



**Rapport**

180114 CR001

**Project**

Uitbreiding Venster Techniek B.V.  
Zelhem

**Omschrijving**

Statische berekening

**Datum**

29 augustus 2018



Rapport **180114 CR001**

Projectomschrijving **Uitbreiding Venster Techniek B.V.  
Zelhem**

Opdrachtgever **VeeTee Holding B.V.  
Ericaweg 9  
7021 PB ZELHEM**

Omschrijving ***Statische berekening***

Datum **29 augustus 2018**

Oorspronkelijke datum

Berekend **ing. S. Jaspers Faijer**

Paraaf



Gecontroleerd **ing. J. Kobus**

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BTW: NL817292159B01

IBAN: NL92RABO0122131584

Op al onze opdrachten zijn onze algemene voorwaarden van toepassing zoals op ommezijde vermeld en De Nieuwe Regeling 2011 met eventuele aanvullingen gedeponeerd ter griffie van de arrondissementsrechtbank te amsterdam. Op eerste verzoek zal deze regeling worden toegezonden.

## **ALGEMENE VOORWAARDEN VAN CIBIS GROEP B.V.**

### **ARTIKEL 1 ALGEMEEN**

In de Algemene Voorwaarden wordt verstaan onder:

- a. opdrachtgever: de partij die opdracht geeft;
- b. het adviesbureau: CIBIS Bouwadviseurs.

### **ARTIKEL 2 TOEPASSELIJKHEID**

Deze Algemene Voorwaarden zijn van toepassing op alle aanbiedingen en overeenkomsten tussen het adviesbureau en opdrachtgever zulks met uitsluiting van eventuele algemene voorwaarden van opdrachtgever. Wijzigingen in deze voorwaarden dienen door beide partijen uitdrukkelijk en schriftelijk te zijn bevestigd. De rechtsverhouding opdrachtgever-architect, ingenieur en adviseur DNR 2011 is naast deze Algemene Voorwaarden van toepassing op alle onze aanbiedingen en met ons gesloten overeenkomsten. De DNR 2011 is gedeponeerd ter griffie van de rechtbank te Amsterdam op 21 juli 2011 onder nummer 78/2011.

De opdrachtgever die niet op de hoogte is van de inhoud van de DNR 2011 wordt op verzoek een exemplaar toegezonden. In geval van strijdigheid tussen deze Algemene Voorwaarden en de DNR 2011 prevaleren deze Algemene Voorwaarden. Alle door de opdrachtgever gestelde voorwaarden, welke met de Algemene Voorwaarden van het adviesbureau en de DNR 2011 in strijd zijn, zijn op aanbiedingen van en overeenkomsten met het adviesbureau niet van toepassing.

Indien een opdracht namens de opdrachtgever wordt verstrekt door een derde, dan staat die derde er voor in dat de opdrachtgever van deze voorwaarden kennis heeft genomen en aanvaardt, bij gebreke waarvan de derde aan voorwaarden is gebonden als ware hij zelf opdrachtgever. In dat geval zijn zowel opdrachtgever als derde, jegens het adviesbureau hoofdelijk aansprakelijk voor alle verplichtingen uit de overeenkomst en deze Algemene Voorwaarden voortvloeiende.

### **ARTIKEL 3 VRIJWARING DOOR OPDRACHTGEVER**

3.1 Opdrachtgever is verplicht het adviesbureau te vrijwaren voor alle aanspraken van derden, voortvloeiende uit of verband houdende met de uitvoering van de werkzaamheden van het adviesbureau.

### **ARTIKEL 4 AANSPRAKELIJKHEID VAN HET ADVIESBUREAU**

4.1 Het adviesbureau zal de opdracht goed en zorgvuldig uitvoeren, behartigt de belangen van de opdrachtgever naar zijn beste weten en verricht zijn diensten naar beste kunnen. Indien een fout wordt gemaakt doordat de opdrachtgever aan het adviesbureau onjuiste of onvolledige informatie heeft verstrekt, is het adviesbureau voor de daardoor ontstane schade niet aansprakelijk. Indien de opdrachtgever aantoont dat hij schade heeft geleden door een fout van het adviesbureau, die bij zorgvuldig handelen zou zijn vermeden, is het adviesbureau voor die schade slechts aansprakelijk tot maximaal het bedrag van het honorarium voor de desbetreffende opdracht, tenzij er aan de zijde van het adviesbureau sprake is van opzet of daarmee gelijk te stellen grove nalatigheid.

4.2 Voor het overige geldt ten aanzien van de aansprakelijkheid hoofdstuk 6 van de DNR 2011.

### **ARTIKEL 5 ONDERBREKING OPDRACHT**

Indien de startdatum van de werkzaamheden van het adviesbureau en/of de bouwwerkzaamheden meer dan drie maanden opschuiven, na het sluiten van de overeenkomst, wordt dit beschouwd als onderbreking van de opdracht als bedoeld in art. 19 van de DNR 2011. In dat geval worden de werkzaamheden van het adviesbureau afgesloten en afgerekend, naar de stand van de werkzaamheden. In afwijking van het bepaalde in art. 19 van de DNR 2011 zal bij voortgang van de werkzaamheden van het adviesbureau opnieuw worden geoffreerd en dient terzake een nieuwe overeenkomst te worden gesloten.

### **ARTIKEL 6 BETALING**

Betaling door de opdrachtgever dient, zonder aftrek, korting of schuldverrekening, te geschieden binnen de overeengekomen termijn, doch in geen geval later dan dertig dagen na factuurdatum. Betaling dient te geschieden door middel van storting ten gunste van een door het adviesbureau aan te wijzen bankrekening. Indien de opdrachtgever niet binnen de onder lid 6.1 genoemde termijn heeft betaald, is het adviesbureau gerechtigd, nadat de opdrachtgever ten minste een maal is aangemaand te betalen, zonder nadere ingebrekestelling en onverminderd de overige rechten van het adviesbureau, vanaf de vervaldag de opdrachtgever de wettelijke rente in rekening te brengen tot op de datum van algehele voldoening. Alle in redelijkheid gemaakte gerechtelijke en buitengerechtelijke (incasso-)kosten, die het adviesbureau maakt als gevolg van de niet-nakoming door de opdrachtgever van diens betalingsverplichtingen, komen ten laste van de opdrachtgever. Indien de financiële positie of het betalingsgedrag van de opdrachtgever naar het oordeel van het adviesbureau daartoe aanleiding geeft, is het adviesbureau gerechtigd van opdrachtgever te verlangen, dat deze onverwijld (aanvullende) zekerheid stelt in een door het adviesbureau te bepalen vorm. Indien de opdrachtgever nalaat de verlangde zekerheid te stellen, is het adviesbureau gerechtigd, onverminderd de overige rechten, de verdere uitvoering van de overeenkomst onmiddellijk op te schorten en is al hetgeen de opdrachtgever aan het adviesbureau uit welke hoofde dan ook verschuldigd direct opeisbaar.

### **ARTIKEL 7 INTERPRETATIES EN GEBRUIK VAN RAPPORTAGES**

Het adviesbureau is in geen enkel opzicht aansprakelijk voor door anderen gegeven interpretaties van rapportages.

Het is de opdrachtgever uitdrukkelijk verboden de resultaten van het onderzoek en de in dat kader door het adviesbureau verstrekte gegevens, werkwijzen, adviezen en andere geestesproducten van het adviesbureau, een en ander in de ruimste zin des woord, al dan niet met inschakeling van derden te verveelvoudigen, te openbaren of te exploiteren, zonder schriftelijke toestemming.

### **ARTIKEL 8 TOEPASSELIJK RECHT**

Op alle overeenkomsten tussen de opdrachtgever en het adviesbureau is Nederlands recht van toepassing. Verschillen van mening tussen de opdrachtgever en het adviesbureau zullen zoveel mogelijk langs minnelijke weg worden opgelost. Indien een verschil van mening niet langs minnelijke weg is opgelost, wordt geacht een geschil te bestaan. Alle geschillen, daaronder begrepen die welke door slechts één der partijen als zodanig worden beschouwd, welke tussen de opdrachtgever en het adviesbureau mochten ontstaan in verband met de opdracht of enige overeenkomst die daarvan een uitvloeisel is, zullen met uitsluiting van de gewone rechter uitsluitend en in hoogste instantie worden beslecht door arbitrage overeenkomstig het Reglement van de Commissie van Geschillen, vastgesteld door het Hoofdbestuur van het Koninklijk Instituut van Ingenieurs, zoals dat reglement ter griffie van de Arrondissementsrechtbank te 's-Gravenhage zal zijn gedeponeerd op de dag waarop het geschil aanhangig wordt gemaakt.

Een overeenkomstig lid 2 van dit artikel en het aldaar genoemde Reglement benoemd scheidsgerecht oordeelt als goede man(nen) naar billijkheid. Waar in dit artikel wordt gesproken van de opdrachtgever respectievelijk het adviesbureau worden rechtverkrigenden van de opdrachtgever respectievelijk het adviesbureau daaronder begrepen.

|                                                                  |                                   |                                                                                     |
|------------------------------------------------------------------|-----------------------------------|-------------------------------------------------------------------------------------|
| Projectnummer:<br><b>180114 CR001</b>                            | Datum:<br><b>29 augustus 2018</b> |  |
| Projectomschrijving:<br><b>Uitbreiding Venster Techniek B.V.</b> |                                   |                                                                                     |

## Projectomschrijving

Aan de Ericaweg 9 te Zelhem wordt de bestaande bedrijfshal van Venster Techniek B.V. uitgebreid.

De uitbreiding wordt op gelijke wijze als de bestaande hal uitgevoerd.

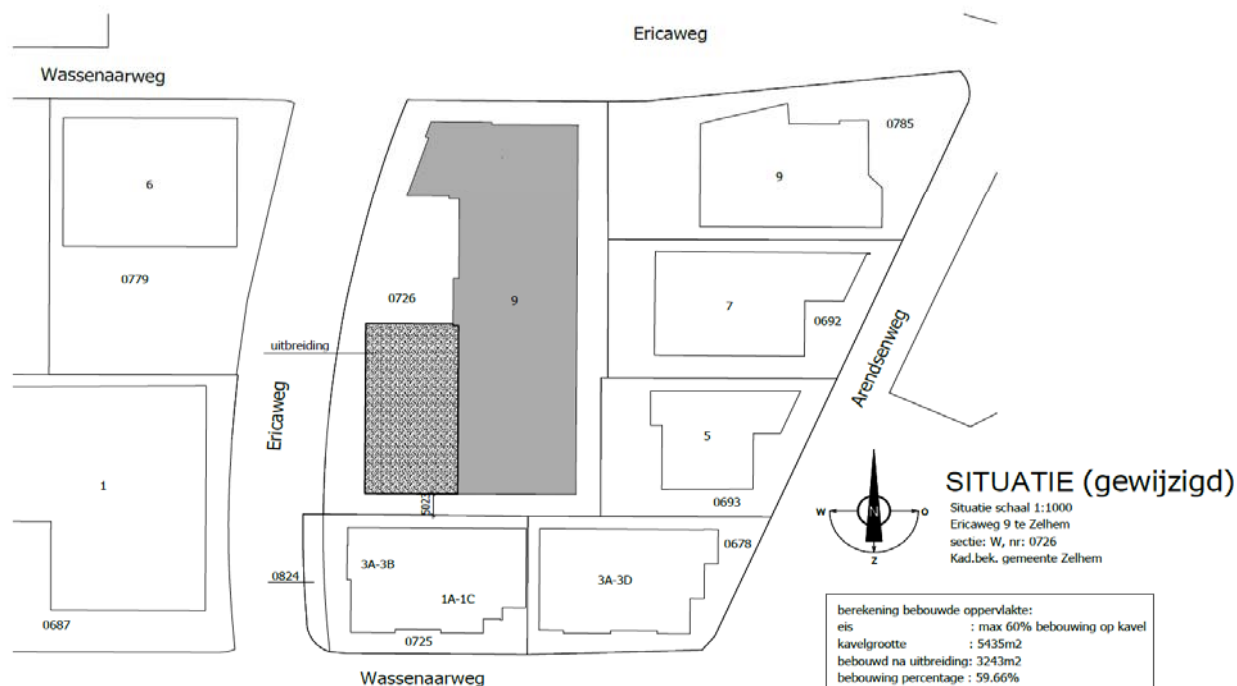
Het dak wordt uitgevoerd als stalen dakplaat welke van spant naar spant overspant. De spanten overspannen in de korte richting van de hal en worden ondersteunt door stalen kolommen.

Het stalen skelet wordt voorzien van stabiliteitskruizen. De windbelasting op de gevel wordt afgedragen naar het dak en de fundering. In het dak zijn windkruizen opgenomen welke de belasting naar de gevels afdragen. In de gevels zorgen de windbokken voor de afdracht naar de fundering.

De begane grondvloer is een betonvloer op zand.

Rondom wordt als fundering een betonnen ringbalk geplaatst. Hierop dragen de spanten de belasting af.

Situatie:



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## Algemeen

Alle opdrachten worden aanvaard en uitgevoerd volgens De Nieuwe Regeling 2011, zoals gedeponneerd bij de arrondissementsrechtbank te Amsterdam.

(een samenvatting van hoofdstukken is bij ons kantoor opvraagbaar)

### Bij de berekening is uitgegaan van de volgende normen, tekeningen en aannames:

|            |                                          |
|------------|------------------------------------------|
| NEN-EN1990 | Grondslagen van het constructief ontwerp |
| NEN-EN1991 | Belastingen op constructies              |
| NEN-EN1992 | Betonconstructies                        |
| NEN-EN1993 | Staalconstructies                        |
| NEN-EN1994 | Staal-beton constructies                 |
| NEN-EN1995 | Houtconstructies                         |
| NEN-EN1996 | Steenconstructies                        |
| NEN-EN1997 | Geotechniek                              |
| NEN-EN1998 | Aardbevingsbestendige constructies       |
| NEN-EN1999 | Aluminiumconstructies                    |

Indien nodig, wordt er tevens gebruik gemaakt van richtlijnen c.q. rapporten

### De berekeningen zijn uitgevoerd op basis van de aan ons verstrekte gegevens, namelijk:

|                   |                   |                                       |
|-------------------|-------------------|---------------------------------------|
| Tekening:         | blad: 1a, 2a en 3 | d.d. 12-06-2018/18-06-2018/19-07-2018 |
| Tekening:         |                   | d.d.                                  |
| Funderingsadvies: |                   | d.d.                                  |

### Het bouwwerk is als volgt ingedeeld:

|                    |                                                           |  |  |
|--------------------|-----------------------------------------------------------|--|--|
| Omschrijving:      | bedrijfshal                                               |  |  |
| Gevolgklasse:      | CC1                                                       |  |  |
| $K_{FI}$ -factor:  | 0,9                                                       |  |  |
| Referentieperiode: | 50 jaar                                                   |  |  |
| Gebouwhoogte:      | 7 m <sup>1</sup>                                          |  |  |
| Windgebied:        | 3, Onbebouwd                                              |  |  |
| $q_p(ze)$ :        | 0,62 kN/m <sup>2</sup> (uitgaande van een $C_s C_d = 1$ ) |  |  |

|        | Bel. Comt blijvend | opgelegd |
|--------|--------------------|----------|
| 6.10.a | 1,22               | 1,35     |
| 6.10.b | 1,08               | 1,35     |

Opgelegd\* $\psi_0$   
2 extreem, rest\* $\psi_0$

### Materialen:

|        |                                                                                                                                                            |
|--------|------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Staal: | Walsprofielen S235 $f_y = 235$ N/mm <sup>2</sup><br>Kokerprofielen S275 $f_y = 275$ N/mm <sup>2</sup><br>Bouten kwaliteit 8.8<br>Ankerbouten kwaliteit 4.6 |
| Beton: | Betonsterkte C20/25 $f_{cd} = 13,3$ N/mm <sup>2</sup><br>Milieuklasse XC2 (nat, zelden droog)<br>Betonstaal B500                                           |
| Hout:  | Kwaliteit C18                                                                                                                                              |
| Steen: | Kalkzandsteen CS12 ( $f'_{cd} = 12$ N/mm <sup>2</sup> )<br>Lijmwerk                                                                                        |

### Fundering:

Voor het funderingsontwerp is uitgegaan van goede draagkrachtige (zand-)grond, waarbij een  $\phi'$ -waarde van 32,5° is gehanteerd (zand, matig vast).

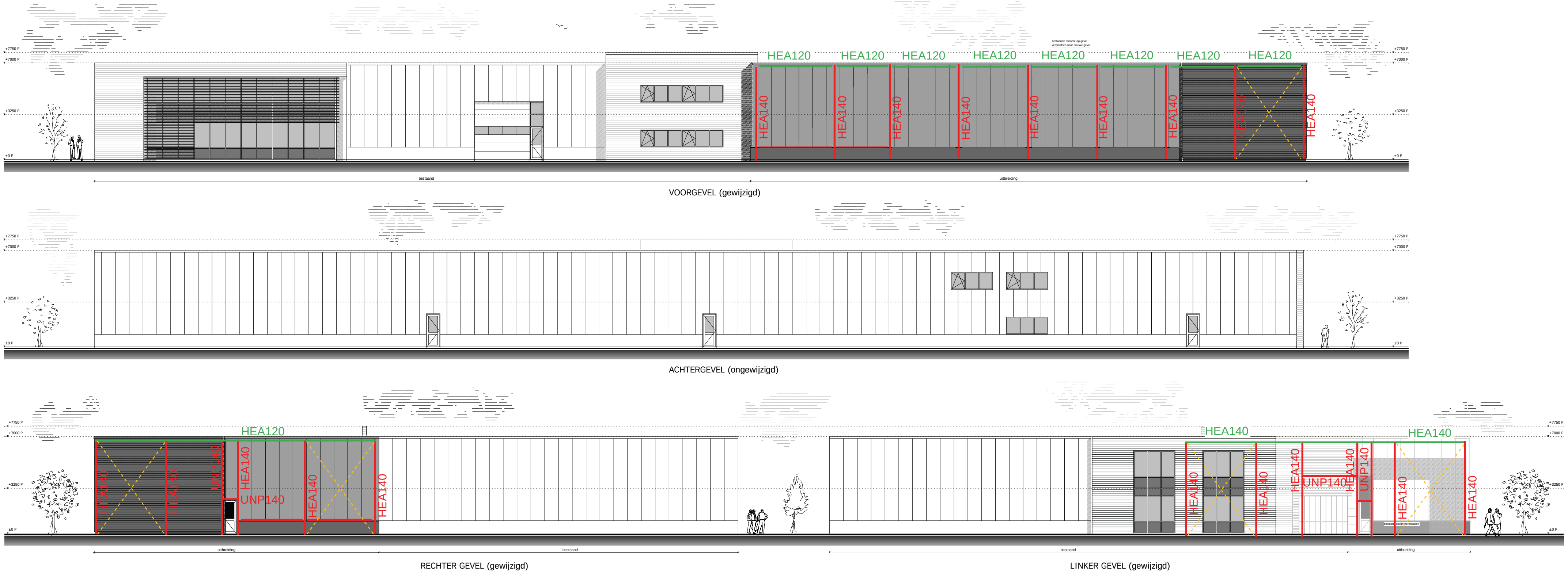
Conusweerstand minimaal 4.0 MN/m<sup>2</sup> (= 40kg/cm<sup>2</sup>) !!!

Waar nodig grondverbetering toepassen.

Gedane aannames dienen (in het werk) te worden gecontroleerd !!!

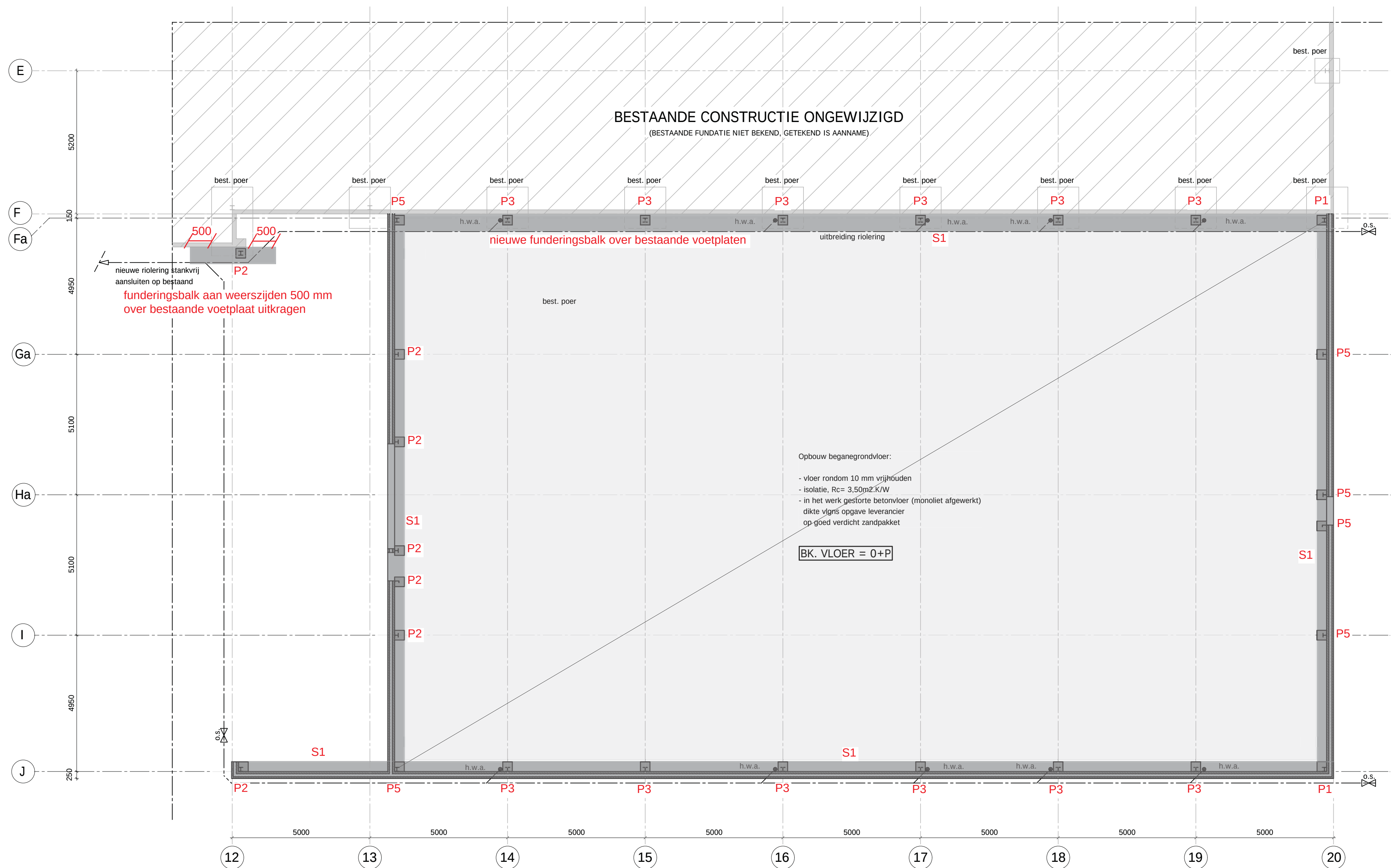
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-  noodoverlaat 200x100 mm<sup>2</sup> 30 mm boven dakvlak
-  noodoverlaat 400x100 mm<sup>2</sup> 30 mm boven dakvlak

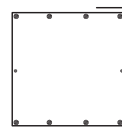


## FUNDERING EN BEGANE GRONDVLOER

- betonvloer op zand dik 180 mm<sup>1</sup> (C20/25)  
Wapening #ø8-150 onder/ boven  
milieuklasse XC2 onder / XC1 boven  
dekking 35 mm onder en boven
- funderingsbalk 500x500 mm<sup>2</sup> (C20/25)  
wapening zie hiernaast  
milieuklasse XC2  
dekking 50 mm onder en boven 40 mm zijanten

Standaard wapening in balken  
500x500

4ø16 (b)  
2ø8 (flank)  
4ø16 (o)  
Bgls. ø8-150





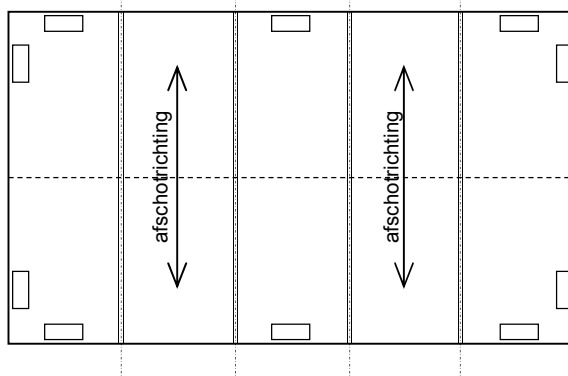
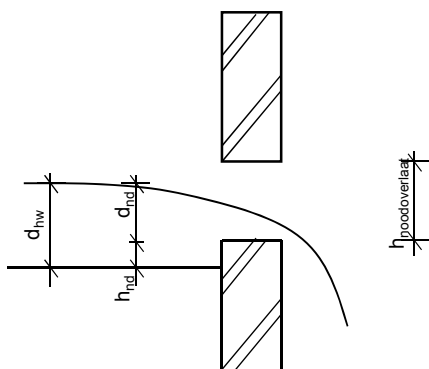
|                                                                  |                                   |                                                                                     |
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| Projectomschrijving:<br><b>Uitbreiding Venster Techniek B.V.</b> |                                   |                                                                                     |

## Belastingaannames per m<sup>2</sup> conform NEN-EN 1991

| Omschrijving         | Blijvend                                                                                                                                                                                     | Veranderlijk                                                                                                                                                                                                                    |
|----------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                      |                                                                                                                                                                                              |                                                                                                                                                                                                                                 |
|                      |                                                                                                                                                                                              |                                                                                                                                                                                                                                 |
|                      |                                                                                                                                                                                              |                                                                                                                                                                                                                                 |
| b) Plat dak          | Zonnepanelen niet gereken 0,00 kN/m <sup>2</sup><br>Dakbedekking 0,10 „<br>Isolatie 0,05 „<br>Stalen dakplaat 0,15 „<br>Windverbanden e.d. 0,05 „<br>G <sub>k</sub> = 0,35 kN/m <sup>2</sup> | ψ <sub>0</sub> = 0,00<br>ψ <sub>1</sub> = 0,00<br>ψ <sub>2</sub> = 0,00<br>q <sub>k</sub> = 1,00 kN/m <sup>2</sup><br>q <sub>k mom</sub> = 0,00 kN/m <sup>2</sup>                                                               |
| c)                   |                                                                                                                                                                                              |                                                                                                                                                                                                                                 |
|                      |                                                                                                                                                                                              |                                                                                                                                                                                                                                 |
|                      |                                                                                                                                                                                              |                                                                                                                                                                                                                                 |
|                      |                                                                                                                                                                                              |                                                                                                                                                                                                                                 |
| f) Begane grond      | Vloer op zand 4,30 kN/m <sup>2</sup><br>Isolatie 0,10 „<br>Overig 0,10 „<br>Overig 0,00 „<br>Overig 0,00 kN/m <sup>2</sup><br>G <sub>k</sub> = 4,50 kN/m <sup>2</sup>                        | Lichte scheidingswanden 0,00 kN/m <sup>2</sup><br>ψ <sub>0</sub> = 1,00<br>ψ <sub>1</sub> = 0,90<br>ψ <sub>2</sub> = 0,80<br>q <sub>k</sub> = 5,00 kN/m <sup>2</sup> (incl. lsw)<br>q <sub>k mom</sub> = 5,00 kN/m <sup>2</sup> |
| g) Overig            | G <sub>k</sub> = 0,00 kN/m <sup>2</sup>                                                                                                                                                      | ψ = 0,0 P <sub>g,rep</sub> = 0,00 P <sub>k mom</sub> = 0,00                                                                                                                                                                     |
| h) Windbelasting     | G <sub>k</sub> = 0,00 kN/m <sup>2</sup>                                                                                                                                                      | ψ = 0,0 P <sub>w,rep</sub> = 0,62 P <sub>k mom</sub> = 0,00                                                                                                                                                                     |
| i) Metselwerk ρ =    | 20 KN/m <sup>3</sup> 100 mm <sup>1</sup> 2,00 kN/m <sup>2</sup>                                                                                                                              | <b>Belastingsfactoren</b><br>γ <sub>Gj,sup</sub> = 1,08 γ <sub>Q,i</sub> = 1,35<br>γ <sub>Gj,sup</sub> = 1,22                                                                                                                   |
| j) Kalkzandsteen ρ = | 19 KN/m <sup>3</sup> 100 mm <sup>1</sup> 1,90 kN/m <sup>2</sup>                                                                                                                              |                                                                                                                                                                                                                                 |
| k) betonwand ρ =     | 24 KN/m <sup>3</sup> 120 mm <sup>1</sup> 2,88 kN/m <sup>2</sup>                                                                                                                              |                                                                                                                                                                                                                                 |
| l) Stroken ρ =       | 24 KN/m <sup>3</sup> 200 mm <sup>1</sup> 4,80 kN/m <sup>2</sup>                                                                                                                              |                                                                                                                                                                                                                                 |

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## Noodoverlaten conform NEN 3215 (NO1)



### Plaatsing noodoverlaten:

- Maximaal om de 2 velden met een maximum van 15 meter.
- Tevens 2 noodoverlaten plaatsen in de kopse gevels, ivm waterophoping door wind.
- Afschot minimaal 16mm/meter
- In het midden van het veld (laagste punt)

### Formules :

$$(1) Q_h = A \cdot i_r$$

$$(2) d_{nd} = 0,70 \cdot (Q_h / b)^{2/3}$$

$$(3) d_{hw;(x=0)} = d_{nd} + h_{nd}$$

waarin:

$Q_h$  = het debiet dat door de noodafvoer moet worden afgevoerd [ $m^3/s$ ]

$i_r$  = regenintensiteit = 0,060 E-03 m/s

$A$  = Oppervlak van het afvoergebied

$b$  = breedte van de noodafvoer [m]

$h_{nd}$  = hoogte van de noodafvoer boven het dakoppervlak [m]

$d_{nd}$  = hoogte waterstand boven de noodafvoer [m]

$d_{hw;(x=0)}$  = waterhoogte tpv. Noodafvoer [m]

### Dakvlak:

|                  |                          |
|------------------|--------------------------|
| $B_{dakvlak}$ =  | 40,0 m                   |
| $L_{dakvlak}$ =  | 10,0 m                   |
| $A_{dakvlak}$ =  | 400 m <sup>2</sup>       |
| $Q_{h;totaal}$ = | 0,0240 m <sup>3</sup> /s |

|                                                |        |
|------------------------------------------------|--------|
| $h_{nd}$ =                                     | 30 mm  |
| Max. waterstand op het dak ( $d_{hw}$ ) =      | 100 mm |
| $d_{nd}$ = max. waterstand op dak - $h_{nd}$ = | 70 mm  |
| $b_{noodoverlaat; tot}$ =                      | 0,76 m |

### Noodoverlaat:

|                            |                          |
|----------------------------|--------------------------|
| Aantal noodoverlaten (n) : | 4 stuks                  |
| $B_{noodoverlaat}$ :       | 200 mm                   |
| $H_{noodoverlaat}$ :       | 100 mm                   |
| $Q_{h;noodoverlaat}$ :     | 0,0060 m <sup>3</sup> /s |

### Controle breedte noodoverlaat:

$$\frac{B_{benodigd}}{n \cdot B_{noodoverlaat}} = \frac{760}{4 \cdot 200} \leq 1 \quad \text{VOLDOET}$$

### Controle capaciteit noodoverlaat:

$$\frac{Q_{h;noodoverlaat}}{Q_{noodoverlaat}} = \frac{0,0060}{0,0108} \leq 1 \quad \text{VOLDOET}$$

### NPR3216

$$Q_{noodoverlaat} = 1,7 \cdot b \cdot h^{3/2} = 0,0108 \text{ m}^3/\text{s}$$

### NEN6702: art. 8.7.1.6

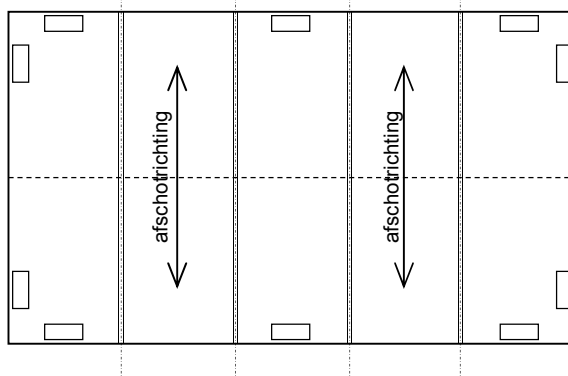
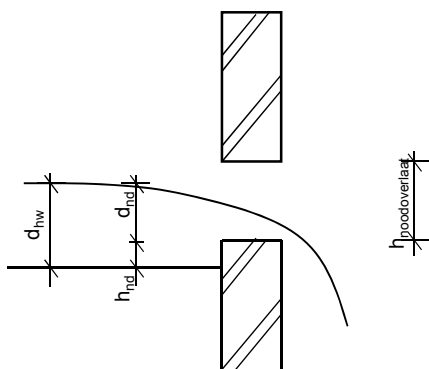
|            |                                             |
|------------|---------------------------------------------|
| $d_{nd}$ = | 68 mm                                       |
| Benodigd : | $H_{noodoverlaat} - d_{nd} = 30 \text{ mm}$ |
| Aanwezig:  | $100 - 68 = 32 \text{ mm}$                  |

### Controle vrije hoogte noodoverlaat:

$$\frac{H_{benodigd}}{H_{aanwezig}} = \frac{30}{32} \leq 1 \quad \text{VOLDOET}$$

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## Noodoverlaten conform NEN 3215 (NO2)



### Plaatsing noodoverlaten:

- Maximaal om de 2 velden met een maximum van 15 meter.
- Tevens 2 noodoverlaten plaatsen in de kopse gevels, ivm waterophoping door wind.
- Afschot minimaal 16mm/meter
- In het midden van het veld (laagste punt)

### Formules :

- $Q_h = A \cdot i_r$
- $d_{nd} = 0,70 \cdot (Q_h / b)^{2/3}$
- $d_{hw;(x=0)} = d_{nd} + h_{nd}$

waarin:

- $Q_h$  = het debiet dat door de noodafvoer moet worden afgevoerd [ $m^3/s$ ]  
 $i_r$  = regenintensiteit = 0,060 E-03 m/s  
 $A$  = Oppervlak van het afvoergebied  
 $b$  = breedte van de noodafvoer [m]  
 $h_{nd}$  = hoogte van de noodafvoer boven het dakoppervlak [m]  
 $d_{nd}$  = hoogte waterstand boven de noodafvoer [m]  
 $d_{hw;(x=0)}$  = waterhoogte tpv. Noodafvoer [m]

### Dakvlak:

|                  |                          |
|------------------|--------------------------|
| $B_{dakvlak}$ =  | 40,0 m                   |
| $L_{dakvlak}$ =  | 10,0 m                   |
| $A_{dakvlak}$ =  | 400 m <sup>2</sup>       |
| $Q_{h;totaal}$ = | 0,0240 m <sup>3</sup> /s |

|                                                |        |
|------------------------------------------------|--------|
| $h_{nd}$ =                                     | 30 mm  |
| Max. waterstand op het dak ( $d_{hw}$ ) =      | 100 mm |
| $d_{nd}$ = max. waterstand op dak - $h_{nd}$ = | 70 mm  |
| $b_{noodoverlaat;tot}$ =                       | 0,76 m |

### Noodoverlaat:

|                            |                          |
|----------------------------|--------------------------|
| Aantal noodoverlaten (n) : | 2 stuks                  |
| $B_{noodoverlaat}$ :       | 400 mm                   |
| $H_{noodoverlaat}$ :       | 100 mm                   |
| $Q_{h;noodoverlaat}$ :     | 0,0120 m <sup>3</sup> /s |

### Controle breedte noodoverlaat:

$$\frac{B_{benodigd}}{n \cdot B_{noodoverlaat}} = \frac{760}{2 \cdot 400} \leq 1 \quad \text{VOLDOET}$$

### Controle capaciteit noodoverlaat:

$$\frac{Q_{h;noodoverlaat}}{Q_{noodoverlaat}} = \frac{0,0120}{0,0215} \leq 1 \quad \text{VOLDOET}$$

### NPR3216

$$Q_{noodoverlaat} = 1,7 \cdot b \cdot h^{3/2} = 0,0215 \text{ m}^3/\text{s}$$

### NEN6702: art. 8.7.1.6

|            |                                             |
|------------|---------------------------------------------|
| $d_{nd}$ = | 68 mm                                       |
| Benodigd : | $H_{noodoverlaat} - d_{nd} = 30 \text{ mm}$ |
| Aanwezig:  | $100 - 68 = 32 \text{ mm}$                  |

### Controle vrije hoogte noodoverlaat:

$$\frac{H_{benodigd}}{H_{aanwezig}} = \frac{30}{32} \leq 1 \quad \text{VOLDOET}$$

SJF

## Stabiliteit

De windbelasting op de gevel draagt af op de dakconstructie en de fundering.

De belasting op het dak wordt door middel van kruizen afgedragen naar de windbokken in de gevels.

De windbokken dragen de belasting af op de fundering.

### Uitgangspunten:

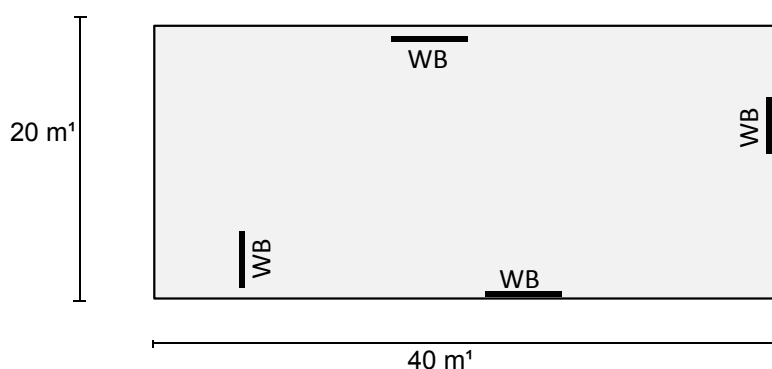
Windgebied II, onbebouwd

Gebouwhoogte 7 m<sup>1</sup>

Gebouwbreedte 40 m<sup>1</sup> / 20 m<sup>1</sup>

$q_{p(ze)}$ : 0,62 kN/m<sup>2</sup>

$C_s C_d = 1,0$



### // Cijferassen:

$$Q = 1/2 \times h \times C_s C_d \times (C_e + C_i) \times q_{p(ze)} + c_{fr} \times b \times q_{p(ze)}$$

$$Q = (1/2 \times 7,0) \times 1,0 \times (0,8+0,5) \times 0,62 + 0,02 \times 20 \times 0,62 = 3,07 \text{ kN/m}^1$$

$$R \text{ (as 13 en 20)} = (25 \text{ m}^1) \times 3,07 \text{ kN/m}^1 = 76,7 \text{ kN}$$

### // Letterassen:

$$Q = 1/2 \times h \times C_s C_d \times (C_e + C_i) \times q_{p(ze)} + c_{fr} \times b \times q_{p(ze)}$$

$$Q = (1/2 \times 7,0) \times 1,0 \times (0,8+0,5) \times 0,62 + 0,02 \times 40 \times 0,62 = 3,32 \text{ kN/m}^1$$

$$R \text{ (as Fa en J)} = (1/2 \times 20 \text{ m}^1) \times 3,32 \text{ kN/m}^1 = 33,2 \text{ kN}$$

### // Cijferassen:

$$Q = 1/2 \times h \times C_s C_d \times (C_e + C_i) \times q_{p(ze)} + c_{fr} \times b \times q_{p(ze)}$$

$$Q = (1/2 \times 7,0) \times 1,0 \times (0,8+0,5) \times 0,62 + 0,02 \times 20 \times 0,62 = 3,07 \text{ kN/m}^1$$

$$R \text{ (as 13 en 20)} = (25 \text{ m}^1) \times 3,07 \text{ kN/m}^1 = 76,7 \text{ kN}$$

### Krachten spel:

$$\text{Diagonaal: } N = 1/2 \times (35 - 5) \times 3,07 \times (7,1 / 5,0) = 65,4 \text{ kN}$$

$$\text{Drukkoker: } N = 1/2 \times (35 - 5) \times 3,07 = 46,1 \text{ kN}$$

$$\text{Wandstaaf: } N = (1/8 \times 3,07 \times 35^2) / 20,0 = 23,5 \text{ kN}$$

### Dimensionering diagonalen:

$$N_{ed} = 65,4 \times 1,35 = 88 \text{ kN}$$

$$N_{cRd} = 97 \text{ kN}$$

| L70x70x7 mm <sup>3</sup> | S235                                           |
|--------------------------|------------------------------------------------|
| 3x M12 (8.8)             | p1 30 mm <sup>1</sup><br>s1 50 mm <sup>1</sup> |

$$u.c. = 88,29/97,1 = 0,91 < 1,0$$

### Dimensionering wandstaaf:

$$N_{ed} = 23,5 \times 1,35 = 32 \text{ kN}$$

$$\lambda = 5000 / (93,91 \times 30,2) = 1,76$$

$$\text{knikkromme } \chi = 0,243$$

$$N_{cRd} = \chi \times f_{yd} \times A = 0,243 \times 235 \times 2530 = 144,5 \text{ kN}$$

| HEA 120 | S235 |
|---------|------|
|---------|------|

$$u.c. = 31,725/144,5 = 0,22 < 1,0$$



### // Letterassen:

$$Q = 1/2 \times h \times C_s C_d \times (C_e + C_i) \times q_{p(ze)} + c_{fr} \times b \times q_{p(ze)}$$

$$Q = (1/2 \times 7,0) \times 1,0 \times (0,8+0,5) \times 0,62 + 0,02 \times 40 \times 0,62 = 3,32 \text{ kN/m}^1$$

$$R \text{ (as Fa en J)} = (1/2 \times 20 \text{ m}^1) \times 3,32 \text{ kN/m}^1 = 33,2 \text{ kN}$$

### Krachtspel:

$$\text{Diagonaal: } N = 1/2 \times (20 - 5,0) \times 3,32 \times (7,1 / 5) = 35,4 \text{ kN}$$

$$\text{Drukkoker: } N = 1/2 \times (20 - 5,0) \times 3,32 = 24,9 \text{ kN}$$

$$\text{Wandstaaf: } N = (1/8 \times 3,32 \times 20,0^2) / 20 = 8,3 \text{ kN}$$

### Dimensionering diagonalen:

$$N_{ed} = 35,4 \times 1,35 = 47,8 \text{ kN}$$

$$N_{cRd} = 97 \text{ kN}$$

|                                |                                                |
|--------------------------------|------------------------------------------------|
| <b>L70x70x7 mm<sup>3</sup></b> | <b>S235</b>                                    |
| 3x M12 (8.8)                   | p1 30 mm <sup>1</sup><br>s1 50 mm <sup>1</sup> |

$$u.c. = 47,79/97,1 = 0,49 < 1,0$$

### Dimensionering drukker:

$$N_{ed} = 24,9 \times 1,35 = 34 \text{ kN}$$

$$\lambda = 5000 / (86,8 \times 26,4) = 1,89$$

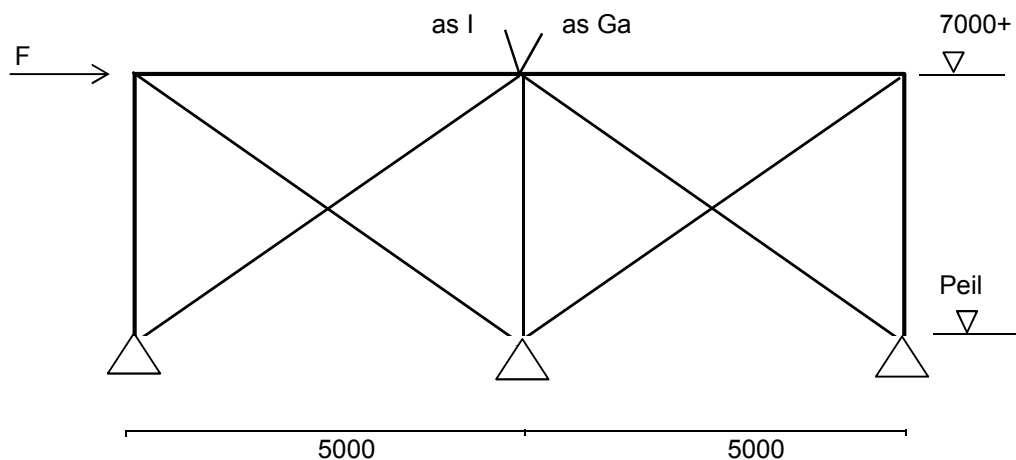
$$\text{knikkromme } a \quad \chi = 0,190$$

$$N_{cRd} = \chi \times f_{yd} \times A = 0,190 \times 275 \times 1290 = 67,4 \text{ kN}$$

|                   |             |
|-------------------|-------------|
| <b>K70x70x5,0</b> | <b>S275</b> |
|-------------------|-------------|

$$u.c. = 33,615/67,4 = 0,5 < 1,0$$

## Windbok as 13 en 20



### Belasting:

F = 76,7 kN

### Krachtspel:

|            |     |      |   |                |         |
|------------|-----|------|---|----------------|---------|
| Kolommen   | N = | 76,7 | x | 7000 / 10000 = | 53,7 kN |
| Diagonalen | N = | 76,7 | x | 8602 / 10000 = | 66 kN   |

### Dimensionering diagonalen:

$N_{ed} \quad 1,35 \quad \times \quad 66 = \quad 89,1 \text{ kN}$

$N_{cRd} \quad 95,4 \text{ kN}$

|                                   |      |
|-----------------------------------|------|
| $\nless 60 \times 8 \text{ mm}^2$ | S235 |
| 3x M12 (8.8)                      |      |

u.c. =  $89,1 / 95,4 = 0,93 < 1,0$

Neem ankers 4x M16 gerolde draad 4.6

$F_{ved} = 1,35 \times 76,7 \times 0,5 = 51,773 \text{ kN}$   
 ↳ 2 voetplaten

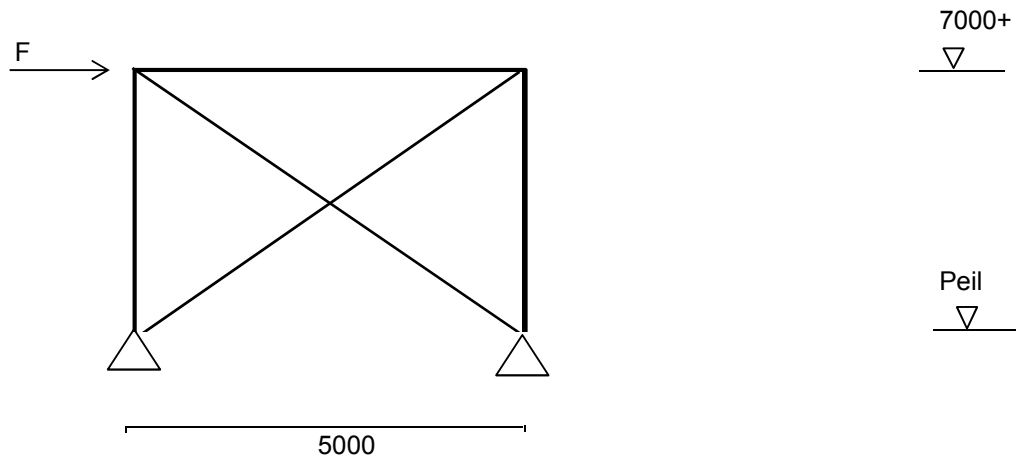
Kracht grijpt centrisch aan op de ankergroep. De kracht wordt opgenomen door 4 ankers.

