.90	$G_{k,1}$	+	1.35 $Q_{k,2}$
15	Fund.	0.90	$G_{k,1}$	+	1.35 $Q_{k,3}$
16	Fund.	0.90	$G_{k,1}$	+	1.35 $Q_{k,4}$
17	Fund.	0.90	$G_{k,1}$	+	1.35 $Q_{k,5}$
18	Fund.	0.90	$G_{k,1}$	+	1.35 $Q_{k,6}$
19	Fund.	0.90	$G_{k,1}$	+	1.35 $Q_{k,7}$
20	Fund.	0.90	$G_{k,1}$	+	1.35 $Q_{k,8}$
21	Fund.	0.90	$G_{k,1}$	+	1.35 $Q_{k,9}$
22	Fund.	0.90	$G_{k,1}$	+	1.35 $Q_{k,10}$
23	Fund.	0.90	$G_{k,1}$	+	1.35 $Q_{k,11}$
24	Fund.	0.90	$G_{k,1}$	+	1.35 $Q_{k,12}$
25	Kar.	1.00	$G_{k,1}$	+	1.00 $Q_{k,2}$
26	Kar.	1.00	$G_{k,1}$	+	1.00 $Q_{k,3}$
27	Kar.	1.00	$G_{k,1}$	+	1.00 $Q_{k,4}$
28	Kar.	1.00	$G_{k,1}$	+	1.00 $Q_{k,5}$
29	Kar.	1.00	$G_{k,1}$	+	1.00 $Q_{k,6}$
30	Kar.	1.00	$G_{k,1}$	+	1.00 $Q_{k,7}$
31	Kar.	1.00	$G_{k,1}$	+	1.00 $Q_{k,8}$
32	Kar.	1.00	$G_{k,1}$	+	1.00 $Q_{k,9}$
33	Kar.	1.00	$G_{k,1}$	+	1.00 $Q_{k,10}$
34	Kar.	1.00	$G_{k,1}$	+	1.00 $Q_{k,11}$
35	Kar.	1.00	$G_{k,1}$	+	1.00 $Q_{k,12}$
36	Quas.	1.00	$G_{k,1}$		
37	Freq.	1.00	$G_{k,1}$		
38	Freq.	1.00	$G_{k,1}$	+	1.00 $\psi_1 Q_{k,2}$
39	Freq.	1.00	$G_{k,1}$	+	1.00 $\psi_1 Q_{k,3}$
40	Freq.	1.00	$G_{k,1}$	+	1.00 $\psi_1 Q_{k,4}$
41	Freq.	1.00	$G_{k,1}$	+	1.00 $\psi_1 Q_{k,5}$
42	Freq.	1.00	$G_{k,1}$	+	1.00 $\psi_1 Q_{k,6}$
43	Freq.	1.00	$G_{k,1}$	+	1.00 $\psi_1 Q_{k,7}$
44	Freq.	1.00	$G_{k,1}$	+	1.00 $\psi_1 Q_{k,8}$
45	Freq.	1.00	$G_{k,1}$	+	1.00 $\psi_1 Q_{k,9}$
46	Freq.	1.00	$G_{k,1}$	+	1.00 $\psi_1 Q_{k,10}$
47	Freq.	1.00	$G_{k,1}$	+	1.00 $\psi_1 Q_{k,11}$
48	Freq.	1.00	$G_{k,1}$	+	1.00 $\psi_1 Q_{k,12}$
49	Blij.	1.00	$G_{k,1}$		

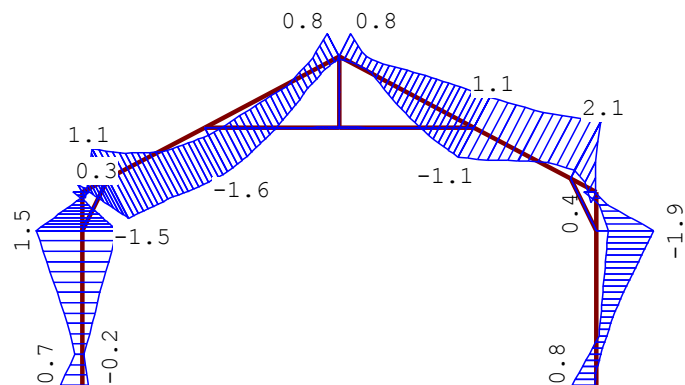
Project...: bedrijfshal te Lottum
Onderdeel: tussenspanten

GUNSTIGE WERKING PERMANENTE BELASTINGEN

BC Staven met gunstige werking	
1	Geen
2	Alle staven de factor:0.90
3	Geen
4	Geen
5	Geen
6	Geen
7	Geen
8	Geen
9	Geen
10	Geen
11	Geen
12	Geen
13	Geen
14	Alle staven de factor:0.90
15	Alle staven de factor:0.90
16	Alle staven de factor:0.90
17	Alle staven de factor:0.90
18	Alle staven de factor:0.90
19	Alle staven de factor:0.90
20	Alle staven de factor:0.90
21	Alle staven de factor:0.90
22	Alle staven de factor:0.90
23	Alle staven de factor:0.90
24	Alle staven de factor:0.90

OMHULLENDE VAN DE FUNDAMENTELE COMBINATIES

MOMENTEN	2e orde	Fundamentele combinatie
-----------------	---------	-------------------------

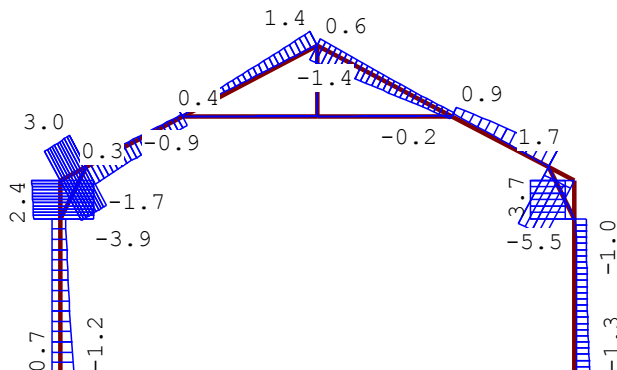


Project..: bedrijfshal te Lottum
Onderdeel: tussenspanen

DWARSKRACHTEN

2e orde

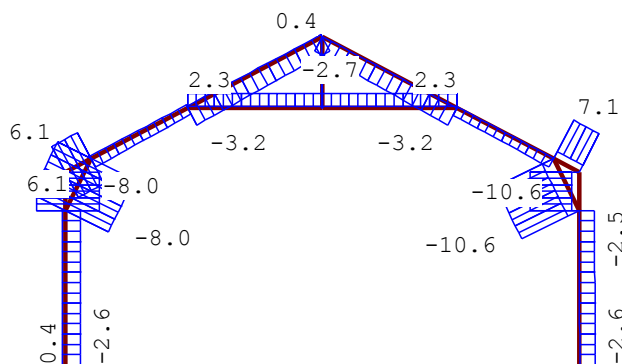
Fundamentele combinatie



NORMAALKRACHTEN

2e orde

Fundamentele combinatie



STAATSKRACHTEN

2e 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		-2.60	11	0.39	17	-1.22	14	0.70	11	-0.20	12	0.70	14
1		0.480	-2.59	11	0.41	17	-1.00	14	0.70	11	-0.07	12	0.23	14
1	2		-2.53	11	0.46	17	-0.46	15	0.69	11	-1.12	15	1.47	11
2	2		-5.68	15	4.65	11	-2.86	11	2.25	15	-1.12	15	1.47	11
2		0.500	-5.67	15	4.67	11	-2.85	11	2.38	15	-0.00	17	0.05	11
2	3		-5.66	15	4.67	11	-2.85	11	2.41	15	-0.24	11	0.27	15
3	3		-4.76	15	4.70	11	-3.90	15	2.81	11	-0.24	11	0.27	15
3		0.090	-4.76	15	4.72	11	-3.87	15	2.85	11	-0.08	11	0.04	14
3	5		-4.74	15	4.81	11	-3.76	15	3.03	11	-1.46	15	1.08	11
4	5		-1.65	11	0.38	17	-1.67	11	0.28	17	-1.46	15	1.08	11
4		0.595	-1.50	11	0.42	17	-1.39	11	0.21	17	-1.50	15	0.28	12
4		0.680	-1.48	11	0.42	17	-1.35	11	0.21	17	-1.50	15	0.19	12
4		0.881	-1.43	11	0.43	17	-1.25	11	0.20	17	-1.54	3	0.00	23
4		1.530	-1.27	11	0.47	17	-0.95	11	0.16	17	-1.63	3	-0.24	2
4	6		-1.23	11	0.48	17	-0.87	11	0.18	15	-1.63	3	-0.29	2

Project...: bedrijfshal te Lottum
Onderdeel: tussenspananten

STAAFKRACHTEN			2e orde				Fundamentele combinatie					
St.	Kn.	Pos.	NXi/NXj				DZi/DZj				MYi/MYj	
			Min	BC	Max	BC	Min	BC	Max	BC	Min	BC
5	6		-3.24	11	0.25	17	0.08	2	0.43	4	-1.63	3
5		0.852	-3.03	11	0.30	17	0.17	2	0.69	3	-1.18	3
5		1.508	-2.87	11	0.34	17	0.14	21	0.96	3	-0.64	3
5	4		-2.66	11	0.39	17	0.08	21	1.36	11	-0.08	17
6	4		-2.66	11	0.05	17	-1.36	11	0.63	15	-0.08	17
6		0.172	-2.70	11	0.04	17	-1.28	11	0.60	15	0.00	17
6		0.284	-2.73	11	0.04	17	-1.23	11	0.57	15	0.04	17
6		0.379	-2.75	11	0.03	17	-1.18	11	0.55	15	0.04	21
6		0.586	-2.80	11	0.02	17	-1.08	11	0.51	15	0.00	23
6		1.893	-3.12	11	-0.06	17	-0.47	11	0.33	15	-0.95	12
6	8		-3.24	11	-0.08	17	-0.24	11	0.36	14	-1.09	12
7	8		-1.42	7	0.14	17	0.24	2	0.87	11	-1.09	12
7		1.156	-1.52	7	0.08	17	0.11	17	1.41	11	0.00	12
7	9		-1.65	11	0.04	17	0.03	17	1.67	11	0.29	2
8	9		1.27	2	7.13	3	-5.49	3	-0.80	2	0.29	2
8		0.276	1.25	2	7.12	3	-5.46	3	-0.77	2	0.00	2
8		0.436	1.24	2	7.11	3	-5.44	3	-0.75	2	-0.35	2
8	7		1.24	2	7.10	3	-5.44	3	-0.75	2	-0.39	2
9	11		-2.60	11	-0.07	17	-1.34	4	-0.18	2	0.05	2
9		0.222	-2.59	11	-0.07	17	-1.27	4	-0.18	2	0.00	23
9		0.686	-2.58	11	-0.05	17	-1.15	3	-0.18	2	-0.28	11
9	10		-2.53	11	-0.01	17	-1.00	3	-0.08	21	-1.86	3
10	10		1.22	2	8.10	3	0.75	2	3.72	3	-1.86	3
10		0.437	1.24	2	8.12	3	0.75	2	3.75	3	-0.29	7
10		0.571	1.24	2	8.12	3	0.75	2	3.76	3	0.00	7
10	7		1.24	2	8.12	3	0.75	2	3.76	3	0.06	7
11	2		-8.01	11	6.12	15	-0.01	1	-0.01	2	0.00	1
11		0.452	-7.99	11	6.14	15	-0.00	1	0.00	2	-0.00	1
11	5		-7.98	11	6.15	15	0.01	2	0.01	1	0.00	1
12	9		-10.61	3	-2.10	2	-0.01	1	-0.01	15	0.00	1
12		0.452	-10.63	3	-2.12	2	-0.00	1	0.00	14	-0.00	1
12	10		-10.64	3	-2.13	2	0.01	15	0.01	1	0.00	1
13	6		0.19	16	2.29	11	-0.05	11	-0.02	17	0.00	1
13		0.838	0.19	16	2.29	11	-0.02	11	0.00	17	-0.03	11
13		1.592	0.19	16	2.29	11	-0.00	22	0.02	6	-0.04	11
13		1.598	0.19	16	2.29	11	-0.00	22	0.02	6	-0.04	11
13		1.676	0.19	16	2.29	11	-0.00	22	0.03	6	-0.04	11
13	12		0.19	16	2.29	11	0.01	22	0.04	6	-0.04	11
14	12		0.19	16	2.29	11	-0.04	6	-0.01	22	-0.04	11
14		0.419	0.19	16	2.29	11	-0.03	6	0.00	22	-0.04	11
14		0.497	0.19	16	2.29	11	-0.02	6	0.00	22	-0.04	11
14		1.257	0.19	16	2.29	11	-0.00	6	0.02	22	-0.03	11
14	8		0.19	16	2.29	11	0.02	17	0.05	11	0.00	11
15	12		0.02	22	0.08	6	-0.00	12	0.00	3	0.00	1