Per anker 12,9 kN

$F_{vRd} = 18,8 \text{ kN}$

u.c. =  $12,9 / 18,8 = 0,69 < 1,0$

## Windbok as Fa en J



### Belasting:

F = 33,2 kN

### Krachtspel:

|            |     |      |   |               |         |
|------------|-----|------|---|---------------|---------|
| Kolommen   | N = | 33,2 | x | 7000 / 5000 = | 46,5 kN |
| Diagonalen | N = | 33,2 | x | 8602 / 5000 = | 57,1 kN |

### Dimensionering diagonalen:

$N_{ed} \quad 1,35 \quad x \quad 57,1 = \quad 77,085 \text{ kN}$

$N_{cRd} \quad 95,4 \text{ kN}$

|                                 |             |
|---------------------------------|-------------|
| $\neq 60 \times 8 \text{ mm}^2$ | <b>S235</b> |
| 3x M12 (8.8)                    |             |

u.c. =  $77,085 / 95,4 = 0,81 < 1,0$

Neem ankers 4x M16 gerolde draad 4.6

$F_{ved} = 1,35 \times 33,2 = 44,82 \text{ kN}$

Kracht grijpt centrisch aan op de ankergroep. De kracht wordt opgenomen door 4 ankers.

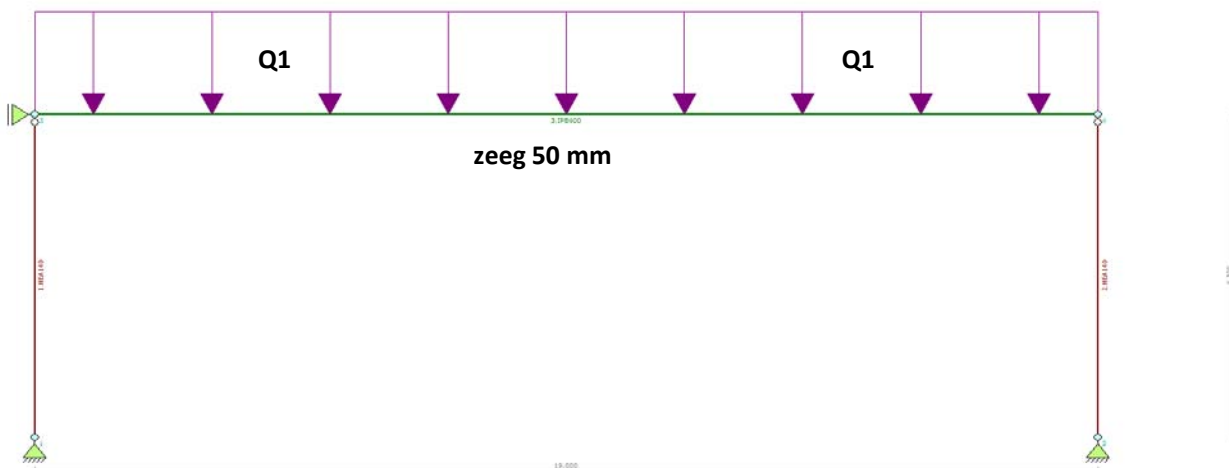
Per anker 11,2 kN

$F_{vRd} = 18,8 \text{ kN}$

u.c. =  $11,2 / 18,8 = 0,6 < 1,0$

**Berekening:** spant as 12

**Geometrie:**



Belastingbreedte: 3,0 m<sup>1</sup>

**Belasting:**

Permanent: Q1    Dak    3,0 m<sup>1</sup> x 0,35 kN/m<sup>2</sup>    = 1,05 kN/m<sup>1</sup>

Veranderlijk Q1    Dak    met behulp van lastengenerator technosoft

**Berekening:**

Zie uitvoer Technosoft, Bijlage A.

**Samenvatting:**

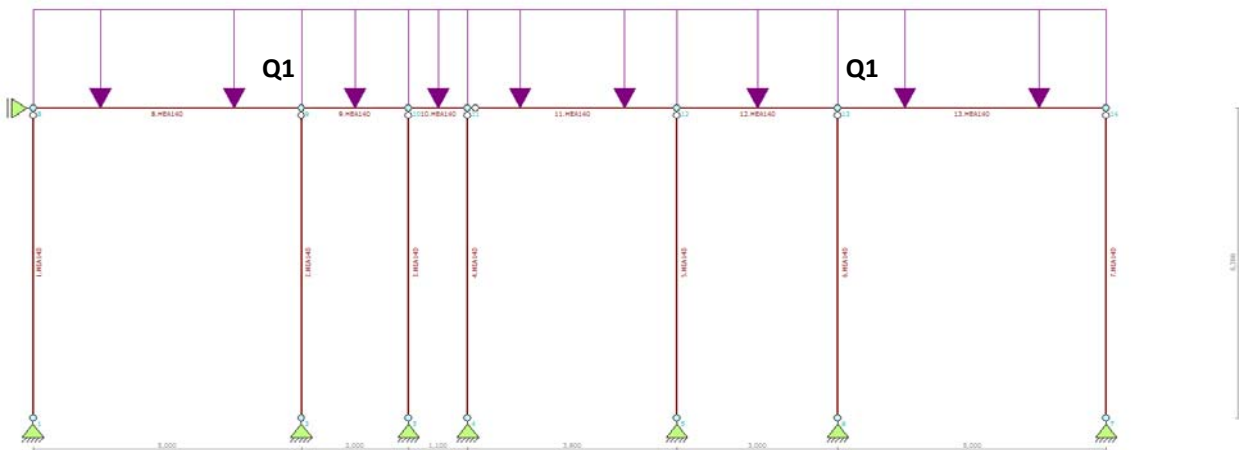
zie uitvoer Technosoft raamwerken voor unity-checks

|                 |            |
|-----------------|------------|
| Max. Spanning   | 0,60 ≤ 1,0 |
| Max. Vervorming | 0,90 ≤ 1,0 |

Akkoord

## Berekening: spant as 13

### Geometrie:



Belastingbreedte: 5,0 m<sup>1</sup>

### Belasting:

Permanent: Q1 Dak 5,0 m<sup>1</sup> x 0,35 kN/m<sup>2</sup> = 1,75 kN/m<sup>1</sup>

Veranderlijk Q1 Dak met behulp van lastengenerator technosoft

### Berekening:

Zie uitvoer Technosoft, Bijlage B.

### Samenvatting:

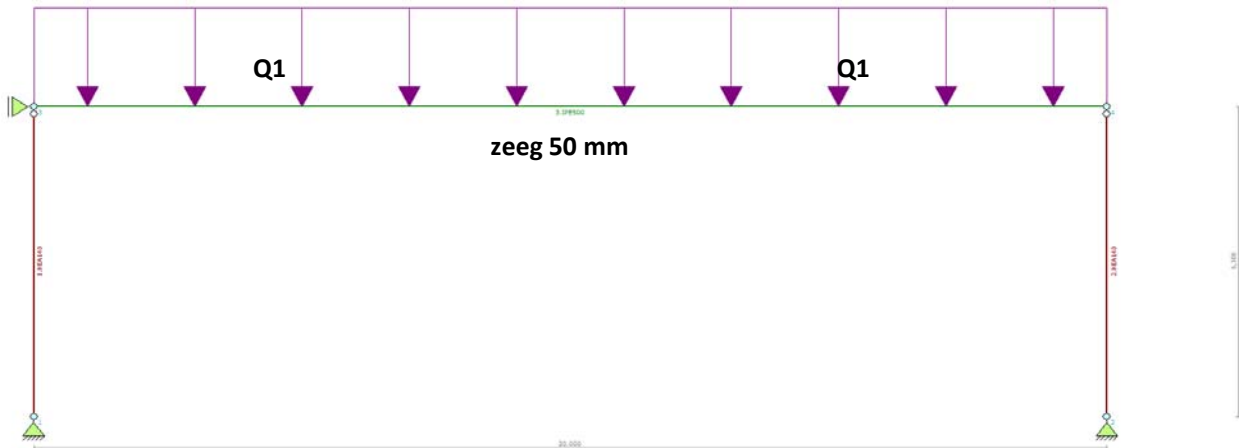
zie uitvoer Technosoft raamwerken voor unity-checks

Max. Spanning 0,77 ≤ 1,0  
Max. Vervorming 0,60 ≤ 1,0

Akkoord

**Berekening:** spant as 14 t/m 19

**Geometrie:**



Belastingbreedte: 5,0 m<sup>1</sup>

**Belasting:**

Permanent: Q1    Dak    5,0 m<sup>1</sup> x 0,35 kN/m<sup>2</sup>    = 1,75 kN/m<sup>1</sup>

Veranderlijk Q1    Dak    met behulp van lastengenerator technosoft

**Berekening:**

Zie uitvoer Technosoft, Bijlage C.

**Samenvatting:**

zie uitvoer Technosoft raamwerken voor unity-checks

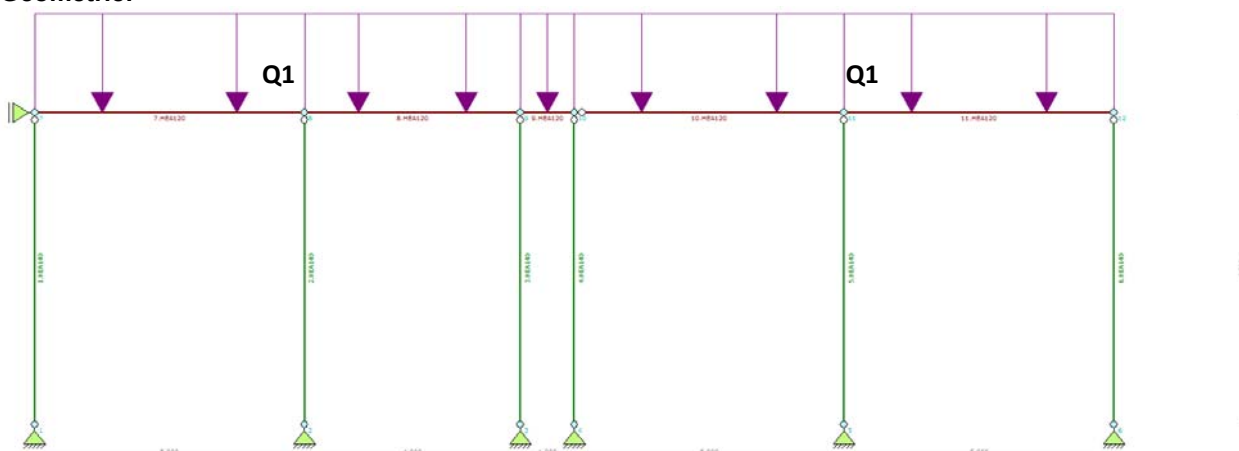
|                 |            |
|-----------------|------------|
| Max. Spanning   | 0,97 ≤ 1,0 |
| Max. Vervorming | 0,78 ≤ 1,0 |

Akkoord



**Berekening:** spant as 20

**Geometrie:**



Belastingbreedte: 2,5 m<sup>1</sup>

**Belasting:**

Permanent: Q1    Dak    2,5 m<sup>1</sup> x 0,35 kN/m<sup>2</sup>    = 0,88 kN/m<sup>1</sup>

Veranderlijk Q1    Dak    met behulp van lastengenerator technosoft

**Berekening:**

Zie uitvoer Technosoft, Bijlage D.

**Samenvatting:**

zie uitvoer Technosoft raamwerken voor unity-checks

|                 |            |
|-----------------|------------|
| Max. Spanning   | 0,54 ≤ 1,0 |
| Max. Vervorming | 0,68 ≤ 1,0 |

Akkoord

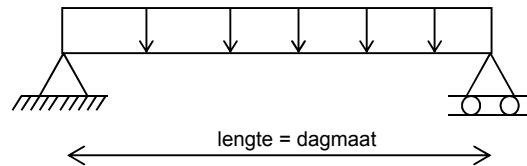
| Overzicht lateien              |  |    |    |    |    |    |    |    |    |    |    |    |    |  | Belastingfactoren |                  |                    |                  |      |
|--------------------------------|--|----|----|----|----|----|----|----|----|----|----|----|----|--|-------------------|------------------|--------------------|------------------|------|
|                                |  |    |    |    |    |    |    |    |    |    |    |    |    |  | 6.10.a            | $\gamma_{Gj,su}$ | 1,22               | $\gamma_{Q,i} =$ | 1,35 |
|                                |  |    |    |    |    |    |    |    |    |    |    |    |    |  | 6.10.b            | $\gamma_{Gj,su}$ | 1,08               | $\gamma_{Q,i} =$ | 1,35 |
| Belastingen per m <sup>1</sup> |  |    |    |    |    |    |    |    |    |    |    |    |    |  |                   |                  |                    |                  |      |
| Latei nummer                   |  |    |    |    |    |    |    |    |    |    |    |    |    |  | G <sub>k</sub>    | q <sub>k</sub>   | q <sub>k</sub> mon |                  |      |
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|                                |  | a) | b) | c) | d) | e) | f) | g) | h) | i) | j) | k) | l) |  |                   |                  |                    |                  |      |
| Positie latei                  |  |    |    |    |    |    |    |    |    |    |    |    |    |  |                   |                  |                    |                  |      |
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|                                |  |    |    |    |    |    |    |    |    |    |    |    |    |  |                   |                  |                    |                  |      |
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|                                |  |    |    |    |    |    |    |    |    |    |    |    |    |  |                   |                  |                    |                  |      |
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|                                |  |    |    |    |    |    |    |    |    |    |    |    |    |  |                   |                  |                    |                  |      |
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|                                |  |    |    |    |    |    |    |    |    |    |    |    |    |  |                   |                  |                    |                  |      |

## Overzicht lateien

6.10.a

6.10.b

| Belastingfactoren |      |               |      |
|-------------------|------|---------------|------|
| $\gamma_{Gj,su}$  | 1,22 | $\gamma_{Qi}$ | 1,35 |
| $\gamma_{Gj,su}$  | 1,08 | $\gamma_{Qi}$ | 1,35 |

[illegible]

SJF

| Belastingafdracht naar de stroken |                |                |                    |      |  |  |  |  |  |  |  |  | Belastingfactoren |                  |      |                  |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
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|                                   |                |                |                    |      |  |  |  |  |  |  |  |  | 6.10.a            | $\gamma_{Gj,su}$ | 1,22 | $\gamma_{Q,i} =$ | 1,35 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                                   |                |                |                    |      |  |  |  |  |  |  |  |  | 6.10.b            | $\gamma_{Gj,su}$ | 1,08 | $\gamma_{Q,i} =$ | 1,35 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Belastingen per m <sup>1</sup>    |                |                |                    |      |  |  |  |  |  |  |  |  |                   |                  |      |                  |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Strook                            | G <sub>k</sub> | q <sub>k</sub> | q <sub>k,nom</sub> |      |  |  |  |  |  |  |  |  |                   |                  |      |                  |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| a)                                |                |                |                    |      |  |  |  |  |  |  |  |  |                   |                  |      |                  |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| b)                                | 0,35           | 1,00           |                    |      |  |  |  |  |  |  |  |  |                   |                  |      |                  |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| c)                                |                |                |                    |      |  |  |  |  |  |  |  |  |                   |                  |      |                  |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
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| e)                                |                |                |                    |      |  |  |  |  |  |  |  |  |                   |                  |      |                  |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| f)                                | 4,50           | 5,00           | 5,00               |      |  |  |  |  |  |  |  |  |                   |                  |      |                  |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| g)                                |                |                |                    |      |  |  |  |  |  |  |  |  |                   |                  |      |                  |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| h)                                |                | 0,62           |                    |      |  |  |  |  |  |  |  |  |                   |                  |      |                  |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| i)                                | 2,00           |                |                    |      |  |  |  |  |  |  |  |  |                   |                  |      |                  |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| j)                                | 1,90           |                |                    |      |  |  |  |  |  |  |  |  |                   |                  |      |                  |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| k)                                | 2,88           |                |                    |      |  |  |  |  |  |  |  |  |                   |                  |      |                  |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| l)                                | 4,80           |                |                    |      |  |  |  |  |  |  |  |  |                   |                  |      |                  |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| S1                                | 7,4            | 5,0            | 5,0                | 15,7 |  |  |  |  |  |  |  |  |                   |                  |      |                  |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

| Belastingafdracht naar de poeren |                 |                  |                     |                                                   |      |                                       |  |                                       |  |                             |  | Belastingfactoren           |      |                          |      |  |  |
|----------------------------------|-----------------|------------------|---------------------|---------------------------------------------------|------|---------------------------------------|--|---------------------------------------|--|-----------------------------|--|-----------------------------|------|--------------------------|------|--|--|
|                                  |                 |                  |                     |                                                   |      |                                       |  |                                       |  |                             |  | 6.10.a                      |      | 6.10.b                   |      |  |  |
|                                  |                 |                  |                     |                                                   |      |                                       |  |                                       |  |                             |  | $\gamma_{Gj,su}$            | 1,22 | $\gamma_{Qi}$ =          | 1,35 |  |  |
|                                  |                 | $\gamma_{Gj,su}$ | 1,08                | $\gamma_{Qi}$ =                                   | 1,35 |                                       |  |                                       |  |                             |  |                             |      |                          |      |  |  |
| Belastingen per m²               |                 |                  |                     |                                                   |      |                                       |  |                                       |  |                             |  |                             |      |                          |      |  |  |
| Poer                             | P <sub>Gk</sub> | P <sub>qk</sub>  | P <sub>qk,nom</sub> |                                                   |      |                                       |  |                                       |  |                             |  |                             |      |                          |      |  |  |
| a) -                             |                 |                  |                     |                                                   |      |                                       |  |                                       |  |                             |  |                             |      |                          |      |  |  |
| b) Plaat dak                     | 0,35            | 1,00             |                     |                                                   |      |                                       |  |                                       |  |                             |  |                             |      |                          |      |  |  |
| c) -                             |                 |                  |                     |                                                   |      |                                       |  |                                       |  |                             |  |                             |      |                          |      |  |  |
| d) -                             |                 |                  |                     |                                                   |      |                                       |  |                                       |  |                             |  |                             |      |                          |      |  |  |
| e) -                             |                 |                  |                     |                                                   |      |                                       |  |                                       |  |                             |  |                             |      |                          |      |  |  |
| f) Begane grond                  | 4,50            | 5,00             | 5,00                |                                                   |      |                                       |  |                                       |  |                             |  |                             |      |                          |      |  |  |
| g) Overig                        |                 |                  |                     |                                                   |      |                                       |  |                                       |  |                             |  |                             |      |                          |      |  |  |
| h) Windbelasting                 |                 | 0,62             |                     |                                                   |      |                                       |  |                                       |  |                             |  |                             |      |                          |      |  |  |
| i) 100mm¹ Metselwerk             | 2,00            |                  |                     |                                                   |      |                                       |  |                                       |  |                             |  |                             |      |                          |      |  |  |
| j) 100mm¹ Kalkzandsteen          | 1,90            |                  |                     |                                                   |      |                                       |  |                                       |  |                             |  |                             |      |                          |      |  |  |
| k) 120mm¹ betonwand              | 2,88            |                  |                     |                                                   |      |                                       |  |                                       |  |                             |  |                             |      |                          |      |  |  |
| l) 200mm¹ Stroken                | 4,80            |                  |                     |                                                   |      |                                       |  |                                       |  |                             |  |                             |      |                          |      |  |  |
|                                  |                 |                  |                     | F <sub>Gk</sub> (blijvend)                        |      | F <sub>qk</sub> (veranderlijk) 6.10.a |  | F <sub>qk</sub> (veranderlijk) 6.10.b |  | F <sub>Ed</sub> (subtotaal) |  | F <sub>Ed</sub> (Uitwendig) |      | F <sub>Ed</sub> (totaal) |      |  |  |
|                                  |                 |                  |                     | kN                                                |      | kN                                    |  | kN                                    |  | kN                          |  | kN                          |      | kN                       |      |  |  |
| P1                               |                 |                  |                     | 2,2                                               |      |                                       |  | 6,3                                   |  | 10,8                        |  |                             |      | 10,8                     |      |  |  |
| P2                               |                 |                  |                     | 8,8                                               |      |                                       |  | 25,0                                  |  | 43,2                        |  |                             |      | 43,2                     |      |  |  |
| P3                               |                 |                  |                     | 17,5                                              |      |                                       |  | 50,0                                  |  | 86,4                        |  |                             |      | 86,4                     |      |  |  |
| P4                               |                 |                  |                     | 10,5                                              |      |                                       |  | 30,0                                  |  | 51,8                        |  |                             |      | 51,8                     |      |  |  |
| P5                               |                 |                  |                     | 4,4                                               |      |                                       |  | 12,5                                  |  | 21,6                        |  |                             |      | 21,6                     |      |  |  |
| P6                               |                 |                  |                     |                                                   |      |                                       |  |                                       |  |                             |  |                             |      |                          |      |  |  |
| P7                               |                 |                  |                     |                                                   |      |                                       |  |                                       |  |                             |  |                             |      |                          |      |  |  |
| P8                               |                 |                  |                     |                                                   |      |                                       |  |                                       |  |                             |  |                             |      |                          |      |  |  |
| P9                               |                 |                  |                     |                                                   |      |                                       |  |                                       |  |                             |  |                             |      |                          |      |  |  |
| P10                              |                 |                  |                     |                                                   |      |                                       |  |                                       |  |                             |  |                             |      |                          |      |  |  |
| P11                              |                 |                  |                     |                                                   |      |                                       |  |                                       |  |                             |  |                             |      |                          |      |  |  |
| P12                              |                 |                  |                     |                                                   |      |                                       |  |                                       |  |                             |  |                             |      |                          |      |  |  |
| P13                              |                 |                  |                     |                                                   |      |                                       |  |                                       |  |                             |  |                             |      |                          |      |  |  |
| P14                              |                 |                  |                     |                                                   |      |                                       |  |                                       |  |                             |  |                             |      |                          |      |  |  |
| P15                              |                 |                  |                     |                                                   |      |                                       |  |                                       |  |                             |  |                             |      |                          |      |  |  |
| P16                              |                 |                  |                     |                                                   |      |                                       |  |                                       |  |                             |  |                             |      |                          |      |  |  |
| P17                              |                 |                  |                     |                                                   |      |                                       |  |                                       |  |                             |  |                             |      |                          |      |  |  |
| P18                              |                 |                  |                     |                                                   |      |                                       |  |                                       |  |                             |  |                             |      |                          |      |  |  |
| P19                              |                 |                  |                     |                                                   |      |                                       |  |                                       |  |                             |  |                             |      |                          |      |  |  |
| P20                              |                 |                  |                     |                                                   |      |                                       |  |                                       |  |                             |  |                             |      |                          |      |  |  |
| P21                              |                 |                  |                     |                                                   |      |                                       |  |                                       |  |                             |  |                             |      |                          |      |  |  |
| P22                              |                 |                  |                     |                                                   |      |                                       |  |                                       |  |                             |  |                             |      |                          |      |  |  |
| P23                              |                 |                  |                     |                                                   |      |                                       |  |                                       |  |                             |  |                             |      |                          |      |  |  |
| P24                              |                 |                  |                     |                                                   |      |                                       |  |                                       |  |                             |  |                             |      |                          |      |  |  |
| P25                              |                 |                  |                     |                                                   |      |                                       |  |                                       |  |                             |  |                             |      |                          |      |  |  |
| P26                              |                 |                  |                     |                                                   |      |                                       |  |                                       |  |                             |  |                             |      |                          |      |  |  |
| P27                              |                 |                  |                     |                                                   |      |                                       |  |                                       |  |                             |  |                             |      |                          |      |  |  |
| P28                              |                 |                  |                     |                                                   |      |                                       |  |                                       |  |                             |  |                             |      |                          |      |  |  |
| P29                              |                 |                  |                     |                                                   |      |                                       |  |                                       |  |                             |  |                             |      |                          |      |  |  |
| P30                              |                 |                  |                     |                                                   |      |                                       |  |                                       |  |                             |  |                             |      |                          |      |  |  |
| SJF                              |                 |                  |                     |                                                   |      |                                       |  |                                       |  |                             |  |                             |      |                          |      |  |  |
| CIBIS.NL                         |                 |                  |                     | BOUWKUNDIG ADVIESBUREAU   ALMELO   0546 - 549 240 |      |                                       |  | Blad:                                 |  |                             |  | 24                          |      |                          |      |  |  |

|                                                                  |                                   |                                                                                     |
|------------------------------------------------------------------|-----------------------------------|-------------------------------------------------------------------------------------|
| Projectnummer:<br><b>180114 CR001</b>                            | Datum:<br><b>29 augustus 2018</b> |  |
| Projectomschrijving:<br><b>Uitbreiding Venster Techniek B.V.</b> |                                   |                                                                                     |

**Bijlage A: Uitvoer Technosoft Raamwerken, Spant 12**

**Bijlage B: Uitvoer Technosoft Raamwerken, Spant 13**

**Bijlage C: Uitvoer Technosoft Raamwerken, Spant 14 t/m 19**

**Bijlage D: Uitvoer Technosoft Raamwerken, Spant 20**

**Bijlage E: Uitvoer Technosoft Liggers, Fundering**

SJF

Project...: 180114 Uitbreiding Venster Techniek

Onderdeel: Spant 12

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

Datum....: 28/08/2018

Bestand...: F:\Projecten\2018\180114 Uitbreiding Venstertechniek te  
Zelhem\Constructief CIBIS\spant as 12.rww

Belastingbreedte.: 3.000

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

Theorieën voor de bepaling van de krachtsverdeling:

1) Losse belastinggevallen:

Lineaire-elasticiteitstheorie

2) Uiterste grenstoestand:

Geometrisch niet lineair alle staven.

Fysisch lineair alle staven.

3) Gebruiksgrenstoestand:

Geometrisch niet lineair alle staven.

Fysisch lineair alle staven.

Maximum aantal iteraties.....: 50

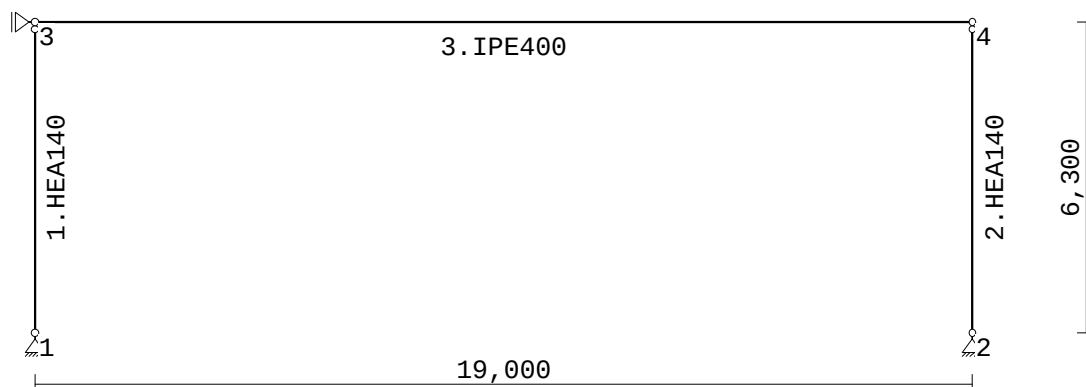
Max.deellengte kolommen/wanden: 0.500 Max.deellengte balken/vloeren: 0.500

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) |
| Staal       | NEN-EN 1993-1-1:2006 | C2:2009 | NB:2011(nl) |

**GEOMETRIE****MATERIALEN**

| Mt | Omschrijving | E-modulus[N/mm <sup>2</sup> ] | S.M. | Pois. | Uitz. coëff |
|----|--------------|-------------------------------|------|-------|-------------|
| 1  | S235         | 210000                        | 78.5 | 0.30  | 1.2000e-05  |

Project...: 180114 Uitbreiding Venster Techniek

Onderdeel: Spant 12

**PROFIELEN [mm]**

| Prof. | Omschrijving | Materiaal | Oppervlak  | Traagheid  | Vormf. |
|-------|--------------|-----------|------------|------------|--------|
| 1     | HEA140       | 1:S235    | 3.1420e+03 | 1.0330e+07 | 0.00   |
| 2     | IPE400       | 1:S235    | 8.4500e+03 | 2.3130e+08 | 0.00   |

**PROFIELEN vervolg [mm]**

| Prof. | Staaftype | Breedte | Hoogte | e     | Type | b1 | h1 | b2 | h2 |
|-------|-----------|---------|--------|-------|------|----|----|----|----|
| 1     | 0:Normaal | 140     | 133    | 66.5  |      |    |    |    |    |
| 2     | 0:Normaal | 180     | 400    | 200.0 |      |    |    |    |    |

**PROFIELVORMEN [mm]**

1 HEA140



2 IPE400

**KNOPEN**

| Knoop | X      | Z     |
|-------|--------|-------|
| 1     | 0.000  | 0.000 |
| 2     | 19.000 | 0.000 |
| 3     | 0.000  | 6.300 |
| 4     | 19.000 | 6.300 |

**STAVEN**

| St. | ki | kj | Profiel  | Aansl.i | Aansl.j | Lengte Opm. |
|-----|----|----|----------|---------|---------|-------------|
| 1   | 1  | 3  | 1:HEA140 | NDM     | ND-     | 6.300       |
| 2   | 2  | 4  | 1:HEA140 | NDM     | ND-     | 6.300       |
| 3   | 3  | 4  | 2:IPE400 | NDM     | NDM     | 19.000      |

**VASTE STEUNPUNTEN**

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

**BELASTINGGENERATIE ALGEMEEN.**

|                              |       |                         |      |
|------------------------------|-------|-------------------------|------|
| Betrouwbaarheidsklasse.....: | 1     | Referentieperiode.....: | 50   |
| Gebouwdiepte.....:           | 40.00 | Gebouwhoogte.....:      | 6.30 |
| Niveau aansl.terrein.....:   | 0.00  | E.g. scheid.w. [kN/m2]: | 1.20 |



Project...: 180114 Uitbreiding Venster Techniek

Onderdeel: Spant 12

**WIND**

Terrein categorie ...[4.3.2]...: Onbebouwd  
 Windgebied .....: 3 Vb,0 ..[4.2].....: 24.500  
 Positie spant in het gebouw....: 6.000 Kr ....[4.3.2].....: 0.209  
 z0 .....[4.3.2]...: 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**

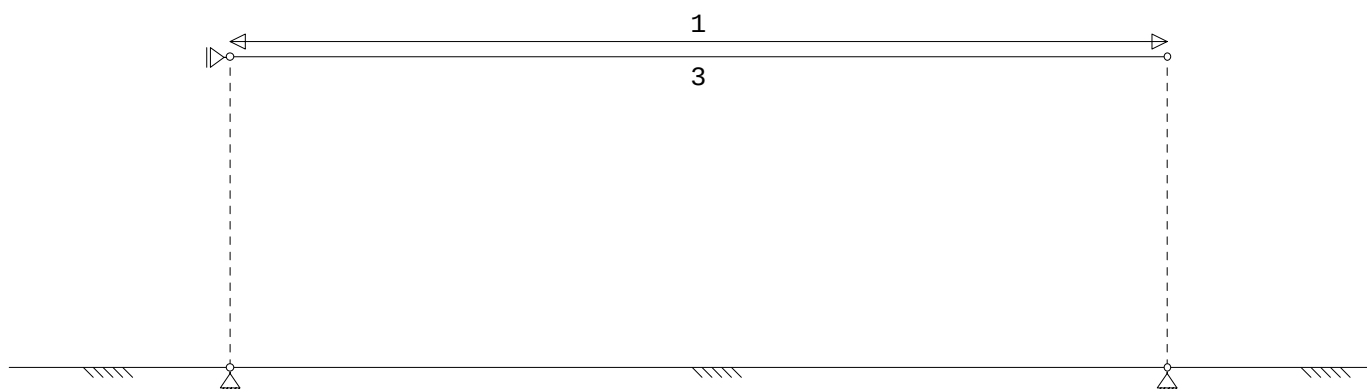
Sneeuwbelasting (sk) 50 jaar : 0.70  
 Sneeuwbelasting (sn) n jaar : 0.70

**STAFTYPEN**

| Type             | staven |
|------------------|--------|
| 5:Linker gevel.  | : 1    |
| 6:Rechter gevel. | : 2    |
| 7:Dak.           | : 3    |

**LASTVELDEN**

Veranderlijke belastingen door personen

**LASTVELDEN**

| Nr | Balk | Veld | Gebruiksfunctie                                         | Psi-t |
|----|------|------|---------------------------------------------------------|-------|
| 1  | 3-3  | 3-3  | Dak niet toegankelijk voor dagelijks gebruik. Tabel 6.9 | 1.00  |

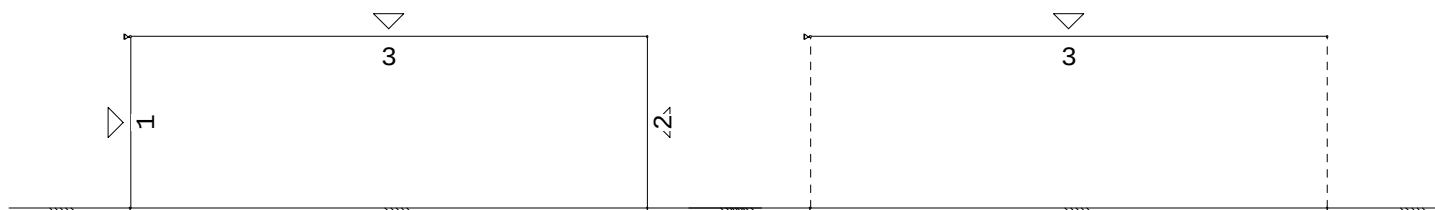
Project...: 180114 Uitbreiding Venster Techniek

Onderdeel: Spant 12

**LASTVELDEN**

Wind staven

Sneeuw staven

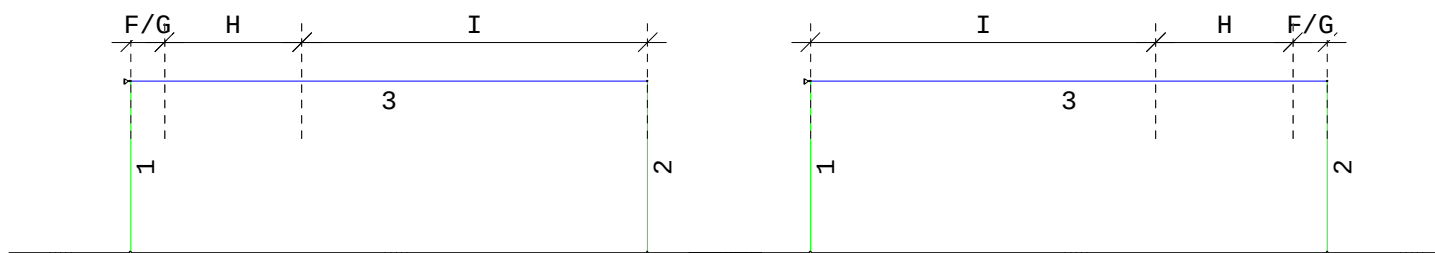
**WIND DAKTYPES**

| Nr. | Staaft Type | reductie bij<br>wind van links | reductie bij<br>wind van Rechts | Cpe volgens art: |
|-----|-------------|--------------------------------|---------------------------------|------------------|
| 1   | 1 Gevel     | 1.000                          | 1.000                           | 7.2.2            |
| 2   | 3 Plat dak  | 1.000                          | 1.000                           | 7.2.3            |
| 3   | 2 Gevel     | 1.000                          | 1.000                           | 7.2.2            |

**WIND ZONES**

Wind van links

Wind van rechts

**WIND VAN LINKS ZONES****WIND VAN RECHTS ZONES**

| Nr. | Staaft | Positie | Lengte | Zone |
|-----|--------|---------|--------|------|
| 1   | 1      | 0.000   | 6.300  | D    |
| 2   | 3      | 0.000   | 1.260  | F/G  |
| 3   | 3      | 1.260   | 5.040  | H    |
| 4   | 3      | 6.300   | 12.700 | I    |
| 5   | 2      | 0.000   | 6.300  | E    |

| Nr. | Staaft | Positie | Lengte | Zone |
|-----|--------|---------|--------|------|
| 1   | 2      | 0.000   | 6.300  | D    |
| 2   | 3      | 0.000   | 1.260  | F/G  |
| 3   | 3      | 1.260   | 5.040  | H    |
| 4   | 3      | 6.300   | 12.700 | I    |
| 5   | 1      | 0.000   | 6.300  | E    |

**Wind indexen**

| Index | CsCd | Cpe/Cpi | qp    | breedte | reductie | Qw Zone | Hoek(en) |
|-------|------|---------|-------|---------|----------|---------|----------|
| Qw1   |      | 0.300   | 0.591 | 3.000   | -0.532   | -i      |          |
| Qw2   |      | -0.300  | 0.591 | 3.000   | 0.532    | -i      |          |
| Qw3   | 1.00 | 0.800   | 0.591 | 3.000   | -1.418   | D       |          |
| Qw4   | 1.00 | -1.200  | 0.591 | 3.000   | 2.127    | G       | 0.0      |
| Qw5   | 1.00 | -0.700  | 0.591 | 3.000   | 1.241    | H       | 0.0      |
| Qw6   | 1.00 | -0.200  | 0.591 | 3.000   | 0.354    | I       | 0.0      |
| Qw7   | 1.00 | 0.500   | 0.591 | 3.000   | -0.886   | E       |          |
| Qw8   |      | -0.200  | 0.591 | 3.000   | 0.354    | +i      |          |
| Qw9   |      | 0.200   | 0.591 | 3.000   | -0.354   | +i      |          |
| Qw10  | 1.00 | 0.200   | 0.591 | 3.000   | -0.354   | I       | 0.0      |

Project...: 180114 Uitbreiding Venster Techniek

Onderdeel: Spant 12

**Wind indexen**

| Index | CsCd | Cpe/Cpi | qp    | breedte | reductie | Qw     | Zone | Hoek(en) |
|-------|------|---------|-------|---------|----------|--------|------|----------|
| Qw11  | 1.00 | -0.800  | 0.591 | 3.000   |          | 1.418  | D    |          |
| Qw12  | 1.00 | -0.500  | 0.591 | 3.000   |          | 0.886  | E    |          |
| Qw13  | 1.00 | -0.800  | 0.591 | 3.000   |          | 1.418  | B    |          |
| Qw14  | 1.00 | 0.800   | 0.591 | 3.000   |          | -1.418 | B    |          |
| Qw15  | 1.00 | -0.700  | 0.591 | 1.800   |          | 0.744  | H    | 0.0      |
| Qw16  | 1.00 | 0.200   | 0.591 | 1.200   |          | -0.142 | I    | 0.0      |
| Qw17  | 1.00 | -0.200  | 0.591 | 1.200   |          | 0.142  | I    | 0.0      |
| Qw18  | 1.00 | -0.500  | 0.591 | 3.000   |          | 0.886  | C    |          |
| Qw19  | 1.00 | 0.500   | 0.591 | 3.000   |          | -0.886 | C    |          |

**SNEEUW DAKTYPEN**

Staaft artikel

3-3 5.3.2 Lessenaarsdak

**Sneeuw indexen**

| Index | art   | $\mu$ | $s_k$ | red. | posfac | breedte | $Q_s$ | hoek |
|-------|-------|-------|-------|------|--------|---------|-------|------|
| Qs1   | 5.3.2 | 0.800 | 0.70  | 1.00 |        | 3.000   | 1.680 | 0.0  |

**BELASTINGGEVALLEN**

| B.G. | Omschrijving                     | Type |
|------|----------------------------------|------|
|      | 1 Permanente belasting EGZ=-1.00 | 1    |
| g    | 2 Ver. bel. pers. ed. (p_rep)    | 2    |
| g    | 3 Ver. bel. pers. ed. (F_rep)    | 3    |
| g    | 4 Wind van links onderdruk A     | 7    |
| g    | 5 Wind van links overdruk A      | 8    |
| g    | 6 Wind van links onderdruk B     | 9    |
| g    | 7 Wind van links overdruk B      | 10   |
| g    | 8 Wind van rechts onderdruk A    | 11   |
| g    | 9 Wind van rechts overdruk A     | 12   |
| g    | 10 Wind van rechts onderdruk B   | 13   |
| g    | 11 Wind van rechts overdruk B    | 14   |
| g    | 12 Wind loodrecht onderdruk A    | 15   |
| g    | 13 Wind loodrecht overdruk A     | 16   |
| g    | 14 Wind loodrecht onderdruk B    | 45   |
| g    | 15 Wind loodrecht overdruk B     | 46   |
| g    | 16 Sneeuw A                      | 22   |
| g    | = gegenereerd belastinggeval     |      |

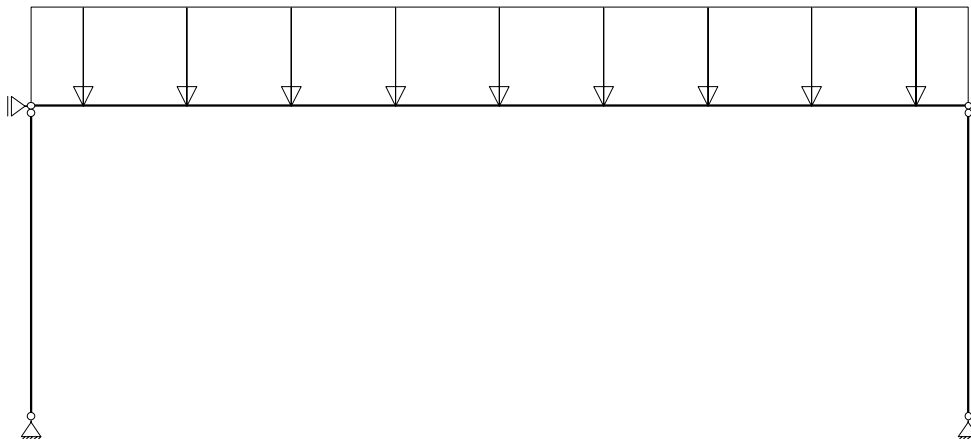
Project...: 180114 Uitbreiding Venster Techniek

Onderdeel: Spant 12

**BELASTINGEN**

B.G:1 Permanente belasting

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

**STAAFBELASTINGEN**

B.G:1 Permanente belasting

| Staaftype     | q1/p/m | q2    | A     | B     | $\Psi_0$ | $\Psi_1$ | $\Psi_2$ |
|---------------|--------|-------|-------|-------|----------|----------|----------|
| 3 5:QZGlobaal | -1.05  | -1.05 | 0.000 | 0.000 |          |          |          |

**REACTIES**

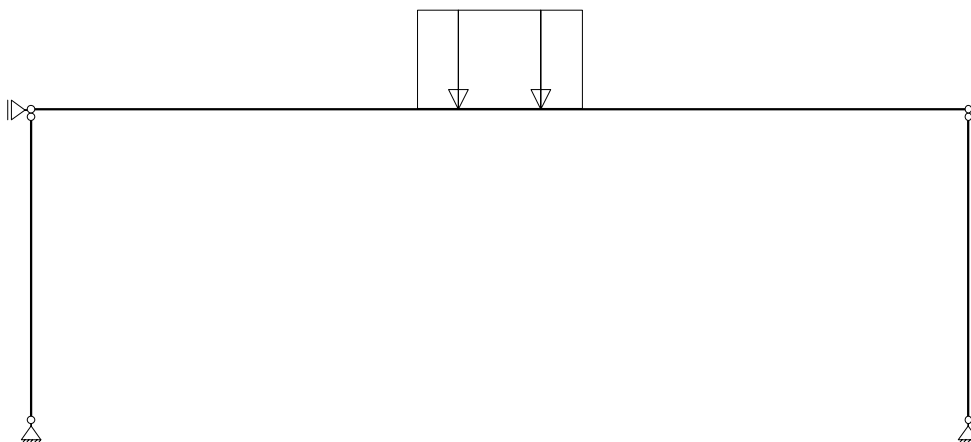
1e orde

B.G:1 Permanente belasting

| Kn. | X    | Z      | M                        |
|-----|------|--------|--------------------------|
| 1   | 0.00 | 17.83  |                          |
| 2   | 0.00 | 17.83  |                          |
| 3   | 0.00 |        |                          |
|     | 0.00 | 35.66  | : Som van de reacties    |
|     | 0.00 | -35.66 | : Som van de belastingen |

**BELASTINGEN**

B.G:2 Ver. bel. pers. ed. (p\_rep)



Project...: 180114 Uitbreiding Venster Techniek

Onderdeel: Spant 12

**STAAFBELASTINGEN**

B.G:2 Ver. bel. pers. ed. (p\_rep)

| Staat Type    | q1/p/m | q2    | A     | B     | $\Psi_0$ | $\Psi_1$ | $\Psi_2$ |
|---------------|--------|-------|-------|-------|----------|----------|----------|
| 3 3:QZgeProj. | -3.00  | -3.00 | 7.833 | 7.833 | 0.0      | 0.0      | 0.0      |

**VERANDERLIJKE BELASTING SITUATIES**

| Nr Lastvelden extreem | Lastvelden momentaan |
|-----------------------|----------------------|
| 1 1                   |                      |

**REACTIES**

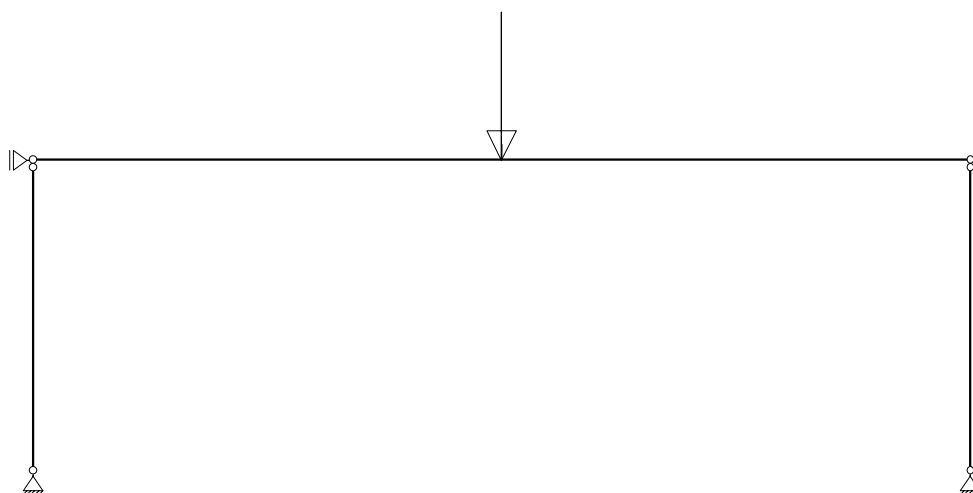
1e orde

B.G:2 Ver. bel. pers. ed. (p\_rep)

| Kn. | X    | Z      | M                        |
|-----|------|--------|--------------------------|
| 1   | 0.00 | 5.00   |                          |
| 2   | 0.00 | 5.00   |                          |
| 3   | 0.00 |        |                          |
|     | 0.00 | 10.00  | : Som van de reacties    |
|     | 0.00 | -10.00 | : Som van de belastingen |

**BELASTINGEN**

B.G:3 Ver. bel. pers. ed. (F-rep)

**STAAFBELASTINGEN**

B.G:3 Ver. bel. pers. ed. (F-rep)

| Staat Type     | q1/p/m | q2 | A     | B | $\Psi_0$ | $\Psi_1$ | $\Psi_2$ |
|----------------|--------|----|-------|---|----------|----------|----------|
| 3 10:PZGeproj. | -1.50  |    | 9.500 |   | 0.0      | 0.0      | 0.0      |

**VERANDERLIJKE BELASTING SITUATIES**

| Nr Lastvelden extreem | Lastvelden momentaan |
|-----------------------|----------------------|
| 1 1                   |                      |

**REACTIES**

1e orde

B.G:3 Ver. bel. pers. ed. (F-rep)

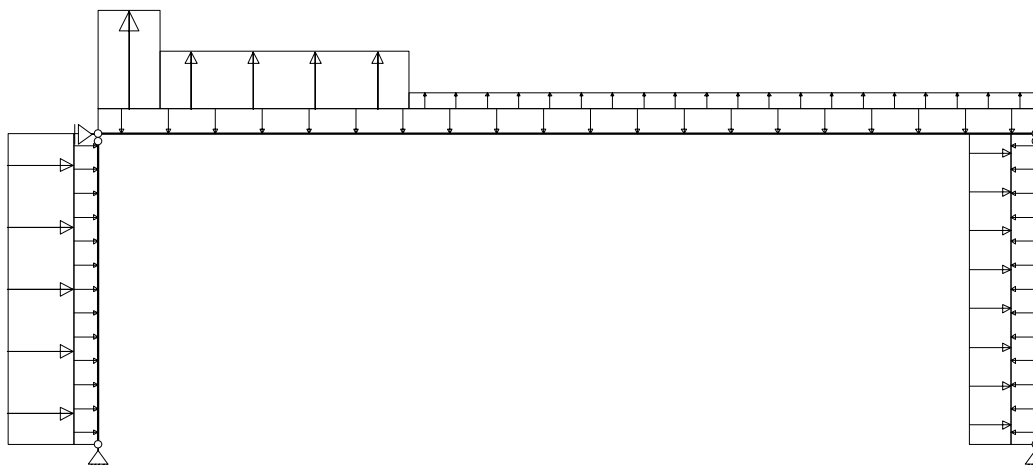
| Kn. | X    | Z     | M                        |
|-----|------|-------|--------------------------|
| 1   | 0.00 | 0.75  |                          |
| 2   | 0.00 | 0.75  |                          |
| 3   | 0.00 |       |                          |
|     | 0.00 | 1.50  | : Som van de reacties    |
|     | 0.00 | -1.50 | : Som van de belastingen |

Project...: 180114 Uitbreiding Venster Techniek

Onderdeel: Spant 12

**BELASTINGEN**

B.G:4 Wind van links onderdruk A

**STAAFBELASTINGEN**

B.G:4 Wind van links onderdruk A

| Staat | Type       | Index | q1/p/m | q2    | A     | B      | $\psi_0$ | $\psi_1$ | $\psi_2$ |
|-------|------------|-------|--------|-------|-------|--------|----------|----------|----------|
| 1     | 1:QZLokaal | Qw1   | -0.53  | -0.53 | 0.000 | 0.000  | 0.0      | 0.2      | 0.0      |
| 3     | 1:QZLokaal | Qw1   | -0.53  | -0.53 | 0.000 | 0.000  | 0.0      | 0.2      | 0.0      |
| 2     | 1:QZLokaal | Qw2   | 0.53   | 0.53  | 0.000 | 0.000  | 0.0      | 0.2      | 0.0      |
| 1     | 1:QZLokaal | Qw3   | -1.42  | -1.42 | 0.000 | 0.000  | 0.0      | 0.2      | 0.0      |
| 3     | 1:QZLokaal |       | 0.00   | 0.00  | 0.000 | 17.740 | 0.0      | 0.2      | 0.0      |
| 3     | 1:QZLokaal | Qw4   | 2.13   | 2.13  | 0.000 | 17.740 | 0.0      | 0.2      | 0.0      |
| 3     | 1:QZLokaal | Qw5   | 1.24   | 1.24  | 1.260 | 12.700 | 0.0      | 0.2      | 0.0      |
| 3     | 1:QZLokaal | Qw6   | 0.35   | 0.35  | 6.300 | 0.000  | 0.0      | 0.2      | 0.0      |
| 2     | 1:QZLokaal | Qw7   | -0.89  | -0.89 | 0.000 | 0.000  | 0.0      | 0.2      | 0.0      |

**REACTIES**

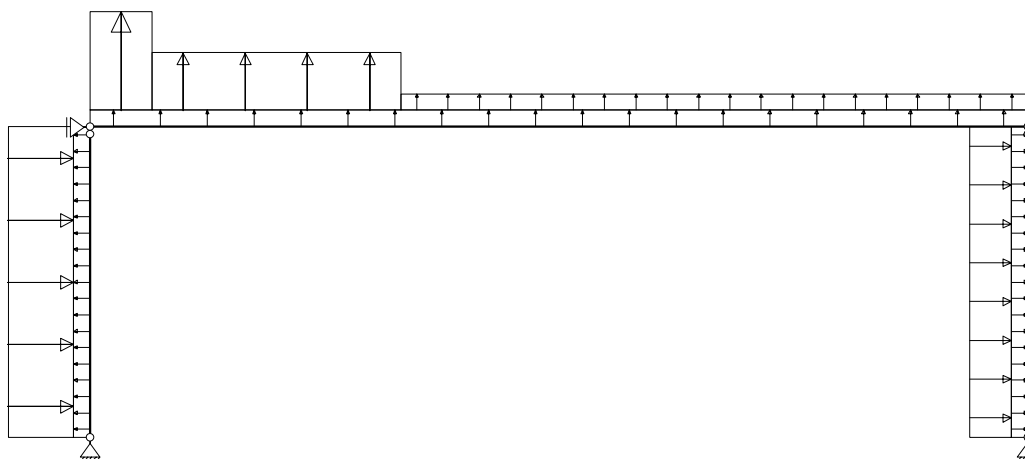
1e orde

B.G:4 Wind van links onderdruk A

| Kn. | X      | Z     | M                        |
|-----|--------|-------|--------------------------|
| 1   | -6.14  | -4.05 |                          |
| 2   | -1.12  | 0.72  |                          |
| 3   | -7.26  |       |                          |
|     | -14.52 | -3.33 | : Som van de reacties    |
|     | 14.52  | 3.33  | : Som van de belastingen |

**BELASTINGEN**

B.G:5 Wind van links overdruk A



Project...: 180114 Uitbreiding Venster Techniek

Onderdeel: Spant 12

**STAAFBELASTINGEN**

B.G:5 Wind van links overdruk A

| Staaftype    | Index | q1/p/m | q2    | A     | B      | $\psi_0$ | $\psi_1$ | $\psi_2$ |
|--------------|-------|--------|-------|-------|--------|----------|----------|----------|
| 1 1:QZLokaal | Qw8   | 0.35   | 0.35  | 0.000 | 0.000  | 0.0      | 0.2      | 0.0      |
| 3 1:QZLokaal | Qw8   | 0.35   | 0.35  | 0.000 | 0.000  | 0.0      | 0.2      | 0.0      |
| 2 1:QZLokaal | Qw9   | -0.35  | -0.35 | 0.000 | 0.000  | 0.0      | 0.2      | 0.0      |
| 1 1:QZLokaal | Qw3   | -1.42  | -1.42 | 0.000 | 0.000  | 0.0      | 0.2      | 0.0      |
| 3 1:QZLokaal |       | 0.00   | 0.00  | 0.000 | 17.740 | 0.0      | 0.2      | 0.0      |
| 3 1:QZLokaal | Qw4   | 2.13   | 2.13  | 0.000 | 17.740 | 0.0      | 0.2      | 0.0      |
| 3 1:QZLokaal | Qw5   | 1.24   | 1.24  | 1.260 | 12.700 | 0.0      | 0.2      | 0.0      |
| 3 1:QZLokaal | Qw6   | 0.35   | 0.35  | 6.300 | 0.000  | 0.0      | 0.2      | 0.0      |
| 2 1:QZLokaal | Qw7   | -0.89  | -0.89 | 0.000 | 0.000  | 0.0      | 0.2      | 0.0      |

**REACTIES**

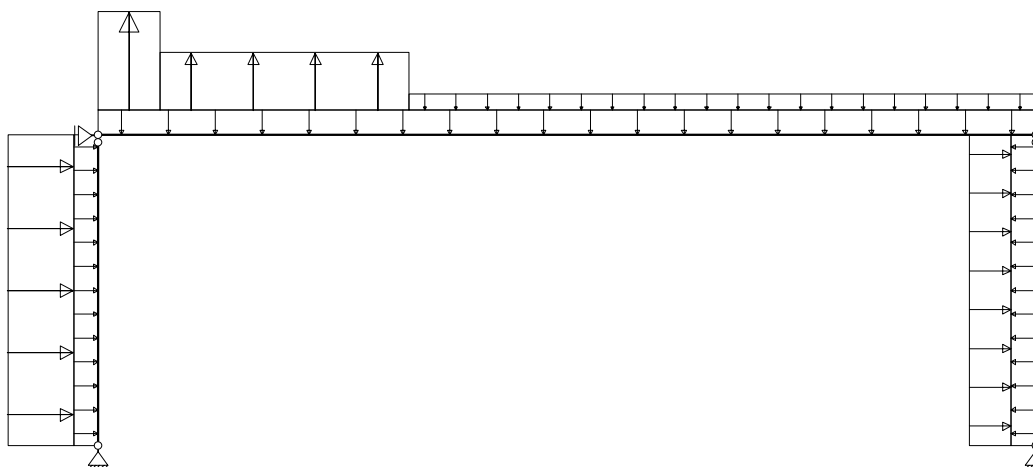
1e orde

B.G:5 Wind van links overdruk A

| Kn. | X      | Z      | M                        |
|-----|--------|--------|--------------------------|
| 1   | -3.35  | -12.47 |                          |
| 2   | -3.91  | -7.70  |                          |
| 3   | -7.26  |        |                          |
|     | -14.52 | -20.17 | : Som van de reacties    |
|     | 14.52  | 20.17  | : Som van de belastingen |

**BELASTINGEN**

B.G:6 Wind van links onderdruk B

**STAAFBELASTINGEN**

B.G:6 Wind van links onderdruk B

| Staaftype    | Index | q1/p/m | q2    | A     | B      | $\psi_0$ | $\psi_1$ | $\psi_2$ |
|--------------|-------|--------|-------|-------|--------|----------|----------|----------|
| 1 1:QZLokaal | Qw1   | -0.53  | -0.53 | 0.000 | 0.000  | 0.0      | 0.2      | 0.0      |
| 3 1:QZLokaal | Qw1   | -0.53  | -0.53 | 0.000 | 0.000  | 0.0      | 0.2      | 0.0      |
| 2 1:QZLokaal | Qw2   | 0.53   | 0.53  | 0.000 | 0.000  | 0.0      | 0.2      | 0.0      |
| 1 1:QZLokaal | Qw3   | -1.42  | -1.42 | 0.000 | 0.000  | 0.0      | 0.2      | 0.0      |
| 3 1:QZLokaal |       | 0.00   | 0.00  | 0.000 | 17.740 | 0.0      | 0.2      | 0.0      |
| 3 1:QZLokaal | Qw4   | 2.13   | 2.13  | 0.000 | 17.740 | 0.0      | 0.2      | 0.0      |
| 3 1:QZLokaal | Qw5   | 1.24   | 1.24  | 1.260 | 12.700 | 0.0      | 0.2      | 0.0      |
| 3 1:QZLokaal | Qw10  | -0.35  | -0.35 | 6.300 | 0.000  | 0.0      | 0.2      | 0.0      |
| 2 1:QZLokaal | Qw7   | -0.89  | -0.89 | 0.000 | 0.000  | 0.0      | 0.2      | 0.0      |

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Onderdeel: Spant 12

**REACTIES**

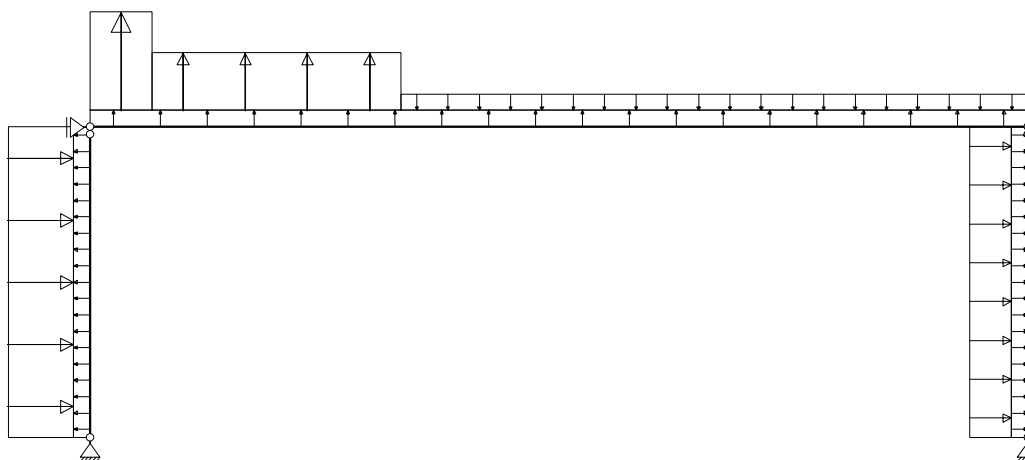
1e orde

B.G:6 Wind van links onderdruk B

| Kn. | X      | Z     | M                        |
|-----|--------|-------|--------------------------|
| 1   | -6.14  | -1.04 |                          |
| 2   | -1.12  | 6.72  |                          |
| 3   | -7.26  |       |                          |
|     | -14.52 | 5.67  | : Som van de reacties    |
|     | 14.52  | -5.67 | : Som van de belastingen |

**BELASTINGEN**

B.G:7 Wind van links overdruk B

**STAAFBELASTINGEN**

B.G:7 Wind van links overdruk B

| Staat | Type       | Index | q1/p/m | q2    | A     | B      | $\psi_0$ | $\psi_1$ | $\psi_2$ |
|-------|------------|-------|--------|-------|-------|--------|----------|----------|----------|
| 1     | 1:QZLokaal | Qw8   | 0.35   | 0.35  | 0.000 | 0.000  | 0.0      | 0.2      | 0.0      |
| 3     | 1:QZLokaal | Qw8   | 0.35   | 0.35  | 0.000 | 0.000  | 0.0      | 0.2      | 0.0      |
| 2     | 1:QZLokaal | Qw9   | -0.35  | -0.35 | 0.000 | 0.000  | 0.0      | 0.2      | 0.0      |
| 1     | 1:QZLokaal | Qw3   | -1.42  | -1.42 | 0.000 | 0.000  | 0.0      | 0.2      | 0.0      |
| 3     | 1:QZLokaal |       | 0.00   | 0.00  | 0.000 | 17.740 | 0.0      | 0.2      | 0.0      |
| 3     | 1:QZLokaal | Qw4   | 2.13   | 2.13  | 0.000 | 17.740 | 0.0      | 0.2      | 0.0      |
| 3     | 1:QZLokaal | Qw5   | 1.24   | 1.24  | 1.260 | 12.700 | 0.0      | 0.2      | 0.0      |
| 3     | 1:QZLokaal | Qw10  | -0.35  | -0.35 | 6.300 | 0.000  | 0.0      | 0.2      | 0.0      |
| 2     | 1:QZLokaal | Qw7   | -0.89  | -0.89 | 0.000 | 0.000  | 0.0      | 0.2      | 0.0      |

**REACTIES**

1e orde

B.G:7 Wind van links overdruk B

| Kn. | X      | Z      | M                        |
|-----|--------|--------|--------------------------|
| 1   | -3.35  | -9.46  |                          |
| 2   | -3.91  | -1.70  |                          |
| 3   | -7.26  |        |                          |
|     | -14.52 | -11.17 | : Som van de reacties    |
|     | 14.52  | 11.17  | : Som van de belastingen |

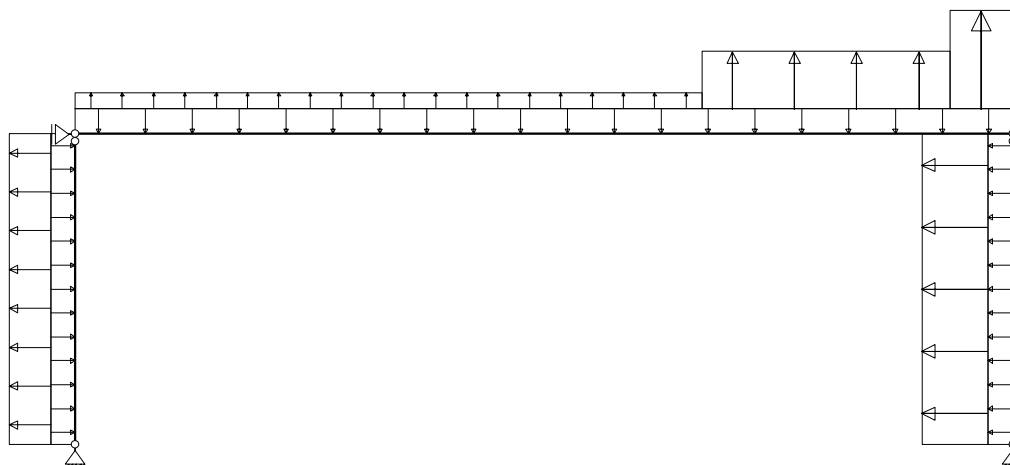


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Onderdeel: Spant 12

**BELASTINGEN**

B.G:8 Wind van rechts onderdruk A

**STAAFBELASTINGEN**

B.G:8 Wind van rechts onderdruk A

| Staat | Type       | Index | q1/p/m | q2    | A      | B     | $\psi_0$ | $\psi_1$ | $\psi_2$ |
|-------|------------|-------|--------|-------|--------|-------|----------|----------|----------|
| 1     | 1:QZLokaal | Qw1   | -0.53  | -0.53 | 0.000  | 0.000 | 0.0      | 0.2      | 0.0      |
| 3     | 1:QZLokaal | Qw1   | -0.53  | -0.53 | 0.000  | 0.000 | 0.0      | 0.2      | 0.0      |
| 2     | 1:QZLokaal | Qw2   | 0.53   | 0.53  | 0.000  | 0.000 | 0.0      | 0.2      | 0.0      |
| 2     | 1:QZLokaal | Qw11  | 1.42   | 1.42  | 0.000  | 0.000 | 0.0      | 0.2      | 0.0      |
| 3     | 1:QZLokaal |       | 0.00   | 0.00  | 17.740 | 0.000 | 0.0      | 0.2      | 0.0      |
| 3     | 1:QZLokaal | Qw4   | 2.13   | 2.13  | 17.740 | 0.000 | 0.0      | 0.2      | 0.0      |
| 3     | 1:QZLokaal | Qw5   | 1.24   | 1.24  | 12.700 | 1.260 | 0.0      | 0.2      | 0.0      |
| 3     | 1:QZLokaal | Qw6   | 0.35   | 0.35  | 0.000  | 6.300 | 0.0      | 0.2      | 0.0      |
| 1     | 1:QZLokaal | Qw12  | 0.89   | 0.89  | 0.000  | 0.000 | 0.0      | 0.2      | 0.0      |

**REACTIES**

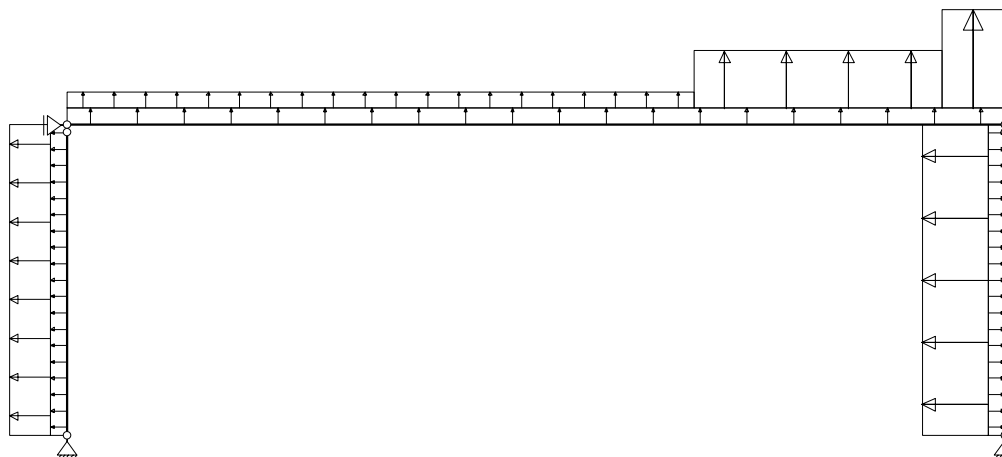
1e orde

B.G:8 Wind van rechts onderdruk A

| Kn. | X      | Z     | M                        |
|-----|--------|-------|--------------------------|
| 1   | 1.12   | 0.72  |                          |
| 2   | 6.14   | -4.05 |                          |
| 3   | 7.26   |       |                          |
|     | 14.52  | -3.33 | : Som van de reacties    |
|     | -14.52 | 3.33  | : Som van de belastingen |

**BELASTINGEN**

B.G:9 Wind van rechts overdruk A



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Onderdeel: Spant 12

**STAAFBELASTINGEN**

B.G:9 Wind van rechts overdruk A

| Staaftype    | Index | q1/p/m | q2    | A      | B     | $\psi_0$ | $\psi_1$ | $\psi_2$ |
|--------------|-------|--------|-------|--------|-------|----------|----------|----------|
| 1 1:QZLokaal | Qw8   | 0.35   | 0.35  | 0.000  | 0.000 | 0.0      | 0.2      | 0.0      |
| 3 1:QZLokaal | Qw8   | 0.35   | 0.35  | 0.000  | 0.000 | 0.0      | 0.2      | 0.0      |
| 2 1:QZLokaal | Qw9   | -0.35  | -0.35 | 0.000  | 0.000 | 0.0      | 0.2      | 0.0      |
| 2 1:QZLokaal | Qw11  | 1.42   | 1.42  | 0.000  | 0.000 | 0.0      | 0.2      | 0.0      |
| 3 1:QZLokaal |       | 0.00   | 0.00  | 17.740 | 0.000 | 0.0      | 0.2      | 0.0      |
| 3 1:QZLokaal | Qw4   | 2.13   | 2.13  | 17.740 | 0.000 | 0.0      | 0.2      | 0.0      |
| 3 1:QZLokaal | Qw5   | 1.24   | 1.24  | 12.700 | 1.260 | 0.0      | 0.2      | 0.0      |
| 3 1:QZLokaal | Qw6   | 0.35   | 0.35  | 0.000  | 6.300 | 0.0      | 0.2      | 0.0      |
| 1 1:QZLokaal | Qw12  | 0.89   | 0.89  | 0.000  | 0.000 | 0.0      | 0.2      | 0.0      |

**REACTIES**

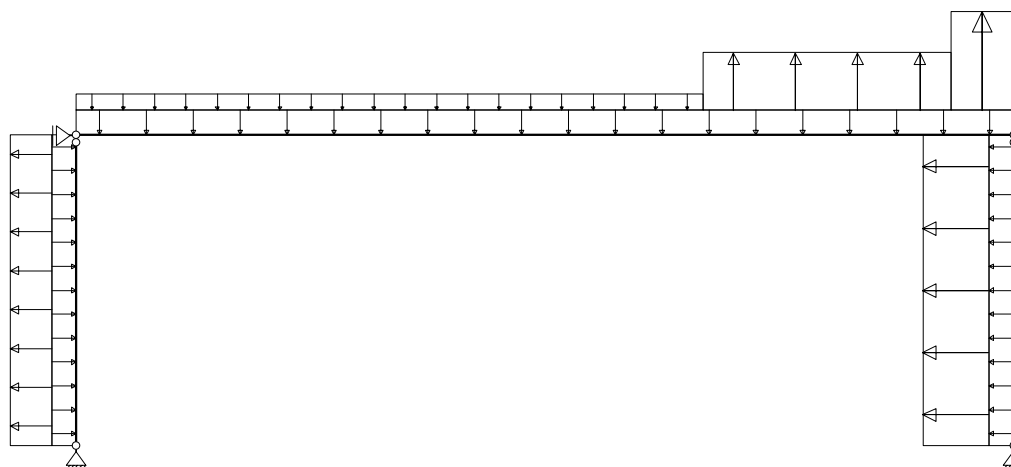
1e orde

B.G:9 Wind van rechts overdruk A

| Kn. | X      | Z      | M                        |
|-----|--------|--------|--------------------------|
| 1   | 3.91   | -7.70  |                          |
| 2   | 3.35   | -12.47 |                          |
| 3   | 7.26   |        |                          |
|     | 14.52  | -20.17 | : Som van de reacties    |
|     | -14.52 | 20.17  | : Som van de belastingen |

**BELASTINGEN**

B.G:10 Wind van rechts onderdruk B

**STAAFBELASTINGEN**

B.G:10 Wind van rechts onderdruk B

| Staaftype    | Index | q1/p/m | q2    | A      | B     | $\psi_0$ | $\psi_1$ | $\psi_2$ |
|--------------|-------|--------|-------|--------|-------|----------|----------|----------|
| 1 1:QZLokaal | Qw1   | -0.53  | -0.53 | 0.000  | 0.000 | 0.0      | 0.2      | 0.0      |
| 3 1:QZLokaal | Qw1   | -0.53  | -0.53 | 0.000  | 0.000 | 0.0      | 0.2      | 0.0      |
| 2 1:QZLokaal | Qw2   | 0.53   | 0.53  | 0.000  | 0.000 | 0.0      | 0.2      | 0.0      |
| 2 1:QZLokaal | Qw11  | 1.42   | 1.42  | 0.000  | 0.000 | 0.0      | 0.2      | 0.0      |
| 3 1:QZLokaal |       | 0.00   | 0.00  | 17.740 | 0.000 | 0.0      | 0.2      | 0.0      |
| 3 1:QZLokaal | Qw4   | 2.13   | 2.13  | 17.740 | 0.000 | 0.0      | 0.2      | 0.0      |
| 3 1:QZLokaal | Qw5   | 1.24   | 1.24  | 12.700 | 1.260 | 0.0      | 0.2      | 0.0      |
| 3 1:QZLokaal | Qw10  | -0.35  | -0.35 | 0.000  | 6.300 | 0.0      | 0.2      | 0.0      |
| 1 1:QZLokaal | Qw12  | 0.89   | 0.89  | 0.000  | 0.000 | 0.0      | 0.2      | 0.0      |

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**REACTIES**

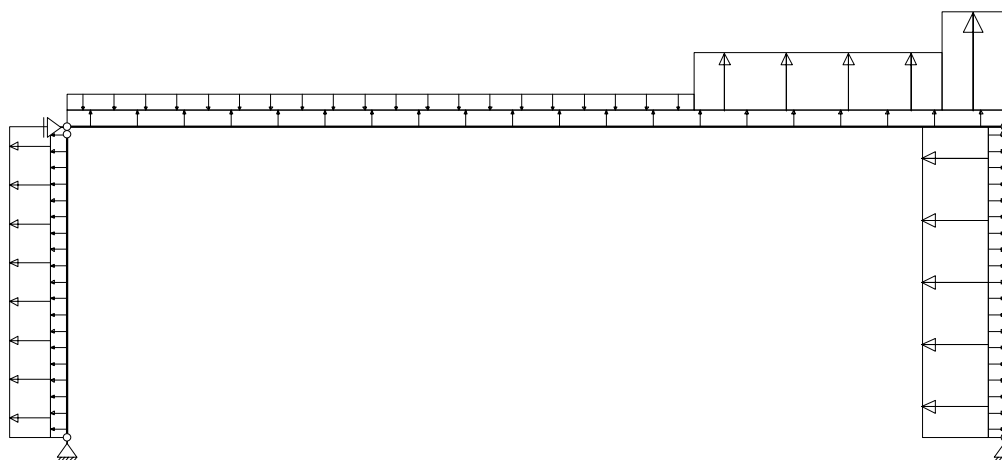
1e orde

B.G:10 Wind van rechts onderdruk B

| Kn. | X      | Z     | M                        |
|-----|--------|-------|--------------------------|
| 1   | 1.12   | 6.72  |                          |
| 2   | 6.14   | -1.04 |                          |
| 3   | 7.26   |       |                          |
|     | 14.52  | 5.67  | : Som van de reacties    |
|     | -14.52 | -5.67 | : Som van de belastingen |

**BELASTINGEN**

B.G:11 Wind van rechts overdruk B

**STAAFBELASTINGEN**

B.G:11 Wind van rechts overdruk B

| Staaftype    | Index | q1/p/m | q2    | A      | B     | $\psi_0$ | $\psi_1$ | $\psi_2$ |
|--------------|-------|--------|-------|--------|-------|----------|----------|----------|
| 1 1:QZLokaal | Qw8   | 0.35   | 0.35  | 0.000  | 0.000 | 0.0      | 0.2      | 0.0      |
| 3 1:QZLokaal | Qw8   | 0.35   | 0.35  | 0.000  | 0.000 | 0.0      | 0.2      | 0.0      |
| 2 1:QZLokaal | Qw9   | -0.35  | -0.35 | 0.000  | 0.000 | 0.0      | 0.2      | 0.0      |
| 2 1:QZLokaal | Qw11  | 1.42   | 1.42  | 0.000  | 0.000 | 0.0      | 0.2      | 0.0      |
| 3 1:QZLokaal |       | 0.00   | 0.00  | 17.740 | 0.000 | 0.0      | 0.2      | 0.0      |
| 3 1:QZLokaal | Qw4   | 2.13   | 2.13  | 17.740 | 0.000 | 0.0      | 0.2      | 0.0      |
| 3 1:QZLokaal | Qw5   | 1.24   | 1.24  | 12.700 | 1.260 | 0.0      | 0.2      | 0.0      |
| 3 1:QZLokaal | Qw10  | -0.35  | -0.35 | 0.000  | 6.300 | 0.0      | 0.2      | 0.0      |
| 1 1:QZLokaal | Qw12  | 0.89   | 0.89  | 0.000  | 0.000 | 0.0      | 0.2      | 0.0      |

**REACTIES**

1e orde

B.G:11 Wind van rechts overdruk B

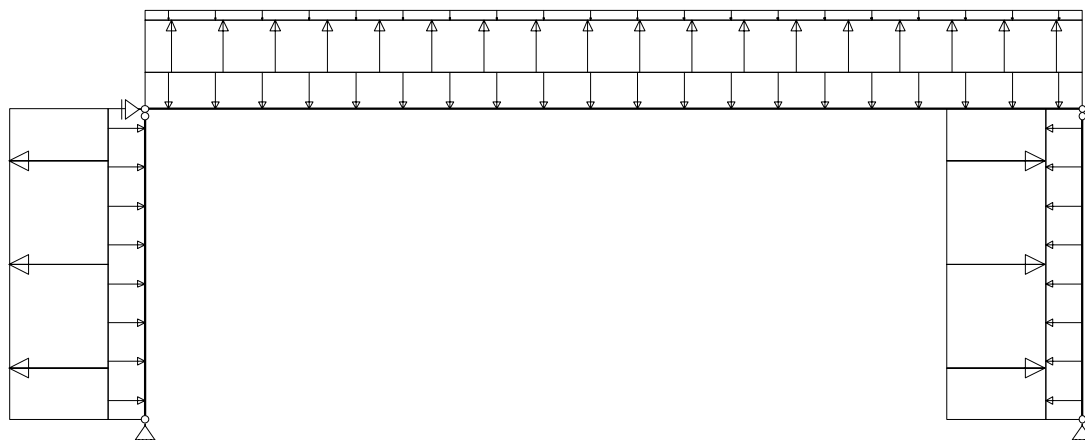
| Kn. | X      | Z      | M                        |
|-----|--------|--------|--------------------------|
| 1   | 3.91   | -1.70  |                          |
| 2   | 3.35   | -9.46  |                          |
| 3   | 7.26   |        |                          |
|     | 14.52  | -11.17 | : Som van de reacties    |
|     | -14.52 | 11.17  | : Som van de belastingen |

Project...: 180114 Uitbreiding Venster Techniek

Onderdeel: Spant 12

**BELASTINGEN**

B.G:12 Wind loodrecht onderdruk A

**STAAFBELASTINGEN**

B.G:12 Wind loodrecht onderdruk A

| Staaftype    | Index | q1/p/m | q2    | A     | B     | $\Psi_0$ | $\Psi_1$ | $\Psi_2$ |
|--------------|-------|--------|-------|-------|-------|----------|----------|----------|
| 1 1:QZLokaal | Qw1   | -0.53  | -0.53 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 3 1:QZLokaal | Qw1   | -0.53  | -0.53 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 2 1:QZLokaal | Qw2   | 0.53   | 0.53  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 1 1:QZLokaal | Qw13  | 1.42   | 1.42  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 2 1:QZLokaal | Qw14  | -1.42  | -1.42 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 3 1:QZLokaal | Qw15  | 0.74   | 0.74  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 3 1:QZLokaal | Qw16  | -0.14  | -0.14 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |

**REACTIES**

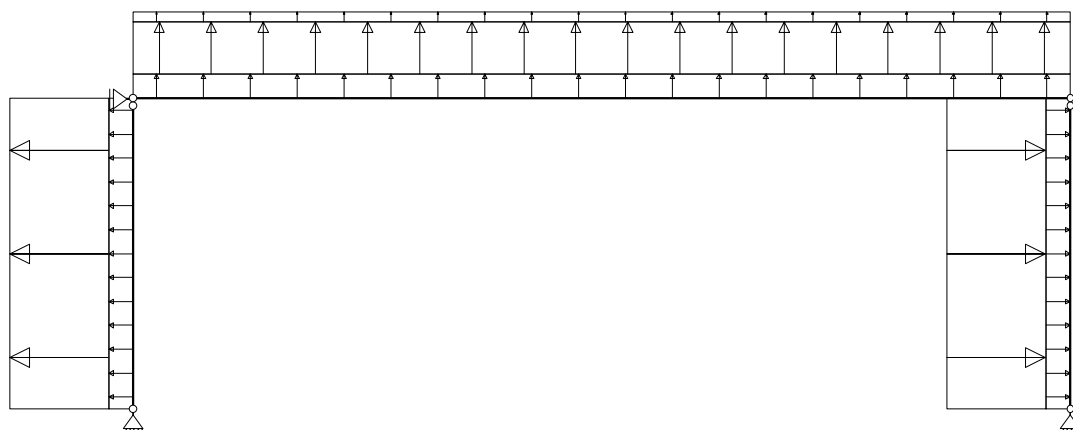
1e orde

B.G:12 Wind loodrecht onderdruk A

| Kn. | X     | Z     | M                        |
|-----|-------|-------|--------------------------|
| 1   | 2.79  | -0.67 |                          |
| 2   | -2.79 | -0.67 |                          |
| 3   | 0.00  |       |                          |
|     | 0.00  | -1.35 | : Som van de reacties    |
|     | 0.00  | 1.35  | : Som van de belastingen |

**BELASTINGEN**

B.G:13 Wind loodrecht overdruk A



Project...: 180114 Uitbreiding Venster Techniek

Onderdeel: Spant 12

**STAAFBELASTINGEN**

B.G:13 Wind loodrecht overdruk A

| Staaftype    | Index | q1/p/m | q2    | A     | B     | $\Psi_0$ | $\Psi_1$ | $\Psi_2$ |
|--------------|-------|--------|-------|-------|-------|----------|----------|----------|
| 1 1:QZLokaal | Qw8   | 0.35   | 0.35  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 3 1:QZLokaal | Qw8   | 0.35   | 0.35  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 2 1:QZLokaal | Qw9   | -0.35  | -0.35 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 1 1:QZLokaal | Qw13  | 1.42   | 1.42  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 2 1:QZLokaal | Qw14  | -1.42  | -1.42 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 3 1:QZLokaal | Qw15  | 0.74   | 0.74  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 3 1:QZLokaal | Qw17  | 0.14   | 0.14  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |

**REACTIES**

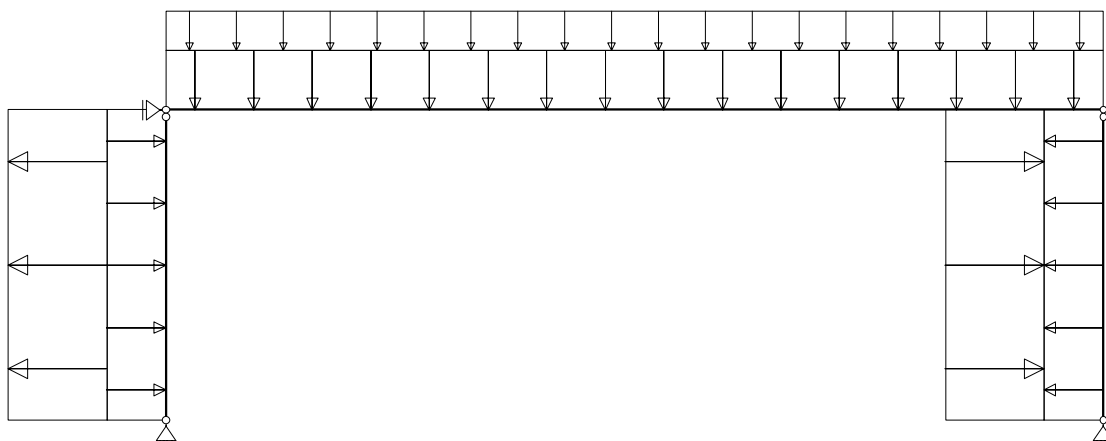
1e orde

B.G:13 Wind loodrecht overdruk A

| Kn. | X     | Z      | M                        |
|-----|-------|--------|--------------------------|
| 1   | 5.58  | -11.79 |                          |
| 2   | -5.58 | -11.79 |                          |
| 3   | 0.00  |        |                          |
|     | 0.00  | -23.57 | : Som van de reacties    |
|     | 0.00  | 23.57  | : Som van de belastingen |

**BELASTINGEN**

B.G:14 Wind loodrecht onderdruk B

**STAAFBELASTINGEN**

B.G:14 Wind loodrecht onderdruk B

| Staaftype    | Index | q1/p/m | q2    | A     | B     | $\Psi_0$ | $\Psi_1$ | $\Psi_2$ |
|--------------|-------|--------|-------|-------|-------|----------|----------|----------|
| 1 1:QZLokaal | Qw1   | -0.53  | -0.53 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 3 1:QZLokaal | Qw1   | -0.53  | -0.53 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 2 1:QZLokaal | Qw2   | 0.53   | 0.53  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 1 1:QZLokaal | Qw18  | 0.89   | 0.89  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 2 1:QZLokaal | Qw19  | -0.89  | -0.89 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 3 1:QZLokaal | Qw10  | -0.35  | -0.35 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |

**REACTIES**

1e orde

B.G:14 Wind loodrecht onderdruk B

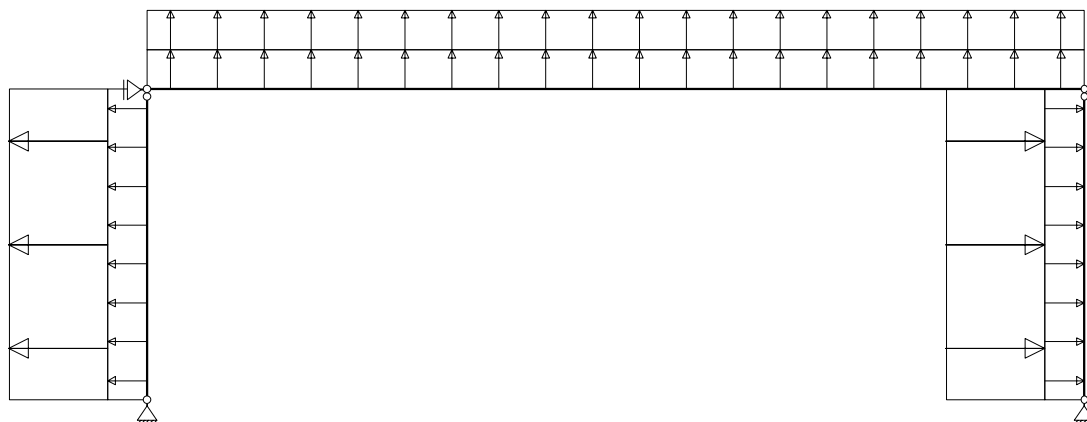
| Kn. | X     | Z      | M                        |
|-----|-------|--------|--------------------------|
| 1   | 1.12  | 8.42   |                          |
| 2   | -1.12 | 8.42   |                          |
| 3   | 0.00  |        |                          |
|     | 0.00  | 16.84  | : Som van de reacties    |
|     | 0.00  | -16.84 | : Som van de belastingen |

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**BELASTINGEN**

B.G:15 Wind loodrecht overdruk B

**STAAFBELASTINGEN**

B.G:15 Wind loodrecht overdruk B

| Staad | Type       | Index | q1/p/m | q2    | A     | B     | $\psi_0$ | $\psi_1$ | $\psi_2$ |
|-------|------------|-------|--------|-------|-------|-------|----------|----------|----------|
| 1     | 1:QZLokaal | Qw8   | 0.35   | 0.35  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 3     | 1:QZLokaal | Qw8   | 0.35   | 0.35  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 2     | 1:QZLokaal | Qw9   | -0.35  | -0.35 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 1     | 1:QZLokaal | Qw18  | 0.89   | 0.89  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 2     | 1:QZLokaal | Qw19  | -0.89  | -0.89 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 3     | 1:QZLokaal | Qw6   | 0.35   | 0.35  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |

**REACTIES**

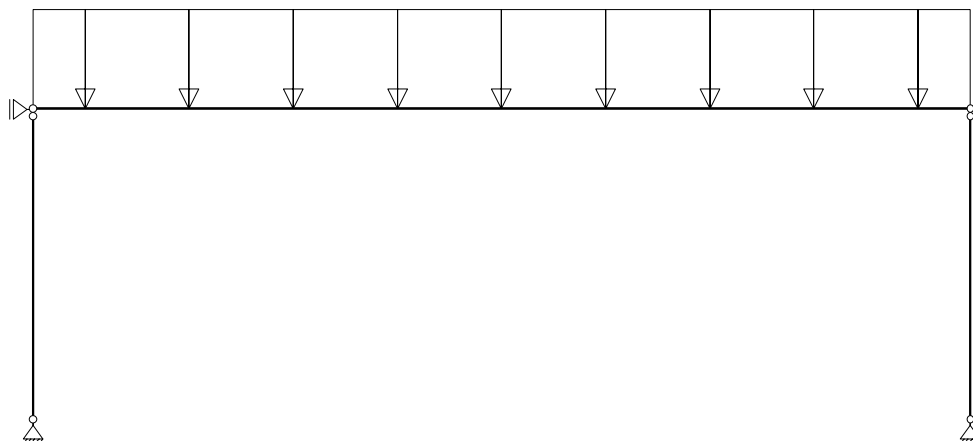
1e orde

B.G:15 Wind loodrecht overdruk B

| Kn. | X     | Z      | M                        |
|-----|-------|--------|--------------------------|
| 1   | 3.91  | -6.74  |                          |
| 2   | -3.91 | -6.74  |                          |
| 3   | 0.00  |        |                          |
|     | 0.00  | -13.47 | : Som van de reacties    |
|     | 0.00  | 13.47  | : Som van de belastingen |

**BELASTINGEN**

B.G:16 Sneeuw A



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**STAAFBELASTINGEN**

B.G:16 Sneeuw A

| Staaft Type   | Index | q1/p/m | q2    | A     | B     | $\Psi_0$ | $\Psi_1$ | $\Psi_2$ |
|---------------|-------|--------|-------|-------|-------|----------|----------|----------|
| 3 3:QZgeProj. | Qs1   | -1.68  | -1.68 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |

**REACTIES**

1e orde

B.G:16 Sneeuw A

| Kn. | X    | Z      | M                        |
|-----|------|--------|--------------------------|
| 1   | 0.00 | 15.96  |                          |
| 2   | 0.00 | 15.96  |                          |
| 3   | 0.00 |        |                          |
|     | 0.00 | 31.92  | : Som van de reacties    |
|     | 0.00 | -31.92 | : Som van de belastingen |

**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 |
| 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 |

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**BEREKENINGSTATUS**

Controlerende berekening

**B.C. Iteratie Status**

|    |                          |
|----|--------------------------|
| 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 |
| 50 | 3 Nauwkeurigheid bereikt |
| 51 | 3 Nauwkeurigheid bereikt |
| 52 | 3 Nauwkeurigheid bereikt |
| 53 | 3 Nauwkeurigheid bereikt |
| 54 | 3 Nauwkeurigheid bereikt |
| 55 | 3 Nauwkeurigheid bereikt |
| 56 | 3 Nauwkeurigheid bereikt |
| 57 | 3 Nauwkeurigheid bereikt |
| 58 | 3 Nauwkeurigheid bereikt |
| 59 | 3 Nauwkeurigheid bereikt |
| 60 | 3 Nauwkeurigheid bereikt |
| 61 | 3 Nauwkeurigheid bereikt |
| 62 | 3 Nauwkeurigheid bereikt |
| 63 | 3 Nauwkeurigheid bereikt |

**BELASTINGCOMBINATIES**

| BC Type  | BG | Gen. | Factor | BG | Gen. | Factor | BG | Gen. | Factor | BG | Gen. | Factor |
|----------|----|------|--------|----|------|--------|----|------|--------|----|------|--------|
| 1 Fund.  | 1  | Perm | 1.22   |    |      |        |    |      |        |    |      |        |
| 2 Fund.  | 1  | Perm | 0.90   |    |      |        |    |      |        |    |      |        |
| 3 Fund.  | 1  | Perm | 1.08   | 2  | Extr | 1.35   |    |      |        |    |      |        |
| 4 Fund.  | 1  | Perm | 1.08   | 3  | Extr | 1.35   |    |      |        |    |      |        |
| 5 Fund.  | 1  | Perm | 1.08   | 4  | Extr | 1.35   |    |      |        |    |      |        |
| 6 Fund.  | 1  | Perm | 1.08   | 5  | Extr | 1.35   |    |      |        |    |      |        |
| 7 Fund.  | 1  | Perm | 1.08   | 6  | Extr | 1.35   |    |      |        |    |      |        |
| 8 Fund.  | 1  | Perm | 1.08   | 7  | Extr | 1.35   |    |      |        |    |      |        |
| 9 Fund.  | 1  | Perm | 1.08   | 8  | Extr | 1.35   |    |      |        |    |      |        |
| 10 Fund. | 1  | Perm | 1.08   | 9  | Extr | 1.35   |    |      |        |    |      |        |
| 11 Fund. | 1  | Perm | 1.08   | 10 | Extr | 1.35   |    |      |        |    |      |        |
| 12 Fund. | 1  | Perm | 1.08   | 11 | Extr | 1.35   |    |      |        |    |      |        |
| 13 Fund. | 1  | Perm | 1.08   | 12 | Extr | 1.35   |    |      |        |    |      |        |
| 14 Fund. | 1  | Perm | 1.08   | 13 | Extr | 1.35   |    |      |        |    |      |        |
| 15 Fund. | 1  | Perm | 1.08   | 14 | Extr | 1.35   |    |      |        |    |      |        |
| 16 Fund. | 1  | Perm | 1.08   | 15 | Extr | 1.35   |    |      |        |    |      |        |
| 17 Fund. | 1  | Perm | 1.08   | 16 | Extr | 1.35   |    |      |        |    |      |        |