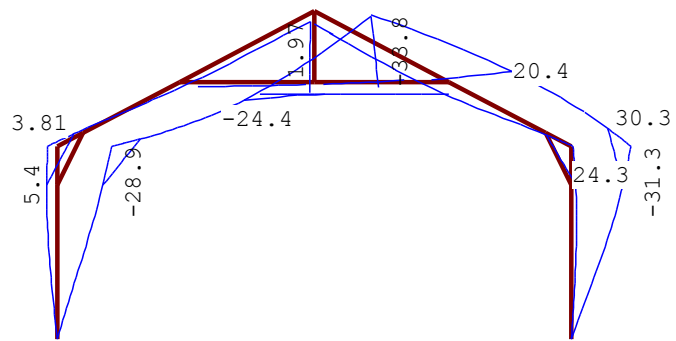
Project...: bedrijfshal te Lottum
Onderdeel: tussenspannten

STAAFKRACHTEN			2e orde						Fundamentele combinatie					
			NXi/NXj				DZi/DZj				MYi/MYj			
St.	Kn.	Pos.	Min	BC	Max	BC	Min	BC	Max	BC	Min	BC	Max	BC
15	4		0.05	22	0.12	6	-0.00	3	0.00	12	0.00	12	0.00	3

REACTIES		2e orde		Fundamentele combinatie			
Kn.		X-min	X-max	Z-min	Z-max	M-min	M-max
1		-1.20	0.69	-0.38	2.60	-0.70	0.20
11		-1.33	-0.18	0.08	2.60	-0.79	-0.05

OMHULLENDE VAN DE KARAKTERISTIEKE COMBINATIES

VERPLAATSINGEN	2e orde [mm]	Karakteristieke combinatie
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TS/Raamwerken

berekening kopgevel

Project...: bedrijfshal te Lottum
 Onderdeel: kopgevel
 Dimensies: kN;m;rad (tenzij anders aangegeven)

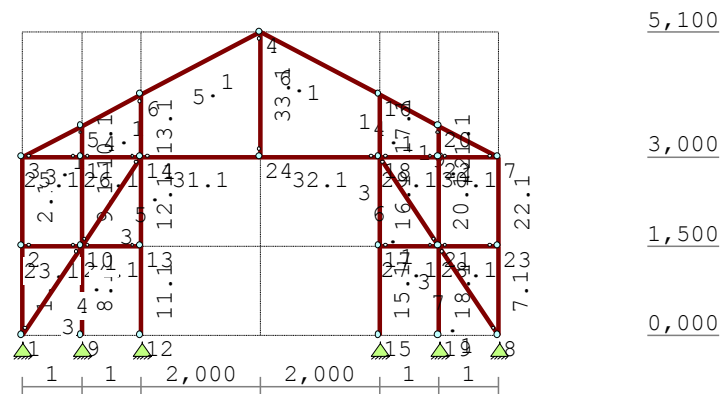
Belastingbreedte.: 0.750
 Rekenmodel.....: 2e-orde-elastisch.
 Theorieën voor de bepaling van de krachtsverdeling:
 1) Uiterste grenstoestand:
 Geometrisch niet lineair alle staven.
 Fysisch lineair alle staven.
 2) Gebruiksgrenstoestand:
 Geometrisch niet lineair alle staven.
 Fysisch lineair alle staven.

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.

Toegepaste normen volgens Eurocode met Nederlandse NB

Belastingen	NEN-EN 1990:2002	C2:2010	NB:2011(nl)
	NEN-EN 1991-1-1:2002	C1:2009	NB:2011(nl)
	NEN-EN 1991-1-3:2003	C1:2009	NB:2011(nl)
	NEN-EN 1991-1-4:2005	C2:2011	NB:2011(nl)

GEOMETRIE**STRAMIENLIJNEN**

Nr.	X	Z-min	Z-max
1	0.000	0.000	5.100
2	4.000	0.000	5.100
3	8.000	0.000	5.100
4	1.000	0.000	5.100
5	2.000	0.000	5.100
6	6.000	0.000	5.100
7	7.000	0.000	5.100

Project...: bedrijfshal te Lottum
Onderdeel: kopgevel

NIVEAUS

Nr.	Z	X-min	X-max
1	0.000	0.000	8.000
2	5.100	0.000	8.000
3	3.000	0.000	8.000
4	1.500	0.000	8.000

MATERIALEN

Mt	Omschrijving	E-modulus[N/mm2]	S.M.	Pois.	Uitz. coëff
1	S235	210000	78.5	0.30	1.2000e-005

PROFIELEN [mm]

Prof.	Omschrijving	Materiaal	Oppervlak	Traagheid	Vormf.
1	_C150/45/1.5	1:S235	3.8700e+002	1.2883e+006	0.00

PROFIELEN vervolg [mm]

Prof.	Staaftype	Breedte	Hoogte	e	Type	b1	h1	b2	h2
1	0:Normaal	45	150	75.0					

KNOPEN

Knoop	X	Z	Knoop	X	Z
1	0.000	0.000	6	2.000	4.050
2	0.000	1.500	7	8.000	3.000
3	0.000	3.000	8	8.000	0.000
4	4.000	5.100	9	1.000	0.000
5	1.000	3.525	10	1.000	1.500
11	1.000	3.000	16	6.000	4.050
12	2.000	0.000	17	6.000	1.500
13	2.000	1.500	18	6.000	3.000
14	2.000	3.000	19	7.000	0.000
15	6.000	0.000	20	7.000	3.525
21	7.000	1.500			
22	7.000	3.000			
23	8.000	1.500			
24	4.000	3.000			

STAVEN

St.	ki	kj	Profiel	Aansl.i	Aansl.j	Lengte	Opm.
1	1	2	1:_C150/45/1.5	NDM	NDM	1.500	
2	2	3	1:_C150/45/1.5	NDM	NDM	1.500	
3	3	5	1:_C150/45/1.5	NDM	NDM	1.129	
4	5	6	1:_C150/45/1.5	NDM	NDM	1.129	
5	6	4	1:_C150/45/1.5	NDM	NDM	2.259	
6	4	16	1:_C150/45/1.5	NDM	NDM	2.259	
7	8	23	1:_C150/45/1.5	NDM	NDM	1.500	
8	9	10	1:_C150/45/1.5	NDM	NDM	1.500	
9	10	11	1:_C150/45/1.5	NDM	NDM	1.500	
10	11	5	1:_C150/45/1.5	NDM	ND	0.525	
11	12	13	1:_C150/45/1.5	NDM	NDM	1.500	
12	13	14	1:_C150/45/1.5	NDM	NDM	1.500	
13	14	6	1:_C150/45/1.5	NDM	ND	1.050	
14	16	20	1:_C150/45/1.5	NDM	NDM	1.129	

Project...: bedrijfshal te Lottum
Onderdeel: kopgevel

STAVEN

St.	ki	kj	Profiel	Aansl.i	Aansl.j	Lengte	Opm.
15	15	17	1:_C150/45/1.5	NDM	NDM	1.500	
16	17	18	1:_C150/45/1.5	NDM	NDM	1.500	
17	18	16	1:_C150/45/1.5	NDM	NDM	1.050	
18	19	21	1:_C150/45/1.5	NDM	NDM	1.500	
19	20	7	1:_C150/45/1.5	NDM	NDM	1.129	
20	21	22	1:_C150/45/1.5	NDM	NDM	1.500	
21	22	20	1:_C150/45/1.5	NDM	ND	0.525	
22	23	7	1:_C150/45/1.5	NDM	NDM	1.500	
23	2	10	1:_C150/45/1.5	ND	ND	1.000	
24	10	13	1:_C150/45/1.5	ND	ND	1.000	
25	3	11	1:_C150/45/1.5	ND	ND	1.000	
26	11	14	1:_C150/45/1.5	ND	ND	1.000	
27	17	21	1:_C150/45/1.5	ND	ND	1.000	
28	21	23	1:_C150/45/1.5	ND	ND	1.000	
29	18	22	1:_C150/45/1.5	ND	ND	1.000	
30	22	7	1:_C150/45/1.5	ND	ND	1.000	
31	14	24	1:_C150/45/1.5	ND	NDM	2.000	
32	24	18	1:_C150/45/1.5	NDM	ND	2.000	
33	24	4	1:_C150/45/1.5	ND	ND	2.100	
34	1	10	1:_C150/45/1.5	ND	ND	1.803	
35	10	14	1:_C150/45/1.5	ND	ND	1.803	
36	18	21	1:_C150/45/1.5	ND	ND	1.803	
37	21	8	1:_C150/45/1.5	ND	ND	1.803	

VASTE STEUNPUNTEN

Nr.	knoop	Kode	XZR	1=vast	0=vrij	Hoek
1		1	110			0.00
2		8	110			0.00
3		9	110			0.00
4		12	110			0.00
5		15	110			0.00
6		19	110			0.00

BELASTINGGENERATIE ALGEMEEN.