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**BELASTINGCOMBINATIES**

| BC Type  | BG | Gen. | Factor | BG      | Gen. | Factor | BG | Gen. | Factor | BG | Gen. | Factor |
|----------|----|------|--------|---------|------|--------|----|------|--------|----|------|--------|
| 18 Fund. | 1  | Perm | 0.90   | 2 Extr  | 1.35 |        |    |      |        |    |      |        |
| 19 Fund. | 1  | Perm | 0.90   | 3 Extr  | 1.35 |        |    |      |        |    |      |        |
| 20 Fund. | 1  | Perm | 0.90   | 4 Extr  | 1.35 |        |    |      |        |    |      |        |
| 21 Fund. | 1  | Perm | 0.90   | 5 Extr  | 1.35 |        |    |      |        |    |      |        |
| 22 Fund. | 1  | Perm | 0.90   | 6 Extr  | 1.35 |        |    |      |        |    |      |        |
| 23 Fund. | 1  | Perm | 0.90   | 7 Extr  | 1.35 |        |    |      |        |    |      |        |
| 24 Fund. | 1  | Perm | 0.90   | 8 Extr  | 1.35 |        |    |      |        |    |      |        |
| 25 Fund. | 1  | Perm | 0.90   | 9 Extr  | 1.35 |        |    |      |        |    |      |        |
| 26 Fund. | 1  | Perm | 0.90   | 10 Extr | 1.35 |        |    |      |        |    |      |        |
| 27 Fund. | 1  | Perm | 0.90   | 11 Extr | 1.35 |        |    |      |        |    |      |        |
| 28 Fund. | 1  | Perm | 0.90   | 12 Extr | 1.35 |        |    |      |        |    |      |        |
| 29 Fund. | 1  | Perm | 0.90   | 13 Extr | 1.35 |        |    |      |        |    |      |        |
| 30 Fund. | 1  | Perm | 0.90   | 14 Extr | 1.35 |        |    |      |        |    |      |        |
| 31 Fund. | 1  | Perm | 0.90   | 15 Extr | 1.35 |        |    |      |        |    |      |        |
| 32 Fund. | 1  | Perm | 0.90   | 16 Extr | 1.35 |        |    |      |        |    |      |        |
| 33 Kar.  | 1  | Perm | 1.00   | 2 Extr  | 1.00 |        |    |      |        |    |      |        |
| 34 Kar.  | 1  | Perm | 1.00   | 3 Extr  | 1.00 |        |    |      |        |    |      |        |
| 35 Kar.  | 1  | Perm | 1.00   | 4 Extr  | 1.00 |        |    |      |        |    |      |        |
| 36 Kar.  | 1  | Perm | 1.00   | 5 Extr  | 1.00 |        |    |      |        |    |      |        |
| 37 Kar.  | 1  | Perm | 1.00   | 6 Extr  | 1.00 |        |    |      |        |    |      |        |
| 38 Kar.  | 1  | Perm | 1.00   | 7 Extr  | 1.00 |        |    |      |        |    |      |        |
| 39 Kar.  | 1  | Perm | 1.00   | 8 Extr  | 1.00 |        |    |      |        |    |      |        |
| 40 Kar.  | 1  | Perm | 1.00   | 9 Extr  | 1.00 |        |    |      |        |    |      |        |
| 41 Kar.  | 1  | Perm | 1.00   | 10 Extr | 1.00 |        |    |      |        |    |      |        |
| 42 Kar.  | 1  | Perm | 1.00   | 11 Extr | 1.00 |        |    |      |        |    |      |        |
| 43 Kar.  | 1  | Perm | 1.00   | 12 Extr | 1.00 |        |    |      |        |    |      |        |
| 44 Kar.  | 1  | Perm | 1.00   | 13 Extr | 1.00 |        |    |      |        |    |      |        |
| 45 Kar.  | 1  | Perm | 1.00   | 14 Extr | 1.00 |        |    |      |        |    |      |        |
| 46 Kar.  | 1  | Perm | 1.00   | 15 Extr | 1.00 |        |    |      |        |    |      |        |
| 47 Kar.  | 1  | Perm | 1.00   | 16 Extr | 1.00 |        |    |      |        |    |      |        |
| 48 Quas. | 1  | Perm | 1.00   |         |      |        |    |      |        |    |      |        |
| 49 Freq. | 1  | Perm | 1.00   |         |      |        |    |      |        |    |      |        |
| 50 Freq. | 1  | Perm | 1.00   | 4 psi1  | 1.00 |        |    |      |        |    |      |        |
| 51 Freq. | 1  | Perm | 1.00   | 5 psi1  | 1.00 |        |    |      |        |    |      |        |
| 52 Freq. | 1  | Perm | 1.00   | 6 psi1  | 1.00 |        |    |      |        |    |      |        |
| 53 Freq. | 1  | Perm | 1.00   | 7 psi1  | 1.00 |        |    |      |        |    |      |        |
| 54 Freq. | 1  | Perm | 1.00   | 8 psi1  | 1.00 |        |    |      |        |    |      |        |
| 55 Freq. | 1  | Perm | 1.00   | 9 psi1  | 1.00 |        |    |      |        |    |      |        |
| 56 Freq. | 1  | Perm | 1.00   | 10 psi1 | 1.00 |        |    |      |        |    |      |        |
| 57 Freq. | 1  | Perm | 1.00   | 11 psi1 | 1.00 |        |    |      |        |    |      |        |
| 58 Freq. | 1  | Perm | 1.00   | 12 psi1 | 1.00 |        |    |      |        |    |      |        |
| 59 Freq. | 1  | Perm | 1.00   | 13 psi1 | 1.00 |        |    |      |        |    |      |        |
| 60 Freq. | 1  | Perm | 1.00   | 14 psi1 | 1.00 |        |    |      |        |    |      |        |
| 61 Freq. | 1  | Perm | 1.00   | 15 psi1 | 1.00 |        |    |      |        |    |      |        |
| 62 Freq. | 1  | Perm | 1.00   | 16 psi1 | 1.00 |        |    |      |        |    |      |        |
| 63 Blij. | 1  | Perm | 1.00   |         |      |        |    |      |        |    |      |        |

**GUNSTIGE WERKING PERMANENTE BELASTINGEN**

BC Staven met gunstige werking

- 1 Geen
- 2 Alle staven de factor:0.90
- 3 Geen
- 4 Geen
- 5 Geen

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**GUNSTIGE WERKING PERMANENTE BELASTINGEN**

BC Staven met gunstige werking

6 Geen  
 7 Geen  
 8 Geen  
 9 Geen  
 10 Geen  
 11 Geen  
 12 Geen  
 13 Geen  
 14 Geen  
 15 Geen  
 16 Geen  
 17 Geen  
 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  
 25 Alle staven de factor:0.90  
 26 Alle staven de factor:0.90  
 27 Alle staven de factor:0.90  
 28 Alle staven de factor:0.90  
 29 Alle staven de factor:0.90  
 30 Alle staven de factor:0.90  
 31 Alle staven de factor:0.90  
 32 Alle staven de factor:0.90

**REACTIES** 2e orde B.C:1 Fundamenteel B (6.10a)

| Kn. | X     | Z      | M                        |
|-----|-------|--------|--------------------------|
| 1   | 0.00  | 21.66  |                          |
| 2   | -0.00 | 21.66  |                          |
| 3   | 0.00  |        |                          |
|     | 0.00  | 43.33  | : Som van de reacties    |
|     | 0.00  | -43.33 | : Som van de belastingen |

**REACTIES** 2e orde B.C:2 Fundamenteel B (6.10a)

| Kn. | X     | Z      | M                        |
|-----|-------|--------|--------------------------|
| 1   | 0.00  | 16.05  |                          |
| 2   | -0.00 | 16.05  |                          |
| 3   | 0.00  |        |                          |
|     | 0.00  | 32.09  | : Som van de reacties    |
|     | 0.00  | -32.09 | : Som van de belastingen |

**REACTIES** 2e orde B.C:3 Fundamenteel B (6.10b)

| Kn. | X     | Z      | M                        |
|-----|-------|--------|--------------------------|
| 1   | 0.00  | 26.01  |                          |
| 2   | -0.01 | 26.01  |                          |
| 3   | 0.01  |        |                          |
|     | 0.00  | 52.01  | : Som van de reacties    |
|     | 0.00  | -52.01 | : Som van de belastingen |

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| <b>REACTIES</b> |       | 2e orde | B.C:4 Fundamenteel B (6.10b) |  |
|-----------------|-------|---------|------------------------------|--|
| Kn.             | X     | Z       | M                            |  |
| 1               | 0.00  | 20.27   |                              |  |
| 2               | -0.00 | 20.27   |                              |  |
| 3               | 0.00  |         |                              |  |
|                 | 0.00  | 40.54   | : Som van de reacties        |  |
|                 | 0.00  | -40.54  | : Som van de belastingen     |  |

| <b>REACTIES</b> |        | 2e orde | B.C:5 Fundamenteel B (6.10b) |  |
|-----------------|--------|---------|------------------------------|--|
| Kn.             | X      | Z       | M                            |  |
| 1               | -8.29  | 13.79   |                              |  |
| 2               | -1.51  | 20.23   |                              |  |
| 3               | -9.88  |         |                              |  |
|                 | -19.67 | 34.02   | : Som van de reacties        |  |
|                 | 19.67  | -34.02  | : Som van de belastingen     |  |

| <b>REACTIES</b> |        | 2e orde | B.C:6 Fundamenteel B (6.10b) |  |
|-----------------|--------|---------|------------------------------|--|
| Kn.             | X      | Z       | M                            |  |
| 1               | -4.52  | 2.42    |                              |  |
| 2               | -5.27  | 8.86    |                              |  |
| 3               | -9.83  |         |                              |  |
|                 | -19.62 | 11.28   | : Som van de reacties        |  |
|                 | 19.62  | -11.28  | : Som van de belastingen     |  |

| <b>REACTIES</b> |        | 2e orde | B.C:7 Fundamenteel B (6.10b) |  |
|-----------------|--------|---------|------------------------------|--|
| Kn.             | X      | Z       | M                            |  |
| 1               | -8.29  | 17.85   |                              |  |
| 2               | -1.51  | 28.32   |                              |  |
| 3               | -9.98  |         |                              |  |
|                 | -19.78 | 46.17   | : Som van de reacties        |  |
|                 | 19.78  | -46.17  | : Som van de belastingen     |  |

| <b>REACTIES</b> |        | 2e orde | B.C:8 Fundamenteel B (6.10b) |  |
|-----------------|--------|---------|------------------------------|--|
| Kn.             | X      | Z       | M                            |  |
| 1               | -4.52  | 6.48    |                              |  |
| 2               | -5.27  | 16.96   |                              |  |
| 3               | -9.89  |         |                              |  |
|                 | -19.69 | 23.44   | : Som van de reacties        |  |
|                 | 19.69  | -23.44  | : Som van de belastingen     |  |

| <b>REACTIES</b> |        | 2e orde | B.C:9 Fundamenteel B (6.10b) |  |
|-----------------|--------|---------|------------------------------|--|
| Kn.             | X      | Z       | M                            |  |
| 1               | 1.51   | 20.23   |                              |  |
| 2               | 8.28   | 13.79   |                              |  |
| 3               | 9.88   |         |                              |  |
|                 | 19.67  | 34.02   | : Som van de reacties        |  |
|                 | -19.67 | -34.02  | : Som van de belastingen     |  |

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| <b>REACTIES</b> |        | 2e orde | B.C:10 Fundamenteel B (6.10b) |  |
|-----------------|--------|---------|-------------------------------|--|
| Kn.             | X      | Z       | M                             |  |
| 1               | 5.27   | 8.87    |                               |  |
| 2               | 4.52   | 2.42    |                               |  |
| 3               | 9.83   |         |                               |  |
|                 | 19.62  | 11.28   | : Som van de reacties         |  |
|                 | -19.62 | -11.28  | : Som van de belastingen      |  |

| <b>REACTIES</b> |        | 2e orde | B.C:11 Fundamenteel B (6.10b) |  |
|-----------------|--------|---------|-------------------------------|--|
| Kn.             | X      | Z       | M                             |  |
| 1               | 1.51   | 28.32   |                               |  |
| 2               | 8.28   | 17.85   |                               |  |
| 3               | 9.99   |         |                               |  |
|                 | 19.78  | 46.17   | : Som van de reacties         |  |
|                 | -19.78 | -46.17  | : Som van de belastingen      |  |

| <b>REACTIES</b> |        | 2e orde | B.C:12 Fundamenteel B (6.10b) |  |
|-----------------|--------|---------|-------------------------------|--|
| Kn.             | X      | Z       | M                             |  |
| 1               | 5.27   | 16.96   |                               |  |
| 2               | 4.52   | 6.48    |                               |  |
| 3               | 9.90   |         |                               |  |
|                 | 19.69  | 23.44   | : Som van de reacties         |  |
|                 | -19.69 | -23.44  | : Som van de belastingen      |  |

| <b>REACTIES</b> |       | 2e orde | B.C:13 Fundamenteel B (6.10b) |  |
|-----------------|-------|---------|-------------------------------|--|
| Kn.             | X     | Z       | M                             |  |
| 1               | 3.77  | 18.35   |                               |  |
| 2               | -3.77 | 18.35   |                               |  |
| 3               | 0.00  |         |                               |  |
|                 | 0.00  | 36.69   | : Som van de reacties         |  |
|                 | -0.00 | -36.69  | : Som van de belastingen      |  |

| <b>REACTIES</b> |       | 2e orde | B.C:14 Fundamenteel B (6.10b) |  |
|-----------------|-------|---------|-------------------------------|--|
| Kn.             | X     | Z       | M                             |  |
| 1               | 7.53  | 3.35    |                               |  |
| 2               | -7.53 | 3.35    |                               |  |
| 3               | -0.00 |         |                               |  |
|                 | -0.00 | 6.69    | : Som van de reacties         |  |
|                 | 0.00  | -6.69   | : Som van de belastingen      |  |

| <b>REACTIES</b> |       | 2e orde | B.C:15 Fundamenteel B (6.10b) |  |
|-----------------|-------|---------|-------------------------------|--|
| Kn.             | X     | Z       | M                             |  |
| 1               | 1.51  | 30.62   |                               |  |
| 2               | -1.51 | 30.62   |                               |  |
| 3               | 0.01  |         |                               |  |
|                 | 0.00  | 61.24   | : Som van de reacties         |  |
|                 | -0.00 | -61.24  | : Som van de belastingen      |  |

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**REACTIES** 2e orde B.C:16 Fundamenteel B (6.10b)

| Kn. | X     | Z      | M                        |
|-----|-------|--------|--------------------------|
| 1   | 5.27  | 10.16  |                          |
| 2   | -5.27 | 10.16  |                          |
| 3   | 0.00  |        |                          |
|     | 0.00  | 20.33  | : Som van de reacties    |
|     | -0.00 | -20.33 | : Som van de belastingen |

**REACTIES** 2e orde B.C:17 Fundamenteel B (6.10b)

| Kn. | X     | Z      | M                        |
|-----|-------|--------|--------------------------|
| 1   | 0.00  | 40.80  |                          |
| 2   | -0.02 | 40.80  |                          |
| 3   | 0.02  |        |                          |
|     | 0.00  | 81.61  | : Som van de reacties    |
|     | 0.00  | -81.61 | : Som van de belastingen |

**REACTIES** 2e orde B.C:18 Fundamenteel B (6.10b)

| Kn. | X     | Z      | M                        |
|-----|-------|--------|--------------------------|
| 1   | 0.00  | 22.80  |                          |
| 2   | -0.00 | 22.80  |                          |
| 3   | 0.00  |        |                          |
|     | 0.00  | 45.59  | : Som van de reacties    |
|     | 0.00  | -45.59 | : Som van de belastingen |

**REACTIES** 2e orde B.C:19 Fundamenteel B (6.10b)

| Kn. | X     | Z      | M                        |
|-----|-------|--------|--------------------------|
| 1   | 0.00  | 17.06  |                          |
| 2   | -0.00 | 17.06  |                          |
| 3   | 0.00  |        |                          |
|     | 0.00  | 34.12  | : Som van de reacties    |
|     | 0.00  | -34.12 | : Som van de belastingen |

**REACTIES** 2e orde B.C:20 Fundamenteel B (6.10b)

| Kn. | X      | Z      | M                        |
|-----|--------|--------|--------------------------|
| 1   | -8.29  | 10.58  |                          |
| 2   | -1.51  | 17.02  |                          |
| 3   | -9.87  |        |                          |
|     | -19.66 | 27.60  | : Som van de reacties    |
|     | 19.66  | -27.60 | : Som van de belastingen |

**REACTIES** 2e orde B.C:21 Fundamenteel B (6.10b)

| Kn. | X      | Z     | M                        |
|-----|--------|-------|--------------------------|
| 1   | -4.52  | -0.79 |                          |
| 2   | -5.27  | 5.66  |                          |
| 3   | -9.81  |       |                          |
|     | -19.61 | 4.87  | : Som van de reacties    |
|     | 19.61  | -4.87 | : Som van de belastingen |

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**REACTIES** 2e orde B.C:22 Fundamenteel B (6.10b)

| Kn. | X      | Z      | M                        |
|-----|--------|--------|--------------------------|
| 1   | -8.29  | 14.64  |                          |
| 2   | -1.51  | 25.11  |                          |
| 3   | -9.96  |        |                          |
|     | -19.75 | 39.75  | : Som van de reacties    |
|     | 19.75  | -39.75 | : Som van de belastingen |

**REACTIES** 2e orde B.C:23 Fundamenteel B (6.10b)

| Kn. | X      | Z      | M                        |
|-----|--------|--------|--------------------------|
| 1   | -4.52  | 3.27   |                          |
| 2   | -5.27  | 13.75  |                          |
| 3   | -9.87  |        |                          |
|     | -19.67 | 17.02  | : Som van de reacties    |
|     | 19.67  | -17.02 | : Som van de belastingen |

**REACTIES** 2e orde B.C:24 Fundamenteel B (6.10b)

| Kn. | X      | Z      | M                        |
|-----|--------|--------|--------------------------|
| 1   | 1.51   | 17.02  |                          |
| 2   | 8.29   | 10.58  |                          |
| 3   | 9.87   |        |                          |
|     | 19.66  | 27.60  | : Som van de reacties    |
|     | -19.66 | -27.60 | : Som van de belastingen |

**REACTIES** 2e orde B.C:25 Fundamenteel B (6.10b)

| Kn. | X      | Z     | M                        |
|-----|--------|-------|--------------------------|
| 1   | 5.27   | 5.66  |                          |
| 2   | 4.52   | -0.79 |                          |
| 3   | 9.81   |       |                          |
|     | 19.61  | 4.87  | : Som van de reacties    |
|     | -19.61 | -4.87 | : Som van de belastingen |

**REACTIES** 2e orde B.C:26 Fundamenteel B (6.10b)

| Kn. | X      | Z      | M                        |
|-----|--------|--------|--------------------------|
| 1   | 1.51   | 25.11  |                          |
| 2   | 8.28   | 14.64  |                          |
| 3   | 9.96   |        |                          |
|     | 19.75  | 39.75  | : Som van de reacties    |
|     | -19.75 | -39.75 | : Som van de belastingen |

**REACTIES** 2e orde B.C:27 Fundamenteel B (6.10b)

| Kn. | X      | Z      | M                        |
|-----|--------|--------|--------------------------|
| 1   | 5.27   | 13.75  |                          |
| 2   | 4.52   | 3.27   |                          |
| 3   | 9.87   |        |                          |
|     | 19.67  | 17.02  | : Som van de reacties    |
|     | -19.67 | -17.02 | : Som van de belastingen |

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**REACTIES** 2e orde B.C:28 Fundamenteel B (6.10b)

| Kn. | X     | Z      | M                        |
|-----|-------|--------|--------------------------|
| 1   | 3.77  | 15.14  |                          |
| 2   | -3.77 | 15.14  |                          |
| 3   | 0.00  |        |                          |
|     | 0.00  | 30.28  | : Som van de reacties    |
|     | -0.00 | -30.28 | : Som van de belastingen |

**REACTIES** 2e orde B.C:29 Fundamenteel B (6.10b)

| Kn. | X     | Z     | M                        |
|-----|-------|-------|--------------------------|
| 1   | 7.53  | 0.14  |                          |
| 2   | -7.53 | 0.14  |                          |
| 3   | 0.00  |       |                          |
|     | -0.00 | 0.27  | : Som van de reacties    |
|     | 0.00  | -0.27 | : Som van de belastingen |

**REACTIES** 2e orde B.C:30 Fundamenteel B (6.10b)

| Kn. | X     | Z      | M                        |
|-----|-------|--------|--------------------------|
| 1   | 1.51  | 27.41  |                          |
| 2   | -1.51 | 27.41  |                          |
| 3   | 0.00  |        |                          |
|     | 0.00  | 54.82  | : Som van de reacties    |
|     | -0.00 | -54.82 | : Som van de belastingen |

**REACTIES** 2e orde B.C:31 Fundamenteel B (6.10b)

| Kn. | X     | Z      | M                        |
|-----|-------|--------|--------------------------|
| 1   | 5.27  | 6.96   |                          |
| 2   | -5.27 | 6.96   |                          |
| 3   | -0.00 |        |                          |
|     | -0.00 | 13.91  | : Som van de reacties    |
|     | 0.00  | -13.91 | : Som van de belastingen |

**REACTIES** 2e orde B.C:32 Fundamenteel B (6.10b)

| Kn. | X     | Z      | M                        |
|-----|-------|--------|--------------------------|
| 1   | 0.00  | 37.59  |                          |
| 2   | -0.01 | 37.59  |                          |
| 3   | 0.01  |        |                          |
|     | 0.00  | 75.19  | : Som van de reacties    |
|     | 0.00  | -75.19 | : Som van de belastingen |

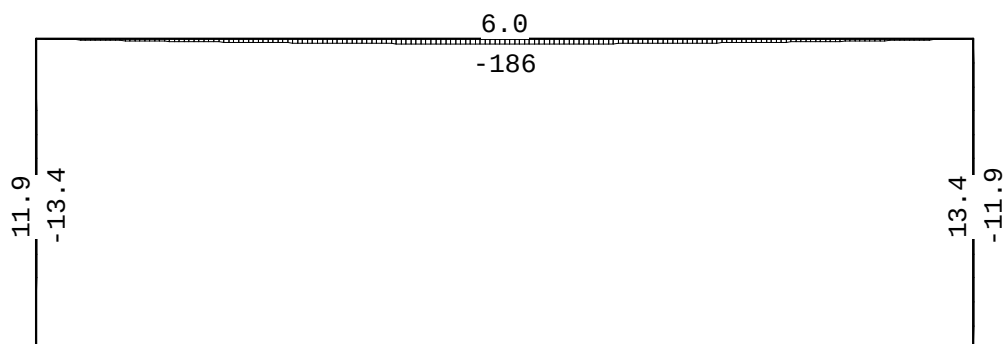
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Onderdeel: Spant 12

**OMHULLENDE VAN DE FUNDAMENTELE COMBINATIES****MOMENTEN**

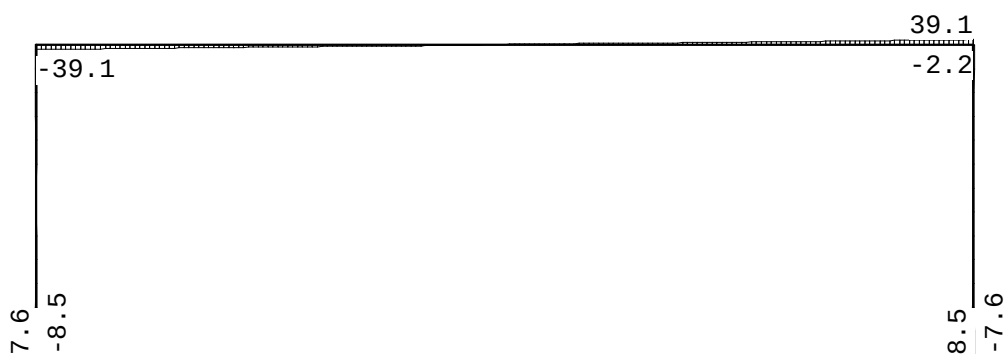
2e orde

Fundamentele combinatie

**DWARSKRACHTEN**

2e orde

Fundamentele combinatie





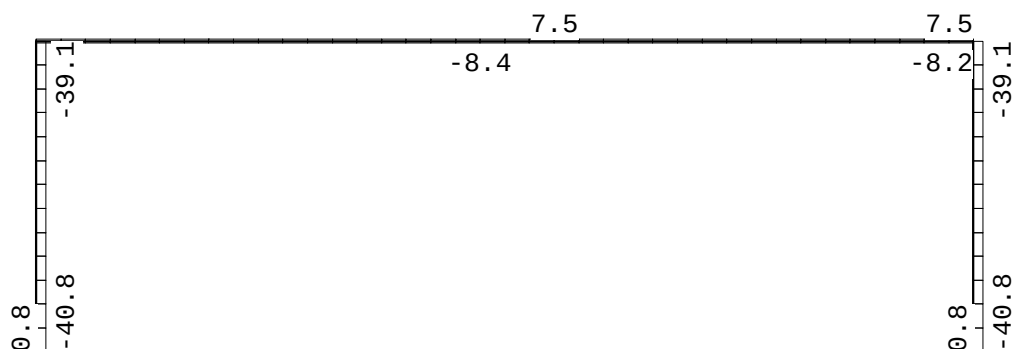
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Onderdeel: Spant 12

**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 |
| 1   | 1      |      | -40.80  | 17 | 0.82    | 21 | -8.52   | 7  |
| 1   | 2.908  |      | -40.03  | 17 | 1.46    | 21 | -0.68   | 7  |
| 1   | 2.908  |      | -40.03  | 17 | 1.46    | 21 | -0.63   | 20 |
| 1   | 3.392  |      | -39.90  | 17 | 1.56    | 21 | -0.58   | 14 |
| 1   | 3.392  |      | -39.90  | 17 | 1.56    | 21 | -0.58   | 14 |
| 1   | 3      |      | -39.12  | 17 | 2.22    | 21 | -7.56   | 14 |
| 2   | 2      |      | -40.80  | 17 | 0.82    | 25 | -7.57   | 14 |
| 2   | 2.908  |      | -40.03  | 17 | 1.46    | 25 | -0.58   | 14 |
| 2   | 2.908  |      | -40.03  | 17 | 1.46    | 25 | -0.58   | 14 |
| 2   | 3.392  |      | -39.90  | 17 | 1.56    | 25 | -0.64   | 11 |
| 2   | 3.392  |      | -39.90  | 17 | 1.56    | 25 | -0.69   | 11 |
| 2   | 4      |      | -39.12  | 17 | 2.22    | 25 | -8.50   | 11 |
| 3   | 3      |      | -8.22   | 24 | 7.54    | 14 | -39.11  | 17 |
| 3   | 7.700  |      | -8.37   | 11 | 7.55    | 29 | -10.08  | 3  |
| 3   | 9.500  |      | -8.37   | 11 | 7.55    | 29 | -2.30   | 22 |
| 3   | 11.300 |      | -8.34   | 9  | 7.55    | 29 | -0.25   | 21 |
| 3   | 4      |      | -8.22   | 24 | 7.54    | 14 | -2.18   | 25 |

**REACTIES**

2e orde

Fundamentele combinatie

| Kn. | X-min | X-max | Z-min | Z-max | M-min | M-max |
|-----|-------|-------|-------|-------|-------|-------|
| 1   | -8.29 | 7.53  | -0.79 | 40.80 |       |       |
| 2   | -7.53 | 8.29  | -0.79 | 40.80 |       |       |
| 3   | -9.98 | 9.99  |       |       |       |       |

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**STAALPROFIELEN - ALGEMENE GEGEVENS**

|                                                |             |
|------------------------------------------------|-------------|
| Stabiliteit: Classificatie gehele constructie: | Ongeschoord |
| Doorbuiging en verplaatsing:                   |             |
| Aantal bouwlagen:                              | 1           |
| Gebouwtype:                                    | Overig      |
| Toel. horiz. verplaatsing gehele gebouw:       | h/300       |
| Kleinste gevelhoogte [m]:                      | 0.0         |

**MATERIAAL**

| Mat nr. | Profielnaam | Vloeisp. [N/mm <sup>2</sup> ] | Productie methode | Min. drsn. klasse |
|---------|-------------|-------------------------------|-------------------|-------------------|
| 1       | HEA140      | 235                           | Gewalst           | 1                 |
| 2       | IPE400      | 235                           | Gewalst           | 1                 |

Partiële veiligheidsfactoren:

|           |   |      |           |   |      |
|-----------|---|------|-----------|---|------|
| Gamma M;0 | : | 1.00 | Gamma M;1 | : | 1.00 |
|-----------|---|------|-----------|---|------|

**KNIKSTABILITEIT**

| Staafl | $l_{sys}$ [m] | Classif. y sterke as | $l_{knik;y}$ [m] | Extra aanp. y [kN] | Classif. z zwakke as | $l_{knik;z}$ [m] | Extra aanp. z [kN] |
|--------|---------------|----------------------|------------------|--------------------|----------------------|------------------|--------------------|
| 1      | 6.300         | Ongeschoord          | 2e orde          |                    | Geschoord            | 6.300            | 0.0                |
| 2      | 6.300         | Ongeschoord          | 2e orde          |                    | Geschoord            | 6.300            | 0.0                |
| 3      | 19.000        | Ongeschoord          | 2e orde          |                    | Geschoord            | 5.000*           | 0.0                |

\* Door gebruiker gedefinieerde kniklengte

**KIPSTABILITEIT**

| Staafl | Plts. aangr. |        | l gaffel [m] | Kipsteunafstanden [m] |
|--------|--------------|--------|--------------|-----------------------|
| 1      | 1.0*h        | boven: | 6.30         | 6,3                   |
|        |              | onder: | 6.30         | 6,3                   |
| 2      | 1.0*h        | boven: | 6.30         | 6,3                   |
|        |              | onder: | 6.30         | 6,3                   |
| 3      | 1.0*h        | boven: | 19.00        | 0                     |
|        |              | onder: | 19.00        | 19                    |

**TOETSING SPANNINGEN**

| Staafl | Mat nr. | BC | Sit | Kl | Plaats | Norm    | Artikel | Formule | Hoogste toetsing U.C. [N/mm <sup>2</sup> ] | Opm. |
|--------|---------|----|-----|----|--------|---------|---------|---------|--------------------------------------------|------|
| 1      | 1       | 7  | 1   | 1  | Staafl | EN3-1-1 | 6.3.3   | (6.62)  | 0.583 137                                  | 47   |
| 2      | 1       | 11 | 1   | 1  | Staafl | EN3-1-1 | 6.3.3   | (6.62)  | 0.522 123                                  | 47   |
| 3      | 2       | 17 | 1   | 1  | My-max | EN3-1-1 | 6.2.9.1 | (6.31)  | 0.604 142                                  |      |

Opmerkingen:

[ 47] Bij verlopende normaalkracht wordt de grootste drukkracht genomen.

**TOETSING DOORBUIGING**

| Staafl | Soort | Mtg | Lengte [m] | Overst I | Zeeg J | $u_{tot}$ [mm] | BC | Sit    | u [mm] | Toelaatbaar [mm] | *l    |
|--------|-------|-----|------------|----------|--------|----------------|----|--------|--------|------------------|-------|
| 3      | Dak   | db  | 19.00      | N        | N      | 50.0-118.5     | 47 | 1 Eind | -68.5  | -76.0            | 0.004 |
|        |       | db  |            |          |        |                | 47 | 1 Bijk | -58.7  | -76.0            | 0.004 |

**TOETSING HORIZONTALE VERPLAATSING**

| Staafl | BC | Sit | Lengte [m] | $u_{eind}$ [mm] | Toelaatbaar [mm] | [h/] |
|--------|----|-----|------------|-----------------|------------------|------|
| 1      | 37 | 1   | 6.300      | -18.9           | 42.0             | 150  |
| 2      | 41 | 1   | 6.300      | 18.9            | 42.0             | 150  |

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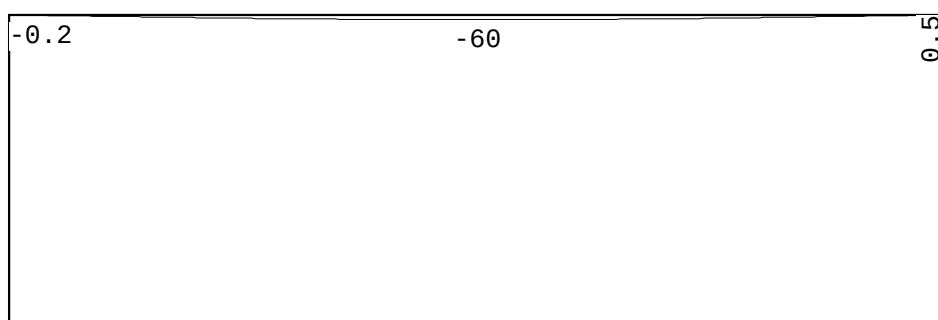
Onderdeel: Spant 12

**TOETSING HOR. VERPLAATSING GLOBAAL**

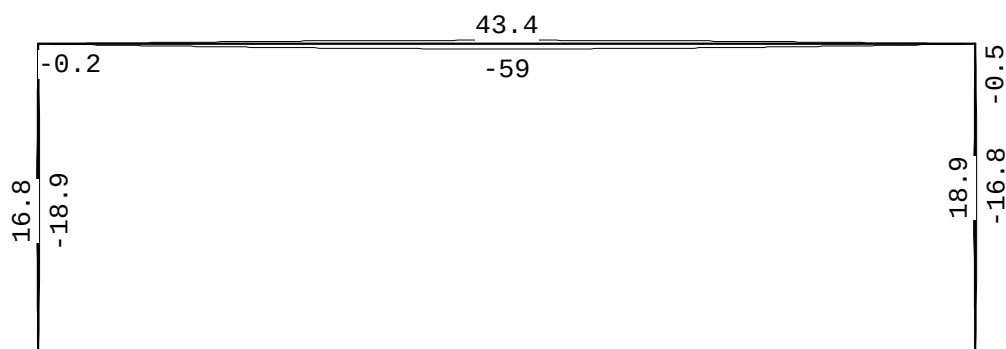
Er is een maximale horizontale verplaatsing van -0.0018 [m] gevonden bij knoop 4 en combinatie 47; belastingsituatie 1, iter:3 (combinatietype 2). Bij een hoogte van 6.300 [m] levert dit  $h/3433$  (toel.:  $h/300$ ).

**VERVORMINGEN w1**

Blijvende combinatie

**VERVORMINGEN w<sub>bij</sub>**

Karakteristieke combinatie

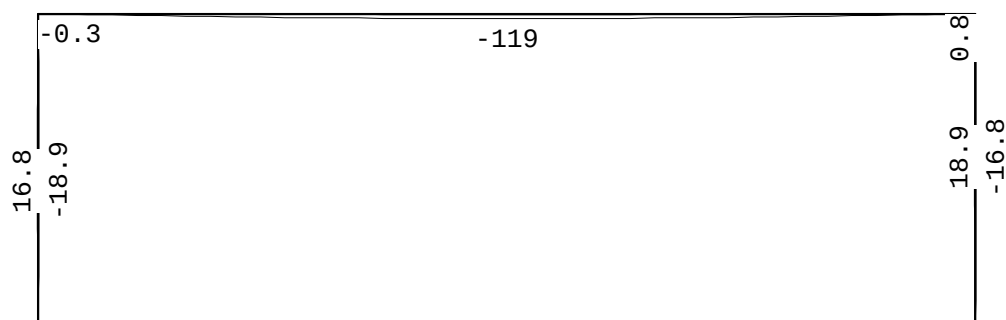


Project...: 180114 Uitbreiding Venster Techniek

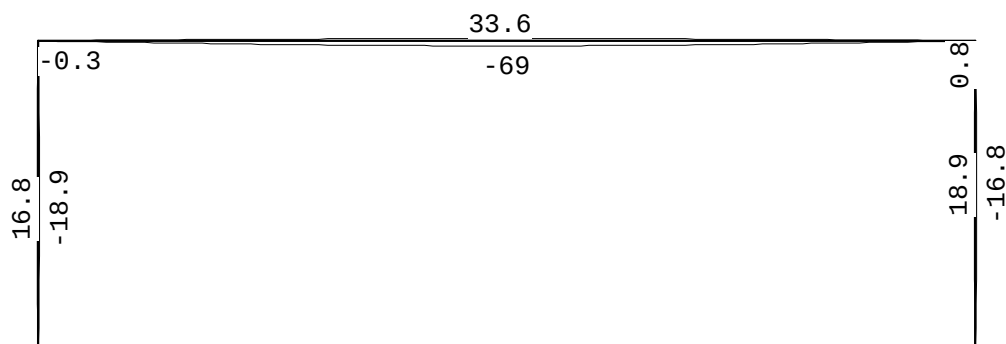
Onderdeel: Spant 12

**VERVORMINGEN  $W_{tot}$** 

Karakteristieke combinatie

**VERVORMINGEN  $W_{max}$** 

Karakteristieke combinatie

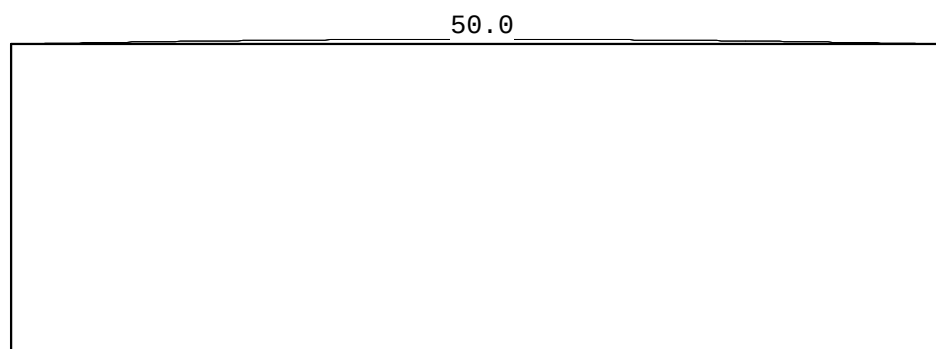


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Onderdeel: Spant 12

**ZEEG wc**

---



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Onderdeel: Spant 13

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

Datum....: 28/08/2018

Bestand...: f:\projecten\2018\180114 uitbreiding venstertechniek te  
zelhem\constructief cibis\spant as 13.rww

Belastingbreedte.: 5.000

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

Theorieën voor de bepaling van de krachtsverdeling:

1) Losse belastinggevallen:

Lineaire-elasticiteitstheorie

2) Uiterste grenstoestand:

Geometrisch niet lineair alle staven.

Fysisch lineair alle staven.

3) Gebruiksgrenstoestand:

Geometrisch niet lineair alle staven.

Fysisch lineair alle staven.

Maximum aantal iteraties.....: 50

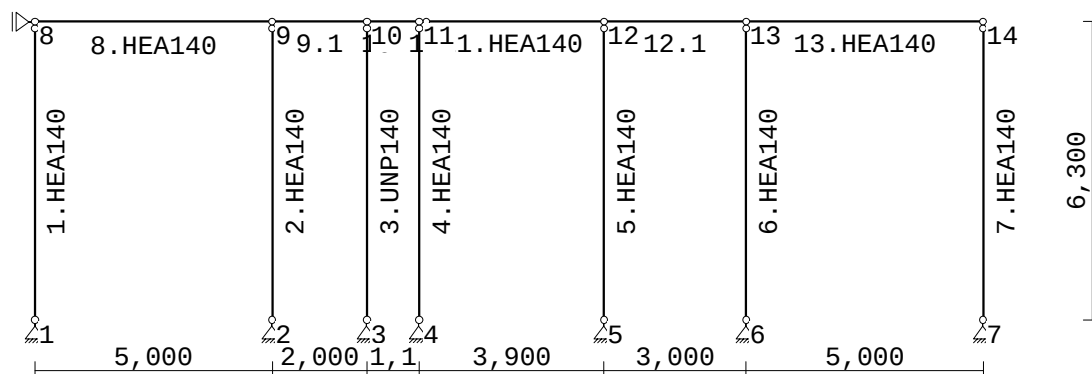
Max.deellengte kolommen/wanden: 0.500 Max.deellengte balken/vloeren: 0.500

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) |
| Staal       | NEN-EN 1993-1-1:2006 | C2:2009 | NB:2011(nl) |

**GEOMETRIE****MATERIALEN**

| Mt | Omschrijving | E-modulus[N/mm2] | S.M. | Pois. | Uitz. coëff |
|----|--------------|------------------|------|-------|-------------|
| 1  | S235         | 210000           | 78.5 | 0.30  | 1.2000e-05  |

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Onderdeel: Spant 13

**PROFIELEN [mm]**

| Prof. | Omschrijving | Materiaal | Oppervlak  | Traagheid  | Vormf. |
|-------|--------------|-----------|------------|------------|--------|
| 1     | HEA140       | 1:S235    | 3.1420e+03 | 1.0330e+07 | 0.00   |
| 2     | HEA140       | 1:S235    | 3.1420e+03 | 1.0330e+07 | 0.00   |
| 3     | UNP140       | 1:S235    | 2.0370e+03 | 6.0500e+06 | 0.00   |

**PROFIELEN vervolg [mm]**

| Prof. | Staaftype | Breedte | Hoogte | e    | Type | b1 | h1 | b2 | h2 |
|-------|-----------|---------|--------|------|------|----|----|----|----|
| 1     | 0:Normaal | 140     | 133    | 66.5 |      |    |    |    |    |
| 2     | 0:Normaal | 140     | 133    | 66.5 |      |    |    |    |    |
| 3     | 0:Normaal | 60      | 140    | 70.0 |      |    |    |    |    |

**PROFIELVORMEN [mm]**

1 HEA140



2 HEA140



3 UNP140

**KNOPEN**

| Knoop | X      | Z     | Knoop | X      | Z     |
|-------|--------|-------|-------|--------|-------|
| 1     | 0.000  | 0.000 | 6     | 15.000 | 0.000 |
| 2     | 5.000  | 0.000 | 7     | 20.000 | 0.000 |
| 3     | 7.000  | 0.000 | 8     | 0.000  | 6.300 |
| 4     | 8.100  | 0.000 | 9     | 5.000  | 6.300 |
| 5     | 12.000 | 0.000 | 10    | 7.000  | 6.300 |
| 11    | 8.100  | 6.300 |       |        |       |
| 12    | 12.000 | 6.300 |       |        |       |
| 13    | 15.000 | 6.300 |       |        |       |
| 14    | 20.000 | 6.300 |       |        |       |

**STAVEN**

| St. | ki | kj | Profiel  | Aansl.i | Aansl.j | Lengte | Opm. |
|-----|----|----|----------|---------|---------|--------|------|
| 1   | 1  | 8  | 2:HEA140 | NDM     | ND-     | 6.300  |      |
| 2   | 2  | 9  | 2:HEA140 | NDM     | ND-     | 6.300  |      |
| 3   | 3  | 10 | 3:UNP140 | NDM     | ND-     | 6.300  |      |
| 4   | 4  | 11 | 2:HEA140 | NDM     | ND-     | 6.300  |      |
| 5   | 5  | 12 | 2:HEA140 | NDM     | ND-     | 6.300  |      |
| 6   | 6  | 13 | 2:HEA140 | NDM     | ND-     | 6.300  |      |
| 7   | 7  | 14 | 2:HEA140 | NDM     | ND-     | 6.300  |      |
| 8   | 8  | 9  | 1:HEA140 | NDM     | NDM     | 5.000  |      |
| 9   | 9  | 10 | 1:HEA140 | NDM     | NDM     | 2.000  |      |
| 10  | 10 | 11 | 1:HEA140 | NDM     | NDM     | 1.100  |      |
| 11  | 11 | 12 | 1:HEA140 | ND-     | NDM     | 3.900  |      |
| 12  | 12 | 13 | 1:HEA140 | NDM     | NDM     | 3.000  |      |
| 13  | 13 | 14 | 1:HEA140 | NDM     | NDM     | 5.000  |      |

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Onderdeel: Spant 13

**VASTE STEUNPUNTEN**

| Nr. | knoop | Kode | XZR 1=vast 0=vrij | Hoek |
|-----|-------|------|-------------------|------|
| 1   | 1     | 110  |                   | 0.00 |
| 2   | 2     | 110  |                   | 0.00 |
| 3   | 3     | 110  |                   | 0.00 |
| 4   | 4     | 110  |                   | 0.00 |
| 5   | 5     | 110  |                   | 0.00 |
| 6   | 6     | 110  |                   | 0.00 |
| 7   | 7     | 110  |                   | 0.00 |
| 8   | 8     | 100  |                   | 0.00 |

**BELASTINGGENERATIE ALGEMEEN.**

|                              |       |                         |      |
|------------------------------|-------|-------------------------|------|
| Betrouwbaarheidsklasse.....: | 1     | Referentieperiode.....: | 50   |
| Gebouwdiepte.....:           | 40.00 | Gebouwhoogte.....:      | 6.30 |
| Niveau aansl.terrein.....:   | 0.00  | E.g. scheid.w. [kN/m2]: | 1.20 |

**WIND**

|                                    |           |                         |        |
|------------------------------------|-----------|-------------------------|--------|
| Terrein categorie ...[4.3.2]....:  | Onbebouwd |                         |        |
| Windgebied .....                   | 3         | Vb,0 ..[4.2].....:      | 24.500 |
| Positie spant in het gebouw....:   | 6.000     | Kr ....[4.3.2].....:    | 0.209  |
| z0 .....[4.3.2]....:               | 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 :  | 0.70 |

**STAFTYPEN**

| Type             | staven |
|------------------|--------|
| 4:Wand / kolom.  | : 2-6  |
| 5:Linker gevel.  | : 1    |
| 6:Rechter gevel. | : 7    |
| 7:Dak.           | : 8-13 |

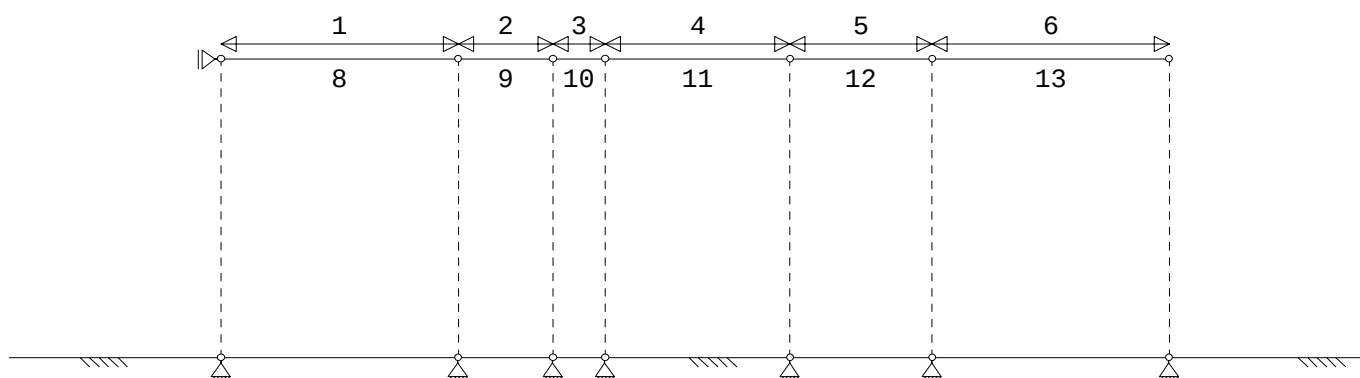


Project...: 180114 Uitbreiding Venster Techniek

Onderdeel: Spant 13

**LASTVELDEN**

Veranderlijke belastingen door personen

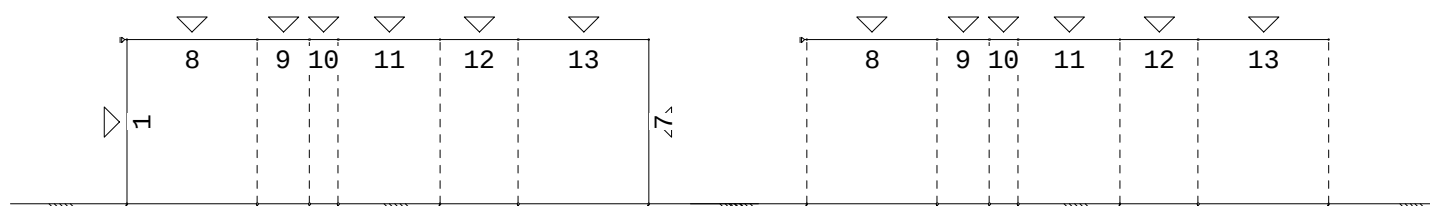
**LASTVELDEN**

| Nr | Balk | Veld  | Gebruiksfunctie                                         | Psi-t |
|----|------|-------|---------------------------------------------------------|-------|
| 1  | 8-13 | 8-8   | Dak niet toegankelijk voor dagelijks gebruik. Tabel 6.9 | 1.00  |
| 2  | 8-13 | 9-9   | Dak niet toegankelijk voor dagelijks gebruik. Tabel 6.9 | 1.00  |
| 3  | 8-13 | 10-10 | Dak niet toegankelijk voor dagelijks gebruik. Tabel 6.9 | 1.00  |
| 4  | 8-13 | 11-11 | Dak niet toegankelijk voor dagelijks gebruik. Tabel 6.9 | 1.00  |
| 5  | 8-13 | 12-12 | Dak niet toegankelijk voor dagelijks gebruik. Tabel 6.9 | 1.00  |
| 6  | 8-13 | 13-13 | Dak niet toegankelijk voor dagelijks gebruik. Tabel 6.9 | 1.00  |

**LASTVELDEN**

Wind staven

Sneeuw staven

**WIND DAKTYPES**

| Nr. | Staaft Type   | reductie bij<br>wind van links | reductie bij<br>wind van Rechts | Cpe volgens art: |
|-----|---------------|--------------------------------|---------------------------------|------------------|
| 1   | 1 Gevel       | 1.000                          | 1.000                           | 7.2.2            |
| 2   | 8-13 Plat dak | 1.000                          | 1.000                           | 7.2.3            |
| 3   | 7 Gevel       | 1.000                          | 1.000                           | 7.2.2            |

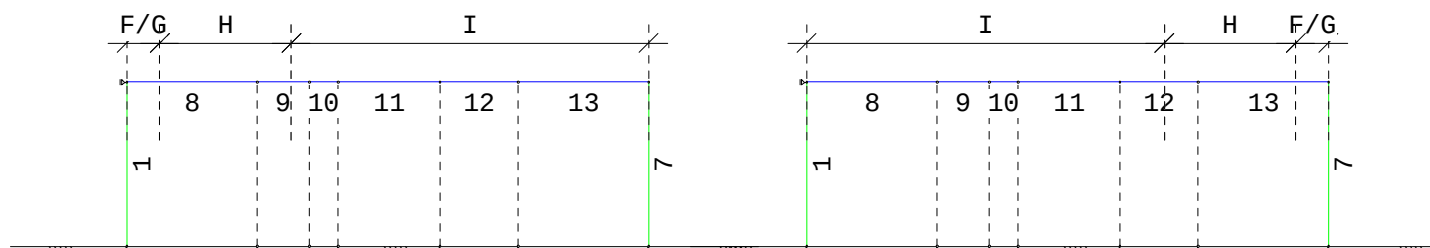
Project...: 180114 Uitbreiding Venster Techniek

Onderdeel: Spant 13

**WIND ZONES**

Wind van links

Wind van rechts

**WIND VAN LINKS ZONES**

| Nr. | Staat | Positie | Lengte | Zone |
|-----|-------|---------|--------|------|
| 1   | 1     | 0.000   | 6.300  | D    |
| 2   | 8-13  | 0.000   | 1.260  | F/G  |
| 3   | 8-13  | 1.260   | 5.040  | H    |
| 4   | 8-13  | 6.300   | 13.700 | I    |
| 5   | 7     | 0.000   | 6.300  | E    |

**WIND VAN RECHTS ZONES**

| Nr. | Staat | Positie | Lengte | Zone |
|-----|-------|---------|--------|------|
| 1   | 7     | 0.000   | 6.300  | D    |
| 2   | 8-13  | 0.000   | 1.260  | F/G  |
| 3   | 8-13  | 1.260   | 5.040  | H    |
| 4   | 8-13  | 6.300   | 13.700 | I    |
| 5   | 1     | 0.000   | 6.300  | E    |

**Wind indexen**

| Index | CsCd | Cpe/Cpi | qp    | breedte | reductie | Qw     | Zone | Hoek(en) |
|-------|------|---------|-------|---------|----------|--------|------|----------|
| Qw1   |      | 0.300   | 0.591 | 5.000   |          | -0.886 | -i   |          |
| Qw2   |      | -0.300  | 0.591 | 5.000   |          | 0.886  | -i   |          |
| Qw3   | 1.00 | 0.800   | 0.591 | 5.000   |          | -2.363 | D    |          |
| Qw4   | 1.00 | -1.200  | 0.591 | 5.000   |          | 3.545  | G    | 0.0      |
| Qw5   | 1.00 | -0.700  | 0.591 | 5.000   |          | 2.068  | H    | 0.0      |
| Qw6   | 1.00 | -0.200  | 0.591 | 5.000   |          | 0.591  | I    | 0.0      |
| Qw7   | 1.00 | 0.500   | 0.591 | 5.000   |          | -1.477 | E    |          |
| Qw8   |      | -0.200  | 0.591 | 5.000   |          | 0.591  | +i   |          |
| Qw9   |      | 0.200   | 0.591 | 5.000   |          | -0.591 | +i   |          |
| Qw10  | 1.00 | 0.200   | 0.591 | 5.000   |          | -0.591 | I    | 0.0      |
| Qw11  | 1.00 | -0.800  | 0.591 | 5.000   |          | 2.363  | D    |          |
| Qw12  | 1.00 | -0.500  | 0.591 | 5.000   |          | 1.477  | E    |          |
| Qw13  | 1.00 | -0.800  | 0.591 | 5.000   |          | 2.363  | B    |          |
| Qw14  | 1.00 | 0.800   | 0.591 | 5.000   |          | -2.363 | B    |          |
| Qw15  | 1.00 | -0.700  | 0.591 | 2.800   |          | 1.158  | H    | 0.0      |
| Qw16  | 1.00 | 0.200   | 0.591 | 2.200   |          | -0.260 | I    | 0.0      |
| Qw17  | 1.00 | -0.200  | 0.591 | 2.200   |          | 0.260  | I    | 0.0      |
| Qw18  | 1.00 | -0.500  | 0.591 | 5.000   |          | 1.477  | C    |          |
| Qw19  | 1.00 | 0.500   | 0.591 | 5.000   |          | -1.477 | C    |          |

**SNEEUW DAKTYPEN**

Staat artikel

8-13 5.3.2 Lessenaarsdak

Project...: 180114 Uitbreiding Venster Techniek

Onderdeel: Spant 13

**Sneeuw indexen**

| Index | art   | $\mu$ | $s_k$ | red. posfac | breedte | $Q_s$ | hoek |
|-------|-------|-------|-------|-------------|---------|-------|------|
| Qs1   | 5.3.2 | 0.800 | 0.70  | 1.00        | 5.000   | 2.800 | 0.0  |

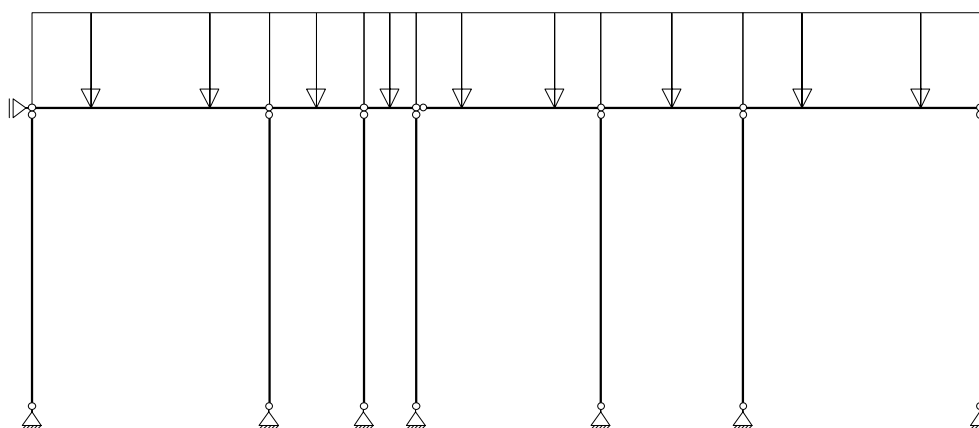
**BELASTINGGEVALLEN**

| B.G. | Omschrijving                     | Type |
|------|----------------------------------|------|
|      | 1 Permanente belasting EGZ=-1.00 | 1    |
| g    | 2 Ver. bel. pers. ed. (p_rep)    | 2    |
| g    | 3 Ver. bel. pers. ed. (F_rep)    | 3    |
| g    | 4 Wind van links onderdruk A     | 7    |
| g    | 5 Wind van links overdruk A      | 8    |
| g    | 6 Wind van links onderdruk B     | 9    |
| g    | 7 Wind van links overdruk B      | 10   |
| g    | 8 Wind van rechts onderdruk A    | 11   |
| g    | 9 Wind van rechts overdruk A     | 12   |
| g    | 10 Wind van rechts onderdruk B   | 13   |
| g    | 11 Wind van rechts overdruk B    | 14   |
| g    | 12 Wind loodrecht onderdruk A    | 15   |
| g    | 13 Wind loodrecht overdruk A     | 16   |
| g    | 14 Wind loodrecht onderdruk B    | 45   |
| g    | 15 Wind loodrecht overdruk B     | 46   |
| g    | 16 Sneeuw A                      | 22   |
| g    | = gegenereerd belastinggeval     |      |

**BELASTINGEN**

B.G:1 Permanente belasting

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

**STAAFBELASTINGEN**

B.G:1 Permanente belasting

| Staat | Type       | q1/p/m | q2    | A     | B     | $\psi_0$ | $\psi_1$ | $\psi_2$ |
|-------|------------|--------|-------|-------|-------|----------|----------|----------|
| 8     | 5:QZGloaal | -1.75  | -1.75 | 0.000 | 0.000 |          |          |          |
| 9     | 5:QZGloaal | -1.75  | -1.75 | 0.000 | 0.000 |          |          |          |
| 10    | 5:QZGloaal | -1.75  | -1.75 | 0.000 | 0.000 |          |          |          |
| 11    | 5:QZGloaal | -1.75  | -1.75 | 0.000 | 0.000 |          |          |          |
| 12    | 5:QZGloaal | -1.75  | -1.75 | 0.000 | 0.000 |          |          |          |
| 13    | 5:QZGloaal | -1.75  | -1.75 | 0.000 | 0.000 |          |          |          |

Project...: 180114 Uitbreiding Venster Techniek

Onderdeel: Spant 13

**REACTIES**

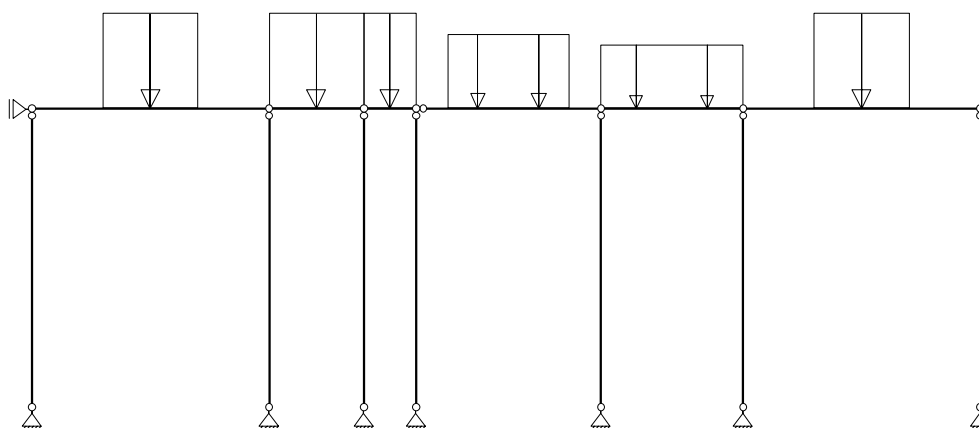
1e orde

B.G:1 Permanente belasting

| Kn. | X    | Z      | M                        |
|-----|------|--------|--------------------------|
| 1   | 0.00 | 5.59   |                          |
| 2   | 0.00 | 12.17  |                          |
| 3   | 0.00 | 0.90   |                          |
| 4   | 0.00 | 6.52   |                          |
| 5   | 0.00 | 8.29   |                          |
| 6   | 0.00 | 11.11  |                          |
| 7   | 0.00 | 5.68   |                          |
| 8   | 0.00 |        |                          |
|     | 0.00 | 50.26  | : Som van de reacties    |
|     | 0.00 | -50.26 | : Som van de belastingen |

**BELASTINGEN**

B.G:2 Ver. bel. pers. ed. (p\_rep)

**STAAFBELASTINGEN**

B.G:2 Ver. bel. pers. ed. (p\_rep)

| Staaftype | Type        | q1/p/m | q2    | A     | B     | $\psi_0$ | $\psi_1$ | $\psi_2$ |
|-----------|-------------|--------|-------|-------|-------|----------|----------|----------|
| 8         | 3:QZgeProj. | -5.00  | -5.00 | 1.500 | 1.500 | 0.0      | 0.0      | 0.0      |
| 9         | 3:QZgeProj. | -5.00  | -5.00 | 0.000 | 0.000 | 0.0      | 0.0      | 0.0      |
| 10        | 3:QZgeProj. | -5.00  | -5.00 | 0.000 | 0.000 | 0.0      | 0.0      | 0.0      |
| 11        | 3:QZgeProj. | -3.90  | -3.90 | 0.668 | 0.668 | 0.0      | 0.0      | 0.0      |
| 12        | 3:QZgeProj. | -3.33  | -3.33 | 0.000 | 0.000 | 0.0      | 0.0      | 0.0      |
| 13        | 3:QZgeProj. | -5.00  | -5.00 | 1.500 | 1.500 | 0.0      | 0.0      | 0.0      |

**VERANDERLIJKE BELASTING SITUATIES**

| Nr | Lastvelden extreem | Lastvelden momentaan |
|----|--------------------|----------------------|
| 1  | 2, 4, 6            |                      |
| 2  | 1, 3, 5            |                      |
| 3  | 2, 3, 5, 6         |                      |
| 4  | 1, 2, 4, 5         |                      |
| 5  | 1, 3, 4, 6         |                      |

Project...: 180114 Uitbreiding Venster Techniek

Onderdeel: Spant 13

**REACTIES**

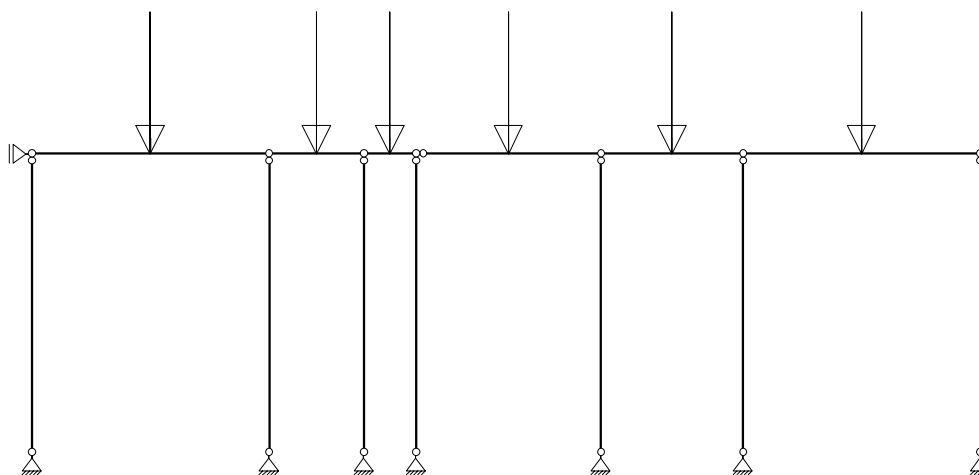
1e orde

B.G:2 Ver. bel. pers. ed. (p\_rep)

| Kn. | X-min | X-max | Z-min | Z-max | M-min | M-max |
|-----|-------|-------|-------|-------|-------|-------|
| 1   | 0.00  | 0.00  | -0.11 | 3.71  |       |       |
| 2   | 0.00  | 0.00  | 4.70  | 15.16 |       |       |
| 3   | 0.00  | 0.00  | -2.65 | 9.40  |       |       |
| 4   | 0.00  | 0.00  | 1.47  | 8.44  |       |       |
| 5   | 0.00  | 0.00  | 2.80  | 12.80 |       |       |
| 6   | 0.00  | 0.00  | 3.59  | 13.61 |       |       |
| 7   | 0.00  | 0.00  | -0.23 | 3.98  |       |       |
| 8   | 0.00  | 0.00  |       |       |       |       |

**BELASTINGEN**

B.G:3 Ver. bel. pers. ed. (F-rep)

**STAAFBELASTINGEN**

B.G:3 Ver. bel. pers. ed. (F-rep)

| Staat | Type          | q1/p/m | q2 | A     | B | $\psi_0$ | $\psi_1$ | $\psi_2$ |
|-------|---------------|--------|----|-------|---|----------|----------|----------|
| 8     | 10:PZGepro.j. | -1.50  |    | 2.500 |   | 0.0      | 0.0      | 0.0      |
| 9     | 10:PZGepro.j. | -1.50  |    | 1.000 |   | 0.0      | 0.0      | 0.0      |
| 10    | 10:PZGepro.j. | -1.50  |    | 0.550 |   | 0.0      | 0.0      | 0.0      |
| 11    | 10:PZGepro.j. | -1.50  |    | 1.950 |   | 0.0      | 0.0      | 0.0      |
| 12    | 10:PZGepro.j. | -1.50  |    | 1.500 |   | 0.0      | 0.0      | 0.0      |
| 13    | 10:PZGepro.j. | -1.50  |    | 2.500 |   | 0.0      | 0.0      | 0.0      |

**VERANDERLIJKE BELASTING SITUATIES**

| Nr | Lastvelden extreem | Lastvelden momentaan |
|----|--------------------|----------------------|
| 1  | 1                  |                      |
| 2  | 2                  |                      |
| 3  | 3                  |                      |
| 4  | 4                  |                      |
| 5  | 5                  |                      |
| 6  | 6                  |                      |

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Onderdeel: Spant 13

**REACTIES**

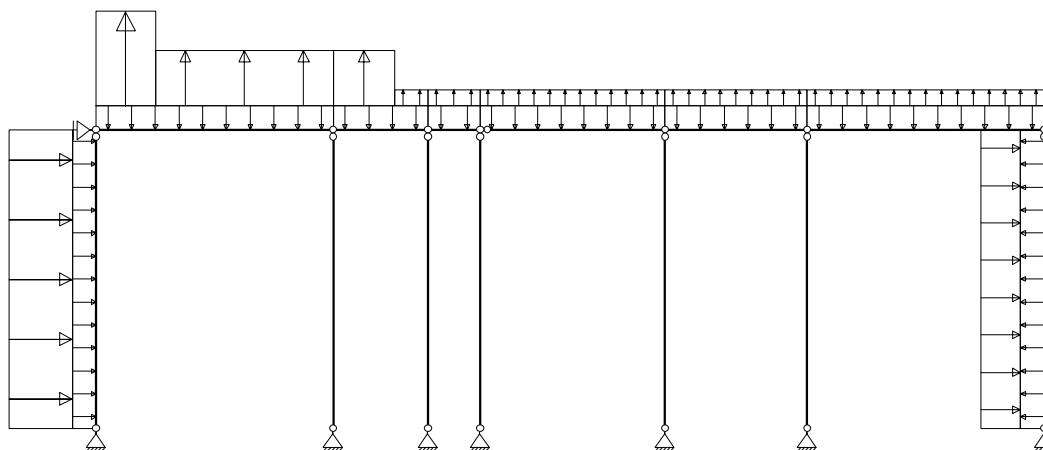
1e orde

B.G:3 Ver. bel. pers. ed. (F-rep)

| Kn. | X-min | X-max | Z-min | Z-max | M-min | M-max |
|-----|-------|-------|-------|-------|-------|-------|
| 1   | 0.00  | 0.00  | -0.02 | 0.54  |       |       |
| 2   | 0.00  | 0.00  | -0.05 | 1.61  |       |       |
| 3   | 0.00  | 0.00  | -0.90 | 1.08  |       |       |
| 4   | 0.00  | 0.00  | -0.25 | 0.67  |       |       |
| 5   | 0.00  | 0.00  | -0.42 | 1.17  |       |       |
| 6   | 0.00  | 0.00  | -0.27 | 1.30  |       |       |
| 7   | 0.00  | 0.00  | -0.05 | 0.57  |       |       |
| 8   | 0.00  | 0.00  |       |       |       |       |

**BELASTINGEN**

B.G:4 Wind van links onderdruk A

**STAAFBELASTINGEN**

B.G:4 Wind van links onderdruk A

| Staaftype | Type       | Index | q1/p/m | q2    | A     | B     | $\psi_0$ | $\psi_1$ | $\psi_2$ |
|-----------|------------|-------|--------|-------|-------|-------|----------|----------|----------|
| 1         | 1:QZLokaal | Qw1   | -0.89  | -0.89 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 8         | 1:QZLokaal | Qw1   | -0.89  | -0.89 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 9         | 1:QZLokaal | Qw1   | -0.89  | -0.89 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 10        | 1:QZLokaal | Qw1   | -0.89  | -0.89 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 11        | 1:QZLokaal | Qw1   | -0.89  | -0.89 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 12        | 1:QZLokaal | Qw1   | -0.89  | -0.89 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 13        | 1:QZLokaal | Qw1   | -0.89  | -0.89 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 7         | 1:QZLokaal | Qw2   | 0.89   | 0.89  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 1         | 1:QZLokaal | Qw3   | -2.36  | -2.36 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 8         | 1:QZLokaal |       | 0.00   | 0.00  | 0.000 | 3.740 | 0.0      | 0.2      | 0.0      |
| 8         | 1:QZLokaal | Qw4   | 3.54   | 3.54  | 0.000 | 3.740 | 0.0      | 0.2      | 0.0      |
| 8         | 1:QZLokaal | Qw5   | 2.07   | 2.07  | 1.260 | 0.000 | 0.0      | 0.2      | 0.0      |
| 9         | 1:QZLokaal | Qw5   | 2.07   | 2.07  | 0.000 | 0.700 | 0.0      | 0.2      | 0.0      |
| 9         | 1:QZLokaal | Qw6   | 0.59   | 0.59  | 1.300 | 0.000 | 0.0      | 0.2      | 0.0      |
| 10        | 1:QZLokaal | Qw6   | 0.59   | 0.59  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 11        | 1:QZLokaal | Qw6   | 0.59   | 0.59  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 12        | 1:QZLokaal | Qw6   | 0.59   | 0.59  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 13        | 1:QZLokaal | Qw6   | 0.59   | 0.59  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 7         | 1:QZLokaal | Qw7   | -1.48  | -1.48 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |

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Onderdeel: Spant 13

**REACTIES**

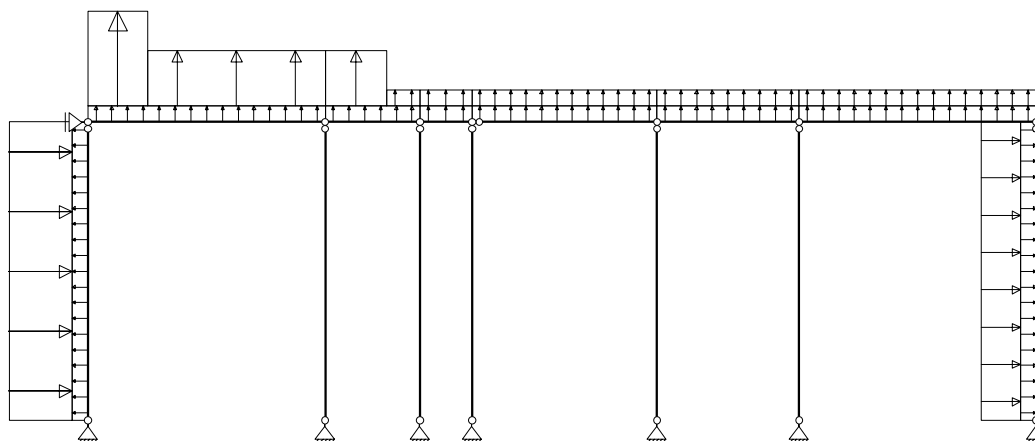
1e orde

B.G:4 Wind van links onderdruk A

| Kn.    | X      | Z     | M                        |
|--------|--------|-------|--------------------------|
| 1      | -10.24 | -3.94 |                          |
| 2      | 0.00   | -6.76 |                          |
| 3      | 0.00   | 2.36  |                          |
| 4      | 0.00   | 0.06  |                          |
| 5      | 0.00   | 1.00  |                          |
| 6      | 0.00   | 1.41  |                          |
| 7      | -1.86  | 0.61  |                          |
| 8      | -12.10 |       |                          |
| -24.19 |        |       | : Som van de reacties    |
| 24.19  |        |       | : Som van de belastingen |

**BELASTINGEN**

B.G:5 Wind van links overdruk A

**STAAFBELASTINGEN**

B.G:5 Wind van links overdruk A

| Staat | Type       | Index | q1/p/m | q2    | A     | B     | $\psi_0$ | $\psi_1$ | $\psi_2$ |
|-------|------------|-------|--------|-------|-------|-------|----------|----------|----------|
| 1     | 1:QZLokaal | Qw8   | 0.59   | 0.59  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 8     | 1:QZLokaal | Qw8   | 0.59   | 0.59  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 9     | 1:QZLokaal | Qw8   | 0.59   | 0.59  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 10    | 1:QZLokaal | Qw8   | 0.59   | 0.59  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 11    | 1:QZLokaal | Qw8   | 0.59   | 0.59  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 12    | 1:QZLokaal | Qw8   | 0.59   | 0.59  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 13    | 1:QZLokaal | Qw8   | 0.59   | 0.59  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 7     | 1:QZLokaal | Qw9   | -0.59  | -0.59 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 1     | 1:QZLokaal | Qw3   | -2.36  | -2.36 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 8     | 1:QZLokaal |       | 0.00   | 0.00  | 0.000 | 3.740 | 0.0      | 0.2      | 0.0      |
| 8     | 1:QZLokaal | Qw4   | 3.54   | 3.54  | 0.000 | 3.740 | 0.0      | 0.2      | 0.0      |
| 8     | 1:QZLokaal | Qw5   | 2.07   | 2.07  | 1.260 | 0.000 | 0.0      | 0.2      | 0.0      |
| 9     | 1:QZLokaal | Qw5   | 2.07   | 2.07  | 0.000 | 0.700 | 0.0      | 0.2      | 0.0      |
| 9     | 1:QZLokaal | Qw6   | 0.59   | 0.59  | 1.300 | 0.000 | 0.0      | 0.2      | 0.0      |
| 10    | 1:QZLokaal | Qw6   | 0.59   | 0.59  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 11    | 1:QZLokaal | Qw6   | 0.59   | 0.59  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 12    | 1:QZLokaal | Qw6   | 0.59   | 0.59  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 13    | 1:QZLokaal | Qw6   | 0.59   | 0.59  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 7     | 1:QZLokaal | Qw7   | -1.48  | -1.48 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |

Project...: 180114 Uitbreiding Venster Techniek

Onderdeel: Spant 13

**REACTIES**

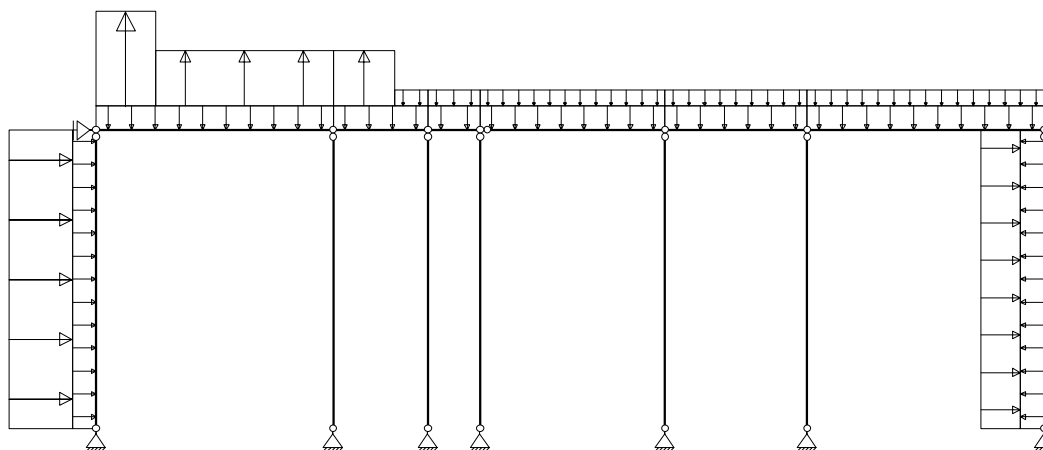
1e orde

B.G:5 Wind van links overdruk A

| Kn.    | X      | Z      | M                        |
|--------|--------|--------|--------------------------|
| 1      | -5.58  | -6.93  |                          |
| 2      | 0.00   | -14.62 |                          |
| 3      | 0.00   | 2.45   |                          |
| 4      | 0.00   | -3.61  |                          |
| 5      | 0.00   | -3.99  |                          |
| 6      | 0.00   | -5.66  |                          |
| 7      | -6.51  | -2.44  |                          |
| 8      | -12.10 |        |                          |
| -24.19 |        |        | : Som van de reacties    |
| 24.19  |        |        | : Som van de belastingen |

**BELASTINGEN**

B.G:6 Wind van links onderdruk B

**STAAFBELASTINGEN**

B.G:6 Wind van links onderdruk B

| Staat | Type       | Index | q1/p/m | q2    | A     | B     | $\psi_0$ | $\psi_1$ | $\psi_2$ |
|-------|------------|-------|--------|-------|-------|-------|----------|----------|----------|
| 1     | 1:QZLokaal | Qw1   | -0.89  | -0.89 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 8     | 1:QZLokaal | Qw1   | -0.89  | -0.89 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 9     | 1:QZLokaal | Qw1   | -0.89  | -0.89 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 10    | 1:QZLokaal | Qw1   | -0.89  | -0.89 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 11    | 1:QZLokaal | Qw1   | -0.89  | -0.89 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 12    | 1:QZLokaal | Qw1   | -0.89  | -0.89 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 13    | 1:QZLokaal | Qw1   | -0.89  | -0.89 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 7     | 1:QZLokaal | Qw2   | 0.89   | 0.89  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 1     | 1:QZLokaal | Qw3   | -2.36  | -2.36 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 8     | 1:QZLokaal |       | 0.00   | 0.00  | 0.000 | 3.740 | 0.0      | 0.2      | 0.0      |
| 8     | 1:QZLokaal | Qw4   | 3.54   | 3.54  | 0.000 | 3.740 | 0.0      | 0.2      | 0.0      |
| 8     | 1:QZLokaal | Qw5   | 2.07   | 2.07  | 1.260 | 0.000 | 0.0      | 0.2      | 0.0      |
| 9     | 1:QZLokaal | Qw5   | 2.07   | 2.07  | 0.000 | 0.700 | 0.0      | 0.2      | 0.0      |
| 9     | 1:QZLokaal | Qw10  | -0.59  | -0.59 | 1.300 | 0.000 | 0.0      | 0.2      | 0.0      |
| 10    | 1:QZLokaal | Qw10  | -0.59  | -0.59 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 11    | 1:QZLokaal | Qw10  | -0.59  | -0.59 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 12    | 1:QZLokaal | Qw10  | -0.59  | -0.59 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 13    | 1:QZLokaal | Qw10  | -0.59  | -0.59 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 7     | 1:QZLokaal | Qw7   | -1.48  | -1.48 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |



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Onderdeel: Spant 13

**REACTIES**

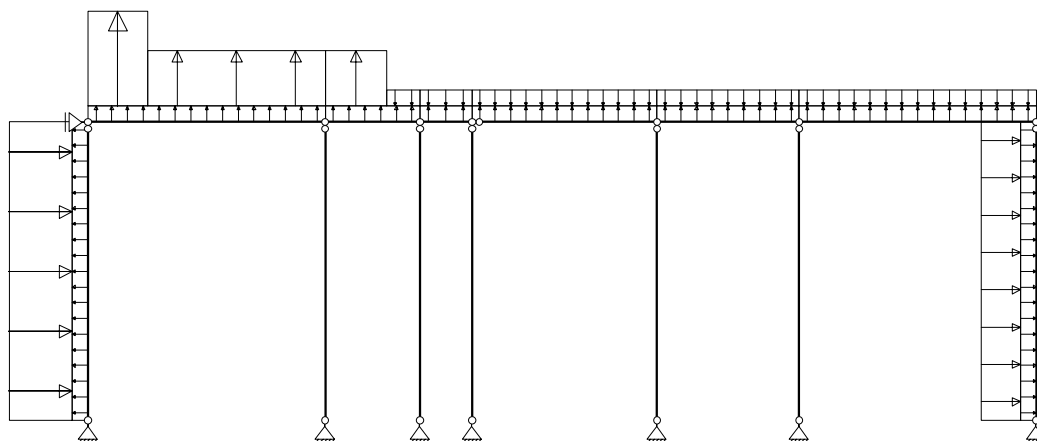
1e orde

B.G:6 Wind van links onderdruk B

| Kn.   | X      | Z      | M                        |
|-------|--------|--------|--------------------------|
| 1     | -10.24 | -3.94  |                          |
| 2     | 0.00   | -6.68  |                          |
| 3     | 0.00   | 3.91   |                          |
| 4     | 0.00   | 2.53   |                          |
| 5     | 0.00   | 4.98   |                          |
| 6     | 0.00   | 7.07   |                          |
| 7     | -1.86  | 3.05   |                          |
| 8     | -12.10 |        |                          |
| <hr/> |        |        |                          |
|       | -24.19 | 10.93  | : Som van de reacties    |
|       | 24.19  | -10.93 | : Som van de belastingen |

**BELASTINGEN**

B.G:7 Wind van links overdruk B

**STAAFBELASTINGEN**

B.G:7 Wind van links overdruk B

| Staat | Type       | Index | q1/p/m | q2    | A     | B     | $\psi_0$ | $\psi_1$ | $\psi_2$ |
|-------|------------|-------|--------|-------|-------|-------|----------|----------|----------|
| 1     | 1:QZLokaal | Qw8   | 0.59   | 0.59  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 8     | 1:QZLokaal | Qw8   | 0.59   | 0.59  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 9     | 1:QZLokaal | Qw8   | 0.59   | 0.59  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 10    | 1:QZLokaal | Qw8   | 0.59   | 0.59  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 11    | 1:QZLokaal | Qw8   | 0.59   | 0.59  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 12    | 1:QZLokaal | Qw8   | 0.59   | 0.59  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 13    | 1:QZLokaal | Qw8   | 0.59   | 0.59  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 7     | 1:QZLokaal | Qw9   | -0.59  | -0.59 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 1     | 1:QZLokaal | Qw3   | -2.36  | -2.36 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 8     | 1:QZLokaal |       | 0.00   | 0.00  | 0.000 | 3.740 | 0.0      | 0.2      | 0.0      |
| 8     | 1:QZLokaal | Qw4   | 3.54   | 3.54  | 0.000 | 3.740 | 0.0      | 0.2      | 0.0      |
| 8     | 1:QZLokaal | Qw5   | 2.07   | 2.07  | 1.260 | 0.000 | 0.0      | 0.2      | 0.0      |
| 9     | 1:QZLokaal | Qw5   | 2.07   | 2.07  | 0.000 | 0.700 | 0.0      | 0.2      | 0.0      |
| 9     | 1:QZLokaal | Qw10  | -0.59  | -0.59 | 1.300 | 0.000 | 0.0      | 0.2      | 0.0      |
| 10    | 1:QZLokaal | Qw10  | -0.59  | -0.59 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 11    | 1:QZLokaal | Qw10  | -0.59  | -0.59 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 12    | 1:QZLokaal | Qw10  | -0.59  | -0.59 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 13    | 1:QZLokaal | Qw10  | -0.59  | -0.59 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 7     | 1:QZLokaal | Qw7   | -1.48  | -1.48 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |

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Onderdeel: Spant 13

**REACTIES**

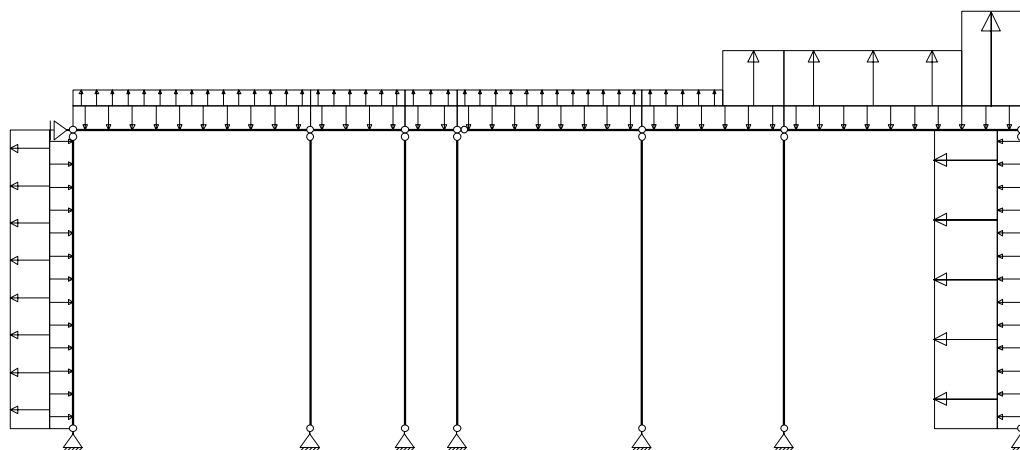
1e orde

B.G:7 Wind van links overdruk B

| Kn. | X      | Z      | M                        |
|-----|--------|--------|--------------------------|
| 1   | -5.58  | -6.93  |                          |
| 2   | 0.00   | -14.53 |                          |
| 3   | 0.00   | 3.99   |                          |
| 4   | 0.00   | -1.14  |                          |
| 5   | 0.00   | -0.00  |                          |
| 6   | 0.00   | 0.00   |                          |
| 7   | -6.51  | -0.00  |                          |
| 8   | -12.10 |        |                          |
|     |        |        |                          |
|     | -24.19 | -18.61 | : Som van de reacties    |
|     | 24.19  | 18.61  | : Som van de belastingen |

**BELASTINGEN**

B.G:8 Wind van rechts onderdruk A

**STAAFBELASTINGEN**

B.G:8 Wind van rechts onderdruk A

| Staat | Type       | Index | q1/p/m | q2    | A     | B     | $\psi_0$ | $\psi_1$ | $\psi_2$ |
|-------|------------|-------|--------|-------|-------|-------|----------|----------|----------|
| 1     | 1:QZLokaal | Qw1   | -0.89  | -0.89 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 8     | 1:QZLokaal | Qw1   | -0.89  | -0.89 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 9     | 1:QZLokaal | Qw1   | -0.89  | -0.89 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 10    | 1:QZLokaal | Qw1   | -0.89  | -0.89 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 11    | 1:QZLokaal | Qw1   | -0.89  | -0.89 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 12    | 1:QZLokaal | Qw1   | -0.89  | -0.89 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 13    | 1:QZLokaal | Qw1   | -0.89  | -0.89 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 7     | 1:QZLokaal | Qw2   | 0.89   | 0.89  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 7     | 1:QZLokaal | Qw11  | 2.36   | 2.36  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 13    | 1:QZLokaal |       | 0.00   | 0.00  | 3.740 | 0.000 | 0.0      | 0.2      | 0.0      |
| 13    | 1:QZLokaal | Qw4   | 3.54   | 3.54  | 3.740 | 0.000 | 0.0      | 0.2      | 0.0      |
| 13    | 1:QZLokaal | Qw5   | 2.07   | 2.07  | 0.000 | 1.260 | 0.0      | 0.2      | 0.0      |
| 12    | 1:QZLokaal | Qw5   | 2.07   | 2.07  | 1.700 | 0.000 | 0.0      | 0.2      | 0.0      |
| 12    | 1:QZLokaal | Qw6   | 0.59   | 0.59  | 0.000 | 1.300 | 0.0      | 0.2      | 0.0      |
| 11    | 1:QZLokaal | Qw6   | 0.59   | 0.59  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 10    | 1:QZLokaal | Qw6   | 0.59   | 0.59  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 9     | 1:QZLokaal | Qw6   | 0.59   | 0.59  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 8     | 1:QZLokaal | Qw6   | 0.59   | 0.59  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 1     | 1:QZLokaal | Qw12  | 1.48   | 1.48  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |

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Onderdeel: Spant 13

**REACTIES**

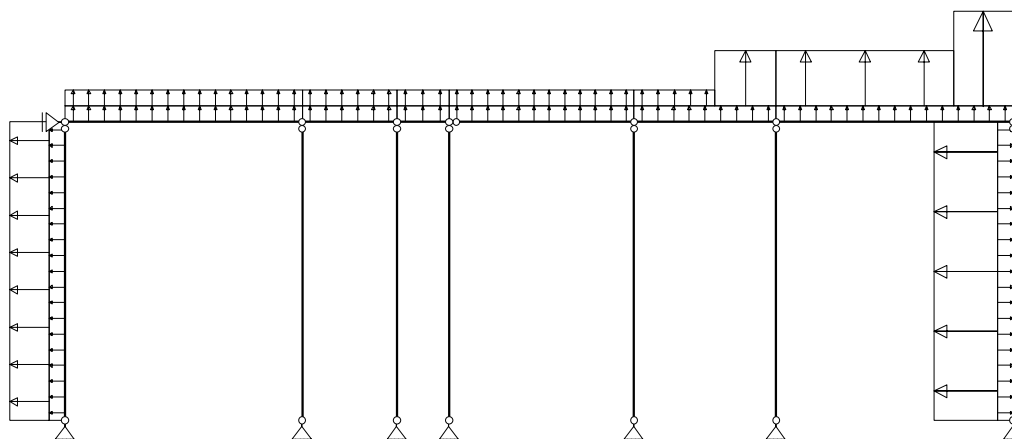
1e orde

B.G:8 Wind van rechts onderdruk A

| Kn. | X      | Z     | M                        |
|-----|--------|-------|--------------------------|
| 1   | 1.86   | 0.60  |                          |
| 2   | 0.00   | 1.57  |                          |
| 3   | 0.00   | -0.02 |                          |
| 4   | 0.00   | 0.61  |                          |
| 5   | 0.00   | 2.08  |                          |
| 6   | 0.00   | -6.10 |                          |
| 7   | 10.24  | -3.99 |                          |
| 8   | 12.10  |       |                          |
|     |        |       |                          |
|     | 24.19  | -5.26 | : Som van de reacties    |
|     | -24.19 | 5.26  | : Som van de belastingen |

**BELASTINGEN**

B.G:9 Wind van rechts overdruk A

**STAAFBELASTINGEN**

B.G:9 Wind van rechts overdruk A

| StAAF | Type       | Index | q1/p/m | q2    | A     | B     | $\psi_0$ | $\psi_1$ | $\psi_2$ |
|-------|------------|-------|--------|-------|-------|-------|----------|----------|----------|
| 1     | 1:QZLokaal | Qw8   | 0.59   | 0.59  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 8     | 1:QZLokaal | Qw8   | 0.59   | 0.59  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 9     | 1:QZLokaal | Qw8   | 0.59   | 0.59  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 10    | 1:QZLokaal | Qw8   | 0.59   | 0.59  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 11    | 1:QZLokaal | Qw8   | 0.59   | 0.59  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 12    | 1:QZLokaal | Qw8   | 0.59   | 0.59  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 13    | 1:QZLokaal | Qw8   | 0.59   | 0.59  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 7     | 1:QZLokaal | Qw9   | -0.59  | -0.59 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 7     | 1:QZLokaal | Qw11  | 2.36   | 2.36  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 13    | 1:QZLokaal |       | 0.00   | 0.00  | 3.740 | 0.000 | 0.0      | 0.2      | 0.0      |
| 13    | 1:QZLokaal | Qw4   | 3.54   | 3.54  | 3.740 | 0.000 | 0.0      | 0.2      | 0.0      |
| 13    | 1:QZLokaal | Qw5   | 2.07   | 2.07  | 0.000 | 1.260 | 0.0      | 0.2      | 0.0      |
| 12    | 1:QZLokaal | Qw5   | 2.07   | 2.07  | 1.700 | 0.000 | 0.0      | 0.2      | 0.0      |
| 12    | 1:QZLokaal | Qw6   | 0.59   | 0.59  | 0.000 | 1.300 | 0.0      | 0.2      | 0.0      |
| 11    | 1:QZLokaal | Qw6   | 0.59   | 0.59  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 10    | 1:QZLokaal | Qw6   | 0.59   | 0.59  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 9     | 1:QZLokaal | Qw6   | 0.59   | 0.59  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 8     | 1:QZLokaal | Qw6   | 0.59   | 0.59  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 1     | 1:QZLokaal | Qw12  | 1.48   | 1.48  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |

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Onderdeel: Spant 13

**REACTIES**

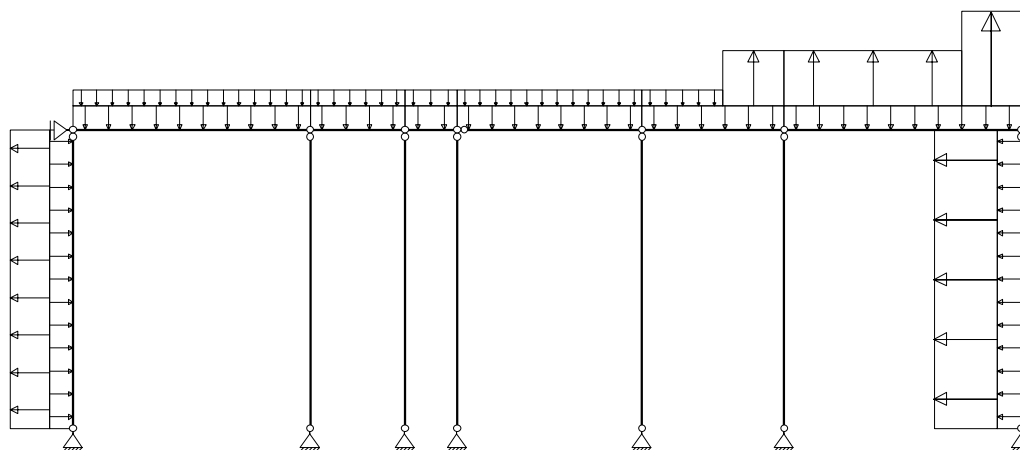
1e orde

B.G:9 Wind van rechts overdruk A

| Kn. | X      | Z      | M                        |
|-----|--------|--------|--------------------------|
| 1   | 6.51   | -2.39  |                          |
| 2   | 0.00   | -6.28  |                          |
| 3   | 0.00   | 0.06   |                          |
| 4   | 0.00   | -3.06  |                          |
| 5   | 0.00   | -2.91  |                          |
| 6   | 0.00   | -13.17 |                          |
| 7   | 5.58   | -7.04  |                          |
| 8   | 12.10  |        |                          |
|     |        |        |                          |
|     | 24.19  | -34.80 | : Som van de reacties    |
|     | -24.19 | 34.80  | : Som van de belastingen |

**BELASTINGEN**

B.G:10 Wind van rechts onderdruk B

**STAAFBELASTINGEN**

B.G:10 Wind van rechts onderdruk B

| Staat | Type       | Index | q1/p/m | q2    | A     | B     | $\psi_0$ | $\psi_1$ | $\psi_2$ |
|-------|------------|-------|--------|-------|-------|-------|----------|----------|----------|
| 1     | 1:QZLokaal | Qw1   | -0.89  | -0.89 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 8     | 1:QZLokaal | Qw1   | -0.89  | -0.89 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 9     | 1:QZLokaal | Qw1   | -0.89  | -0.89 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 10    | 1:QZLokaal | Qw1   | -0.89  | -0.89 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 11    | 1:QZLokaal | Qw1   | -0.89  | -0.89 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 12    | 1:QZLokaal | Qw1   | -0.89  | -0.89 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 13    | 1:QZLokaal | Qw1   | -0.89  | -0.89 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 7     | 1:QZLokaal | Qw2   | 0.89   | 0.89  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 7     | 1:QZLokaal | Qw11  | 2.36   | 2.36  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 13    | 1:QZLokaal |       | 0.00   | 0.00  | 3.740 | 0.000 | 0.0      | 0.2      | 0.0      |
| 13    | 1:QZLokaal | Qw4   | 3.54   | 3.54  | 3.740 | 0.000 | 0.0      | 0.2      | 0.0      |
| 13    | 1:QZLokaal | Qw5   | 2.07   | 2.07  | 0.000 | 1.260 | 0.0      | 0.2      | 0.0      |
| 12    | 1:QZLokaal | Qw5   | 2.07   | 2.07  | 1.700 | 0.000 | 0.0      | 0.2      | 0.0      |
| 12    | 1:QZLokaal | Qw10  | -0.59  | -0.59 | 0.000 | 1.300 | 0.0      | 0.2      | 0.0      |
| 11    | 1:QZLokaal | Qw10  | -0.59  | -0.59 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 10    | 1:QZLokaal | Qw10  | -0.59  | -0.59 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 9     | 1:QZLokaal | Qw10  | -0.59  | -0.59 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 8     | 1:QZLokaal | Qw10  | -0.59  | -0.59 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 1     | 1:QZLokaal | Qw12  | 1.48   | 1.48  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |

Project...: 180114 Uitbreiding Venster Techniek

Onderdeel: Spant 13

**REACTIES**

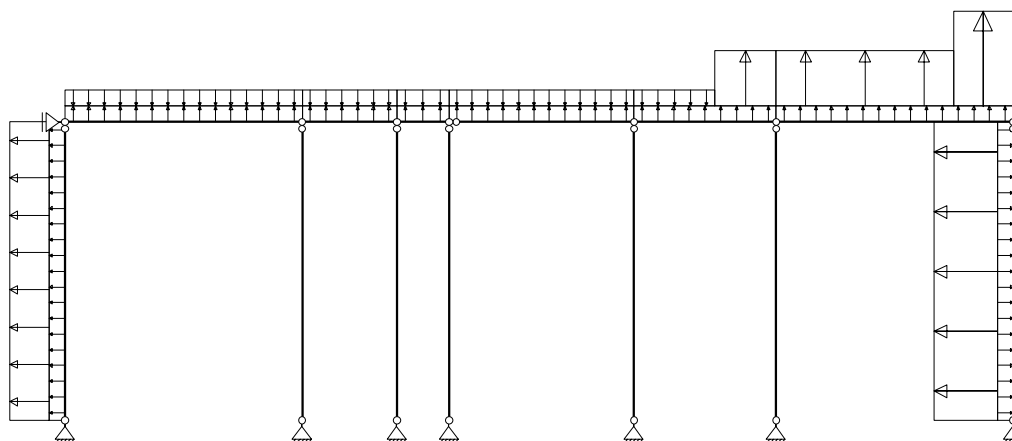
1e orde

B.G:10 Wind van rechts onderdruk B

| Kn. | X      | Z      | M                        |
|-----|--------|--------|--------------------------|
| 1   | 1.86   | 2.99   |                          |
| 2   | 0.00   | 7.86   |                          |
| 3   | 0.00   | -0.09  |                          |
| 4   | 0.00   | 3.46   |                          |
| 5   | 0.00   | 6.80   |                          |
| 6   | 0.00   | -6.09  |                          |
| 7   | 10.24  | -3.98  |                          |
| 8   | 12.10  |        |                          |
|     |        |        |                          |
|     | 24.19  | 10.93  | : Som van de reacties    |
|     | -24.19 | -10.93 | : Som van de belastingen |

**BELASTINGEN**

B.G:11 Wind van rechts overdruk B

**STAAFBELASTINGEN**

B.G:11 Wind van rechts overdruk B

| Staat | Type       | Index | q1/p/m | q2    | A     | B     | $\psi_0$ | $\psi_1$ | $\psi_2$ |
|-------|------------|-------|--------|-------|-------|-------|----------|----------|----------|
| 1     | 1:QZLokaal | Qw8   | 0.59   | 0.59  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 8     | 1:QZLokaal | Qw8   | 0.59   | 0.59  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 9     | 1:QZLokaal | Qw8   | 0.59   | 0.59  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 10    | 1:QZLokaal | Qw8   | 0.59   | 0.59  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 11    | 1:QZLokaal | Qw8   | 0.59   | 0.59  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 12    | 1:QZLokaal | Qw8   | 0.59   | 0.59  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 13    | 1:QZLokaal | Qw8   | 0.59   | 0.59  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 7     | 1:QZLokaal | Qw9   | -0.59  | -0.59 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 7     | 1:QZLokaal | Qw11  | 2.36   | 2.36  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 13    | 1:QZLokaal |       | 0.00   | 0.00  | 3.740 | 0.000 | 0.0      | 0.2      | 0.0      |
| 13    | 1:QZLokaal | Qw4   | 3.54   | 3.54  | 3.740 | 0.000 | 0.0      | 0.2      | 0.0      |
| 13    | 1:QZLokaal | Qw5   | 2.07   | 2.07  | 0.000 | 1.260 | 0.0      | 0.2      | 0.0      |
| 12    | 1:QZLokaal | Qw5   | 2.07   | 2.07  | 1.700 | 0.000 | 0.0      | 0.2      | 0.0      |
| 12    | 1:QZLokaal | Qw10  | -0.59  | -0.59 | 0.000 | 1.300 | 0.0      | 0.2      | 0.0      |
| 11    | 1:QZLokaal | Qw10  | -0.59  | -0.59 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 10    | 1:QZLokaal | Qw10  | -0.59  | -0.59 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 9     | 1:QZLokaal | Qw10  | -0.59  | -0.59 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 8     | 1:QZLokaal | Qw10  | -0.59  | -0.59 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 1     | 1:QZLokaal | Qw12  | 1.48   | 1.48  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |

Project...: 180114 Uitbreiding Venster Techniek

Onderdeel: Spant 13

**REACTIES**

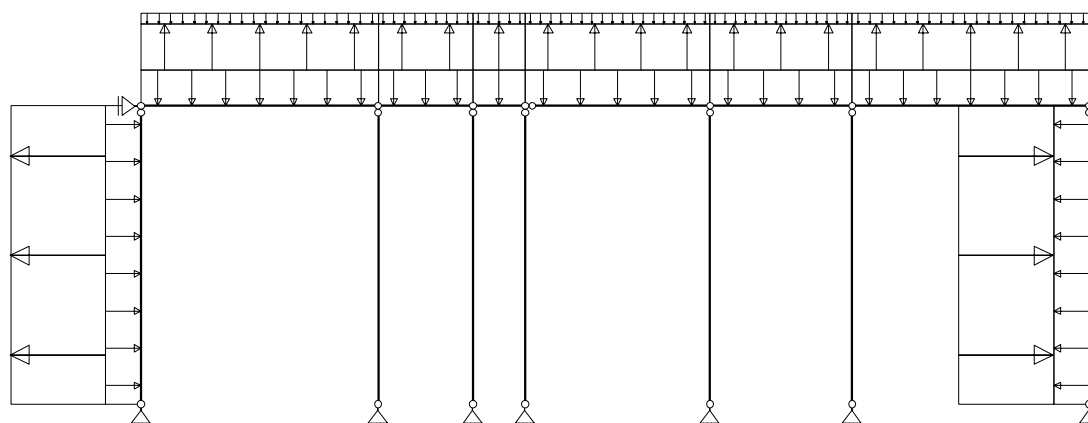
1e orde

B.G:11 Wind van rechts overdruk B

| Kn. | X      | Z      | M                        |
|-----|--------|--------|--------------------------|
| 1   | 6.51   | -0.00  |                          |
| 2   | 0.00   | 0.00   |                          |
| 3   | 0.00   | -0.01  |                          |
| 4   | 0.00   | -0.21  |                          |
| 5   | 0.00   | 1.81   |                          |
| 6   | 0.00   | -13.17 |                          |
| 7   | 5.58   | -7.04  |                          |
| 8   | 12.10  |        |                          |
|     |        |        |                          |
|     | 24.19  | -18.61 | : Som van de reacties    |
|     | -24.19 | 18.61  | : Som van de belastingen |

**BELASTINGEN**

B.G:12 Wind loodrecht onderdruk A

**STAAFBELASTINGEN**

B.G:12 Wind loodrecht onderdruk A

| Staat | Type       | Index | q1/p/m | q2    | A     | B     | $\psi_0$ | $\psi_1$ | $\psi_2$ |
|-------|------------|-------|--------|-------|-------|-------|----------|----------|----------|
| 1     | 1:QZLokaal | Qw1   | -0.89  | -0.89 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 8     | 1:QZLokaal | Qw1   | -0.89  | -0.89 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 9     | 1:QZLokaal | Qw1   | -0.89  | -0.89 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 10    | 1:QZLokaal | Qw1   | -0.89  | -0.89 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 11    | 1:QZLokaal | Qw1   | -0.89  | -0.89 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 12    | 1:QZLokaal | Qw1   | -0.89  | -0.89 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 13    | 1:QZLokaal | Qw1   | -0.89  | -0.89 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 7     | 1:QZLokaal | Qw2   | 0.89   | 0.89  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 1     | 1:QZLokaal | Qw13  | 2.36   | 2.36  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 7     | 1:QZLokaal | Qw14  | -2.36  | -2.36 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 8     | 1:QZLokaal | Qw15  | 1.16   | 1.16  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 8     | 1:QZLokaal | Qw16  | -0.26  | -0.26 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 9     | 1:QZLokaal | Qw15  | 1.16   | 1.16  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 9     | 1:QZLokaal | Qw16  | -0.26  | -0.26 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 10    | 1:QZLokaal | Qw15  | 1.16   | 1.16  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 10    | 1:QZLokaal | Qw16  | -0.26  | -0.26 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 11    | 1:QZLokaal | Qw15  | 1.16   | 1.16  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 11    | 1:QZLokaal | Qw16  | -0.26  | -0.26 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 12    | 1:QZLokaal | Qw15  | 1.16   | 1.16  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 12    | 1:QZLokaal | Qw16  | -0.26  | -0.26 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 13    | 1:QZLokaal | Qw15  | 1.16   | 1.16  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 13    | 1:QZLokaal | Qw16  | -0.26  | -0.26 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |

Project...: 180114 Uitbreiding Venster Techniek

Onderdeel: Spant 13

**REACTIES**

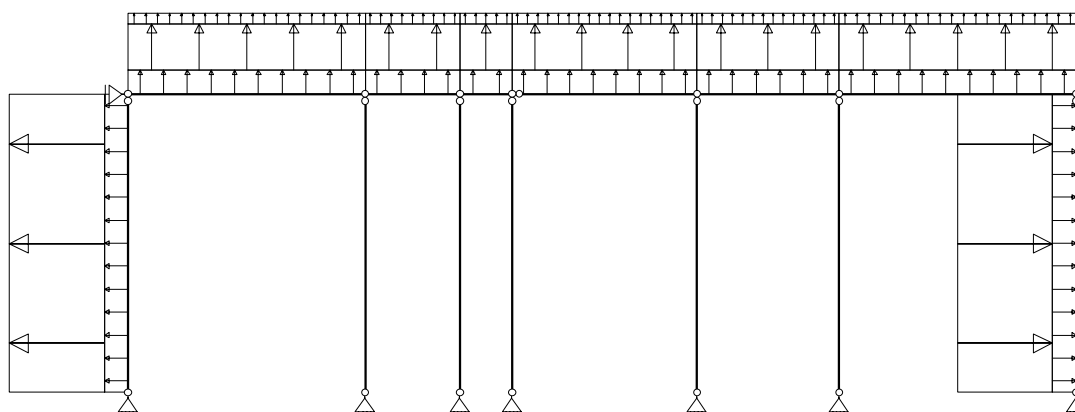
1e orde

B.G:12 Wind loodrecht onderdruk A

| Kn.  | X     | Z     | M                        |
|------|-------|-------|--------------------------|
| 1    | 4.65  | -0.02 |                          |
| 2    | 0.00  | -0.06 |                          |
| 3    | 0.00  | 0.00  |                          |
| 4    | 0.00  | -0.03 |                          |
| 5    | 0.00  | -0.04 |                          |
| 6    | 0.00  | -0.06 |                          |
| 7    | -4.65 | -0.02 |                          |
| 8    | 0.00  |       |                          |
| 0.00 |       |       | : Som van de reacties    |
| 0.00 |       |       | : Som van de belastingen |

**BELASTINGEN**

B.G:13 Wind loodrecht overdruk A

**STAAFBELASTINGEN**

B.G:13 Wind loodrecht overdruk A

| Staat | Type       | Index | q1/p/m | q2    | A     | B     | $\psi_0$ | $\psi_1$ | $\psi_2$ |
|-------|------------|-------|--------|-------|-------|-------|----------|----------|----------|
| 1     | 1:QZLokaal | Qw8   | 0.59   | 0.59  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 8     | 1:QZLokaal | Qw8   | 0.59   | 0.59  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 9     | 1:QZLokaal | Qw8   | 0.59   | 0.59  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 10    | 1:QZLokaal | Qw8   | 0.59   | 0.59  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 11    | 1:QZLokaal | Qw8   | 0.59   | 0.59  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 12    | 1:QZLokaal | Qw8   | 0.59   | 0.59  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 13    | 1:QZLokaal | Qw8   | 0.59   | 0.59  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 7     | 1:QZLokaal | Qw9   | -0.59  | -0.59 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 1     | 1:QZLokaal | Qw13  | 2.36   | 2.36  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 7     | 1:QZLokaal | Qw14  | -2.36  | -2.36 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 8     | 1:QZLokaal | Qw15  | 1.16   | 1.16  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 8     | 1:QZLokaal | Qw17  | 0.26   | 0.26  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 9     | 1:QZLokaal | Qw15  | 1.16   | 1.16  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 9     | 1:QZLokaal | Qw17  | 0.26   | 0.26  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 10    | 1:QZLokaal | Qw15  | 1.16   | 1.16  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 10    | 1:QZLokaal | Qw17  | 0.26   | 0.26  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 11    | 1:QZLokaal | Qw15  | 1.16   | 1.16  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 11    | 1:QZLokaal | Qw17  | 0.26   | 0.26  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 12    | 1:QZLokaal | Qw15  | 1.16   | 1.16  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 12    | 1:QZLokaal | Qw17  | 0.26   | 0.26  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 13    | 1:QZLokaal | Qw15  | 1.16   | 1.16  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 13    | 1:QZLokaal | Qw17  | 0.26   | 0.26  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |

Project...: 180114 Uitbreiding Venster Techniek

Onderdeel: Spant 13

**REACTIES**

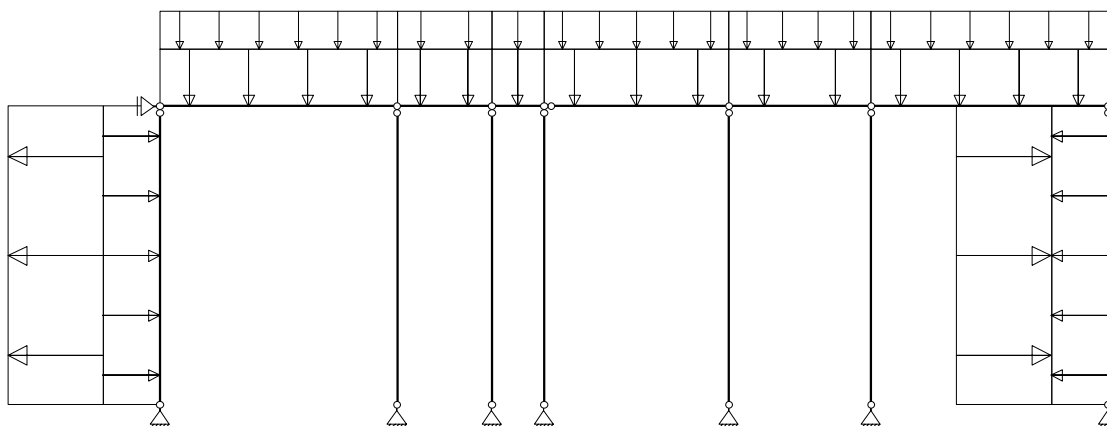
1e orde

B.G:13 Wind loodrecht overdruk A

| Kn.  | X     | Z      | M                        |
|------|-------|--------|--------------------------|
| 1    | 9.31  | -4.06  |                          |
| 2    | 0.00  | -10.68 |                          |
| 3    | 0.00  | 0.11   |                          |
| 4    | 0.00  | -4.99  |                          |
| 5    | 0.00  | -6.78  |                          |
| 6    | 0.00  | -9.62  |                          |
| 7    | -9.31 | -4.15  |                          |
| 8    | 0.00  |        |                          |
| 0.00 |       | -40.17 | : Som van de reacties    |
| 0.00 |       | 40.17  | : Som van de belastingen |

**BELASTINGEN**

B.G:14 Wind loodrecht onderdruk B

**STAAFBELASTINGEN**

B.G:14 Wind loodrecht onderdruk B

| Staat | Type       | Index | q1/p/m | q2    | A     | B     | $\psi_0$ | $\psi_1$ | $\psi_2$ |
|-------|------------|-------|--------|-------|-------|-------|----------|----------|----------|
| 1     | 1:QZLokaal | Qw1   | -0.89  | -0.89 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 8     | 1:QZLokaal | Qw1   | -0.89  | -0.89 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 9     | 1:QZLokaal | Qw1   | -0.89  | -0.89 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 10    | 1:QZLokaal | Qw1   | -0.89  | -0.89 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 11    | 1:QZLokaal | Qw1   | -0.89  | -0.89 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 12    | 1:QZLokaal | Qw1   | -0.89  | -0.89 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 13    | 1:QZLokaal | Qw1   | -0.89  | -0.89 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 7     | 1:QZLokaal | Qw2   | 0.89   | 0.89  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 1     | 1:QZLokaal | Qw18  | 1.48   | 1.48  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 7     | 1:QZLokaal | Qw19  | -1.48  | -1.48 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 8     | 1:QZLokaal | Qw10  | -0.59  | -0.59 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 9     | 1:QZLokaal | Qw10  | -0.59  | -0.59 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 10    | 1:QZLokaal | Qw10  | -0.59  | -0.59 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 11    | 1:QZLokaal | Qw10  | -0.59  | -0.59 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 12    | 1:QZLokaal | Qw10  | -0.59  | -0.59 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 13    | 1:QZLokaal | Qw10  | -0.59  | -0.59 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |



Project...: 180114 Uitbreiding Venster Techniek

Onderdeel: Spant 13

**REACTIES**

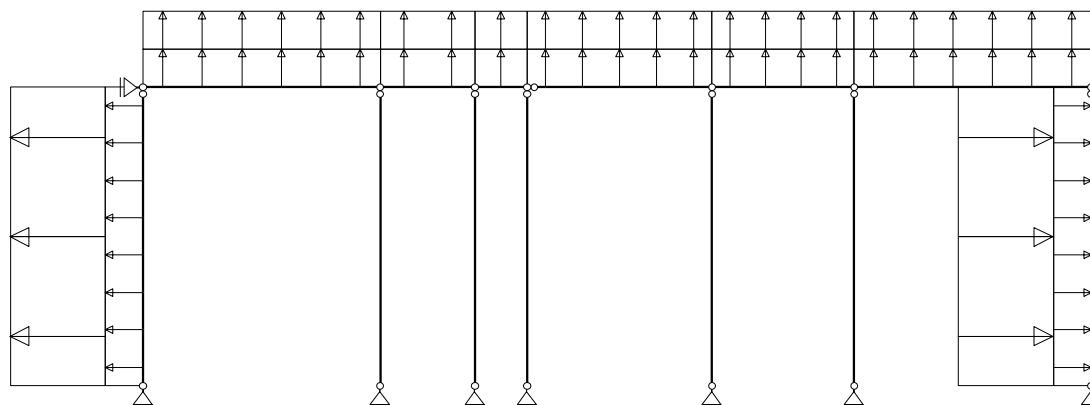
1e orde

B.G:14 Wind loodrecht onderdruk B

| Kn.  | X     | Z     | M                        |
|------|-------|-------|--------------------------|
| 1    | 1.86  | 2.99  |                          |
| 2    | 0.00  | 7.85  |                          |
| 3    | 0.00  | -0.08 |                          |
| 4    | 0.00  | 3.67  |                          |
| 5    | 0.00  | 4.99  |                          |
| 6    | 0.00  | 7.07  |                          |
| 7    | -1.86 | 3.05  |                          |
| 8    | 0.00  |       |                          |
| 0.00 |       |       | : Som van de reacties    |
| 0.00 |       |       | : Som van de belastingen |

**BELASTINGEN**

B.G:15 Wind loodrecht overdruk B

**STAAFBELASTINGEN**

B.G:15 Wind loodrecht overdruk B

| Staat | Type       | Index | q1/p/m | q2    | A     | B     | $\psi_0$ | $\psi_1$ | $\psi_2$ |
|-------|------------|-------|--------|-------|-------|-------|----------|----------|----------|
| 1     | 1:QZLokaal | Qw8   | 0.59   | 0.59  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 8     | 1:QZLokaal | Qw8   | 0.59   | 0.59  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 9     | 1:QZLokaal | Qw8   | 0.59   | 0.59  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 10    | 1:QZLokaal | Qw8   | 0.59   | 0.59  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 11    | 1:QZLokaal | Qw8   | 0.59   | 0.59  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 12    | 1:QZLokaal | Qw8   | 0.59   | 0.59  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 13    | 1:QZLokaal | Qw8   | 0.59   | 0.59  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 7     | 1:QZLokaal | Qw9   | -0.59  | -0.59 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 1     | 1:QZLokaal | Qw18  | 1.48   | 1.48  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 7     | 1:QZLokaal | Qw19  | -1.48  | -1.48 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 8     | 1:QZLokaal | Qw6   | 0.59   | 0.59  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 9     | 1:QZLokaal | Qw6   | 0.59   | 0.59  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 10    | 1:QZLokaal | Qw6   | 0.59   | 0.59  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 11    | 1:QZLokaal | Qw6   | 0.59   | 0.59  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 12    | 1:QZLokaal | Qw6   | 0.59   | 0.59  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 13    | 1:QZLokaal | Qw6   | 0.59   | 0.59  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |

Project...: 180114 Uitbreiding Venster Techniek

Onderdeel: Spant 13

**REACTIES**

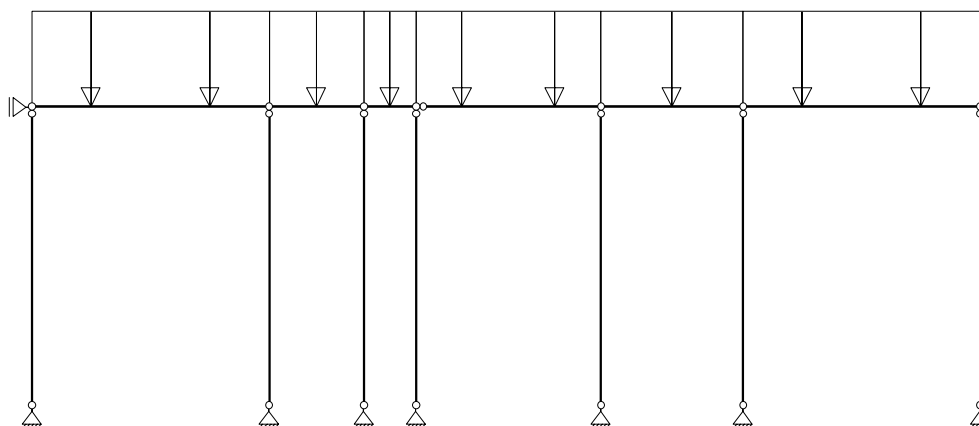
1e orde

B.G:15 Wind loodrecht overdruk B

| Kn.   | X     | Z      | M                        |
|-------|-------|--------|--------------------------|
| 1     | 6.51  | -2.39  |                          |
| 2     | 0.00  | -6.28  |                          |
| 3     | 0.00  | 0.07   |                          |
| 4     | 0.00  | -2.94  |                          |
| 5     | 0.00  | -3.99  |                          |
| 6     | 0.00  | -5.66  |                          |
| 7     | -6.51 | -2.44  |                          |
| 8     | 0.00  |        |                          |
| <hr/> |       |        |                          |
|       | 0.00  | -23.63 | : Som van de reacties    |
|       | 0.00  | 23.63  | : Som van de belastingen |

**BELASTINGEN**

B.G:16 Sneeuw A

**STAAFBELASTINGEN**

B.G:16 Sneeuw A

| Staaftype | Type        | Index | q1/p/m | q2    | A     | B     | $\psi_0$ | $\psi_1$ | $\psi_2$ |
|-----------|-------------|-------|--------|-------|-------|-------|----------|----------|----------|
| 8         | 3:QZgeProj. | Qs1   | -2.80  | -2.80 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 9         | 3:QZgeProj. | Qs1   | -2.80  | -2.80 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 10        | 3:QZgeProj. | Qs1   | -2.80  | -2.80 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 11        | 3:QZgeProj. | Qs1   | -2.80  | -2.80 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 12        | 3:QZgeProj. | Qs1   | -2.80  | -2.80 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 13        | 3:QZgeProj. | Qs1   | -2.80  | -2.80 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |

**REACTIES**

1e orde

B.G:16 Sneeuw A

| Kn.   | X    | Z      | M                        |
|-------|------|--------|--------------------------|
| 1     | 0.00 | 5.66   |                          |
| 2     | 0.00 | 14.89  |                          |
| 3     | 0.00 | -0.16  |                          |
| 4     | 0.00 | 6.96   |                          |
| 5     | 0.00 | 9.45   |                          |
| 6     | 0.00 | 13.40  |                          |
| 7     | 0.00 | 5.79   |                          |
| 8     | 0.00 |        |                          |
| <hr/> |      |        |                          |
|       | 0.00 | 56.00  | : Som van de reacties    |
|       | 0.00 | -56.00 | : Som van de belastingen |

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Onderdeel: Spant 13

**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 |
| 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 |

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**BEREKENINGSTATUS**

Controlerende berekening

**B.C. Iteratie Status**

|    |   |                        |
|----|---|------------------------|
| 47 | 3 | Nauwkeurigheid bereikt |
| 48 | 3 | Nauwkeurigheid bereikt |
| 49 | 3 | Nauwkeurigheid bereikt |
| 50 | 3 | Nauwkeurigheid bereikt |
|    |   |                        |
| 51 | 3 | Nauwkeurigheid bereikt |
| 52 | 3 | Nauwkeurigheid bereikt |
| 53 | 3 | Nauwkeurigheid bereikt |
| 54 | 3 | Nauwkeurigheid bereikt |
| 55 | 3 | Nauwkeurigheid bereikt |
|    |   |                        |
| 56 | 3 | Nauwkeurigheid bereikt |
| 57 | 3 | Nauwkeurigheid bereikt |
| 58 | 3 | Nauwkeurigheid bereikt |
| 59 | 3 | Nauwkeurigheid bereikt |
| 60 | 3 | Nauwkeurigheid bereikt |
|    |   |                        |
| 61 | 3 | Nauwkeurigheid bereikt |
| 62 | 3 | Nauwkeurigheid bereikt |
| 63 | 3 | Nauwkeurigheid bereikt |

**BELASTINGCOMBINATIES**

| BC Type | BG | Gen. | Factor | BG | Gen. | Factor | BG | Gen. | Factor | BG | Gen. | Factor |
|---------|----|------|--------|----|------|--------|----|------|--------|----|------|--------|
|---------|----|------|--------|----|------|--------|----|------|--------|----|------|--------|

|    |       |   |      |      |    |      |      |  |  |  |  |  |
|----|-------|---|------|------|----|------|------|--|--|--|--|--|
| 1  | Fund. | 1 | Perm | 1.22 |    |      |      |  |  |  |  |  |
| 2  | Fund. | 1 | Perm | 0.90 |    |      |      |  |  |  |  |  |
| 3  | Fund. | 1 | Perm | 1.08 | 2  | Extr | 1.35 |  |  |  |  |  |
| 4  | Fund. | 1 | Perm | 1.08 | 3  | Extr | 1.35 |  |  |  |  |  |
| 5  | Fund. | 1 | Perm | 1.08 | 4  | Extr | 1.35 |  |  |  |  |  |
| 6  | Fund. | 1 | Perm | 1.08 | 5  | Extr | 1.35 |  |  |  |  |  |
| 7  | Fund. | 1 | Perm | 1.08 | 6  | Extr | 1.35 |  |  |  |  |  |
| 8  | Fund. | 1 | Perm | 1.08 | 7  | Extr | 1.35 |  |  |  |  |  |
| 9  | Fund. | 1 | Perm | 1.08 | 8  | Extr | 1.35 |  |  |  |  |  |
| 10 | Fund. | 1 | Perm | 1.08 | 9  | Extr | 1.35 |  |  |  |  |  |
| 11 | Fund. | 1 | Perm | 1.08 | 10 | Extr | 1.35 |  |  |  |  |  |
| 12 | Fund. | 1 | Perm | 1.08 | 11 | Extr | 1.35 |  |  |  |  |  |
| 13 | Fund. | 1 | Perm | 1.08 | 12 | Extr | 1.35 |  |  |  |  |  |
| 14 | Fund. | 1 | Perm | 1.08 | 13 | Extr | 1.35 |  |  |  |  |  |
| 15 | Fund. | 1 | Perm | 1.08 | 14 | Extr | 1.35 |  |  |  |  |  |
| 16 | Fund. | 1 | Perm | 1.08 | 15 | Extr | 1.35 |  |  |  |  |  |
| 17 | Fund. | 1 | Perm | 1.08 | 16 | Extr | 1.35 |  |  |  |  |  |
| 18 | Fund. | 1 | Perm | 0.90 | 2  | Extr | 1.35 |  |  |  |  |  |
| 19 | Fund. | 1 | Perm | 0.90 | 3  | Extr | 1.35 |  |  |  |  |  |
| 20 | Fund. | 1 | Perm | 0.90 | 4  | Extr | 1.35 |  |  |  |  |  |
| 21 | Fund. | 1 | Perm | 0.90 | 5  | Extr | 1.35 |  |  |  |  |  |
| 22 | Fund. | 1 | Perm | 0.90 | 6  | Extr | 1.35 |  |  |  |  |  |
| 23 | Fund. | 1 | Perm | 0.90 | 7  | Extr | 1.35 |  |  |  |  |  |
| 24 | Fund. | 1 | Perm | 0.90 | 8  | Extr | 1.35 |  |  |  |  |  |
| 25 | Fund. | 1 | Perm | 0.90 | 9  | Extr | 1.35 |  |  |  |  |  |
| 26 | Fund. | 1 | Perm | 0.90 | 10 | Extr | 1.35 |  |  |  |  |  |
| 27 | Fund. | 1 | Perm | 0.90 | 11 | Extr | 1.35 |  |  |  |  |  |
| 28 | Fund. | 1 | Perm | 0.90 | 12 | Extr | 1.35 |  |  |  |  |  |
| 29 | Fund. | 1 | Perm | 0.90 | 13 | Extr | 1.35 |  |  |  |  |  |
| 30 | Fund. | 1 | Perm | 0.90 | 14 | Extr | 1.35 |  |  |  |  |  |
| 31 | Fund. | 1 | Perm | 0.90 | 15 | Extr | 1.35 |  |  |  |  |  |
| 32 | Fund. | 1 | Perm | 0.90 | 16 | Extr | 1.35 |  |  |  |  |  |

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**BELASTINGCOMBINATIES**

| BC Type  | BG Gen. Factor | BG Gen. Factor | BG Gen. Factor | BG Gen. Factor |
|----------|----------------|----------------|----------------|----------------|
| 33 Kar.  | 1 Perm 1.00    | 2 Extr 1.00    |                |                |
| 34 Kar.  | 1 Perm 1.00    | 3 Extr 1.00    |                |                |
| 35 Kar.  | 1 Perm 1.00    | 4 Extr 1.00    |                |                |
| 36 Kar.  | 1 Perm 1.00    | 5 Extr 1.00    |                |                |
| 37 Kar.  | 1 Perm 1.00    | 6 Extr 1.00    |                |                |
| 38 Kar.  | 1 Perm 1.00    | 7 Extr 1.00    |                |                |
| 39 Kar.  | 1 Perm 1.00    | 8 Extr 1.00    |                |                |
| 40 Kar.  | 1 Perm 1.00    | 9 Extr 1.00    |                |                |
| 41 Kar.  | 1 Perm 1.00    | 10 Extr 1.00   |                |                |
| 42 Kar.  | 1 Perm 1.00    | 11 Extr 1.00   |                |                |
| 43 Kar.  | 1 Perm 1.00    | 12 Extr 1.00   |                |                |
| 44 Kar.  | 1 Perm 1.00    | 13 Extr 1.00   |                |                |
| 45 Kar.  | 1 Perm 1.00    | 14 Extr 1.00   |                |                |
| 46 Kar.  | 1 Perm 1.00    | 15 Extr 1.00   |                |                |
| 47 Kar.  | 1 Perm 1.00    | 16 Extr 1.00   |                |                |
| 48 Quas. | 1 Perm 1.00    |                |                |                |
| 49 Freq. | 1 Perm 1.00    |                |                |                |
| 50 Freq. | 1 Perm 1.00    | 4 psi1 1.00    |                |                |
| 51 Freq. | 1 Perm 1.00    | 5 psi1 1.00    |                |                |
| 52 Freq. | 1 Perm 1.00    | 6 psi1 1.00    |                |                |
| 53 Freq. | 1 Perm 1.00    | 7 psi1 1.00    |                |                |
| 54 Freq. | 1 Perm 1.00    | 8 psi1 1.00    |                |                |
| 55 Freq. | 1 Perm 1.00    | 9 psi1 1.00    |                |                |
| 56 Freq. | 1 Perm 1.00    | 10 psi1 1.00   |                |                |
| 57 Freq. | 1 Perm 1.00    | 11 psi1 1.00   |                |                |
| 58 Freq. | 1 Perm 1.00    | 12 psi1 1.00   |                |                |
| 59 Freq. | 1 Perm 1.00    | 13 psi1 1.00   |                |                |
| 60 Freq. | 1 Perm 1.00    | 14 psi1 1.00   |                |                |
| 61 Freq. | 1 Perm 1.00    | 15 psi1 1.00   |                |                |
| 62 Freq. | 1 Perm 1.00    | 16 psi1 1.00   |                |                |
| 63 Blij. | 1 Perm 1.00    |                |                |                |

**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 Geen
- 15 Geen
- 16 Geen
- 17 Geen
- 18 Alle staven de factor:0.90
- 19 Alle staven de factor:0.90
- 20 Alle staven de factor:0.90

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**GUNSTIGE WERKING PERMANENTE BELASTINGEN**

BC Staven met gunstige werking

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  
 25 Alle staven de factor:0.90  
 26 Alle staven de factor:0.90  
 27 Alle staven de factor:0.90  
 28 Alle staven de factor:0.90  
 29 Alle staven de factor:0.90  
 30 Alle staven de factor:0.90  
 31 Alle staven de factor:0.90  
 32 Alle staven de factor:0.90

**REACTIES**

2e orde

B.C:1 Fundamenteel B (6.10a)

| Kn. | X     | Z      | M                        |
|-----|-------|--------|--------------------------|
| 1   | 0.00  | 6.79   |                          |
| 2   | -0.00 | 14.79  |                          |
| 3   | -0.00 | 1.09   |                          |
| 4   | -0.00 | 7.92   |                          |
| 5   | -0.00 | 10.08  |                          |
| 6   | -0.00 | 13.50  |                          |
| 7   | -0.00 | 6.90   |                          |
| 8   | 0.00  |        |                          |
|     |       |        |                          |
|     | 0.00  | 61.07  | : Som van de reacties    |
|     | 0.00  | -61.07 | : Som van de belastingen |

**REACTIES**

2e orde

B.C:2 Fundamenteel B (6.10a)

| Kn. | X     | Z      | M                        |
|-----|-------|--------|--------------------------|
| 1   | 0.00  | 5.03   |                          |
| 2   | -0.00 | 10.95  |                          |
| 3   | -0.00 | 0.81   |                          |
| 4   | -0.00 | 5.86   |                          |
| 5   | -0.00 | 7.46   |                          |
| 6   | -0.00 | 10.00  |                          |
| 7   | -0.00 | 5.11   |                          |
| 8   | 0.00  |        |                          |
|     |       |        |                          |
|     | 0.00  | 45.24  | : Som van de reacties    |
|     | 0.00  | -45.24 | : Som van de belastingen |

**REACTIES**

2e orde

B.C:3 Fundamenteel B (6.10b)

| Kn. | X-min | X-max | Z-min | Z-max | M-min | M-max |
|-----|-------|-------|-------|-------|-------|-------|
| 1   | 0.00  | 0.00  | 5.89  | 11.04 |       |       |
| 2   | -0.00 | -0.00 | 19.49 | 33.61 |       |       |
| 3   | -0.00 | 0.00  | -2.62 | 13.66 |       |       |
| 4   | -0.00 | -0.00 | 9.01  | 18.43 |       |       |
| 5   | -0.00 | -0.00 | 12.74 | 26.23 |       |       |
| 6   | -0.00 | -0.00 | 16.84 | 30.38 |       |       |
| 7   | -0.00 | -0.00 | 5.83  | 11.52 |       |       |
| 8   | 0.00  | 0.00  |       |       |       |       |

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**REACTIES** 2e orde B.C:4 Fundamenteel B (6.10b)

| Kn. | X-min | X-max | Z-min | Z-max | M-min | M-max |
|-----|-------|-------|-------|-------|-------|-------|
| 1   | 0.00  | 0.00  | 6.01  | 6.77  |       |       |
| 2   | -0.00 | -0.00 | 13.08 | 15.31 |       |       |
| 3   | -0.00 | 0.00  | -0.24 | 2.43  |       |       |
| 4   | -0.00 | -0.00 | 6.70  | 7.94  |       |       |
| 5   | -0.00 | -0.00 | 8.40  | 10.53 |       |       |
| 6   | -0.00 | -0.00 | 11.63 | 13.76 |       |       |
| 7   | -0.00 | -0.00 | 6.07  | 6.90  |       |       |
| 8   | 0.00  | 0.00  |       |       |       |       |

**REACTIES** 2e orde B.C:5 Fundamenteel B (6.10b)

| Kn. | X      | Z      | M                        |
|-----|--------|--------|--------------------------|
| 1   | -13.81 | 0.70   |                          |
| 2   | 0.00   | 4.12   |                          |
| 3   | 0.00   | 4.05   |                          |
| 4   | 0.00   | 7.15   |                          |
| 5   | 0.00   | 10.30  |                          |
| 6   | 0.00   | 13.91  |                          |
| 7   | -2.51  | 6.96   |                          |
| 8   | -16.34 |        |                          |
|     |        |        |                          |
|     | -32.66 | 47.19  | : Som van de reacties    |
|     | 32.66  | -47.19 | : Som van de belastingen |

**REACTIES** 2e orde B.C:6 Fundamenteel B (6.10b)

| Kn. | X      | Z     | M                        |
|-----|--------|-------|--------------------------|
| 1   | -7.53  | -3.32 |                          |
| 2   | -0.00  | -6.54 |                          |
| 3   | 0.00   | 4.22  |                          |
| 4   | 0.00   | 2.18  |                          |
| 5   | 0.00   | 3.55  |                          |
| 6   | 0.00   | 4.39  |                          |
| 7   | -8.79  | 2.83  |                          |
| 8   | -16.33 |       |                          |
|     |        |       |                          |
|     | -32.65 | 7.31  | : Som van de reacties    |
|     | 32.65  | -7.31 | : Som van de belastingen |

**REACTIES** 2e orde B.C:7 Fundamenteel B (6.10b)

| Kn. | X      | Z      | M                        |
|-----|--------|--------|--------------------------|
| 1   | -13.81 | 0.69   |                          |
| 2   | 0.00   | 4.23   |                          |
| 3   | 0.00   | 6.13   |                          |
| 4   | 0.00   | 10.49  |                          |
| 5   | 0.00   | 15.69  |                          |
| 6   | 0.00   | 21.55  |                          |
| 7   | -2.51  | 10.26  |                          |
| 8   | -16.34 |        |                          |
|     |        |        |                          |
|     | -32.66 | 69.04  | : Som van de reacties    |
|     | 32.66  | -69.04 | : Som van de belastingen |

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**REACTIES** 2e orde B.C:8 Fundamenteel B (6.10b)

| Kn.   | X      | Z      | M                        |
|-------|--------|--------|--------------------------|
| 1     | -7.53  | -3.33  |                          |
| 2     | -0.00  | -6.43  |                          |
| 3     | 0.00   | 6.30   |                          |
| 4     | 0.00   | 5.52   |                          |
| 5     | 0.00   | 8.94   |                          |
| 6     | 0.00   | 12.02  |                          |
| 7     | -8.79  | 6.13   |                          |
| 8     | -16.33 |        |                          |
| <hr/> |        |        |                          |
|       | -32.65 | 29.16  | : Som van de reacties    |
|       | 32.65  | -29.16 | : Som van de belastingen |

**REACTIES** 2e orde B.C:9 Fundamenteel B (6.10b)

| Kn.   | X      | Z      | M                        |
|-------|--------|--------|--------------------------|
| 1     | 2.51   | 6.84   |                          |
| 2     | -0.00  | 15.31  |                          |
| 3     | -0.00  | 0.89   |                          |
| 4     | -0.00  | 7.87   |                          |
| 5     | -0.00  | 11.72  |                          |
| 6     | -0.00  | 3.83   |                          |
| 7     | 13.81  | 0.73   |                          |
| 8     | 16.34  |        |                          |
| <hr/> |        |        |                          |
|       | 32.66  | 47.19  | : Som van de reacties    |
|       | -32.66 | -47.19 | : Som van de belastingen |

**REACTIES** 2e orde B.C:10 Fundamenteel B (6.10b)

| Kn.   | X      | Z     | M                        |
|-------|--------|-------|--------------------------|
| 1     | 8.79   | 2.80  |                          |
| 2     | -0.00  | 4.71  |                          |
| 3     | -0.00  | 1.00  |                          |
| 4     | -0.00  | 2.92  |                          |
| 5     | -0.00  | 5.03  |                          |
| 6     | 0.00   | -5.77 |                          |
| 7     | 7.53   | -3.37 |                          |
| 8     | 16.33  |       |                          |
| <hr/> |        |       |                          |
|       | 32.65  | 7.31  | : Som van de reacties    |
|       | -32.65 | -7.31 | : Som van de belastingen |

**REACTIES** 2e orde B.C:11 Fundamenteel B (6.10b)

| Kn. | X     | Z     | M |
|-----|-------|-------|---|
| 1   | 2.51  | 10.06 |   |
| 2   | -0.00 | 23.82 |   |
| 3   | -0.00 | 0.77  |   |
| 4   | -0.00 | 11.73 |   |
| 5   | -0.00 | 18.10 |   |
| 6   | -0.00 | 3.83  |   |
| 7   | 13.81 | 0.74  |   |
| 8   | 16.34 |       |   |



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|        |        |                          |
|--------|--------|--------------------------|
| 32.66  | 69.04  | : Som van de reacties    |
| -32.66 | -69.04 | : Som van de belastingen |

**REACTIES** 2e orde B.C:12 Fundamenteel B (6.10b)

| Kn.   | X      | Z      | M                        |
|-------|--------|--------|--------------------------|
| 1     | 8.79   | 6.03   |                          |
| 2     | -0.00  | 13.21  |                          |
| 3     | -0.00  | 0.89   |                          |
| 4     | -0.00  | 6.77   |                          |
| 5     | -0.00  | 11.40  |                          |
| 6     | 0.00   | -5.76  |                          |
| 7     | 7.53   | -3.37  |                          |
| 8     | 16.33  |        |                          |
| <hr/> |        |        |                          |
|       | 32.65  | 29.16  | : Som van de reacties    |
|       | -32.65 | -29.16 | : Som van de belastingen |

**REACTIES** 2e orde B.C:13 Fundamenteel B (6.10b)

| Kn.   | X     | Z      | M                        |
|-------|-------|--------|--------------------------|
| 1     | 6.28  | 6.01   |                          |
| 2     | 0.00  | 13.07  |                          |
| 3     | 0.00  | 0.96   |                          |
| 4     | 0.00  | 7.00   |                          |
| 5     | 0.00  | 8.90   |                          |
| 6     | 0.00  | 11.93  |                          |
| 7     | -6.28 | 6.10   |                          |
| 8     | -0.00 |        |                          |
| <hr/> |       |        |                          |
|       | 0.00  | 53.97  | : Som van de reacties    |
|       | -0.00 | -53.97 | : Som van de belastingen |

**REACTIES** 2e orde B.C:14 Fundamenteel B (6.10b)

| Kn.   | X      | Z     | M                        |
|-------|--------|-------|--------------------------|
| 1     | 12.55  | 0.53  |                          |
| 2     | -0.00  | -1.18 |                          |
| 3     | 0.00   | 1.02  |                          |
| 4     | -0.00  | 0.33  |                          |
| 5     | -0.00  | -0.24 |                          |
| 6     | -0.00  | -0.92 |                          |
| 7     | -12.55 | 0.51  |                          |
| 8     | 0.00   |       |                          |
| <hr/> |        |       |                          |
|       | 0.00   | 0.05  | : Som van de reacties    |
|       | -0.00  | -0.05 | : Som van de belastingen |

**REACTIES** 2e orde B.C:15 Fundamenteel B (6.10b)

| Kn. | X     | Z     | M |
|-----|-------|-------|---|
| 1   | 2.51  | 10.07 |   |
| 2   | -0.00 | 23.74 |   |
| 3   | -0.00 | 0.86  |   |
| 4   | -0.00 | 11.99 |   |
| 5   | 0.00  | 15.69 |   |
| 6   | 0.00  | 21.54 |   |

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**REACTIES** 2e orde B.C:15 Fundamenteel B (6.10b)

| Kn. | X     | Z      | M                        |
|-----|-------|--------|--------------------------|
| 7   | -2.51 | 10.26  |                          |
| 8   | 0.00  |        |                          |
|     | 0.00  | 94.16  | : Som van de reacties    |
|     | -0.00 | -94.16 | : Som van de belastingen |

**REACTIES** 2e orde B.C:16 Fundamenteel B (6.10b)

| Kn. | X     | Z      | M                        |
|-----|-------|--------|--------------------------|
| 1   | 8.79  | 2.80   |                          |
| 2   | 0.00  | 4.70   |                          |
| 3   | 0.00  | 1.02   |                          |
| 4   | 0.00  | 3.09   |                          |
| 5   | 0.00  | 3.55   |                          |
| 6   | 0.00  | 4.39   |                          |
| 7   | -8.79 | 2.83   |                          |
| 8   | -0.00 |        |                          |
|     | -0.00 | 22.38  | : Som van de reacties    |
|     | 0.00  | -22.38 | : Som van de belastingen |

**REACTIES** 2e orde B.C:17 Fundamenteel B (6.10b)

| Kn. | X     | Z       | M                        |
|-----|-------|---------|--------------------------|
| 1   | 0.00  | 13.69   |                          |
| 2   | -0.00 | 33.24   |                          |
| 3   | -0.00 | 0.76    |                          |
| 4   | -0.00 | 16.43   |                          |
| 5   | -0.00 | 21.72   |                          |
| 6   | -0.00 | 30.10   |                          |
| 7   | -0.00 | 13.95   |                          |
| 8   | 0.00  |         |                          |
|     | 0.00  | 129.88  | : Som van de reacties    |
|     | 0.00  | -129.88 | : Som van de belastingen |

**REACTIES** 2e orde B.C:18 Fundamenteel B (6.10b)

| Kn. | X-min | X-max | Z-min | Z-max | M-min | M-max |
|-----|-------|-------|-------|-------|-------|-------|
| 1   | 0.00  | 0.00  | 4.88  | 10.04 |       |       |
| 2   | -0.00 | -0.00 | 17.30 | 31.42 |       |       |
| 3   | -0.00 | 0.00  | -2.78 | 13.49 |       |       |
| 4   | -0.00 | -0.00 | 7.84  | 17.26 |       |       |
| 5   | -0.00 | -0.00 | 11.25 | 24.74 |       |       |
| 6   | -0.00 | -0.00 | 14.84 | 28.38 |       |       |
| 7   | -0.00 | -0.00 | 4.81  | 10.49 |       |       |
| 8   | 0.00  | 0.00  |       |       |       |       |