Betrouwbaarheidsklasse.....:	1	Referentieperiode.....:	15
Gebouwdiepte.....:	6.00	Gebouwhoogte.....:	3.30
Niveau aansl.terrein.....:	0.00	E.g. scheid.w. [kN/m2]:	0.00

WIND

Terrein categorie ...[4.3.2]...: Onbebouwd				
Windgebied	3	Vb,0 ..[4.2].....	24.500	
Referentie periode wind.....	15.00	Vb(p) ..[4.2].....	22.397	
K	[4.2].....	0.280	n[4.2].....	0.500
Positie spant in het gebouw....	0.750	Kr[4.3.2].....	0.209	
z0	[4.3.2]....	0.200	Zmin ..[4.3.2].....	4.000

Project...: bedrijfshal te Lottum
Onderdeel: kopgevel

WIND

Co wind van links ..[4.3.3]....:	1.000	Co wind van rechts.....:	1.000
Co wind loodrecht ..[4.3.3]....:	1.000		
Cpi wind van links ..[7.2.9]....:	0.200	-0.300	
Cpi windloodrecht ...[7.2.9]....:	0.200	-0.300	
Cpi wind van rechts .[7.2.9]....:	0.200	-0.300	
Cfr windwrijving[7.5].....:	0.040		

SNEEUW

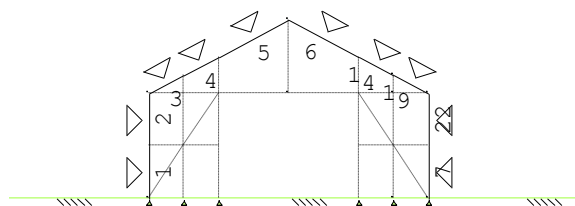
Sneeuwbelasting (sk) 50 jaar :	0.70
Sneeuwbelasting (sn) n jaar :	0.53

STAFTYPEN

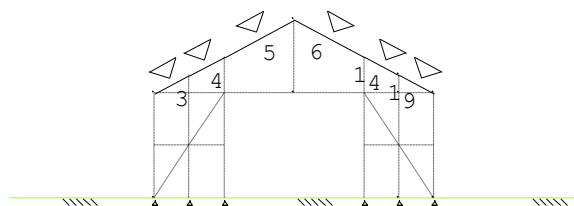
Type	staven
1:Vloer.	: 23-32
4:Wand / kolom.	: 8-13,15-18,20,21,33
5:Linker gevel.	: 1,2
6:Rechter gevel.	: 7,22
7:Dak.	: 3-6,14,19
9:Open.	: 34-37

LASTVELDEN

Wind staven



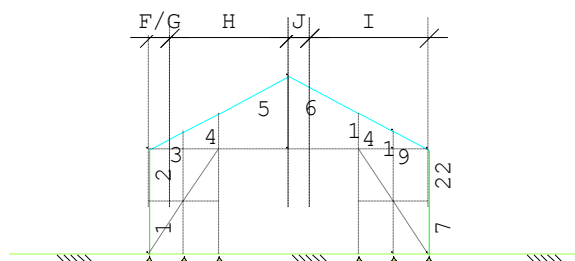
Sneeuw staven

**WIND DAKTYPES**

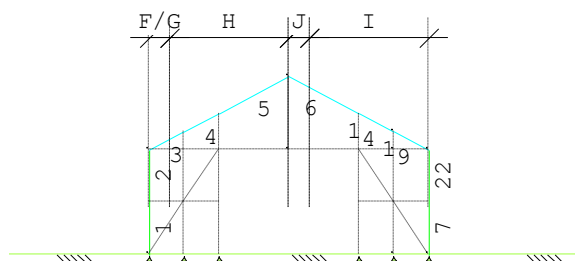
Nr.	Staaft Type	reductie bij wind van links	reductie bij wind van Rechts	Cpe volgens art:
1	1-2 Gevel	1.000	1.000	7.2.2
2	3-5 Zadel dak	1.000	1.000	7.2.5
3	6-19 Zadel dak	1.000	1.000	7.2.5
4	22-7 Gevel	1.000	1.000	7.2.2

WIND ZONES

Wind van links



Wind van rechts



Project...: bedrijfshal te Lottum
Onderdeel: kopgevel

WIND VAN LINKS ZONES

Nr.	Staafl	Positie	Lengte	Zone
1	1-2	0.000	3.000	D
2	3-5	0.000	0.600	F/G
3	3-5	0.600	3.400	H
4	6-19	0.000	0.600	J
5	6-19	0.600	3.400	I
6	22-7	0.000	3.000	E

Wind indexen

Index	CsCd	Cpe/Cpi	qp	breedte	reductie	Qw	Zone	Hoek(en)
Qw1		0.300	0.410	0.750		-0.092		
Qw2		-0.300	0.410	0.750		0.092		
Qw3	1.00	0.800	0.410	0.750		-0.246	D	
Qw4	1.00	0.623	0.410	0.750		-0.192	F	27.7
Qw5	1.00	0.369	0.410	0.750		-0.114	H	27.7
Qw6	1.00	-0.577	0.410	0.750		0.177	J	27.7
Qw7	1.00	-0.400	0.410	0.750		0.123	I	27.7
Qw8	1.00	0.500	0.410	0.750		-0.154	E	
Qw9		-0.200	0.410	0.750		0.062		
Qw10		0.200	0.410	0.750		-0.062		
Qw11	1.00	-0.561	0.410	0.750		0.173	F	27.7
Qw12	1.00	-0.215	0.410	0.750		0.066	H	27.7

SNEEUW DAKTYPEN

Staafl	artikel
3-5	5.3.3 Zadeldak
6-19	5.3.3 Zadeldak

Sneeuw indexen

Index	art	μ	s_k	red.	posfac	breedte	Q_s	hoek
Qs1	5.3.3	0.800	0.53	1.00		0.750	0.316	27.7
Qs2	5.3.3	0.400	0.53	1.00		0.750	0.158	27.7

BELASTINGGEVALLEN

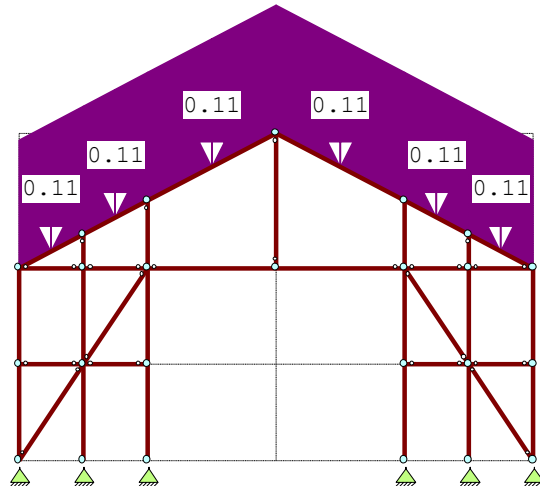
B.G.	Omschrijving	Type
	1 permanent EGZ=-1.00	1 Permanente belasting
g	2 Wind van links onderdruk A	7
g	3 Wind van links overdruk A	8
g	4 Wind van links onderdruk B	9
g	5 Wind van links overdruk B	10
g	6 Wind van links onderdruk C	37
g	7 Wind van links overdruk C	38
g	8 Wind van links onderdruk D	39
g	9 Wind van links overdruk D	40
g	10 Sneeuw A	22
g	11 Sneeuw B	23
g	12 Sneeuw C	33
g	= gegenereerd belastinggeval	

Project...: bedrijfshal te Lottum
Onderdeel: kopgevel

BELASTINGEN

B.G:1 permanent

Eigen gewicht van alle staven is meegenomen in berekening. Richting:↓

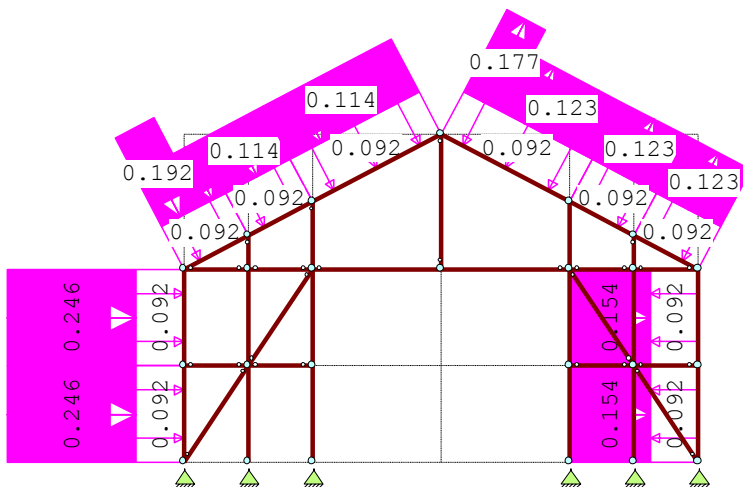
**STAAFBELASTINGEN**

B.G:1 permanent

Staal	Type	q1/p/m	q2	A	B	ψ_0	ψ_1	ψ_2
3	5:QZGloaal	-0.11	-0.11	0.000	0.000			
4	5:QZGloaal	-0.11	-0.11	0.000	0.000			
5	5:QZGloaal	-0.11	-0.11	0.000	0.000			
6	5:QZGloaal	-0.11	-0.11	0.000	0.000			
14	5:QZGloaal	-0.11	-0.11	0.000	0.000			
19	5:QZGloaal	-0.11	-0.11	0.000	0.000			

BELASTINGEN

B.G:2 Wind van links onderdruk A



Project...: bedrijfshal te Lottum
Onderdeel: kopgevel

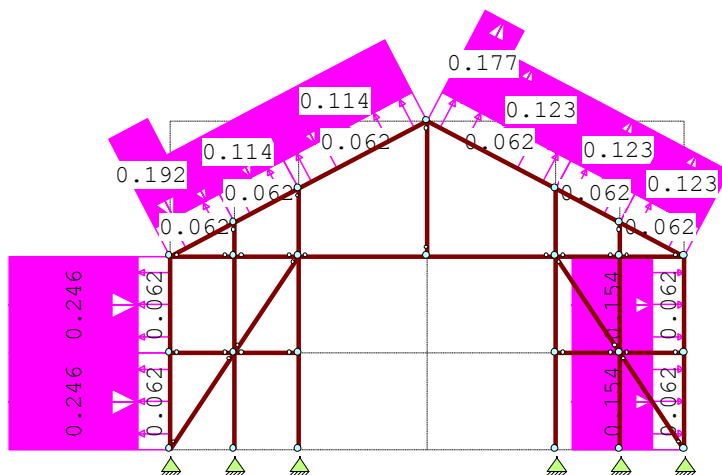
STAAFBELASTINGEN

B.G:2 Wind van links onderdruk A

Staafl	Type	Index	q1/p/m	q2	A	B	Ψ_0	Ψ_1	Ψ_2
1	1:QZLokaal	Qw1	-0.09	-0.09	0.000	0.000	0.0	0.2	0.0
2	1:QZLokaal	Qw1	-0.09	-0.09	0.000	0.000	0.0	0.2	0.0
3	1:QZLokaal	Qw1	-0.09	-0.09	0.000	0.000	0.0	0.2	0.0
4	1:QZLokaal	Qw1	-0.09	-0.09	0.000	0.000	0.0	0.2	0.0
5	1:QZLokaal	Qw1	-0.09	-0.09	0.000	0.000	0.0	0.2	0.0
6	1:QZLokaal	Qw1	-0.09	-0.09	0.000	0.000	0.0	0.2	0.0
14	1:QZLokaal	Qw1	-0.09	-0.09	0.000	0.000	0.0	0.2	0.0
19	1:QZLokaal	Qw1	-0.09	-0.09	0.000	0.000	0.0	0.2	0.0
22	1:QZLokaal	Qw2	0.09	0.09	0.000	0.000	0.0	0.2	0.0
7	1:QZLokaal	Qw2	0.09	0.09	0.000	0.000	0.0	0.2	0.0
1	1:QZLokaal	Qw3	-0.25	-0.25	0.000	0.000	0.0	0.2	0.0
2	1:QZLokaal	Qw3	-0.25	-0.25	0.000	0.000	0.0	0.2	0.0
3	1:QZLokaal	Qw4	-0.19	-0.19	0.000	0.452	0.0	0.2	0.0
3	1:QZLokaal	Qw5	-0.11	-0.11	0.678	0.000	0.0	0.2	0.0
4	1:QZLokaal	Qw5	-0.11	-0.11	0.000	0.000	0.0	0.2	0.0
5	1:QZLokaal	Qw5	-0.11	-0.11	0.000	0.000	0.0	0.2	0.0
6	1:QZLokaal	Qw6	0.18	0.18	0.000	1.581	0.0	0.2	0.0
6	1:QZLokaal	Qw7	0.12	0.12	0.678	0.000	0.0	0.2	0.0
14	1:QZLokaal	Qw7	0.12	0.12	0.000	0.000	0.0	0.2	0.0
19	1:QZLokaal	Qw7	0.12	0.12	0.000	0.000	0.0	0.2	0.0
22	1:QZLokaal	Qw8	-0.15	-0.15	0.000	0.000	0.0	0.2	0.0
7	1:QZLokaal	Qw8	-0.15	-0.15	0.000	0.000	0.0	0.2	0.0