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**REACTIES** 2e orde B.C:19 Fundamenteel B (6.10b)

| Kn. | X-min | X-max | Z-min | Z-max | M-min | M-max |
|-----|-------|-------|-------|-------|-------|-------|
| 1   | 0.00  | 0.00  | 5.00  | 5.77  |       |       |
| 2   | -0.00 | -0.00 | 10.89 | 13.12 |       |       |
| 3   | -0.00 | 0.00  | -0.41 | 2.26  |       |       |
| 4   | -0.00 | -0.00 | 5.52  | 6.77  |       |       |
| 5   | -0.00 | -0.00 | 6.90  | 9.04  |       |       |
| 6   | -0.00 | -0.00 | 9.63  | 11.75 |       |       |
| 7   | -0.00 | -0.00 | 5.04  | 5.88  |       |       |
| 8   | 0.00  | 0.00  |       |       |       |       |

**REACTIES** 2e orde B.C:20 Fundamenteel B (6.10b)

| Kn. | X      | Z      | M                        |
|-----|--------|--------|--------------------------|
| 1   | -13.81 | -0.31  |                          |
| 2   | 0.00   | 1.93   |                          |
| 3   | 0.00   | 3.88   |                          |
| 4   | 0.00   | 5.97   |                          |
| 5   | 0.00   | 8.81   |                          |
| 6   | 0.00   | 11.91  |                          |
| 7   | -2.51  | 5.94   |                          |
| 8   | -16.33 |        |                          |
|     | -32.66 | 38.14  | : Som van de reacties    |
|     | 32.66  | -38.14 | : Som van de belastingen |

**REACTIES** 2e orde B.C:21 Fundamenteel B (6.10b)

| Kn. | X      | Z     | M                        |
|-----|--------|-------|--------------------------|
| 1   | -7.53  | -4.33 |                          |
| 2   | -0.00  | -8.73 |                          |
| 3   | 0.00   | 4.05  |                          |
| 4   | 0.00   | 1.01  |                          |
| 5   | 0.00   | 2.06  |                          |
| 6   | 0.00   | 2.39  |                          |
| 7   | -8.79  | 1.81  |                          |
| 8   | -16.33 |       |                          |
|     | -32.65 | -1.74 | : Som van de reacties    |
|     | 32.65  | 1.74  | : Som van de belastingen |

**REACTIES** 2e orde B.C:22 Fundamenteel B (6.10b)

| Kn. | X      | Z      | M                        |
|-----|--------|--------|--------------------------|
| 1   | -13.81 | -0.32  |                          |
| 2   | 0.00   | 2.04   |                          |
| 3   | 0.00   | 5.97   |                          |
| 4   | 0.00   | 9.32   |                          |
| 5   | 0.00   | 14.19  |                          |
| 6   | 0.00   | 19.55  |                          |
| 7   | -2.51  | 9.24   |                          |
| 8   | -16.33 |        |                          |
|     | -32.66 | 59.99  | : Som van de reacties    |
|     | 32.66  | -59.99 | : Som van de belastingen |

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**REACTIES** 2e orde B.C:23 Fundamenteel B (6.10b)

| Kn.   | X      | Z      | M                        |
|-------|--------|--------|--------------------------|
| 1     | -7.53  | -4.34  |                          |
| 2     | -0.00  | -8.61  |                          |
| 3     | 0.00   | 6.14   |                          |
| 4     | 0.00   | 4.35   |                          |
| 5     | 0.00   | 7.45   |                          |
| 6     | 0.00   | 10.02  |                          |
| 7     | -8.79  | 5.11   |                          |
| 8     | -16.33 |        |                          |
| <hr/> |        |        |                          |
|       | -32.65 | 20.11  | : Som van de reacties    |
|       | 32.65  | -20.11 | : Som van de belastingen |

**REACTIES** 2e orde B.C:24 Fundamenteel B (6.10b)

| Kn.   | X      | Z      | M                        |
|-------|--------|--------|--------------------------|
| 1     | 2.51   | 5.83   |                          |
| 2     | -0.00  | 13.11  |                          |
| 3     | -0.00  | 0.74   |                          |
| 4     | -0.00  | 6.70   |                          |
| 5     | -0.00  | 10.23  |                          |
| 6     | -0.00  | 1.82   |                          |
| 7     | 13.81  | -0.29  |                          |
| 8     | 16.33  |        |                          |
| <hr/> |        |        |                          |
|       | 32.66  | 38.14  | : Som van de reacties    |
|       | -32.66 | -38.14 | : Som van de belastingen |

**REACTIES** 2e orde B.C:25 Fundamenteel B (6.10b)

| Kn.   | X      | Z     | M                        |
|-------|--------|-------|--------------------------|
| 1     | 8.79   | 1.80  |                          |
| 2     | -0.00  | 2.52  |                          |
| 3     | -0.00  | 0.84  |                          |
| 4     | -0.00  | 1.74  |                          |
| 5     | -0.00  | 3.53  |                          |
| 6     | 0.00   | -7.78 |                          |
| 7     | 7.53   | -4.40 |                          |
| 8     | 16.33  |       |                          |
| <hr/> |        |       |                          |
|       | 32.65  | -1.74 | : Som van de reacties    |
|       | -32.65 | 1.74  | : Som van de belastingen |

**REACTIES** 2e orde B.C:26 Fundamenteel B (6.10b)

| Kn. | X     | Z     | M |
|-----|-------|-------|---|
| 1   | 2.51  | 9.05  |   |
| 2   | -0.00 | 21.62 |   |
| 3   | -0.00 | 0.62  |   |
| 4   | -0.00 | 10.55 |   |
| 5   | -0.00 | 16.60 |   |
| 6   | -0.00 | 1.83  |   |
| 7   | 13.81 | -0.28 |   |
| 8   | 16.33 |       |   |

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|        |        |                          |
|--------|--------|--------------------------|
| 32.66  | 59.99  | : Som van de reacties    |
| -32.66 | -59.99 | : Som van de belastingen |

**REACTIES** 2e orde B.C:27 Fundamenteel B (6.10b)

| Kn.   | X      | Z      | M                        |
|-------|--------|--------|--------------------------|
| 1     | 8.79   | 5.02   |                          |
| 2     | -0.00  | 11.02  |                          |
| 3     | -0.00  | 0.73   |                          |
| 4     | -0.00  | 5.59   |                          |
| 5     | -0.00  | 9.91   |                          |
| 6     | 0.00   | -7.77  |                          |
| 7     | 7.53   | -4.39  |                          |
| 8     | 16.33  |        |                          |
| <hr/> |        |        |                          |
|       | 32.65  | 20.11  | : Som van de reacties    |
|       | -32.65 | -20.11 | : Som van de belastingen |

**REACTIES** 2e orde B.C:28 Fundamenteel B (6.10b)

| Kn.   | X     | Z      | M                        |
|-------|-------|--------|--------------------------|
| 1     | 6.28  | 5.00   |                          |
| 2     | 0.00  | 10.88  |                          |
| 3     | 0.00  | 0.80   |                          |
| 4     | 0.00  | 5.83   |                          |
| 5     | 0.00  | 7.40   |                          |
| 6     | 0.00  | 9.93   |                          |
| 7     | -6.28 | 5.08   |                          |
| 8     | -0.00 |        |                          |
| <hr/> |       |        |                          |
|       | 0.00  | 44.92  | : Som van de reacties    |
|       | -0.00 | -44.92 | : Som van de belastingen |

**REACTIES** 2e orde B.C:29 Fundamenteel B (6.10b)

| Kn.   | X      | Z     | M                        |
|-------|--------|-------|--------------------------|
| 1     | 12.56  | -0.48 |                          |
| 2     | -0.00  | -3.36 |                          |
| 3     | 0.00   | 0.85  |                          |
| 4     | -0.00  | -0.84 |                          |
| 5     | -0.00  | -1.74 |                          |
| 6     | -0.00  | -2.92 |                          |
| 7     | -12.56 | -0.51 |                          |
| 8     | 0.00   |       |                          |
| <hr/> |        |       |                          |
|       | 0.00   | -9.00 | : Som van de reacties    |
|       | -0.00  | 9.00  | : Som van de belastingen |

**REACTIES** 2e orde B.C:30 Fundamenteel B (6.10b)

| Kn. | X     | Z     | M |
|-----|-------|-------|---|
| 1   | 2.51  | 9.07  |   |
| 2   | -0.00 | 21.55 |   |
| 3   | -0.00 | 0.70  |   |
| 4   | 0.00  | 10.82 |   |
| 5   | 0.00  | 14.20 |   |
| 6   | 0.00  | 19.54 |   |

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**REACTIES** 2e orde B.C:30 Fundamenteel B (6.10b)

| Kn. | X     | Z      | M                        |
|-----|-------|--------|--------------------------|
| 7   | -2.51 | 9.24   |                          |
| 8   | -0.00 |        |                          |
|     | 0.00  | 85.12  | : Som van de reacties    |
|     | -0.00 | -85.12 | : Som van de belastingen |

**REACTIES** 2e orde B.C:31 Fundamenteel B (6.10b)

| Kn. | X     | Z      | M                        |
|-----|-------|--------|--------------------------|
| 1   | 8.79  | 1.80   |                          |
| 2   | 0.00  | 2.51   |                          |
| 3   | 0.00  | 0.85   |                          |
| 4   | 0.00  | 1.91   |                          |
| 5   | 0.00  | 2.06   |                          |
| 6   | 0.00  | 2.39   |                          |
| 7   | -8.79 | 1.81   |                          |
| 8   | -0.00 |        |                          |
|     | -0.00 | 13.33  | : Som van de reacties    |
|     | 0.00  | -13.33 | : Som van de belastingen |

**REACTIES** 2e orde B.C:32 Fundamenteel B (6.10b)

| Kn. | X     | Z       | M                        |
|-----|-------|---------|--------------------------|
| 1   | 0.00  | 12.68   |                          |
| 2   | -0.00 | 31.05   |                          |
| 3   | -0.00 | 0.59    |                          |
| 4   | -0.00 | 15.26   |                          |
| 5   | -0.00 | 20.23   |                          |
| 6   | -0.00 | 28.10   |                          |
| 7   | -0.00 | 12.93   |                          |
| 8   | 0.00  |         |                          |
|     | 0.00  | 120.84  | : Som van de reacties    |
|     | 0.00  | -120.84 | : Som van de belastingen |

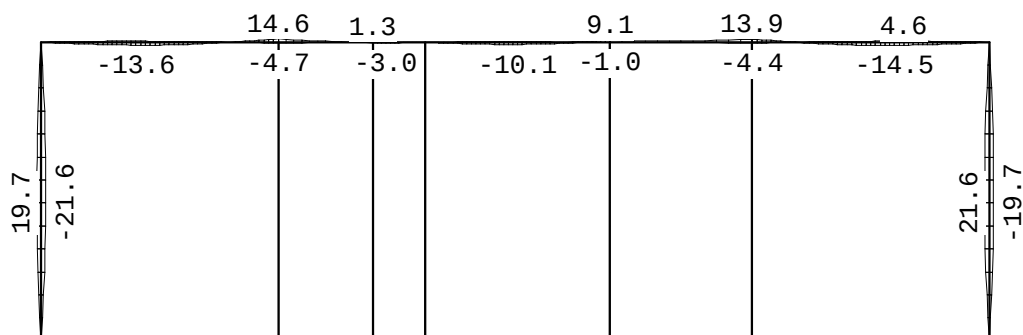
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**OMHULLENDE VAN DE FUNDAMENTELE COMBINATIES****MOMENTEN**

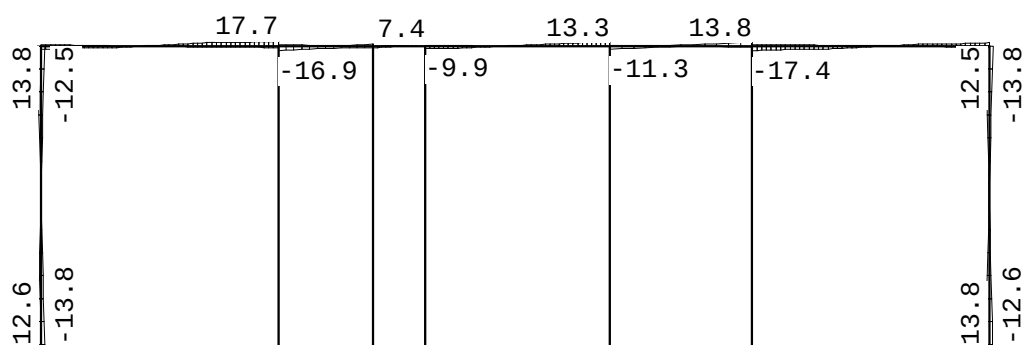
2e orde

Fundamentele combinatie

**DWARSKRACHTEN**

2e orde

Fundamentele combinatie



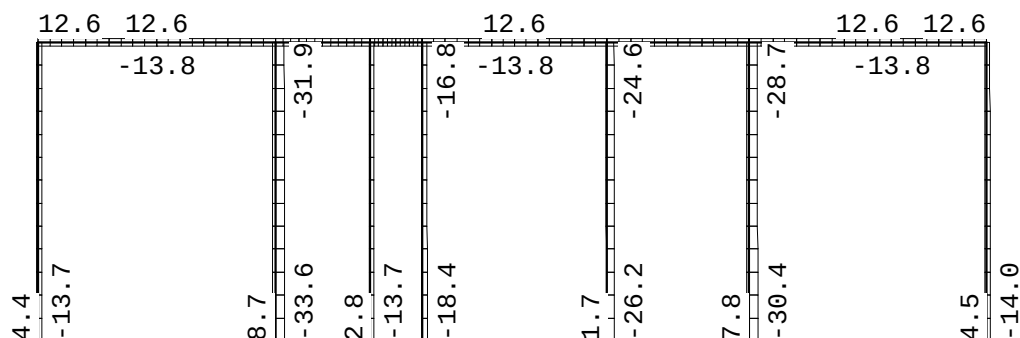
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**NORMAALKRACHTEN**

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     |      | -13.69  | 17 | 4.42  | 23 | -13.82  | 5  | 12.56 | 14 | -0.00   | 14 | 0.00  | 5  |
| 1   | 2.908 |      | -12.91  | 17 | 5.04  | 23 | -1.05   | 5  | 0.96  | 14 | -21.62  | 5  | 19.65 | 14 |
| 1   | 3.392 |      | -12.78  | 17 | 5.14  | 23 | -0.97   | 14 | 1.07  | 5  | -21.62  | 5  | 19.65 | 14 |
| 1   | 8     |      | -12.01  | 17 | 5.82  | 23 | -12.54  | 14 | 13.80 | 5  | 0.00    | 5  | 0.00  | 27 |
| 2   | 2     |      | -33.61  | 3  | 8.73  | 21 | -0.00   | 14 | 0.00  | 11 | 0.00    | 1  | 0.00  | 1  |
| 2   | 9     |      | -31.93  | 3  | 10.12 | 21 | -0.00   | 11 | 0.00  | 14 | 0.00    | 25 | 0.00  | 14 |
| 3   | 3     |      | -13.66  | 3  | 2.78  | 18 | -0.00   | 14 | 0.00  | 11 | 0.00    | 1  | 0.00  | 1  |
| 3   | 10    |      | -12.59  | 18 | 3.70  | 3  | -0.00   | 11 | 0.00  | 14 | 0.00    | 9  | 0.00  | 29 |
| 4   | 4     |      | -18.43  | 3  | 0.84  | 29 | -0.00   | 14 | 0.00  | 11 | 0.00    | 1  | 0.00  | 1  |
| 4   | 11    |      | -16.76  | 3  | 2.24  | 29 | -0.00   | 11 | 0.00  | 14 | 0.00    | 25 | 0.00  | 24 |
| 5   | 5     |      | -26.23  | 3  | 1.74  | 29 | -0.00   | 14 | 0.00  | 11 | 0.00    | 1  | 0.00  | 1  |
| 5   | 12    |      | -24.55  | 3  | 3.13  | 29 | -0.00   | 11 | 0.00  | 14 | 0.00    | 11 | 0.00  | 21 |
| 6   | 6     |      | -30.38  | 3  | 7.78  | 25 | -0.00   | 14 | 0.00  | 11 | 0.00    | 1  | 0.00  | 1  |
| 6   | 13    |      | -28.70  | 3  | 9.17  | 25 | -0.00   | 11 | 0.00  | 14 | 0.00    | 24 | 0.00  | 16 |
| 7   | 7     |      | -13.95  | 17 | 4.48  | 25 | -12.56  | 14 | 13.82 | 11 | -0.00   | 11 | 0.00  | 14 |
| 7   | 2.908 |      | -13.18  | 17 | 5.10  | 25 | -0.96   | 14 | 1.05  | 11 | -19.65  | 14 | 21.62 | 11 |
| 7   | 3.392 |      | -13.05  | 17 | 5.20  | 25 | -1.07   | 11 | 0.97  | 14 | -19.65  | 14 | 21.62 | 11 |
| 7   | 14    |      | -12.27  | 17 | 5.88  | 25 | -13.80  | 11 | 12.54 | 14 | 0.00    | 13 | 0.00  | 11 |
| 8   | 8     |      | -13.81  | 24 | 12.57 | 29 | -12.01  | 17 | 5.71  | 23 | 0.00    | 1  | 0.00  | 1  |
| 8   | 1.700 |      | -13.82  | 9  | 12.57 | 29 | -4.35   | 3  | 0.31  | 29 | -12.40  | 3  | 4.42  | 23 |
| 8   | 2.000 |      | -13.82  | 9  | 12.57 | 29 | -1.68   | 3  | 0.11  | 18 | -13.57  | 3  | 4.36  | 23 |
| 8   | 2.200 |      | -13.82  | 9  | 12.57 | 29 | -0.72   | 21 | 1.05  | 17 | -13.46  | 3  | 4.30  | 23 |
| 8   | 3.900 |      | -13.81  | 24 | 12.57 | 29 | -3.75   | 21 | 12.70 | 3  | -1.56   | 17 | 0.46  | 23 |
| 8   | 4.100 |      | -13.81  | 24 | 12.57 | 29 | -4.11   | 21 | 13.13 | 3  | -0.32   | 21 | 2.00  | 3  |
| 8   | 9     |      | -13.81  | 24 | 12.57 | 14 | -5.73   | 21 | 17.67 | 17 | -4.74   | 21 | 14.65 | 3  |
| 9   | 9     |      | -13.84  | 11 | 12.57 | 14 | -16.86  | 3  | 4.39  | 21 | -4.74   | 21 | 14.65 | 3  |
| 9   | 1.500 |      | -13.82  | 9  | 12.57 | 14 | -7.22   | 3  | 2.41  | 18 | -1.07   | 18 | 0.72  | 3  |
| 9   | 10    |      | -13.82  | 9  | 12.57 | 14 | -6.14   | 3  | 6.69  | 18 | -2.70   | 3  | 1.32  | 18 |



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**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 |
| 10  | 10  |       | -13.82  | 9  | 12.57 | 14 | -6.00   | 3  | 0.29  | 29 | -2.70   | 3  | 1.32  | 18 |
| 10  |     | 0.092 | -13.82  | 9  | 12.57 | 14 | -5.19   | 3  | 0.23  | 18 | -2.81   | 3  | 1.01  | 18 |
| 10  |     | 0.275 | -13.82  | 9  | 12.57 | 14 | -3.55   | 3  | 0.56  | 18 | -3.04   | 3  | 0.68  | 18 |
| 10  | 11  |       | -13.82  | 9  | 12.57 | 14 | -0.73   | 21 | 7.36  | 3  | 0.00    | 32 | 0.00  | 17 |
| 11  | 11  |       | -13.82  | 9  | 12.57 | 14 | -9.91   | 17 | 1.51  | 29 | 0.00    | 1  | 0.00  | 1  |
| 11  |     | 1.463 | -13.82  | 9  | 12.57 | 14 | -2.17   | 3  | 0.18  | 29 | -9.85   | 3  | 1.24  | 29 |
| 11  |     | 1.950 | -13.82  | 9  | 12.57 | 14 | -0.29   | 19 | 2.34  | 3  | -10.11  | 3  | 1.22  | 29 |
| 11  |     | 1.950 | -13.82  | 9  | 12.57 | 14 | -0.26   | 29 | 2.34  | 3  | -10.11  | 3  | 1.22  | 29 |
| 11  |     | 2.925 | -13.82  | 9  | 12.57 | 14 | -1.15   | 29 | 9.58  | 3  | -5.03   | 3  | 0.53  | 29 |
| 11  |     | 3.412 | -13.82  | 9  | 12.57 | 14 | -1.59   | 29 | 12.25 | 3  | -0.16   | 18 | 2.94  | 3  |
| 11  | 12  |       | -13.82  | 9  | 12.57 | 14 | -2.04   | 29 | 13.30 | 3  | -1.02   | 29 | 9.13  | 3  |
| 12  | 12  |       | -13.83  | 11 | 12.57 | 14 | -11.26  | 3  | 1.09  | 29 | -1.02   | 29 | 9.13  | 3  |
| 12  |     | 0.500 | -13.82  | 11 | 12.57 | 14 | -7.93   | 3  | 0.64  | 29 | -0.59   | 29 | 5.30  | 3  |
| 12  |     | 1.500 | -13.82  | 9  | 12.57 | 14 | -1.51   | 27 | 3.79  | 3  | -2.46   | 18 | 6.17  | 3  |
| 12  |     | 2.000 | -13.82  | 11 | 12.57 | 14 | -1.70   | 25 | 7.12  | 3  | -1.90   | 27 | 7.41  | 3  |
| 12  | 13  |       | -13.82  | 11 | 12.57 | 14 | -3.49   | 25 | 13.77 | 3  | -4.44   | 27 | 13.95 | 3  |
| 13  | 13  |       | -13.82  | 11 | 12.57 | 29 | -17.41  | 17 | 5.70  | 27 | -4.44   | 27 | 13.95 | 3  |
| 13  |     | 0.800 | -13.82  | 11 | 12.57 | 29 | -13.21  | 3  | 4.27  | 27 | -0.49   | 27 | 2.76  | 3  |
| 13  |     | 1.100 | -13.82  | 11 | 12.57 | 29 | -12.56  | 3  | 3.73  | 27 | -3.02   | 3  | 0.73  | 25 |
| 13  |     | 2.800 | -13.82  | 11 | 12.57 | 29 | -0.79   | 17 | 0.67  | 27 | -14.50  | 3  | 4.50  | 25 |
| 13  |     | 3.000 | -13.82  | 11 | 12.57 | 29 | -0.19   | 18 | 2.15  | 3  | -14.52  | 3  | 4.55  | 25 |
| 13  |     | 3.100 | -13.82  | 11 | 12.57 | 29 | -0.17   | 29 | 3.04  | 3  | -14.08  | 3  | 4.58  | 25 |
| 13  |     | 3.200 | -13.82  | 11 | 12.57 | 29 | -0.26   | 29 | 3.93  | 3  | -13.64  | 3  | 4.60  | 25 |
| 13  | 14  |       | -13.82  | 11 | 12.57 | 29 | -5.82   | 25 | 12.27 | 17 | 0.00    | 4  | 0.00  | 18 |

**REACTIES**

2e orde

Fundamentele combinatie

| Kn. | X-min  | X-max | Z-min | Z-max | M-min | M-max |
|-----|--------|-------|-------|-------|-------|-------|
| 1   | -13.81 | 12.56 | -4.34 | 13.69 |       |       |
| 2   | -0.00  | 0.00  | -8.73 | 33.61 |       |       |
| 3   | -0.00  | 0.00  | -2.78 | 13.66 |       |       |
| 4   | -0.00  | 0.00  | -0.84 | 18.43 |       |       |
| 5   | -0.00  | 0.00  | -1.74 | 26.23 |       |       |
| 6   | -0.00  | 0.00  | -7.78 | 30.38 |       |       |
| 7   | -12.56 | 13.81 | -4.40 | 13.95 |       |       |
| 8   | -16.34 | 16.34 |       |       |       |       |

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**STAALPROFIELEN - ALGEMENE GEGEVENS**

Stabiliteit: Classificatie gehele constructie: Ongeschoord  
 Doorbuiging en verplaatsing:  
     Aantal bouwlagen: 1  
     Gebouwtype: Overig  
     Toel. horiz. verplaatsing gehele gebouw: h/300  
     Kleinste gevelhoogte [m]: 0.0

**MATERIAAL**

| Mat nr. | Profielnaam | Vloeisp. [N/mm <sup>2</sup> ] | Productie methode | Min. drsn. klasse |
|---------|-------------|-------------------------------|-------------------|-------------------|
| 1       | HEA140      | 235                           | Gewalst           | 1                 |
| 2       | HEA140      | 235                           | Gewalst           | 1                 |
| 3       | UNP140      | 235                           | Gewalst           | 1                 |

Partiële veiligheidsfactoren:

Gamma M;0 : 1.00      Gamma M;1 : 1.00

**KNIKSTABILITEIT**

| Staafl | l <sub>sys</sub> [m] | Classif. y<br>sterke as | l <sub>knik;y</sub> [m] | Extra        | Classif. z<br>zwakke as | l <sub>knik;z</sub> [m] | Extra        |
|--------|----------------------|-------------------------|-------------------------|--------------|-------------------------|-------------------------|--------------|
|        |                      |                         |                         | aanp. y [kN] |                         |                         | aanp. z [kN] |
| 1      | 6.300                | Ongeschoord             | 2e orde                 |              | Geschoord               | 6.300                   | 0.0          |
| 2      | 6.300                | Ongeschoord             | 2e orde                 |              | Geschoord               | 6.300                   | 0.0          |
| 3      | 6.300                | Ongeschoord             | 2e orde                 |              | Geschoord               | 6.300                   | 0.0          |
| 4      | 6.300                | Ongeschoord             | 2e orde                 |              | Geschoord               | 6.300                   | 0.0          |
| 5      | 6.300                | Ongeschoord             | 2e orde                 |              | Geschoord               | 6.300                   | 0.0          |
| 6      | 6.300                | Ongeschoord             | 2e orde                 |              | Geschoord               | 6.300                   | 0.0          |
| 7      | 6.300                | Ongeschoord             | 2e orde                 |              | Geschoord               | 6.300                   | 0.0          |
| 8      | 5.000                | Ongeschoord             | 2e orde                 |              | Geschoord               | 5.000                   | 0.0          |
| 9      | 2.000                | Ongeschoord             | 2e orde                 |              | Geschoord               | 2.000                   | 0.0          |
| 10     | 1.100                | Ongeschoord             | 2e orde                 |              | Geschoord               | 1.100                   | 0.0          |
| 11     | 3.900                | Ongeschoord             | 2e orde                 |              | Geschoord               | 3.900                   | 0.0          |
| 12     | 3.000                | Ongeschoord             | 2e orde                 |              | Geschoord               | 3.000                   | 0.0          |
| 13     | 5.000                | Ongeschoord             | 2e orde                 |              | Geschoord               | 5.000                   | 0.0          |

**KIPSTABILITEIT**

| Staafl | Plts. aangr. | l gaffel [m] |      | Kipsteunafstanden [m] |  |
|--------|--------------|--------------|------|-----------------------|--|
| 1      | 1.0*h        | boven:       | 6.30 | 6,3                   |  |
|        |              | onder:       | 6.30 | 6,3                   |  |
| 2      | 1.0*h        | boven:       | 6.30 | 6,3                   |  |
|        |              | onder:       | 6.30 | 6,3                   |  |
| 3      | 1.0*h        | boven:       | 6.30 | 6,3                   |  |
|        |              | onder:       | 6.30 | 6,3                   |  |
| 4      | 1.0*h        | boven:       | 6.30 | 6,3                   |  |
|        |              | onder:       | 6.30 | 6,3                   |  |
| 5      | 1.0*h        | boven:       | 6.30 | 6,3                   |  |
|        |              | onder:       | 6.30 | 6,3                   |  |
| 6      | 1.0*h        | boven:       | 6.30 | 6,3                   |  |
|        |              | onder:       | 6.30 | 6,3                   |  |
| 7      | 0.0*h        | boven:       | 6.30 | 6,3                   |  |
|        |              | onder:       | 6.30 | 6,3                   |  |
| 8      | 1.0*h        | boven:       | 5.00 | 5.000                 |  |
|        |              | onder:       | 5.00 | 5.000                 |  |

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**KIPSTABILITEIT**

| Staafl | Plts.<br>aangr. | l gaffel | Kipsteunafstanden |       |
|--------|-----------------|----------|-------------------|-------|
|        |                 |          | [m]               | [m]   |
| 9      | 1.0*h           | boven:   | 2.00              | 2.000 |
|        |                 | onder:   | 2.00              | 2.000 |
| 10     | 1.0*h           | boven:   | 1.10              | 1.100 |
|        |                 | onder:   | 1.10              | 1.100 |
| 11     | 1.0*h           | boven:   | 3.90              | 3.900 |
|        |                 | onder:   | 3.90              | 3.900 |
| 12     | 1.0*h           | boven:   | 3.00              | 3.000 |
|        |                 | onder:   | 3.00              | 3.000 |
| 13     | 1.0*h           | boven:   | 5.00              | 5.000 |
|        |                 | onder:   | 5.00              | 5.000 |

**TOETSING SPANNINGEN**

| Staafl | Mat | BC | Sit | Kl | Plaats | Norm    | Artikel | Formule | Hoogste toetsing          |     | Opm.       |
|--------|-----|----|-----|----|--------|---------|---------|---------|---------------------------|-----|------------|
| nr.    |     |    |     |    |        |         |         |         | U.C. [N/mm <sup>2</sup> ] |     |            |
| 1      | 2   | 5  | 1   | 1  | Staafl | EN3-1-1 | 6.3.3   | (6.62)  | 0.772                     | 181 | 47         |
| 2      | 2   | 3  | 4   | 1  | Staafl | EN3-1-1 | 6.3.1.1 | (6.47z) | 0.214                     | 50  | 47         |
| 3      | 3   | 3  | 3   | 1  | Staafl | EN3-1-1 | 6.3.1.1 | (6.47z) | 0.472                     | 111 | 47, 18, 40 |
| 4      | 2   | 3  | 5   | 1  | Staafl | EN3-1-1 | 6.3.1.1 | (6.47z) | 0.117                     | 28  | 47         |
| 5      | 2   | 3  | 4   | 1  | Staafl | EN3-1-1 | 6.3.1.1 | (6.47z) | 0.167                     | 39  | 47         |
| 6      | 2   | 3  | 3   | 1  | Staafl | EN3-1-1 | 6.3.1.1 | (6.47z) | 0.193                     | 45  | 47         |
| 7      | 2   | 11 | 1   | 1  | Staafl | EN3-1-1 | 6.3.3   | (6.62)  | 0.772                     | 182 | 47         |
| 8      | 1   | 3  | 4   | 1  | Staafl | EN3-1-1 | 6.3.2   | (6.54)  | 0.456                     | 107 | 46         |
| 9      | 1   | 3  | 4   | 1  | Begin  | EN3-1-1 | 6.2.8   | (6.30)  | 0.359                     | 84  |            |
| 10     | 1   | 3  | 2   | 1  | My-max | EN3-1-1 | 6.2.5   | (6.12y) | 0.075                     | 18  |            |
| 11     | 1   | 3  | 1   | 1  | Staafl | EN3-1-1 | 6.3.2   | (6.54)  | 0.298                     | 70  | 46         |
| 12     | 1   | 3  | 3   | 1  | Einde  | EN3-1-1 | 6.2.8   | (6.30)  | 0.342                     | 80  | 46         |
| 13     | 1   | 3  | 5   | 1  | Staafl | EN3-1-1 | 6.3.2   | (6.54)  | 0.468                     | 110 | 46         |

Opmerkingen:

[ 18] Eulerse torsiekracht N<sub>cr</sub>; T is onbekend. De toetsing op torsie volgens EC3 1.1/NB 6.3.1.4 (2) is niet uitgevoerd.[ 40] Eulerse torsieknikkraft N<sub>cr</sub>; T<sub>F</sub> is onbekend. De toetsing op torsieknik volgens EC3 1.1/NB 6.3.1.4 (2) is niet uitgevoerd.

[ 46] T.b.v. kip is een equivalente Q-last berekend.

[ 47] Bij verlopende normaalkraft wordt de grootste drukkracht genomen.

**TOETSING DOORBUIGING**

| Staafl | Soort | Mtg | Lengte | Overst |   | Zeeg | u <sub>tot</sub> | BC Sit |        | u     | Toelaatbaar |       |
|--------|-------|-----|--------|--------|---|------|------------------|--------|--------|-------|-------------|-------|
|        |       |     | [m]    | I      | J | [mm] | [mm]             |        |        | [mm]  | [mm]        | *l    |
| 8      | Dak   | db  | 5.00   | N      | N | 0.0  | -10.5            | 33     | 5 Eind | -10.5 | -20.0       | 0.004 |
|        |       | db  |        |        |   |      |                  | 33     | 5 Bijk | -6.5  | -20.0       | 0.004 |
| 9      | Dak   | db  | 2.00   | N      | N | 0.0  | 0.9              | 33     | 5 Eind | 0.9   | -8.0        | 0.004 |
|        |       | db  |        |        |   |      | -0.2             | 38     | 1 Eind | -0.2  |             |       |
|        |       | db  |        |        |   |      |                  | 38     | 1 Bijk | -0.5  | -8.0        | 0.004 |
| 10     | Dak   | db  | 1.10   | N      | N | 0.0  | -0.2             | 33     | 5 Eind | -0.2  | -4.4        | 0.004 |
|        |       | db  |        |        |   |      |                  | 33     | 5 Bijk | -0.1  | -4.4        | 0.004 |
| 11     | Dak   | db  | 3.90   | N      | N | 0.0  | -5.4             | 33     | 1 Eind | -5.4  | -15.6       | 0.004 |
|        |       | db  |        |        |   |      |                  | 33     | 1 Bijk | -3.6  | -15.6       | 0.004 |
| 12     | Dak   | db  | 3.00   | N      | N | 0.0  | 2.7              | 33     | 5 Eind | 2.7   | -12.0       | 0.004 |
|        |       | db  |        |        |   |      | -0.3             | 33     | 2 Eind | -0.3  |             |       |
|        |       | db  |        |        |   |      |                  | 33     | 2 Bijk | -1.0  | -12.0       | 0.004 |

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**TOETSING DOORBUIGING**

| Staafl | Soort | Mtg | Lengte<br>[m] | Overst<br>I J | Zeeg<br>[mm] | $u_{tot}$<br>[mm] | BC | Sit    | u<br>[mm] | Toelaatbaar<br>[mm] | *l    |
|--------|-------|-----|---------------|---------------|--------------|-------------------|----|--------|-----------|---------------------|-------|
| 13     | Dak   | db  | 5.00          | N N           | 0.0          | -11.9             | 33 | 5 Eind | -11.9     | -20.0               | 0.004 |
|        |       | db  |               |               |              |                   | 33 | 5 Bijk | -7.5      | -20.0               | 0.004 |

**TOETSING HORIZONTALE VERPLAATSING**

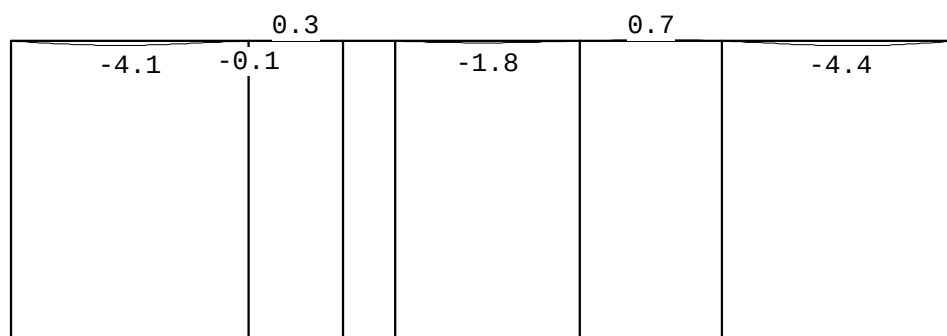
| Staafl | BC | Sit | Lengte<br>[m] | $u_{eind}$<br>[mm] | Toelaatbaar<br>[mm] | [h/] |
|--------|----|-----|---------------|--------------------|---------------------|------|
| 1      | 35 | 1   | 6.300         | -30.5              | 42.0                | 150  |
| 2      | 41 | 1   | 6.300         | 0.1                | 42.0                | 150  |
| 3      | 41 | 1   | 6.300         | 0.1                | 42.0                | 150  |
| 4      | 41 | 1   | 6.300         | 0.2                | 42.0                | 150  |
| 5      | 41 | 1   | 6.300         | 0.2                | 42.0                | 150  |
| 6      | 41 | 1   | 6.300         | 0.3                | 42.0                | 150  |
| 7      | 41 | 1   | 6.300         | 30.6               | 42.0                | 150  |

**TOETSING HOR. VERPLAATSING GLOBAAL**

Er is een maximale horizontale verplaatsing van -0.0003 [m] gevonden bij knoop 14 en combinatie 41; belastingsituatie 1, iter:3 (combinatietype 2). Bij een hoogte van 6.300 [m] levert dit h /18440 (toel.: h / 300).

**VERVORMINGEN w1**

Blijvende combinatie

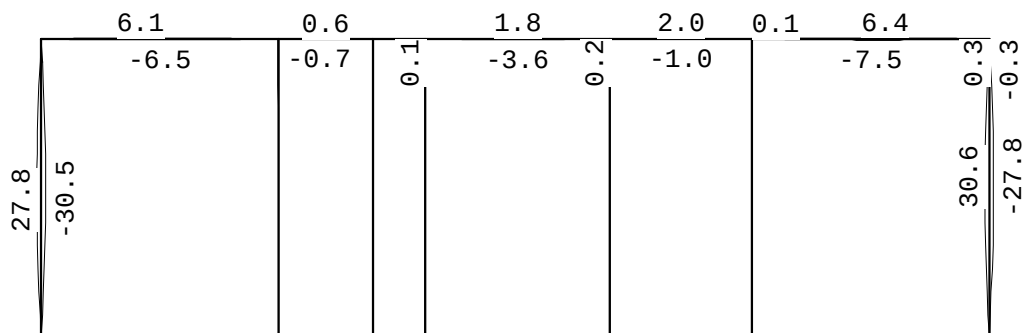


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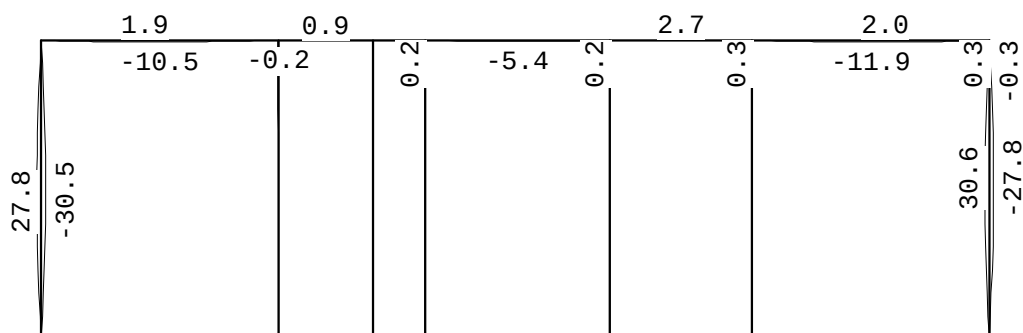
Onderdeel: Spant 13

**VERVORMINGEN W<sub>bij</sub>**

Karakteristieke combinatie

**VERVORMINGEN W<sub>max</sub>**

Karakteristieke combinatie



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Onderdeel: Spant 14 en 19

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

Datum....: 28/08/2018

Bestand...: F:\Projecten\2018\180114 Uitbreiding Venstertechniek te  
Zelhem\Constructief CIBIS\spant as 14 tm 19.rww

Belastingbreedte.: 5.000

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

Theorieën voor de bepaling van de krachtsverdeling:

1) Losse belastinggevallen:

Lineaire-elasticiteitstheorie

2) Uiterste grenstoestand:

Geometrisch niet lineair alle staven.

Fysisch lineair alle staven.

3) Gebruiksgrenstoestand:

Geometrisch niet lineair alle staven.

Fysisch lineair alle staven.

Maximum aantal iteraties.....: 50

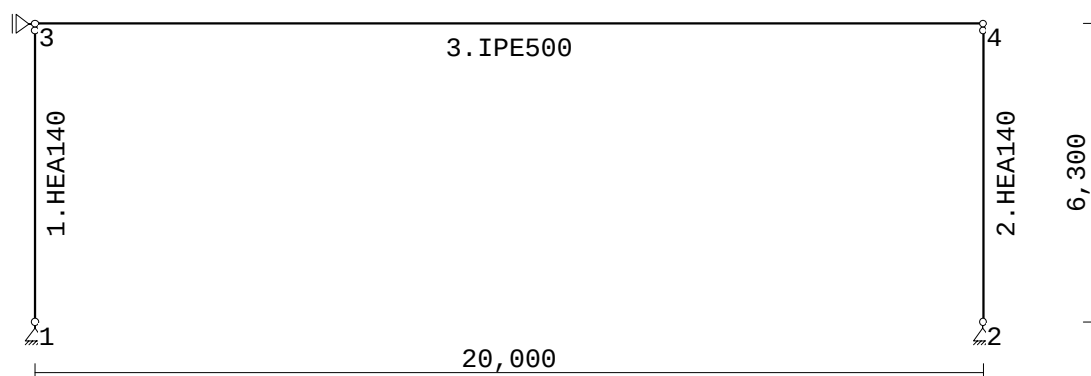
Max.deellengte kolommen/wanden: 0.500 Max.deellengte balken/vloeren: 0.500

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) |
| Staal       | NEN-EN 1993-1-1:2006 | C2:2009 | NB:2011(nl) |

**GEOMETRIE****MATERIALEN**

| Mt | Omschrijving | E-modulus[N/mm <sup>2</sup> ] | S.M. | Pois. | Uitz. coëff |
|----|--------------|-------------------------------|------|-------|-------------|
| 1  | S235         | 210000                        | 78.5 | 0.30  | 1.2000e-05  |

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Onderdeel: Spant 14 en 19

**PROFIELEN [mm]**

| Prof. | Omschrijving | Materiaal | Oppervlak  | Traagheid  | Vormf. |
|-------|--------------|-----------|------------|------------|--------|
| 1     | HEA140       | 1:S235    | 3.1420e+03 | 1.0330e+07 | 0.00   |
| 2     | IPE500       | 1:S235    | 1.1550e+04 | 4.8200e+08 | 0.00   |

**PROFIELEN vervolg [mm]**

| Prof. | Staaftype | Breedte | Hoogte | e     | Type | b1 | h1 | b2 | h2 |
|-------|-----------|---------|--------|-------|------|----|----|----|----|
| 1     | 0:Normaal | 140     | 133    | 66.5  |      |    |    |    |    |
| 2     | 0:Normaal | 200     | 500    | 250.0 |      |    |    |    |    |

**PROFIELVORMEN [mm]**

1 HEA140



2 IPE500

**KNOPEN**

| Knoop | X      | Z     |
|-------|--------|-------|
| 1     | 0.000  | 0.000 |
| 2     | 20.000 | 0.000 |
| 3     | 0.000  | 6.300 |
| 4     | 20.000 | 6.300 |

**STAVEN**

| St. | ki | kj | Profiel  | Aansl.i | Aansl.j | Lengte Opm. |
|-----|----|----|----------|---------|---------|-------------|
| 1   | 1  | 3  | 1:HEA140 | NDM     | ND-     | 6.300       |
| 2   | 2  | 4  | 1:HEA140 | NDM     | ND-     | 6.300       |
| 3   | 3  | 4  | 2:IPE500 | NDM     | NDM     | 20.000      |

**VASTE STEUNPUNTEN**

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

**BELASTINGGENERATIE ALGEMEEN.**

|                              |       |                         |      |
|------------------------------|-------|-------------------------|------|
| Betrouwbaarheidsklasse.....: | 1     | Referentieperiode.....: | 50   |
| Gebouwdiepte.....:           | 40.00 | Gebouwhoogte.....:      | 6.30 |
| Niveau aansl.terrein.....:   | 0.00  | E.g. scheid.w. [kN/m2]: | 1.20 |

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Onderdeel: Spant 14 en 19

**WIND**


---

```

Terrein categorie ...[4.3.2]....: Onbebouwd
Windgebied .....:          3   Vb,0 ..[4.2].....: 24.500
Positie spant in het gebouw....: 6.000   Kr ....[4.3.2].....: 0.209
z0 .....[4.3.2]....: 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 :    0.70

```

**STAFTYPEN**

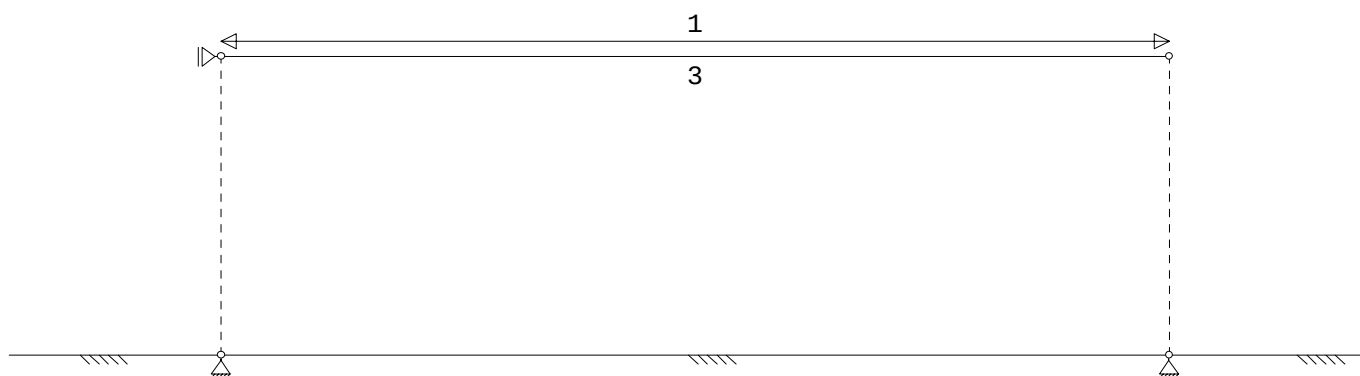

---

| Type             | staven |
|------------------|--------|
| 5:Linker gevel.  | : 1    |
| 6:Rechter gevel. | : 2    |
| 7:Dak.           | : 3    |

---

**LASTVELDEN**


---

Veranderlijke belastingen door personen
**LASTVELDEN**


---

| Nr | Balk | Veld | Gebruiksfunctie                                         | Psi-t |
|----|------|------|---------------------------------------------------------|-------|
| 1  | 3-3  | 3-3  | Dak niet toegankelijk voor dagelijks gebruik. Tabel 6.9 | 1.00  |

---



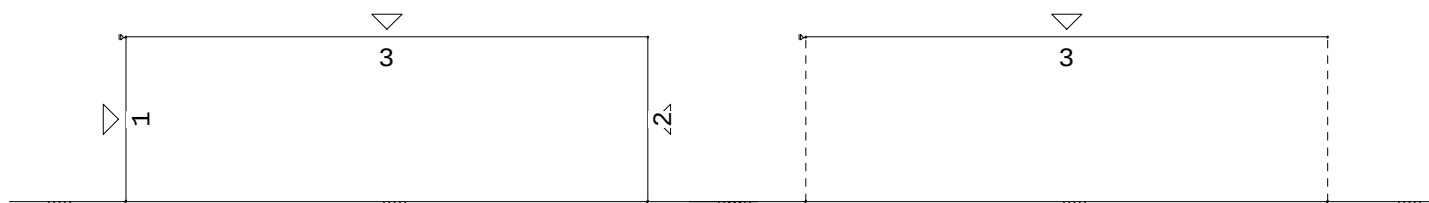
Project...: 180114 Uitbreiding Venster Techniek