BELASTINGEN

B.G:3 Wind van links overdruk A

**STAAFBELASTINGEN**

B.G:3 Wind van links overdruk A

Staafl	Type	Index	q1/p/m	q2	A	B	Ψ_0	Ψ_1	Ψ_2
1	1:QZLokaal	Qw9	0.06	0.06	0.000	0.000	0.0	0.2	0.0
2	1:QZLokaal	Qw9	0.06	0.06	0.000	0.000	0.0	0.2	0.0
3	1:QZLokaal	Qw9	0.06	0.06	0.000	0.000	0.0	0.2	0.0
4	1:QZLokaal	Qw9	0.06	0.06	0.000	0.000	0.0	0.2	0.0
5	1:QZLokaal	Qw9	0.06	0.06	0.000	0.000	0.0	0.2	0.0
6	1:QZLokaal	Qw9	0.06	0.06	0.000	0.000	0.0	0.2	0.0
14	1:QZLokaal	Qw9	0.06	0.06	0.000	0.000	0.0	0.2	0.0
19	1:QZLokaal	Qw9	0.06	0.06	0.000	0.000	0.0	0.2	0.0
22	1:QZLokaal	Qw10	-0.06	-0.06	0.000	0.000	0.0	0.2	0.0

Project...: bedrijfshal te Lottum
Onderdeel: kopgevel

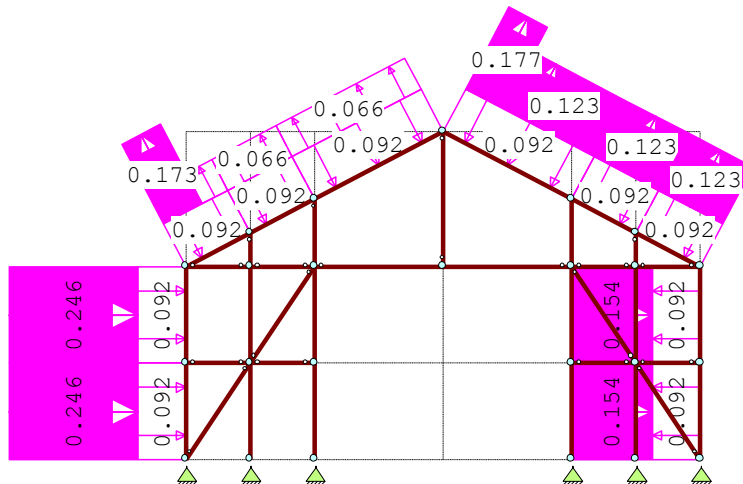
STAAFBELASTINGEN

B.G:3 Wind van links overdruk A

Staaft	Type	Index	q1/p/m	q2	A	B	ψ_0	ψ_1	ψ_2
7	1:QZLokaal	Qw10	-0.06	-0.06	0.000	0.000	0.0	0.2	0.0
1	1:QZLokaal	Qw3	-0.25	-0.25	0.000	0.000	0.0	0.2	0.0
2	1:QZLokaal	Qw3	-0.25	-0.25	0.000	0.000	0.0	0.2	0.0
3	1:QZLokaal	Qw4	-0.19	-0.19	0.000	0.452	0.0	0.2	0.0
3	1:QZLokaal	Qw5	-0.11	-0.11	0.678	0.000	0.0	0.2	0.0
4	1:QZLokaal	Qw5	-0.11	-0.11	0.000	0.000	0.0	0.2	0.0
5	1:QZLokaal	Qw5	-0.11	-0.11	0.000	0.000	0.0	0.2	0.0
6	1:QZLokaal	Qw6	0.18	0.18	0.000	1.581	0.0	0.2	0.0
6	1:QZLokaal	Qw7	0.12	0.12	0.678	0.000	0.0	0.2	0.0
14	1:QZLokaal	Qw7	0.12	0.12	0.000	0.000	0.0	0.2	0.0
19	1:QZLokaal	Qw7	0.12	0.12	0.000	0.000	0.0	0.2	0.0
22	1:QZLokaal	Qw8	-0.15	-0.15	0.000	0.000	0.0	0.2	0.0
7	1:QZLokaal	Qw8	-0.15	-0.15	0.000	0.000	0.0	0.2	0.0

BELASTINGEN

B.G:4 Wind van links onderdruk B

**STAAFBELASTINGEN**

B.G:4 Wind van links onderdruk B

Staaft	Type	Index	q1/p/m	q2	A	B	ψ_0	ψ_1	ψ_2
1	1:QZLokaal	Qw1	-0.09	-0.09	0.000	0.000	0.0	0.2	0.0
2	1:QZLokaal	Qw1	-0.09	-0.09	0.000	0.000	0.0	0.2	0.0
3	1:QZLokaal	Qw1	-0.09	-0.09	0.000	0.000	0.0	0.2	0.0
4	1:QZLokaal	Qw1	-0.09	-0.09	0.000	0.000	0.0	0.2	0.0
5	1:QZLokaal	Qw1	-0.09	-0.09	0.000	0.000	0.0	0.2	0.0
6	1:QZLokaal	Qw1	-0.09	-0.09	0.000	0.000	0.0	0.2	0.0
14	1:QZLokaal	Qw1	-0.09	-0.09	0.000	0.000	0.0	0.2	0.0
19	1:QZLokaal	Qw1	-0.09	-0.09	0.000	0.000	0.0	0.2	0.0
22	1:QZLokaal	Qw2	0.09	0.09	0.000	0.000	0.0	0.2	0.0
7	1:QZLokaal	Qw2	0.09	0.09	0.000	0.000	0.0	0.2	0.0
1	1:QZLokaal	Qw3	-0.25	-0.25	0.000	0.000	0.0	0.2	0.0
2	1:QZLokaal	Qw3	-0.25	-0.25	0.000	0.000	0.0	0.2	0.0
3	1:QZLokaal	Qw11	0.17	0.17	0.000	0.452	0.0	0.2	0.0
3	1:QZLokaal	Qw12	0.07	0.07	0.678	0.000	0.0	0.2	0.0
4	1:QZLokaal	Qw12	0.07	0.07	0.000	0.000	0.0	0.2	0.0
5	1:QZLokaal	Qw12	0.07	0.07	0.000	0.000	0.0	0.2	0.0
6	1:QZLokaal	Qw6	0.18	0.18	0.000	1.581	0.0	0.2	0.0
6	1:QZLokaal	Qw7	0.12	0.12	0.678	0.000	0.0	0.2	0.0

Project...: bedrijfshal te Lottum
Onderdeel: kopgevel

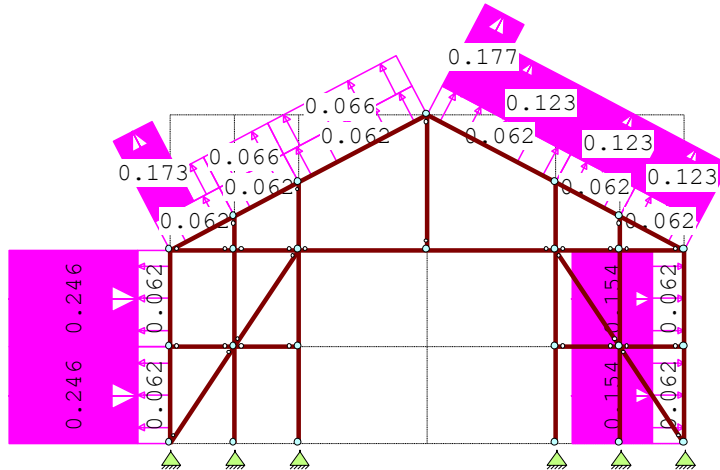
STAAFBELASTINGEN

B.G:4 Wind van links onderdruk B

Staaft	Type	Index	q1/p/m	q2	A	B	ψ_0	ψ_1	ψ_2
14	1:QZLokaal	Qw7	0.12	0.12	0.000	0.000	0.0	0.2	0.0
19	1:QZLokaal	Qw7	0.12	0.12	0.000	0.000	0.0	0.2	0.0
22	1:QZLokaal	Qw8	-0.15	-0.15	0.000	0.000	0.0	0.2	0.0
7	1:QZLokaal	Qw8	-0.15	-0.15	0.000	0.000	0.0	0.2	0.0

BELASTINGEN

B.G:5 Wind van links overdruk B

**STAAFBELASTINGEN**

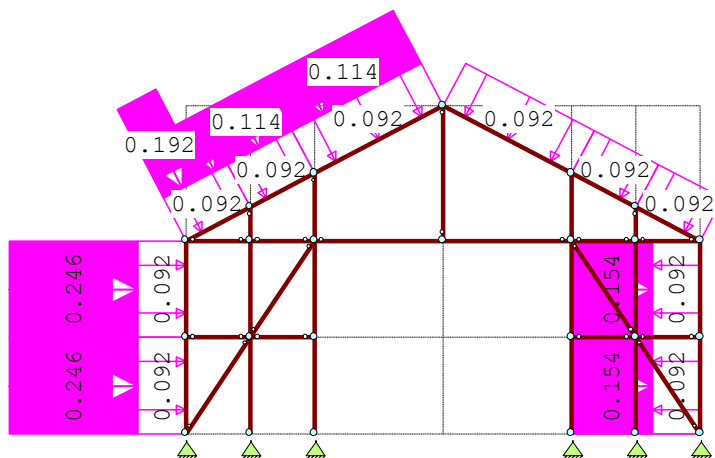
B.G:5 Wind van links overdruk B

Staaft	Type	Index	q1/p/m	q2	A	B	ψ_0	ψ_1	ψ_2
1	1:QZLokaal	Qw9	0.06	0.06	0.000	0.000	0.0	0.2	0.0
2	1:QZLokaal	Qw9	0.06	0.06	0.000	0.000	0.0	0.2	0.0
3	1:QZLokaal	Qw9	0.06	0.06	0.000	0.000	0.0	0.2	0.0
4	1:QZLokaal	Qw9	0.06	0.06	0.000	0.000	0.0	0.2	0.0
5	1:QZLokaal	Qw9	0.06	0.06	0.000	0.000	0.0	0.2	0.0
6	1:QZLokaal	Qw9	0.06	0.06	0.000	0.000	0.0	0.2	0.0
14	1:QZLokaal	Qw9	0.06	0.06	0.000	0.000	0.0	0.2	0.0
19	1:QZLokaal	Qw9	0.06	0.06	0.000	0.000	0.0	0.2	0.0
22	1:QZLokaal	Qw10	-0.06	-0.06	0.000	0.000	0.0	0.2	0.0
7	1:QZLokaal	Qw10	-0.06	-0.06	0.000	0.000	0.0	0.2	0.0
1	1:QZLokaal	Qw3	-0.25	-0.25	0.000	0.000	0.0	0.2	0.0
2	1:QZLokaal	Qw3	-0.25	-0.25	0.000	0.000	0.0	0.2	0.0
3	1:QZLokaal	Qw11	0.17	0.17	0.000	0.452	0.0	0.2	0.0
3	1:QZLokaal	Qw12	0.07	0.07	0.678	0.000	0.0	0.2	0.0
4	1:QZLokaal	Qw12	0.07	0.07	0.000	0.000	0.0	0.2	0.0
5	1:QZLokaal	Qw12	0.07	0.07	0.000	0.000	0.0	0.2	0.0
6	1:QZLokaal	Qw6	0.18	0.18	0.000	1.581	0.0	0.2	0.0
6	1:QZLokaal	Qw7	0.12	0.12	0.678	0.000	0.0	0.2	0.0
14	1:QZLokaal	Qw7	0.12	0.12	0.000	0.000	0.0	0.2	0.0
19	1:QZLokaal	Qw7	0.12	0.12	0.000	0.000	0.0	0.2	0.0
22	1:QZLokaal	Qw8	-0.15	-0.15	0.000	0.000	0.0	0.2	0.0
7	1:QZLokaal	Qw8	-0.15	-0.15	0.000	0.000	0.0	0.2	0.0

Project...: bedrijfshal te Lottum
Onderdeel: kopgevel

BELASTINGEN

B.G:6 Wind van links onderdruk C

**STAAFBELASTINGEN**

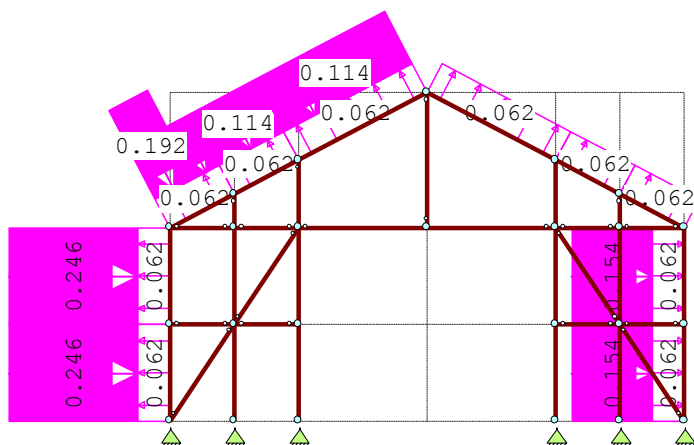
B.G:6 Wind van links onderdruk C

Staal	Type	Index	q1/p/m	q2	A	B	Ψ_0	Ψ_1	Ψ_2
1	1:QZLokaal	Qw1	-0.09	-0.09	0.000	0.000	0.0	0.2	0.0
2	1:QZLokaal	Qw1	-0.09	-0.09	0.000	0.000	0.0	0.2	0.0
3	1:QZLokaal	Qw1	-0.09	-0.09	0.000	0.000	0.0	0.2	0.0
4	1:QZLokaal	Qw1	-0.09	-0.09	0.000	0.000	0.0	0.2	0.0
5	1:QZLokaal	Qw1	-0.09	-0.09	0.000	0.000	0.0	0.2	0.0
6	1:QZLokaal	Qw1	-0.09	-0.09	0.000	0.000	0.0	0.2	0.0
14	1:QZLokaal	Qw1	-0.09	-0.09	0.000	0.000	0.0	0.2	0.0
19	1:QZLokaal	Qw1	-0.09	-0.09	0.000	0.000	0.0	0.2	0.0
22	1:QZLokaal	Qw2	0.09	0.09	0.000	0.000	0.0	0.2	0.0
7	1:QZLokaal	Qw2	0.09	0.09	0.000	0.000	0.0	0.2	0.0
1	1:QZLokaal	Qw3	-0.25	-0.25	0.000	0.000	0.0	0.2	0.0
2	1:QZLokaal	Qw3	-0.25	-0.25	0.000	0.000	0.0	0.2	0.0
3	1:QZLokaal	Qw4	-0.19	-0.19	0.000	0.452	0.0	0.2	0.0
3	1:QZLokaal	Qw5	-0.11	-0.11	0.678	0.000	0.0	0.2	0.0
4	1:QZLokaal	Qw5	-0.11	-0.11	0.000	0.000	0.0	0.2	0.0
5	1:QZLokaal	Qw5	-0.11	-0.11	0.000	0.000	0.0	0.2	0.0
22	1:QZLokaal	Qw8	-0.15	-0.15	0.000	0.000	0.0	0.2	0.0
7	1:QZLokaal	Qw8	-0.15	-0.15	0.000	0.000	0.0	0.2	0.0

Project...: bedrijfshal te Lottum
Onderdeel: kopgevel

BELASTINGEN

B.G:7 Wind van links overdruk C

**STAAFBELASTINGEN**

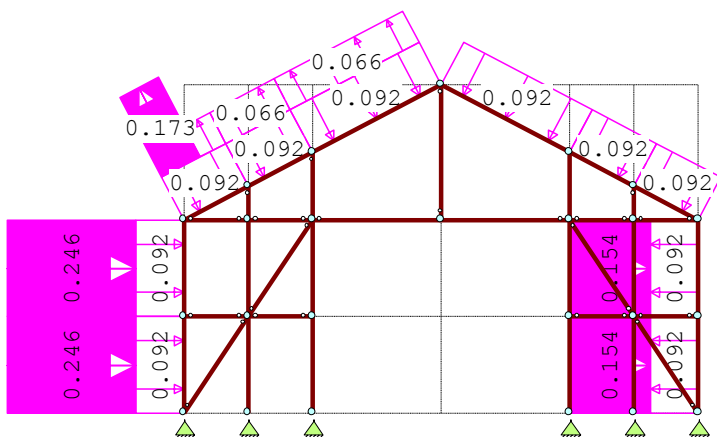
B.G:7 Wind van links overdruk C

Staaft	Type	Index	q1/p/m	q2	A	B	Ψ_0	Ψ_1	Ψ_2
1	1:QZLokaal	Qw9	0.06	0.06	0.000	0.000	0.0	0.2	0.0
2	1:QZLokaal	Qw9	0.06	0.06	0.000	0.000	0.0	0.2	0.0
3	1:QZLokaal	Qw9	0.06	0.06	0.000	0.000	0.0	0.2	0.0
4	1:QZLokaal	Qw9	0.06	0.06	0.000	0.000	0.0	0.2	0.0
5	1:QZLokaal	Qw9	0.06	0.06	0.000	0.000	0.0	0.2	0.0
6	1:QZLokaal	Qw9	0.06	0.06	0.000	0.000	0.0	0.2	0.0
14	1:QZLokaal	Qw9	0.06	0.06	0.000	0.000	0.0	0.2	0.0
19	1:QZLokaal	Qw9	0.06	0.06	0.000	0.000	0.0	0.2	0.0
22	1:QZLokaal	Qw10	-0.06	-0.06	0.000	0.000	0.0	0.2	0.0
7	1:QZLokaal	Qw10	-0.06	-0.06	0.000	0.000	0.0	0.2	0.0
1	1:QZLokaal	Qw3	-0.25	-0.25	0.000	0.000	0.0	0.2	0.0
2	1:QZLokaal	Qw3	-0.25	-0.25	0.000	0.000	0.0	0.2	0.0
3	1:QZLokaal	Qw4	-0.19	-0.19	0.000	0.452	0.0	0.2	0.0
3	1:QZLokaal	Qw5	-0.11	-0.11	0.678	0.000	0.0	0.2	0.0
4	1:QZLokaal	Qw5	-0.11	-0.11	0.000	0.000	0.0	0.2	0.0
5	1:QZLokaal	Qw5	-0.11	-0.11	0.000	0.000	0.0	0.2	0.0
22	1:QZLokaal	Qw8	-0.15	-0.15	0.000	0.000	0.0	0.2	0.0
7	1:QZLokaal	Qw8	-0.15	-0.15	0.000	0.000	0.0	0.2	0.0

Project...: bedrijfshal te Lottum
Onderdeel: kopgevel

BELASTINGEN

B.G:8 Wind van links onderdruk D

**STAAFBELASTINGEN**

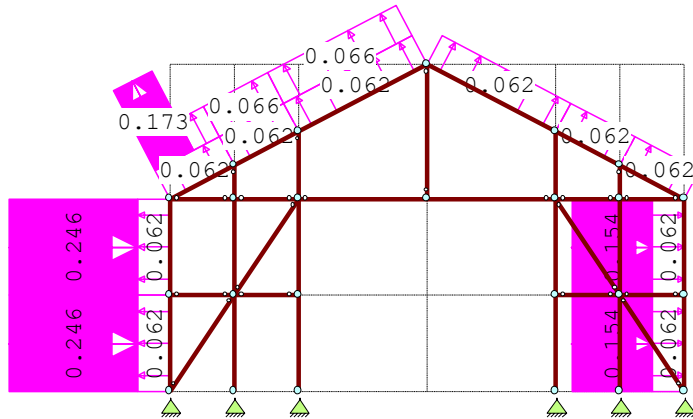
B.G:8 Wind van links onderdruk D

Staafl	Type	Index	q1/p/m	q2	A	B	ψ_0	ψ_1	ψ_2
1	1:QZLokaal	Qw1	-0.09	-0.09	0.000	0.000	0.0	0.2	0.0
2	1:QZLokaal	Qw1	-0.09	-0.09	0.000	0.000	0.0	0.2	0.0
3	1:QZLokaal	Qw1	-0.09	-0.09	0.000	0.000	0.0	0.2	0.0
4	1:QZLokaal	Qw1	-0.09	-0.09	0.000	0.000	0.0	0.2	0.0
5	1:QZLokaal	Qw1	-0.09	-0.09	0.000	0.000	0.0	0.2	0.0
6	1:QZLokaal	Qw1	-0.09	-0.09	0.000	0.000	0.0	0.2	0.0
14	1:QZLokaal	Qw1	-0.09	-0.09	0.000	0.000	0.0	0.2	0.0
19	1:QZLokaal	Qw1	-0.09	-0.09	0.000	0.000	0.0	0.2	0.0
22	1:QZLokaal	Qw2	0.09	0.09	0.000	0.000	0.0	0.2	0.0
7	1:QZLokaal	Qw2	0.09	0.09	0.000	0.000	0.0	0.2	0.0
1	1:QZLokaal	Qw3	-0.25	-0.25	0.000	0.000	0.0	0.2	0.0
2	1:QZLokaal	Qw3	-0.25	-0.25	0.000	0.000	0.0	0.2	0.0
3	1:QZLokaal	Qw11	0.17	0.17	0.000	0.452	0.0	0.2	0.0
3	1:QZLokaal	Qw12	0.07	0.07	0.678	0.000	0.0	0.2	0.0
4	1:QZLokaal	Qw12	0.07	0.07	0.000	0.000	0.0	0.2	0.0
5	1:QZLokaal	Qw12	0.07	0.07	0.000	0.000	0.0	0.2	0.0
22	1:QZLokaal	Qw8	-0.15	-0.15	0.000	0.000	0.0	0.2	0.0
7	1:QZLokaal	Qw8	-0.15	-0.15	0.000	0.000	0.0	0.2	0.0

Project..: bedrijfshal te Lottum
Onderdeel: kopgevel

BELASTINGEN

B.G:9 Wind van links overdruk D



STAAFBELASTINGEN

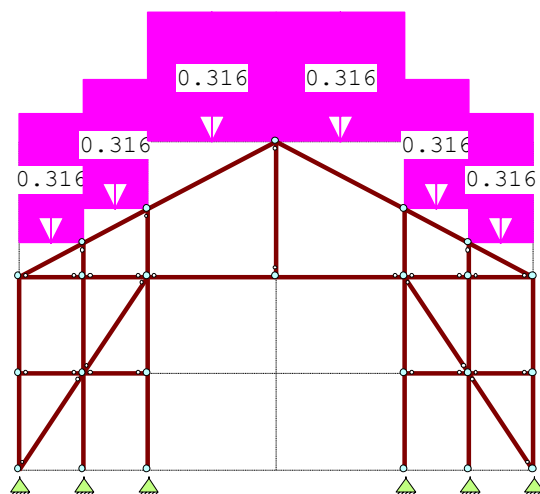
B.G:9 Wind van links overdruk D

Staaf	Type	Index	q1/p/m	q2	A	B	Ψ_0	Ψ_1	Ψ_2
1	1:QZLokaal	Qw9	0.06	0.06	0.000	0.000	0.0	0.2	0.0
2	1:QZLokaal	Qw9	0.06	0.06	0.000	0.000	0.0	0.2	0.0
3	1:QZLokaal	Qw9	0.06	0.06	0.000	0.000	0.0	0.2	0.0
4	1:QZLokaal	Qw9	0.06	0.06	0.000	0.000	0.0	0.2	0.0
5	1:QZLokaal	Qw9	0.06	0.06	0.000	0.000	0.0	0.2	0.0
6	1:QZLokaal	Qw9	0.06	0.06	0.000	0.000	0.0	0.2	0.0
14	1:QZLokaal	Qw9	0.06	0.06	0.000	0.000	0.0	0.2	0.0
19	1:QZLokaal	Qw9	0.06	0.06	0.000	0.000	0.0	0.2	0.0
22	1:QZLokaal	Qw10	-0.06	-0.06	0.000	0.000	0.0	0.2	0.0
7	1:QZLokaal	Qw10	-0.06	-0.06	0.000	0.000	0.0	0.2	0.0
1	1:QZLokaal	Qw3	-0.25	-0.25	0.000	0.000	0.0	0.2	0.0
2	1:QZLokaal	Qw3	-0.25	-0.25	0.000	0.000	0.0	0.2	0.0
3	1:QZLokaal	Qw11	0.17	0.17	0.000	0.452	0.0	0.2	0.0
3	1:QZLokaal	Qw12	0.07	0.07	0.678	0.000	0.0	0.2	0.0
4	1:QZLokaal	Qw12	0.07	0.07	0.000	0.000	0.0	0.2	0.0
5	1:QZLokaal	Qw12	0.07	0.07	0.000	0.000	0.0	0.2	0.0
22	1:QZLokaal	Qw8	-0.15	-0.15	0.000	0.000	0.0	0.2	0.0
7	1:QZLokaal	Qw8	-0.15	-0.15	0.000	0.000	0.0	0.2	0.0

Project...: bedrijfshal te Lottum
Onderdeel: kopgevel

BELASTINGEN

B.G:10 Sneeuw A

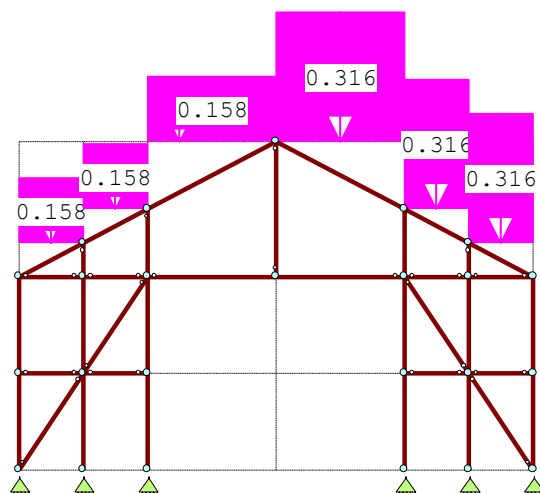
**STAAFBELASTINGEN**

B.G:10 Sneeuw A

Staaftype	Type	Index	q1/p/m	q2	A	B	Ψ_0	Ψ_1	Ψ_2
3	3:QZgeProj.	Qs1	-0.32	-0.32	0.000	0.000	0.0	0.2	0.0
4	3:QZgeProj.	Qs1	-0.32	-0.32	0.000	0.000	0.0	0.2	0.0
5	3:QZgeProj.	Qs1	-0.32	-0.32	0.000	0.000	0.0	0.2	0.0
6	3:QZgeProj.	Qs1	-0.32	-0.32	0.000	0.000	0.0	0.2	0.0
14	3:QZgeProj.	Qs1	-0.32	-0.32	0.000	0.000	0.0	0.2	0.0
19	3:QZgeProj.	Qs1	-0.32	-0.32	0.000	0.000	0.0	0.2	0.0

BELASTINGEN

B.G:11 Sneeuw B



Project...: bedrijfshal te Lottum
Onderdeel: kopgevel

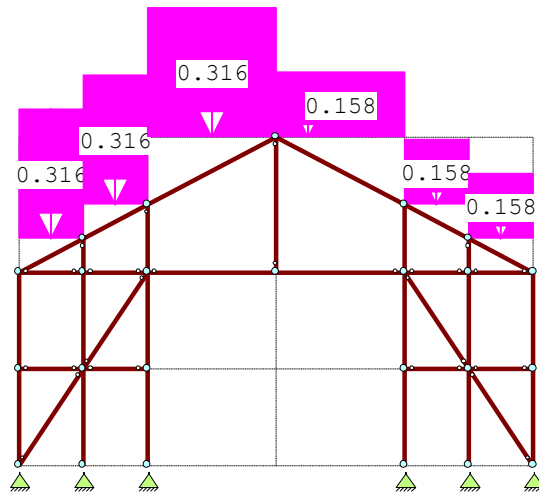
STAAFBELASTINGEN

B.G:11 Sneeuw B

Staafl	Type	Index	q1/p/m	q2	A	B	ψ_0	ψ_1	ψ_2
3	3:QZgeProj.	Qs2	-0.16	-0.16	0.000	0.000	0.0	0.2	0.0
4	3:QZgeProj.	Qs2	-0.16	-0.16	0.000	0.000	0.0	0.2	0.0
5	3:QZgeProj.	Qs2	-0.16	-0.16	0.000	0.000	0.0	0.2	0.0
6	3:QZgeProj.	Qs1	-0.32	-0.32	0.000	0.000	0.0	0.2	0.0
14	3:QZgeProj.	Qs1	-0.32	-0.32	0.000	0.000	0.0	0.2	0.0
19	3:QZgeProj.	Qs1	-0.32	-0.32	0.000	0.000	0.0	0.2	0.0

BELASTINGEN

B.G:12 Sneeuw C

**STAAFBELASTINGEN**

B.G:12 Sneeuw C

Staafl	Type	Index	q1/p/m	q2	A	B	ψ_0	ψ_1	ψ_2
3	3:QZgeProj.	Qs1	-0.32	-0.32	0.000	0.000	0.0	0.2	0.0
4	3:QZgeProj.	Qs1	-0.32	-0.32	0.000	0.000	0.0	0.2	0.0
5	3:QZgeProj.	Qs1	-0.32	-0.32	0.000	0.000	0.0	0.2	0.0
6	3:QZgeProj.	Qs2	-0.16	-0.16	0.000	0.000	0.0	0.2	0.0
14	3:QZgeProj.	Qs2	-0.16	-0.16	0.000	0.000	0.0	0.2	0.0
19	3:QZgeProj.	Qs2	-0.16	-0.16	0.000	0.000	0.0	0.2	0.0

BEREKENINGSTATUS

Controlerende berekening

B.C.	Iteratie	Status
1	2	Nauwkeurigheid bereikt
2	2	Nauwkeurigheid bereikt
3	2	Nauwkeurigheid bereikt
4	2	Nauwkeurigheid bereikt
5	2	Nauwkeurigheid bereikt
6	2	Nauwkeurigheid bereikt
7	2	Nauwkeurigheid bereikt
8	2	Nauwkeurigheid bereikt
9	2	Nauwkeurigheid bereikt
10	2	Nauwkeurigheid bereikt
11	2	Nauwkeurigheid bereikt
12	2	Nauwkeurigheid bereikt

Project...: bedrijfshal te Lottum
Onderdeel: kopgevel

BEREKENINGSTATUS

Controlerende berekening

B.C. Iteratie Status

13	2	Nauwkeurigheid bereikt
14	2	Nauwkeurigheid bereikt
15	2	Nauwkeurigheid bereikt
16	2	Nauwkeurigheid bereikt
17	2	Nauwkeurigheid bereikt
18	2	Nauwkeurigheid bereikt
19	2	Nauwkeurigheid bereikt
20	2	Nauwkeurigheid bereikt
21	2	Nauwkeurigheid bereikt
22	2	Nauwkeurigheid bereikt
23	2	Nauwkeurigheid bereikt
24	2	Nauwkeurigheid bereikt
25	2	Nauwkeurigheid bereikt
26	2	Nauwkeurigheid bereikt
27	2	Nauwkeurigheid bereikt
28	2	Nauwkeurigheid bereikt
29	2	Nauwkeurigheid bereikt
30	2	Nauwkeurigheid bereikt
31	2	Nauwkeurigheid bereikt
32	2	Nauwkeurigheid bereikt
33	2	Nauwkeurigheid bereikt
34	2	Nauwkeurigheid bereikt
35	2	Nauwkeurigheid bereikt
36	2	Nauwkeurigheid bereikt
37	2	Nauwkeurigheid bereikt
38	2	Nauwkeurigheid bereikt
39	2	Nauwkeurigheid bereikt
40	2	Nauwkeurigheid bereikt
41	2	Nauwkeurigheid bereikt
42	2	Nauwkeurigheid bereikt
43	2	Nauwkeurigheid bereikt
44	2	Nauwkeurigheid bereikt
45	2	Nauwkeurigheid bereikt
46	2	Nauwkeurigheid bereikt
47	2	Nauwkeurigheid bereikt
48	2	Nauwkeurigheid bereikt
49	2	Nauwkeurigheid bereikt

BELASTINGCOMBINATIES

BC	Type				
1	Fund.	1.22	$G_{k,1}$		
2	Fund.	0.90	$G_{k,1}$		
3	Fund.	1.08	$G_{k,1}$	+	1.35 $Q_{k,2}$
4	Fund.	1.08	$G_{k,1}$	+	1.35 $Q_{k,3}$
5	Fund.	1.08	$G_{k,1}$	+	1.35 $Q_{k,4}$
6	Fund.	1.08	$G_{k,1}$	+	1.35 $Q_{k,5}$
7	Fund.	1.08	$G_{k,1}$	+	1.35 $Q_{k,6}$

Project...: bedrijfshal te Lottum
 Onderdeel: kopgevel

BELASTINGCOMBINATIES

BC Type					
8 Fund.	1.08	$G_{k,1}$	+	1.35	$Q_{k,7}$
9 Fund.	1.08	$G_{k,1}$	+	1.35	$Q_{k,8}$
10 Fund.	1.08	$G_{k,1}$	+	1.35	$Q_{k,9}$
11 Fund.	1.08	$G_{k,1}$	+	1.35	$Q_{k,10}$
12 Fund.	1.08	$G_{k,1}$	+	1.35	$Q_{k,11}$
13 Fund.	1.08	$G_{k,1}$	+	1.35	$Q_{k,12}$
14 Fund.	0.90	$G_{k,1}$	+	1.35	$Q_{k,2}$
15 Fund.	0.90	$G_{k,1}$	+	1.35	$Q_{k,3}$
16 Fund.	0.90	$G_{k,1}$	+	1.35	$Q_{k,4}$
17 Fund.	0.90	$G_{k,1}$	+	1.35	$Q_{k,5}$
18 Fund.	0.90	$G_{k,1}$	+	1.35	$Q_{k,6}$
19 Fund.	0.90	$G_{k,1}$	+	1.35	$Q_{k,7}$
20 Fund.	0.90	$G_{k,1}$	+	1.35	$Q_{k,8}$
21 Fund.	0.90	$G_{k,1}$	+	1.35	$Q_{k,9}$
22 Fund.	0.90	$G_{k,1}$	+	1.35	$Q_{k,10}$
23 Fund.	0.90	$G_{k,1}$	+	1.35	$Q_{k,11}$
24 Fund.	0.90	$G_{k,1}$	+	1.35	$Q_{k,12}$
25 Kar.	1.00	$G_{k,1}$	+	1.00	$Q_{k,2}$
26 Kar.	1.00	$G_{k,1}$	+	1.00	$Q_{k,3}$
27 Kar.	1.00	$G_{k,1}$	+	1.00	$Q_{k,4}$
28 Kar.	1.00	$G_{k,1}$	+	1.00	$Q_{k,5}$
29 Kar.	1.00	$G_{k,1}$	+	1.00	$Q_{k,6}$
30 Kar.	1.00	$G_{k,1}$	+	1.00	$Q_{k,7}$
31 Kar.	1.00	$G_{k,1}$	+	1.00	$Q_{k,8}$
32 Kar.	1.00	$G_{k,1}$	+	1.00	$Q_{k,9}$
33 Kar.	1.00	$G_{k,1}$	+	1.00	$Q_{k,10}$
34 Kar.	1.00	$G_{k,1}$	+	1.00	$Q_{k,11}$
35 Kar.	1.00	$G_{k,1}$	+	1.00	$Q_{k,12}$
36 Quas.	1.00	$G_{k,1}$			
37 Freq.	1.00	$G_{k,1}$			
38 Freq.	1.00	$G_{k,1}$	+	1.00 ψ_1	$Q_{k,2}$
39 Freq.	1.00	$G_{k,1}$	+	1.00 ψ_1	$Q_{k,3}$
40 Freq.	1.00	$G_{k,1}$	+	1.00 ψ_1	$Q_{k,4}$
41 Freq.	1.00	$G_{k,1}$	+	1.00 ψ_1	$Q_{k,5}$
42 Freq.	1.00	$G_{k,1}$	+	1.00 ψ_1	$Q_{k,6}$
43 Freq.	1.00	$G_{k,1}$	+	1.00 ψ_1	$Q_{k,7}$
44 Freq.	1.00	$G_{k,1}$	+	1.00 ψ_1	$Q_{k,8}$
45 Freq.	1.00	$G_{k,1}$	+	1.00 ψ_1	$Q_{k,9}$
46 Freq.	1.00	$G_{k,1}$	+	1.00 ψ_1	$Q_{k,10}$
47 Freq.	1.00	$G_{k,1}$	+	1.00 ψ_1	$Q_{k,11}$
48 Freq.	1.00	$G_{k,1}$	+	1.00 ψ_1	$Q_{k,12}$
49 Blij.	1.00	$G_{k,1}$			

Project...: bedrijfshal te Lottum
Onderdeel: kopgevel

GUNSTIGE WERKING PERMANENTE BELASTINGEN

BC Staven met gunstige werking

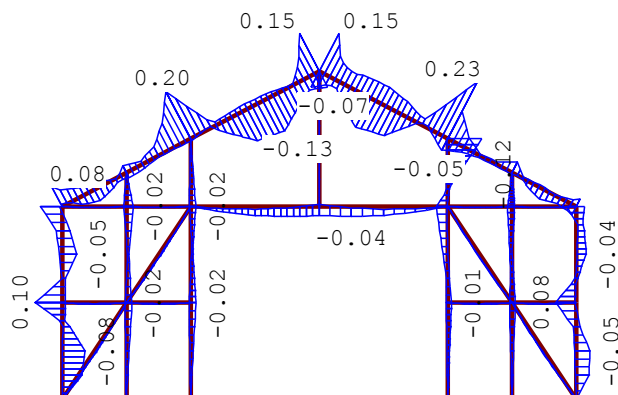
1 Geen
2 Alle staven de factor:0.90
3 Geen
4 Geen
5 Geen
6 Geen
7 Geen
8 Geen
9 Geen
10 Geen
11 Geen
12 Geen
13 Geen
14 Alle staven de factor:0.90
15 Alle staven de factor:0.90
16 Alle staven de factor:0.90
17 Alle staven de factor:0.90
18 Alle staven de factor:0.90
19 Alle staven de factor:0.90
20 Alle staven de factor:0.90
21 Alle staven de factor:0.90
22 Alle staven de factor:0.90
23 Alle staven de factor:0.90
24 Alle staven de factor:0.90

OMHULLENDE VAN DE FUNDAMENTELE COMBINATIES

MOMENTEN

2e orde

Fundamentele combinatie

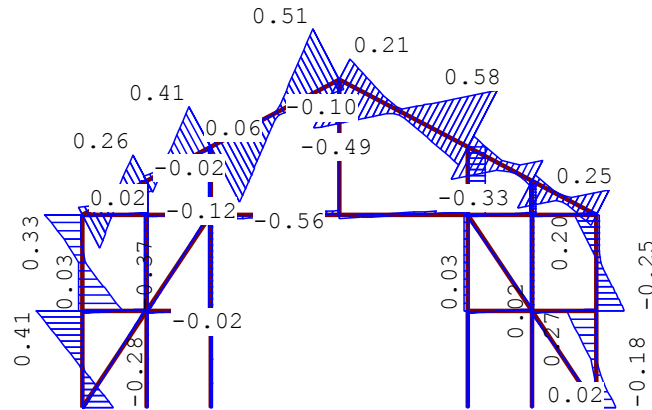


Project..: bedrijfshal te Lottum
Onderdeel: kopgevel

DWARSKRACHTEN

2e orde

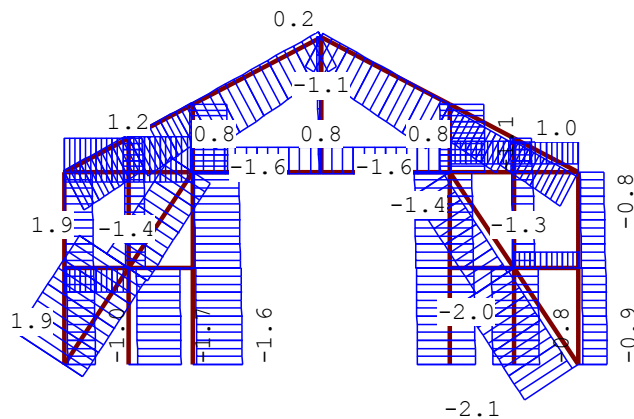
Fundamentele combinatie



NORMAALKRACHTEN

2e orde

Fundamentele combinatie



STAAFKRACHTEN

2e 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		-1.02	11	-0.12	17	-0.28	9	-0.00	2	0.00	1	0.00	1
1		0.750	-0.99	11	-0.10	17	-0.01	11	0.07	14	-0.08	9	-0.00	2
1		1.125	-0.98	11	-0.09	17	-0.01	11	0.24	14	-0.03	9	-0.00	2
1		1.149	-0.98	11	-0.09	17	-0.01	11	0.25	14	-0.02	9	0.00	2
1		1.219	-0.98	11	-0.09	17	-0.01	11	0.28	14	-0.01	9	0.01	2
1	2		-0.97	11	-0.08	17	-0.01	11	0.41	14	-0.01	11	0.10	14
2	2		-0.95	11	-0.07	17	-0.37	16	0.03	11	-0.01	11	0.10	14
2		0.374	-0.94	11	-0.06	17	-0.20	16	0.03	11	-0.01	11	0.00	14
2		0.383	-0.94	11	-0.06	17	-0.19	16	0.03	11	-0.01	9	0.00	24
2		0.750	-0.93	11	-0.05	17	-0.03	16	0.03	11	-0.05	9	0.01	24
2		1.416	-0.91	11	-0.03	17	0.01	2	0.30	7	0.00	16	0.07	11
2	3		-0.90	11	-0.03	17	0.01	2	0.33	7	0.01	16	0.08	11

Project...: bedrijfshal te Lottum
Onderdeel: kopgevel

STAAFKRACHTEN			2e orde				Fundamentele combinatie							
St.	Kn.	Pos.	NXi/NXj				DZi/DZj				MYi/MYj			
			Min	BC	Max	BC	Min	BC	Max	BC	Min	BC	Max	BC
3	3		-1.40	11	0.04	15	-0.34	7	0.07	17	0.01	2	0.08	7
3		0.124	-1.37	11	0.05	15	-0.28	7	0.05	17	0.00	2	0.05	9
3		0.471	-1.28	11	0.07	15	-0.10	7	-0.01	17	-0.04	13	0.03	20
3		0.565	-1.26	11	0.08	15	-0.09	7	-0.00	2	-0.05	13	0.02	21
3		0.753	-1.21	11	0.09	15	-0.08	20	0.09	13	-0.03	13	0.01	21
3		0.905	-1.18	11	0.10	15	-0.09	21	0.16	13	-0.02	13	0.00	17
3		0.941	-1.17	11	0.10	15	-0.09	21	0.17	13	-0.02	13	-0.00	17
3		0.963	-1.16	11	0.10	15	-0.09	21	0.18	13	-0.02	7	0.00	17
3		1.035	-1.14	11	0.10	15	-0.10	21	0.22	13	-0.02	7	0.01	17
3	5		-1.12	11	0.11	15	-0.10	21	0.26	13	-0.02	20	0.03	11
4	5		-1.37	11	0.01	15	-0.12	11	0.05	17	-0.02	21	0.03	11
4		0.282	-1.30	11	0.02	15	0.01	11	0.03	17	-0.02	21	0.01	11
4		0.565	-1.23	11	0.04	15	0.01	23	0.15	5	-0.01	20	0.04	13
4		0.847	-1.16	11	0.05	15	-0.01	21	0.28	13	-0.00	21	0.10	13
4	6		-1.10	11	0.07	15	-0.02	21	0.41	13	-0.01	21	0.20	13
5	6		-1.62	11	0.06	17	-0.56	13	0.06	21	-0.01	21	0.20	13
5		0.184	-1.57	11	0.07	17	-0.47	13	0.05	21	0.00	21	0.11	13
5		0.361	-1.53	11	0.08	17	-0.39	13	0.04	21	0.01	17	0.03	11
5		0.383	-1.52	11	0.08	17	-0.38	13	0.04	21	0.00	17	0.03	11
5		0.452	-1.51	11	0.09	17	-0.35	13	0.03	21	-0.02	17	0.01	11
5		0.904	-1.40	11	0.11	17	-0.14	13	0.01	21	-0.12	3	0.02	21
5		1.084	-1.35	11	0.12	17	-0.05	13	-0.00	21	-0.13	3	0.02	21
5		1.175	-1.33	11	0.13	17	-0.03	13	0.01	20	-0.13	3	0.02	21
5		1.355	-1.28	11	0.14	17	-0.04	17	0.09	11	-0.13	3	0.02	21
5		1.717	-1.20	11	0.16	17	-0.06	17	0.26	11	-0.08	3	0.01	21
5		1.988	-1.13	11	0.18	17	-0.08	17	0.39	11	-0.04	4	0.05	23
5	4		-1.06	11	0.19	17	-0.10	17	0.51	11	-0.07	17	0.15	11
6	4		-1.07	11	0.13	17	-0.49	11	0.21	17	-0.07	17	0.15	11
6		0.361	-1.16	11	0.11	17	-0.33	11	0.13	17	-0.03	21	0.06	3
6		0.542	-1.20	11	0.10	17	-0.24	11	0.09	17	-0.06	12	0.05	14
6		0.904	-1.29	11	0.08	17	-0.07	11	0.03	17	-0.12	12	0.07	15
6		0.994	-1.32	11	0.07	17	-0.04	11	0.02	17	-0.11	12	0.07	15
6		1.084	-1.34	11	0.07	17	-0.03	3	0.03	21	-0.11	12	0.07	15
6		1.175	-1.36	11	0.06	17	-0.03	14	0.07	12	-0.11	12	0.06	15
6		1.752	-1.50	11	0.03	17	-0.11	15	0.34	12	0.00	20	0.03	4
6		1.807	-1.52	11	0.03	17	-0.12	15	0.37	12	0.01	20	0.03	4
6		1.938	-1.55	11	0.02	17	-0.14	15	0.43	12	0.00	17	0.08	11
6	16		-1.63	11	0.00	17	-0.18	15	0.58	12	-0.05	15	0.23	12
7	8		-0.94	11	-0.15	17	-0.18	21	0.01	11	0.00	1	0.00	1
7		0.750	-0.91	11	-0.13	17	0.00	21	0.05	11	-0.05	21	0.01	11
7		1.410	-0.89	11	-0.12	17	0.00	2	0.24	4	0.00	21	0.06	3
7	23		-0.89	11	-0.11	17	0.00	2	0.27	4	0.00	21	0.08	3
8	9		-1.71	3	-0.30	2	-0.01	20	0.00	13	0.00	1	0.00	1
8	10		-1.66	3	-0.26	2	-0.01	20	0.00	13	-0.02	20	0.00	13
9	10		-0.55	11	0.08	21	-0.02	11	0.02	20	-0.02	20	0.00	13
9		0.288	-0.54	11	0.09	21	-0.02	11	0.02	20	-0.02	20	0.00	13
9		0.750	-0.53	11	0.11	21	-0.02	11	0.02	20	-0.01	9	-0.00	2
9		1.007	-0.52	11	0.11	21	-0.02	11	0.02	20	-0.02	11	0.00	2

Project...: bedrijfshal te Lottum
Onderdeel: kopgevel

STAAFKRACHTEN			2e orde				Fundamentele combinatie			
St.	Kn.	Pos.	NXi/NXj				DZi/DZj			
			Min	BC	Max	BC	Min	BC	Max	BC
9	11		-0.50	11	0.13	21	-0.02	11	0.02	20
10	11		-0.47	11	0.15	21	-0.02	20	0.05	11
10	5		-0.45	11	0.17	21	-0.02	20	0.05	11
11	12		-1.61	3	-0.14	21	-0.01	20	0.00	13
11	13		-1.56	3	-0.10	21	-0.01	20	0.00	13
12	13		-1.54	3	-0.09	21	-0.02	11	0.02	20
12		0.362	-1.53	3	-0.08	21	-0.02	11	0.02	20
12		0.750	-1.52	3	-0.07	21	-0.02	11	0.02	20
12		0.938	-1.51	3	-0.06	21	-0.02	11	0.02	20
12		1.216	-1.50	3	-0.05	21	-0.02	11	0.02	20
12		1.219	-1.50	3	-0.05	21	-0.02	11	0.02	20
12	14		-1.49	3	-0.05	21	-0.02	11	0.02	20
13	14		-1.14	13	0.06	21	-0.00	20	0.02	11
13	6		-1.11	13	0.09	21	-0.00	20	0.02	11
14	16		-0.98	11	-0.08	21	-0.33	12	0.11	15
14		0.565	-1.12	11	-0.12	21	-0.06	12	0.03	15
14		0.847	-1.19	11	-0.13	21	-0.01	12	0.07	15
14	20		-1.26	11	-0.15	21	-0.04	17	0.21	11
15	15		-0.83	12	1.04	15	-0.01	10	0.00	14
15	17		-0.78	12	1.08	15	-0.01	10	0.00	14
16	17		-0.76	12	1.10	15	-0.00	14	0.03	11
16		0.375	-0.75	12	1.11	15	-0.00	14	0.03	11
16		0.930	-0.73	12	1.12	15	-0.00	14	0.03	11
16	18		-0.71	12	1.14	15	-0.00	14	0.03	11
17	18		-1.14	12	0.30	15	-0.16	11	-0.00	15
17		0.075	-1.13	12	0.30	15	-0.16	11	-0.00	15
17	16		-1.10	12	0.33	15	-0.16	11	-0.00	15
18	19		-0.82	11	0.69	15	-0.01	21	0.01	3
18	21		-0.77	11	0.73	15	-0.01	21	0.01	3
19	20		-0.97	11	-0.08	21	-0.28	12	0.06	15
19		0.094	-1.00	11	-0.09	21	-0.23	12	0.05	15
19		0.188	-1.02	11	-0.09	21	-0.19	12	0.04	15
19		0.376	-1.07	11	-0.11	21	-0.10	12	0.01	15
19		0.565	-1.11	11	-0.12	21	-0.04	12	0.02	14
19		0.659	-1.14	11	-0.12	21	-0.04	10	0.03	14
19		0.753	-1.16	11	-0.13	21	-0.05	17	0.08	11
19		0.847	-1.18	11	-0.13	21	-0.07	17	0.12	11
19	7		-1.25	11	-0.15	21	-0.11	17	0.25	11
20	21		-0.66	11	0.04	15	-0.01	14	0.02	10
20		0.469	-0.64	11	0.05	15	-0.01	14	0.02	10
20		0.750	-0.64	11	0.06	15	-0.01	14	0.02	10
20	22		-0.61	11	0.08	15	-0.01	14	0.02	10

Project...: bedrijfshal te Lottum
Onderdeel: kopgevel

STAAFKRACHTEN			2e orde				Fundamentele combinatie					
St.	Kn.	Pos.	NXi/NXj				DZi/DZj				MYi/MYj	
			Min	BC	Max	BC	Min	BC	Max	BC	Min	BC
21	22		-0.58	11	0.10	15	-0.03	11	0.02	14	-0.01	14
21	20		-0.56	11	0.12	15	-0.03	11	0.02	14	0.00	14
22	23		-0.87	11	-0.10	17	-0.25	4	-0.01	2	0.00	2
22	0.304		-0.86	11	-0.09	17	-0.17	4	-0.01	2	0.00	2
22	0.528		-0.85	11	-0.08	17	-0.10	4	-0.01	2	-0.02	21
22	0.750		-0.85	11	-0.08	17	-0.04	4	-0.01	2	-0.04	8
22	1.219		-0.83	11	-0.07	17	-0.03	11	0.12	21	-0.03	8
22	1.259		-0.83	11	-0.06	17	-0.03	11	0.13	21	-0.03	7
22	1.313		-0.83	11	-0.06	17	-0.03	11	0.14	21	-0.03	7
22	7		-0.82	11	-0.06	17	-0.03	11	0.20	21	-0.03	11
23	2		-0.77	16	0.04	11	-0.02	1	-0.01	22	0.00	1
23	0.500		-0.77	16	0.04	11	-0.00	1	0.00	22	-0.00	1
23	10		-0.77	16	0.04	11	0.01	22	0.02	1	0.00	1
24	10		-0.03	20	0.02	11	-0.02	1	-0.01	22	0.00	1
24	0.500		-0.03	20	0.02	11	-0.00	1	0.00	22	-0.00	1
24	13		-0.03	20	0.02	11	0.01	22	0.02	1	0.00	1
25	3		-0.33	14	1.08	11	-0.02	1	-0.01	22	0.00	1
25	0.500		-0.33	14	1.08	11	-0.00	1	0.00	22	-0.00	1
25	11		-0.33	14	1.08	11	0.01	22	0.02	1	0.00	1
26	11		-0.33	14	1.15	11	-0.02	1	-0.01	22	0.00	1
26	0.500		-0.33	14	1.15	11	-0.00	1	0.00	22	-0.00	1
26	14		-0.33	14	1.15	11	0.01	22	0.02	1	0.00	1
27	17		-0.01	14	0.04	11	-0.02	1	-0.01	22	0.00	1
27	0.500		-0.01	14	0.04	11	-0.00	1	0.00	22	-0.00	1
27	21		-0.01	14	0.04	11	0.01	22	0.02	1	0.00	1
28	21		0.01	2	0.52	4	-0.02	1	-0.01	15	0.00	1
28	0.500		0.01	2	0.52	4	0.00	1	0.00	15	-0.00	1
28	23		0.01	2	0.52	4	0.01	15	0.02	1	0.00	1
29	18		0.27	20	1.00	11	-0.02	1	-0.01	22	0.00	1
29	0.500		0.27	20	1.00	11	0.00	1	0.00	22	-0.00	1
29	22		0.27	20	1.00	11	0.01	22	0.02	1	0.00	1
30	22		0.27	20	0.96	11	-0.02	1	-0.01	22	0.00	1
30	0.500		0.27	20	0.96	11	0.00	1	0.00	22	-0.00	1
30	7		0.27	20	0.96	11	0.01	22	0.02	1	0.00	1
31	14		-0.05	14	0.79	11	-0.05	11	-0.02	17	0.00	1
31	1.000		-0.05	14	0.79	11	-0.02	11	0.00	17	-0.03	11
31	1.500		-0.05	14	0.79	11	-0.00	22	0.02	6	-0.04	11
31	1.735		-0.05	14	0.79	11	0.00	22	0.03	6	-0.04	11
31	24		-0.05	14	0.79	11	0.01	22	0.04	6	-0.03	11
32	24		-0.05	14	0.79	11	-0.04	6	-0.01	22	-0.03	11
32	0.265		-0.05	14	0.79	11	-0.03	6	-0.00	22	-0.04	11
32	0.500		-0.05	14	0.79	11	-0.02	6	0.00	22	-0.04	11
32	1.000		-0.05	14	0.79	11	-0.00	6	0.02	22	-0.03	11

Project...: bedrijfshal te Lottum
Onderdeel: kopgevel

STAAFKRACHTEN			2e orde				Fundamentele combinatie							
			NXi/NXj				DZi/DZj				MYi/MYj			
St.	Kn.	Pos.	Min	BC	Max	BC	Min	BC	Max	BC	Min	BC	Max	BC
32	18		-0.05	14	0.79	11	0.02	17	0.05	11	0.00	11	0.00	17
33	24		0.02	22	0.07	6	-0.00	4	0.00	9	0.00	1	0.00	1
33	4		0.08	22	0.15	1	-0.00	9	0.00	4	0.00	4	0.00	9
34	1		-0.73	11	1.85	14	-0.02	1	-0.01	14	0.00	1	0.00	1
34		0.901	-0.70	11	1.87	14	-0.00	1	0.00	14	-0.01	1	-0.01	14
34	10		-0.68	11	1.89	14	0.01	14	0.02	1	0.00	1	0.00	14
35	10		-0.73	11	0.83	15	-0.02	1	-0.01	15	0.00	1	0.00	1
35		0.901	-0.71	11	0.85	15	-0.00	1	0.00	15	-0.01	1	-0.01	15
35	14		-0.68	11	0.87	15	0.01	15	0.02	1	0.00	1	0.00	15
36	18		-1.42	3	-0.21	2	-0.02	1	-0.01	2	0.00	1	0.00	1
36		0.901	-1.45	3	-0.23	2	-0.00	1	-0.00	2	-0.01	1	-0.01	2
36	21		-1.47	3	-0.25	2	0.01	2	0.02	1	0.00	1	0.00	2
37	21		-2.03	4	-0.21	2	-0.02	1	-0.01	2	0.00	1	0.00	1
37		0.901	-2.05	4	-0.23	2	-0.00	1	-0.00	2	-0.01	1	-0.01	2
37	8		-2.07	4	-0.25	2	0.01	2	0.02	1	0.00	1	0.00	2

REACTIES		2e orde				Fundamentele combinatie			
Kn.	X-min	X-max	Z-min	Z-max	M-min	M-max			
1	-1.32	0.38	-1.11	1.63					
8	-1.30	-0.12	0.55	2.17					
9	-0.01	0.00	0.30	1.71					
12	-0.01	0.00	0.14	1.61					
15	-0.01	0.00	-1.04	0.83					
19	-0.01	0.01	-0.69	0.82					

Project...: bedrijfshal te Lottum
Onderdeel: kopgevel

OMHULLENDE VAN DE KARAKTERISTIEKE COMBINATIES

VERPLAATSINGEN	2e orde [mm]	Karakteristieke combinatie
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