Onderdeel: Spant 14 en 19

**LASTVELDEN**

Wind staven

Sneeuw staven

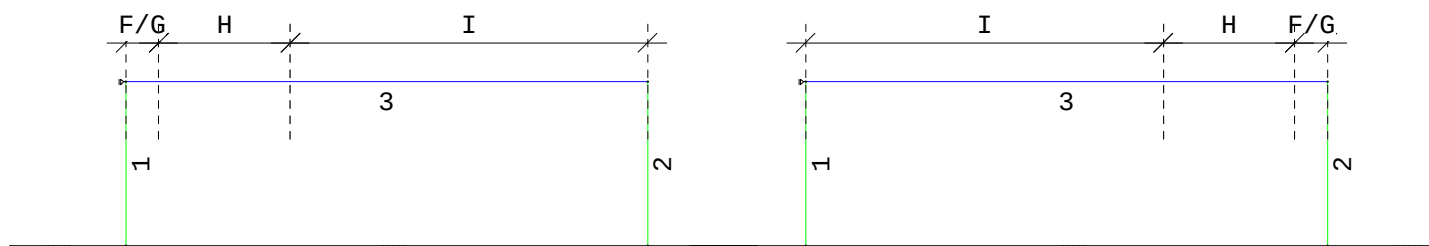
**WIND DAKTYPES**

| Nr. | Staaft Type | reductie bij<br>wind van links | reductie bij<br>wind van Rechts | Cpe volgens art: |
|-----|-------------|--------------------------------|---------------------------------|------------------|
| 1   | 1 Gevel     | 1.000                          | 1.000                           | 7.2.2            |
| 2   | 3 Plat dak  | 1.000                          | 1.000                           | 7.2.3            |
| 3   | 2 Gevel     | 1.000                          | 1.000                           | 7.2.2            |

**WIND ZONES**

Wind van links

Wind van rechts

**WIND VAN LINKS ZONES****WIND VAN RECHTS ZONES**

| Nr. | Staaft | Positie | Lengte | Zone |
|-----|--------|---------|--------|------|
| 1   | 1      | 0.000   | 6.300  | D    |
| 2   | 3      | 0.000   | 1.260  | F/G  |
| 3   | 3      | 1.260   | 5.040  | H    |
| 4   | 3      | 6.300   | 13.700 | I    |
| 5   | 2      | 0.000   | 6.300  | E    |

| Nr. | Staaft | Positie | Lengte | Zone |
|-----|--------|---------|--------|------|
| 1   | 2      | 0.000   | 6.300  | D    |
| 2   | 3      | 0.000   | 1.260  | F/G  |
| 3   | 3      | 1.260   | 5.040  | H    |
| 4   | 3      | 6.300   | 13.700 | I    |
| 5   | 1      | 0.000   | 6.300  | E    |

**Wind indexen**

| Index | CsCd | Cpe/Cpi | qp    | breedte | reductie | Qw Zone | Hoek(en) |
|-------|------|---------|-------|---------|----------|---------|----------|
| Qw1   |      | 0.300   | 0.591 | 5.000   | -0.886   | -i      |          |
| Qw2   |      | -0.300  | 0.591 | 5.000   | 0.886    | -i      |          |
| Qw3   | 1.00 | 0.800   | 0.591 | 5.000   | -2.363   | D       |          |
| Qw4   | 1.00 | -1.200  | 0.591 | 5.000   | 3.545    | G       | 0.0      |
| Qw5   | 1.00 | -0.700  | 0.591 | 5.000   | 2.068    | H       | 0.0      |
| Qw6   | 1.00 | -0.200  | 0.591 | 5.000   | 0.591    | I       | 0.0      |
| Qw7   | 1.00 | 0.500   | 0.591 | 5.000   | -1.477   | E       |          |
| Qw8   |      | -0.200  | 0.591 | 5.000   | 0.591    | +i      |          |
| Qw9   |      | 0.200   | 0.591 | 5.000   | -0.591   | +i      |          |
| Qw10  | 1.00 | 0.200   | 0.591 | 5.000   | -0.591   | I       | 0.0      |

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**Wind indexen**

| Index | CsCd | Cpe/Cpi | qp    | breedte | reductie | Qw     | Zone | Hoek(en) |
|-------|------|---------|-------|---------|----------|--------|------|----------|
| Qw11  | 1.00 | -0.800  | 0.591 | 5.000   |          | 2.363  | D    |          |
| Qw12  | 1.00 | -0.500  | 0.591 | 5.000   |          | 1.477  | E    |          |
| Qw13  | 1.00 | -0.800  | 0.591 | 5.000   |          | 2.363  | B    |          |
| Qw14  | 1.00 | 0.800   | 0.591 | 5.000   |          | -2.363 | B    |          |
| Qw15  | 1.00 | -0.700  | 0.591 | 2.800   |          | 1.158  | H    | 0.0      |
| Qw16  | 1.00 | 0.200   | 0.591 | 2.200   |          | -0.260 | I    | 0.0      |
| Qw17  | 1.00 | -0.200  | 0.591 | 2.200   |          | 0.260  | I    | 0.0      |
| Qw18  | 1.00 | -0.500  | 0.591 | 5.000   |          | 1.477  | C    |          |
| Qw19  | 1.00 | 0.500   | 0.591 | 5.000   |          | -1.477 | C    |          |

**SNEEUW DAKTYPEN**

Staaft artikel

3-3 5.3.2 Lessenaarsdak

**Sneeuw indexen**

| Index | art   | $\mu$ | $s_k$ | red. | posfac | breedte | $Q_s$ | hoek |
|-------|-------|-------|-------|------|--------|---------|-------|------|
| Qs1   | 5.3.2 | 0.800 | 0.70  | 1.00 |        | 5.000   | 2.800 | 0.0  |

**BELASTINGGEVALLEN**

| B.G. | Omschrijving                     | Type |
|------|----------------------------------|------|
|      | 1 Permanente belasting EGZ=-1.00 | 1    |
| g    | 2 Ver. bel. pers. ed. (p_rep)    | 2    |
| g    | 3 Ver. bel. pers. ed. (F_rep)    | 3    |
| g    | 4 Wind van links onderdruk A     | 7    |
| g    | 5 Wind van links overdruk A      | 8    |
| g    | 6 Wind van links onderdruk B     | 9    |
| g    | 7 Wind van links overdruk B      | 10   |
| g    | 8 Wind van rechts onderdruk A    | 11   |
| g    | 9 Wind van rechts overdruk A     | 12   |
| g    | 10 Wind van rechts onderdruk B   | 13   |
| g    | 11 Wind van rechts overdruk B    | 14   |
| g    | 12 Wind loodrecht onderdruk A    | 15   |
| g    | 13 Wind loodrecht overdruk A     | 16   |
| g    | 14 Wind loodrecht onderdruk B    | 45   |
| g    | 15 Wind loodrecht overdruk B     | 46   |
| g    | 16 Sneeuw A                      | 22   |
| g    | = gegenereerd belastinggeval     |      |

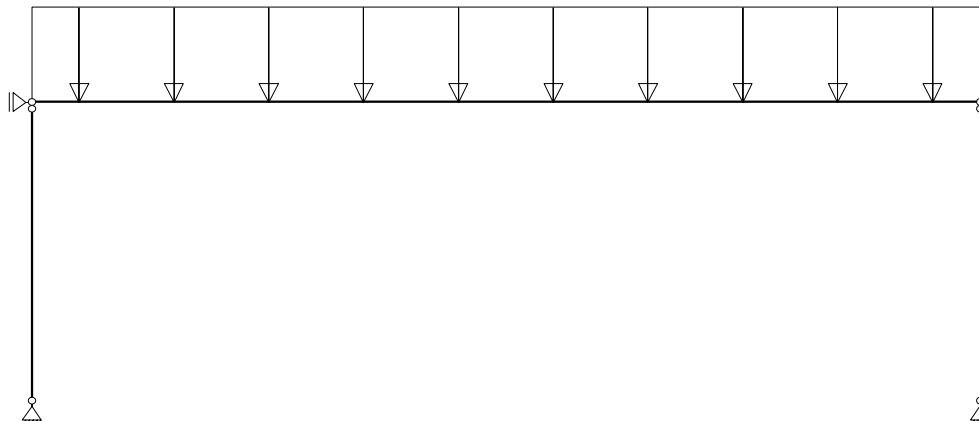
Project...: 180114 Uitbreiding Venster Techniek

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**BELASTINGEN**

B.G:1 Permanente belasting

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

**STAAFBELASTINGEN**

B.G:1 Permanente belasting

| Staat | Type        | q1/p/m | q2    | A     | B     | $\psi_0$ | $\psi_1$ | $\psi_2$ |
|-------|-------------|--------|-------|-------|-------|----------|----------|----------|
| 3     | 5:QZGlobaal | -1.75  | -1.75 | 0.000 | 0.000 |          |          |          |

**REACTIES**

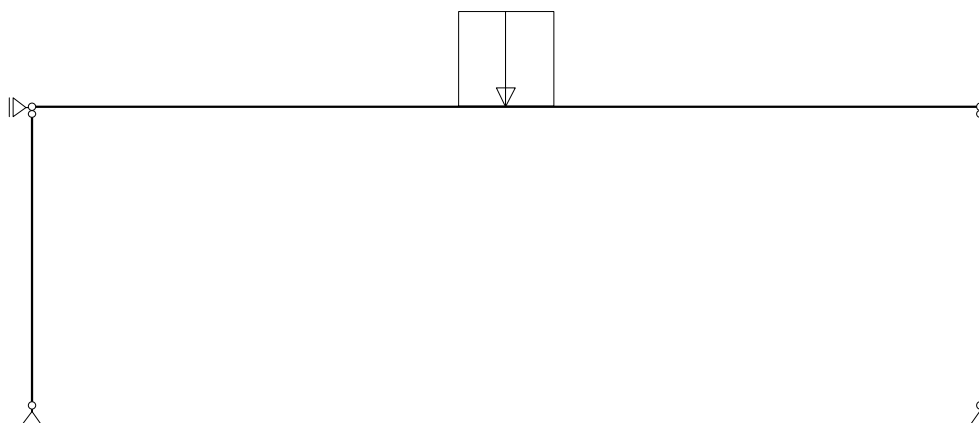
1e orde

B.G:1 Permanente belasting

| Kn. | X    | Z      | M                        |
|-----|------|--------|--------------------------|
| 1   | 0.00 | 28.12  |                          |
| 2   | 0.00 | 28.12  |                          |
| 3   | 0.00 |        |                          |
|     | 0.00 | 56.24  | : Som van de reacties    |
|     | 0.00 | -56.24 | : Som van de belastingen |

**BELASTINGEN**

B.G:2 Ver. bel. pers. ed. (p\_rep)

**STAAFBELASTINGEN**

B.G:2 Ver. bel. pers. ed. (p\_rep)

| Staat | Type        | q1/p/m | q2    | A     | B     | $\psi_0$ | $\psi_1$ | $\psi_2$ |
|-------|-------------|--------|-------|-------|-------|----------|----------|----------|
| 3     | 3:QZgeProj. | -5.00  | -5.00 | 9.000 | 9.000 | 0.0      | 0.0      | 0.0      |

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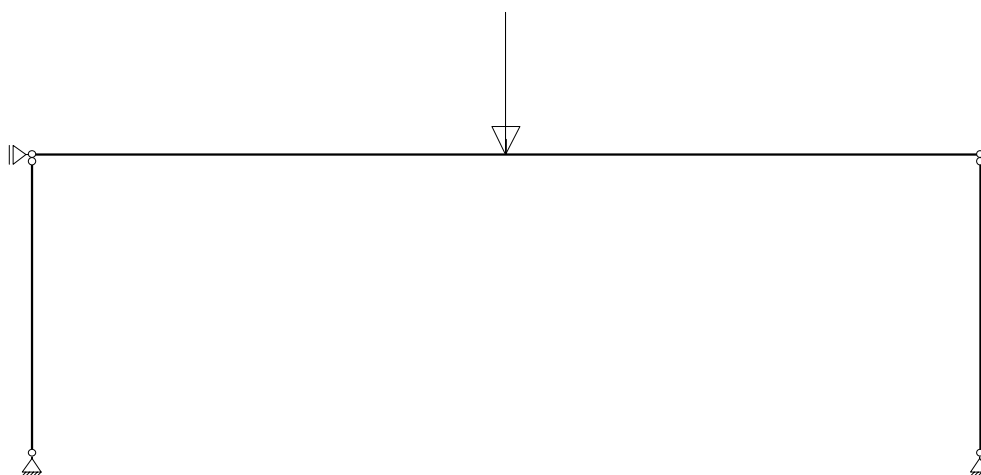
Onderdeel: Spant 14 en 19

**VERANDERLIJKE BELASTING SITUATIES**

| Nr Lastvelden extreem | Lastvelden momentaan |
|-----------------------|----------------------|
| 1 1                   |                      |

**REACTIES** 1e orde B.G:2 Ver. bel. pers. ed. (p\_rep)

| Kn. | X    | Z      | M                        |
|-----|------|--------|--------------------------|
| 1   | 0.00 | 5.00   |                          |
| 2   | 0.00 | 5.00   |                          |
| 3   | 0.00 |        |                          |
|     | 0.00 | 10.00  | : Som van de reacties    |
|     | 0.00 | -10.00 | : Som van de belastingen |

**BELASTINGEN** B.G:3 Ver. bel. pers. ed. (F-rep)**STAAFBELASTINGEN** B.G:3 Ver. bel. pers. ed. (F-rep)

| Staat Type     | q1/p/m | q2     | A | B | $\psi_0$ | $\psi_1$ | $\psi_2$ |
|----------------|--------|--------|---|---|----------|----------|----------|
| 3 10:PZGeproj. | -1.50  | 10.000 |   |   | 0.0      | 0.0      | 0.0      |

**VERANDERLIJKE BELASTING SITUATIES**

| Nr Lastvelden extreem | Lastvelden momentaan |
|-----------------------|----------------------|
| 1 1                   |                      |

**REACTIES** 1e orde B.G:3 Ver. bel. pers. ed. (F-rep)

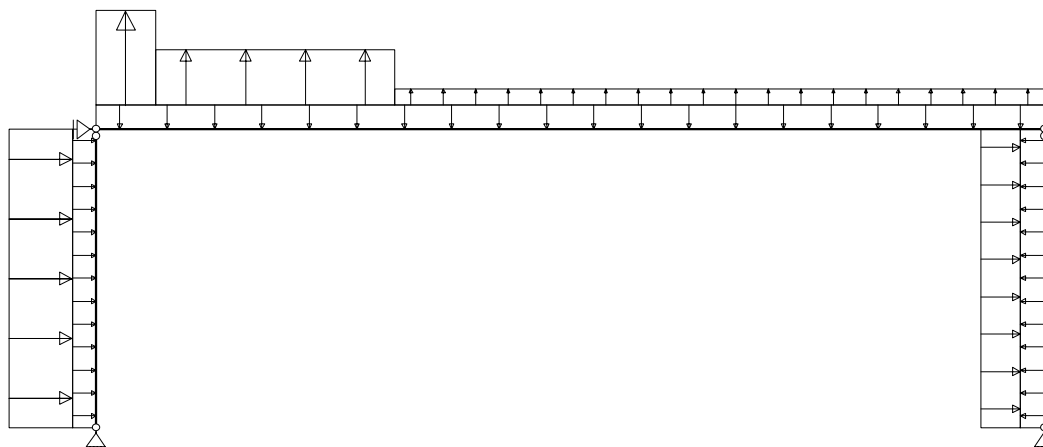
| Kn. | X    | Z     | M                        |
|-----|------|-------|--------------------------|
| 1   | 0.00 | 0.75  |                          |
| 2   | 0.00 | 0.75  |                          |
| 3   | 0.00 |       |                          |
|     | 0.00 | 1.50  | : Som van de reacties    |
|     | 0.00 | -1.50 | : Som van de belastingen |

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Onderdeel: Spant 14 en 19

**BELASTINGEN**

B.G:4 Wind van links onderdruk A

**STAAFBELASTINGEN**

B.G:4 Wind van links onderdruk A

| Staat | Type       | Index | q1/p/m | q2    | A     | B      | $\psi_0$ | $\psi_1$ | $\psi_2$ |
|-------|------------|-------|--------|-------|-------|--------|----------|----------|----------|
| 1     | 1:QZLokaal | Qw1   | -0.89  | -0.89 | 0.000 | 0.000  | 0.0      | 0.2      | 0.0      |
| 3     | 1:QZLokaal | Qw1   | -0.89  | -0.89 | 0.000 | 0.000  | 0.0      | 0.2      | 0.0      |
| 2     | 1:QZLokaal | Qw2   | 0.89   | 0.89  | 0.000 | 0.000  | 0.0      | 0.2      | 0.0      |
| 1     | 1:QZLokaal | Qw3   | -2.36  | -2.36 | 0.000 | 0.000  | 0.0      | 0.2      | 0.0      |
| 3     | 1:QZLokaal |       | 0.00   | 0.00  | 0.000 | 18.740 | 0.0      | 0.2      | 0.0      |
| 3     | 1:QZLokaal | Qw4   | 3.54   | 3.54  | 0.000 | 18.740 | 0.0      | 0.2      | 0.0      |
| 3     | 1:QZLokaal | Qw5   | 2.07   | 2.07  | 1.260 | 13.700 | 0.0      | 0.2      | 0.0      |
| 3     | 1:QZLokaal | Qw6   | 0.59   | 0.59  | 6.300 | 0.000  | 0.0      | 0.2      | 0.0      |
| 2     | 1:QZLokaal | Qw7   | -1.48  | -1.48 | 0.000 | 0.000  | 0.0      | 0.2      | 0.0      |

**REACTIES**

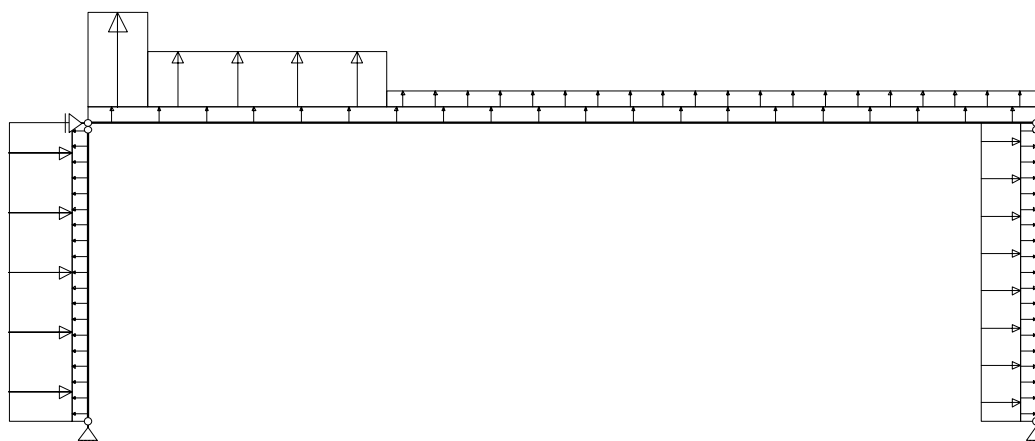
1e orde

B.G:4 Wind van links onderdruk A

| Kn. | X      | Z     | M                        |
|-----|--------|-------|--------------------------|
| 1   | -10.24 | -6.69 |                          |
| 2   | -1.86  | 1.43  |                          |
| 3   | -12.10 |       |                          |
|     | -24.19 | -5.26 | : Som van de reacties    |
|     | 24.19  | 5.26  | : Som van de belastingen |

**BELASTINGEN**

B.G:5 Wind van links overdruk A



Project...: 180114 Uitbreiding Venster Techniek

Onderdeel: Spant 14 en 19

**STAAFBELASTINGEN**

B.G:5 Wind van links overdruk A

| Staatf | Type       | Index | q1/p/m | q2    | A     | B      | $\Psi_0$ | $\Psi_1$ | $\Psi_2$ |
|--------|------------|-------|--------|-------|-------|--------|----------|----------|----------|
| 1      | 1:QZLokaal | Qw8   | 0.59   | 0.59  | 0.000 | 0.000  | 0.0      | 0.2      | 0.0      |
| 3      | 1:QZLokaal | Qw8   | 0.59   | 0.59  | 0.000 | 0.000  | 0.0      | 0.2      | 0.0      |
| 2      | 1:QZLokaal | Qw9   | -0.59  | -0.59 | 0.000 | 0.000  | 0.0      | 0.2      | 0.0      |
| 1      | 1:QZLokaal | Qw3   | -2.36  | -2.36 | 0.000 | 0.000  | 0.0      | 0.2      | 0.0      |
| 3      | 1:QZLokaal |       | 0.00   | 0.00  | 0.000 | 18.740 | 0.0      | 0.2      | 0.0      |
| 3      | 1:QZLokaal | Qw4   | 3.54   | 3.54  | 0.000 | 18.740 | 0.0      | 0.2      | 0.0      |
| 3      | 1:QZLokaal | Qw5   | 2.07   | 2.07  | 1.260 | 13.700 | 0.0      | 0.2      | 0.0      |
| 3      | 1:QZLokaal | Qw6   | 0.59   | 0.59  | 6.300 | 0.000  | 0.0      | 0.2      | 0.0      |
| 2      | 1:QZLokaal | Qw7   | -1.48  | -1.48 | 0.000 | 0.000  | 0.0      | 0.2      | 0.0      |

**REACTIES**

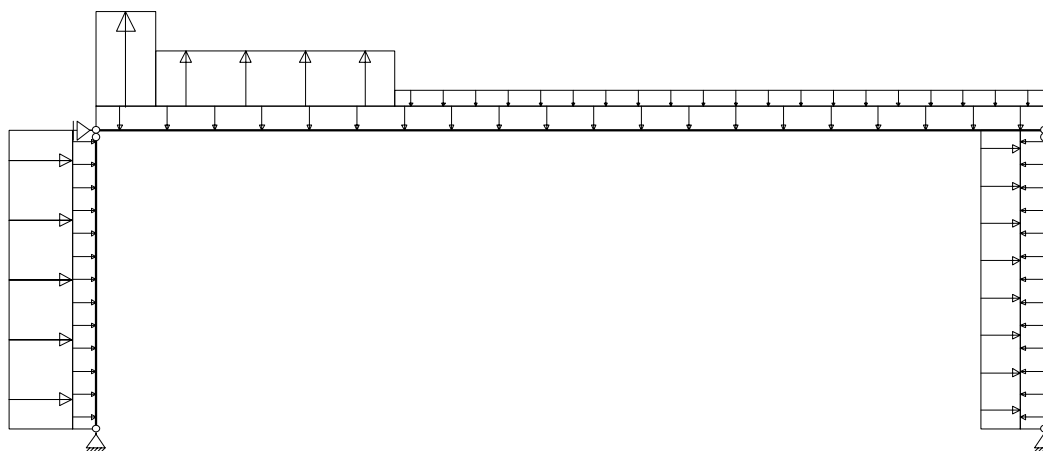
1e orde

B.G:5 Wind van links overdruk A

| Kn. | X      | Z      | M                        |
|-----|--------|--------|--------------------------|
| 1   | -5.58  | -21.46 |                          |
| 2   | -6.51  | -13.34 |                          |
| 3   | -12.10 |        |                          |
|     | -24.19 | -34.80 | : Som van de reacties    |
|     | 24.19  | 34.80  | : Som van de belastingen |

**BELASTINGEN**

B.G:6 Wind van links onderdruk B

**STAAFBELASTINGEN**

B.G:6 Wind van links onderdruk B

| Staatf | Type       | Index | q1/p/m | q2    | A     | B      | $\Psi_0$ | $\Psi_1$ | $\Psi_2$ |
|--------|------------|-------|--------|-------|-------|--------|----------|----------|----------|
| 1      | 1:QZLokaal | Qw1   | -0.89  | -0.89 | 0.000 | 0.000  | 0.0      | 0.2      | 0.0      |
| 3      | 1:QZLokaal | Qw1   | -0.89  | -0.89 | 0.000 | 0.000  | 0.0      | 0.2      | 0.0      |
| 2      | 1:QZLokaal | Qw2   | 0.89   | 0.89  | 0.000 | 0.000  | 0.0      | 0.2      | 0.0      |
| 1      | 1:QZLokaal | Qw3   | -2.36  | -2.36 | 0.000 | 0.000  | 0.0      | 0.2      | 0.0      |
| 3      | 1:QZLokaal |       | 0.00   | 0.00  | 0.000 | 18.740 | 0.0      | 0.2      | 0.0      |
| 3      | 1:QZLokaal | Qw4   | 3.54   | 3.54  | 0.000 | 18.740 | 0.0      | 0.2      | 0.0      |
| 3      | 1:QZLokaal | Qw5   | 2.07   | 2.07  | 1.260 | 13.700 | 0.0      | 0.2      | 0.0      |
| 3      | 1:QZLokaal | Qw10  | -0.59  | -0.59 | 6.300 | 0.000  | 0.0      | 0.2      | 0.0      |
| 2      | 1:QZLokaal | Qw7   | -1.48  | -1.48 | 0.000 | 0.000  | 0.0      | 0.2      | 0.0      |

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**REACTIES**

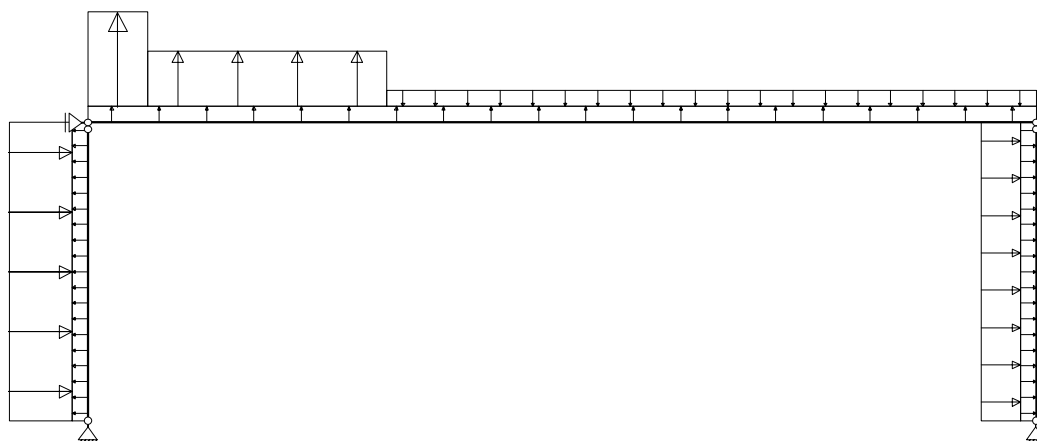
1e orde

B.G:6 Wind van links onderdruk B

| Kn. | X      | Z      | M                        |
|-----|--------|--------|--------------------------|
| 1   | -10.24 | -1.14  |                          |
| 2   | -1.86  | 12.07  |                          |
| 3   | -12.10 |        |                          |
|     | -24.19 | 10.93  | : Som van de reacties    |
|     | 24.19  | -10.93 | : Som van de belastingen |

**BELASTINGEN**

B.G:7 Wind van links overdruk B

**STAAFBELASTINGEN**

B.G:7 Wind van links overdruk B

| Staat | Type       | Index | q1/p/m | q2    | A     | B      | $\psi_0$ | $\psi_1$ | $\psi_2$ |
|-------|------------|-------|--------|-------|-------|--------|----------|----------|----------|
| 1     | 1:QZLokaal | Qw8   | 0.59   | 0.59  | 0.000 | 0.000  | 0.0      | 0.2      | 0.0      |
| 3     | 1:QZLokaal | Qw8   | 0.59   | 0.59  | 0.000 | 0.000  | 0.0      | 0.2      | 0.0      |
| 2     | 1:QZLokaal | Qw9   | -0.59  | -0.59 | 0.000 | 0.000  | 0.0      | 0.2      | 0.0      |
| 1     | 1:QZLokaal | Qw3   | -2.36  | -2.36 | 0.000 | 0.000  | 0.0      | 0.2      | 0.0      |
| 3     | 1:QZLokaal |       | 0.00   | 0.00  | 0.000 | 18.740 | 0.0      | 0.2      | 0.0      |
| 3     | 1:QZLokaal | Qw4   | 3.54   | 3.54  | 0.000 | 18.740 | 0.0      | 0.2      | 0.0      |
| 3     | 1:QZLokaal | Qw5   | 2.07   | 2.07  | 1.260 | 13.700 | 0.0      | 0.2      | 0.0      |
| 3     | 1:QZLokaal | Qw10  | -0.59  | -0.59 | 6.300 | 0.000  | 0.0      | 0.2      | 0.0      |
| 2     | 1:QZLokaal | Qw7   | -1.48  | -1.48 | 0.000 | 0.000  | 0.0      | 0.2      | 0.0      |

**REACTIES**

1e orde

B.G:7 Wind van links overdruk B

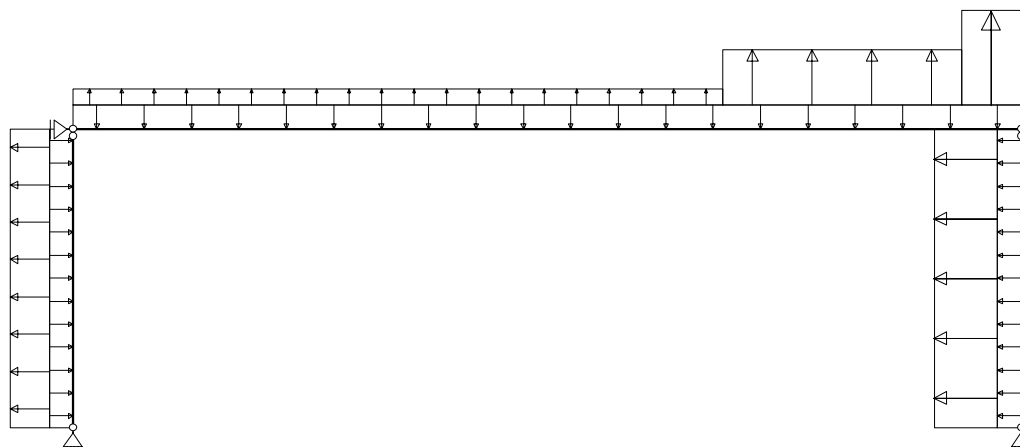
| Kn. | X      | Z      | M                        |
|-----|--------|--------|--------------------------|
| 1   | -5.58  | -15.91 |                          |
| 2   | -6.51  | -2.70  |                          |
| 3   | -12.10 |        |                          |
|     | -24.19 | -18.61 | : Som van de reacties    |
|     | 24.19  | 18.61  | : Som van de belastingen |

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**BELASTINGEN**

B.G:8 Wind van rechts onderdruk A

**STAAFBELASTINGEN**

B.G:8 Wind van rechts onderdruk A

| Staat | Type       | Index | q1/p/m | q2    | A      | B     | $\psi_0$ | $\psi_1$ | $\psi_2$ |
|-------|------------|-------|--------|-------|--------|-------|----------|----------|----------|
| 1     | 1:QZLokaal | Qw1   | -0.89  | -0.89 | 0.000  | 0.000 | 0.0      | 0.2      | 0.0      |
| 3     | 1:QZLokaal | Qw1   | -0.89  | -0.89 | 0.000  | 0.000 | 0.0      | 0.2      | 0.0      |
| 2     | 1:QZLokaal | Qw2   | 0.89   | 0.89  | 0.000  | 0.000 | 0.0      | 0.2      | 0.0      |
| 2     | 1:QZLokaal | Qw11  | 2.36   | 2.36  | 0.000  | 0.000 | 0.0      | 0.2      | 0.0      |
| 3     | 1:QZLokaal |       | 0.00   | 0.00  | 18.740 | 0.000 | 0.0      | 0.2      | 0.0      |
| 3     | 1:QZLokaal | Qw4   | 3.54   | 3.54  | 18.740 | 0.000 | 0.0      | 0.2      | 0.0      |
| 3     | 1:QZLokaal | Qw5   | 2.07   | 2.07  | 13.700 | 1.260 | 0.0      | 0.2      | 0.0      |
| 3     | 1:QZLokaal | Qw6   | 0.59   | 0.59  | 0.000  | 6.300 | 0.0      | 0.2      | 0.0      |
| 1     | 1:QZLokaal | Qw12  | 1.48   | 1.48  | 0.000  | 0.000 | 0.0      | 0.2      | 0.0      |

**REACTIES**

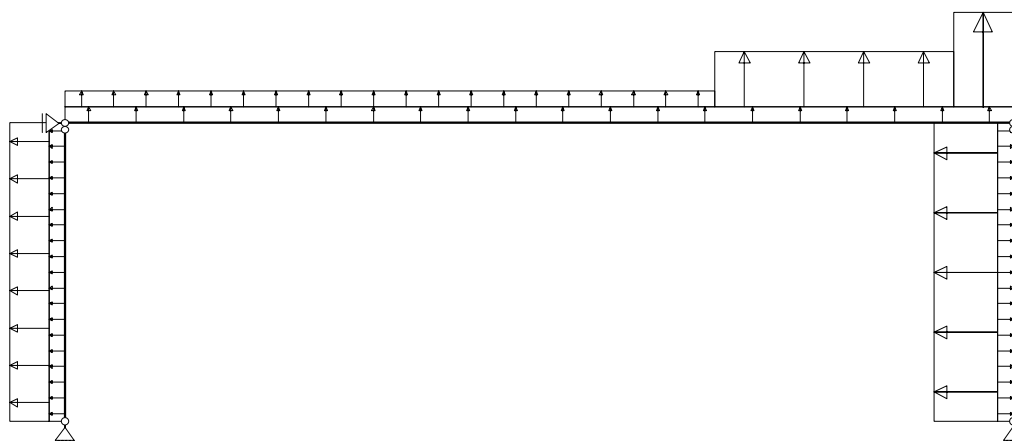
1e orde

B.G:8 Wind van rechts onderdruk A

| Kn. | X      | Z     | M                        |
|-----|--------|-------|--------------------------|
| 1   | 1.86   | 1.43  |                          |
| 2   | 10.24  | -6.69 |                          |
| 3   | 12.10  |       |                          |
|     | 24.19  | -5.26 | : Som van de reacties    |
|     | -24.19 | 5.26  | : Som van de belastingen |

**BELASTINGEN**

B.G:9 Wind van rechts overdruk A





Project...: 180114 Uitbreiding Venster Techniek

Onderdeel: Spant 14 en 19

**STAAFBELASTINGEN**

B.G:9 Wind van rechts overdruk A

| StAAF | Type       | Index | q1/p/m | q2    | A      | B     | $\psi_0$ | $\psi_1$ | $\psi_2$ |
|-------|------------|-------|--------|-------|--------|-------|----------|----------|----------|
| 1     | 1:QZLokaal | Qw8   | 0.59   | 0.59  | 0.000  | 0.000 | 0.0      | 0.2      | 0.0      |
| 3     | 1:QZLokaal | Qw8   | 0.59   | 0.59  | 0.000  | 0.000 | 0.0      | 0.2      | 0.0      |
| 2     | 1:QZLokaal | Qw9   | -0.59  | -0.59 | 0.000  | 0.000 | 0.0      | 0.2      | 0.0      |
| 2     | 1:QZLokaal | Qw11  | 2.36   | 2.36  | 0.000  | 0.000 | 0.0      | 0.2      | 0.0      |
| 3     | 1:QZLokaal |       | 0.00   | 0.00  | 18.740 | 0.000 | 0.0      | 0.2      | 0.0      |
| 3     | 1:QZLokaal | Qw4   | 3.54   | 3.54  | 18.740 | 0.000 | 0.0      | 0.2      | 0.0      |
| 3     | 1:QZLokaal | Qw5   | 2.07   | 2.07  | 13.700 | 1.260 | 0.0      | 0.2      | 0.0      |
| 3     | 1:QZLokaal | Qw6   | 0.59   | 0.59  | 0.000  | 6.300 | 0.0      | 0.2      | 0.0      |
| 1     | 1:QZLokaal | Qw12  | 1.48   | 1.48  | 0.000  | 0.000 | 0.0      | 0.2      | 0.0      |

**REACTIES**

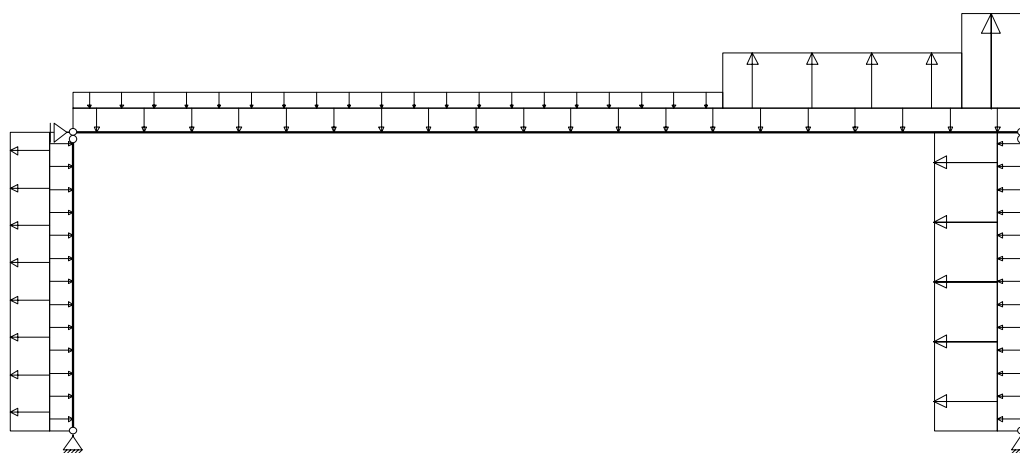
1e orde

B.G:9 Wind van rechts overdruk A

| Kn. | X      | Z      | M                        |
|-----|--------|--------|--------------------------|
| 1   | 6.51   | -13.34 |                          |
| 2   | 5.58   | -21.46 |                          |
| 3   | 12.10  |        |                          |
|     | 24.19  | -34.80 | : Som van de reacties    |
|     | -24.19 | 34.80  | : Som van de belastingen |

**BELASTINGEN**

B.G:10 Wind van rechts onderdruk B

**STAAFBELASTINGEN**

B.G:10 Wind van rechts onderdruk B

| StAAF | Type       | Index | q1/p/m | q2    | A      | B     | $\psi_0$ | $\psi_1$ | $\psi_2$ |
|-------|------------|-------|--------|-------|--------|-------|----------|----------|----------|
| 1     | 1:QZLokaal | Qw1   | -0.89  | -0.89 | 0.000  | 0.000 | 0.0      | 0.2      | 0.0      |
| 3     | 1:QZLokaal | Qw1   | -0.89  | -0.89 | 0.000  | 0.000 | 0.0      | 0.2      | 0.0      |
| 2     | 1:QZLokaal | Qw2   | 0.89   | 0.89  | 0.000  | 0.000 | 0.0      | 0.2      | 0.0      |
| 2     | 1:QZLokaal | Qw11  | 2.36   | 2.36  | 0.000  | 0.000 | 0.0      | 0.2      | 0.0      |
| 3     | 1:QZLokaal |       | 0.00   | 0.00  | 18.740 | 0.000 | 0.0      | 0.2      | 0.0      |
| 3     | 1:QZLokaal | Qw4   | 3.54   | 3.54  | 18.740 | 0.000 | 0.0      | 0.2      | 0.0      |
| 3     | 1:QZLokaal | Qw5   | 2.07   | 2.07  | 13.700 | 1.260 | 0.0      | 0.2      | 0.0      |
| 3     | 1:QZLokaal | Qw10  | -0.59  | -0.59 | 0.000  | 6.300 | 0.0      | 0.2      | 0.0      |
| 1     | 1:QZLokaal | Qw12  | 1.48   | 1.48  | 0.000  | 0.000 | 0.0      | 0.2      | 0.0      |

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**REACTIES**

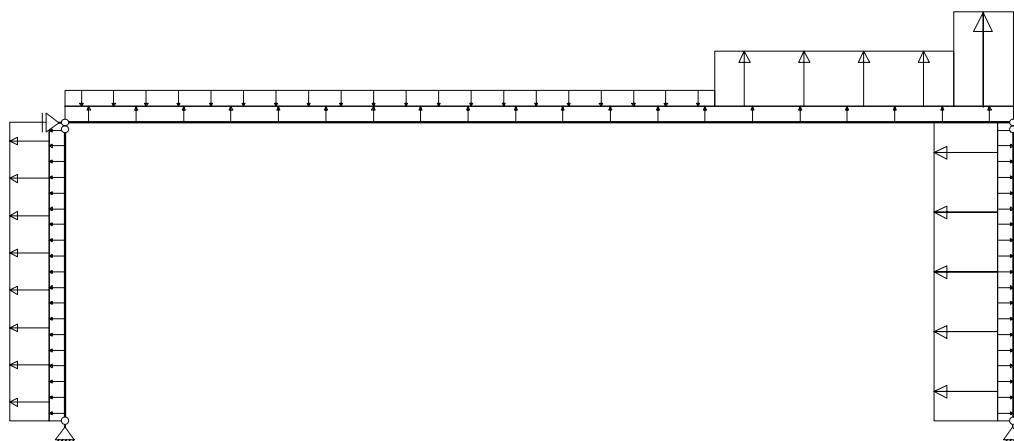
1e orde

B.G:10 Wind van rechts onderdruk B

| Kn. | X      | Z      | M                        |
|-----|--------|--------|--------------------------|
| 1   | 1.86   | 12.07  |                          |
| 2   | 10.24  | -1.14  |                          |
| 3   | 12.10  |        |                          |
|     | 24.19  | 10.93  | : Som van de reacties    |
|     | -24.19 | -10.93 | : Som van de belastingen |

**BELASTINGEN**

B.G:11 Wind van rechts overdruk B

**STAAFBELASTINGEN**

B.G:11 Wind van rechts overdruk B

| Staat | Type       | Index | q1/p/m | q2    | A      | B     | $\psi_0$ | $\psi_1$ | $\psi_2$ |
|-------|------------|-------|--------|-------|--------|-------|----------|----------|----------|
| 1     | 1:QZLokaal | Qw8   | 0.59   | 0.59  | 0.000  | 0.000 | 0.0      | 0.2      | 0.0      |
| 3     | 1:QZLokaal | Qw8   | 0.59   | 0.59  | 0.000  | 0.000 | 0.0      | 0.2      | 0.0      |
| 2     | 1:QZLokaal | Qw9   | -0.59  | -0.59 | 0.000  | 0.000 | 0.0      | 0.2      | 0.0      |
| 2     | 1:QZLokaal | Qw11  | 2.36   | 2.36  | 0.000  | 0.000 | 0.0      | 0.2      | 0.0      |
| 3     | 1:QZLokaal |       | 0.00   | 0.00  | 18.740 | 0.000 | 0.0      | 0.2      | 0.0      |
| 3     | 1:QZLokaal | Qw4   | 3.54   | 3.54  | 18.740 | 0.000 | 0.0      | 0.2      | 0.0      |
| 3     | 1:QZLokaal | Qw5   | 2.07   | 2.07  | 13.700 | 1.260 | 0.0      | 0.2      | 0.0      |
| 3     | 1:QZLokaal | Qw10  | -0.59  | -0.59 | 0.000  | 6.300 | 0.0      | 0.2      | 0.0      |
| 1     | 1:QZLokaal | Qw12  | 1.48   | 1.48  | 0.000  | 0.000 | 0.0      | 0.2      | 0.0      |

**REACTIES**

1e orde

B.G:11 Wind van rechts overdruk B

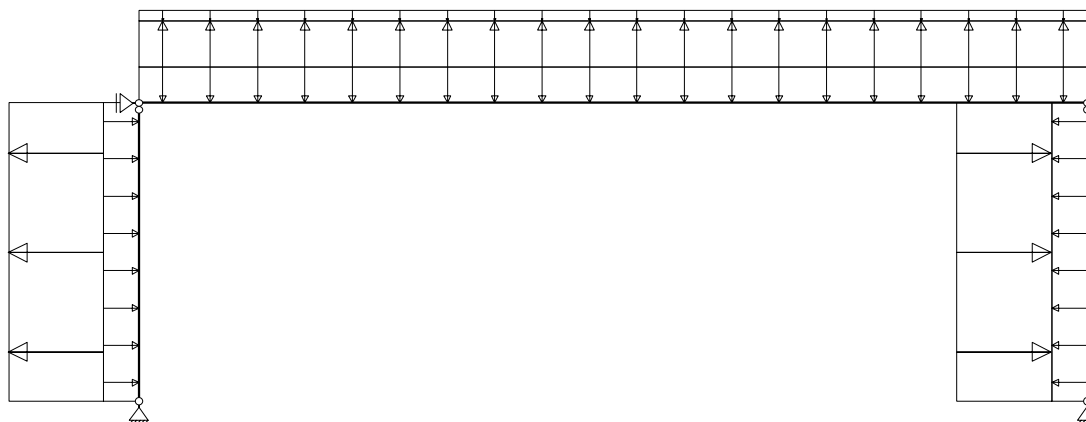
| Kn. | X      | Z      | M                        |
|-----|--------|--------|--------------------------|
| 1   | 6.51   | -2.70  |                          |
| 2   | 5.58   | -15.91 |                          |
| 3   | 12.10  |        |                          |
|     | 24.19  | -18.61 | : Som van de reacties    |
|     | -24.19 | 18.61  | : Som van de belastingen |

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**BELASTINGEN**

B.G:12 Wind loodrecht onderdruk A

**STAAFBELASTINGEN**

B.G:12 Wind loodrecht onderdruk A

| Staad | Type       | Index | q1/p/m | q2    | A     | B     | $\psi_0$ | $\psi_1$ | $\psi_2$ |
|-------|------------|-------|--------|-------|-------|-------|----------|----------|----------|
| 1     | 1:QZLokaal | Qw1   | -0.89  | -0.89 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 3     | 1:QZLokaal | Qw1   | -0.89  | -0.89 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 2     | 1:QZLokaal | Qw2   | 0.89   | 0.89  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 1     | 1:QZLokaal | Qw13  | 2.36   | 2.36  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 2     | 1:QZLokaal | Qw14  | -2.36  | -2.36 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 3     | 1:QZLokaal | Qw15  | 1.16   | 1.16  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 3     | 1:QZLokaal | Qw16  | -0.26  | -0.26 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |

**REACTIES**

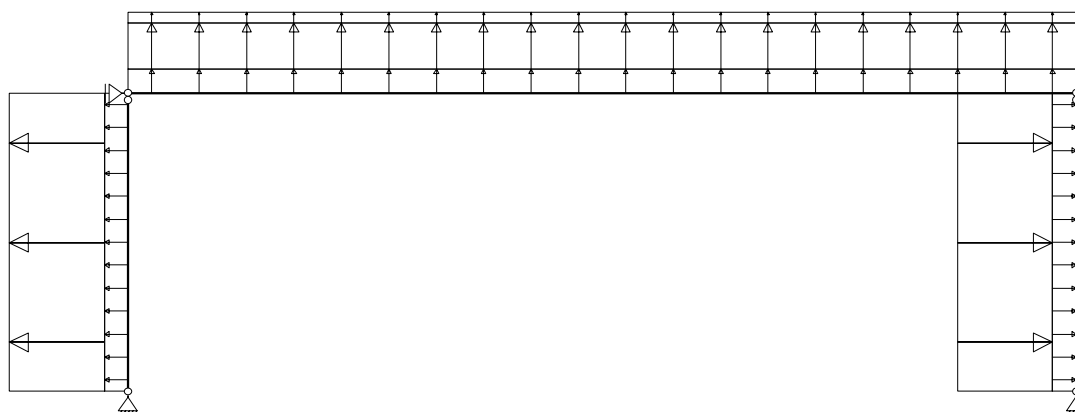
1e orde

B.G:12 Wind loodrecht onderdruk A

| Kn. | X     | Z     | M                        |
|-----|-------|-------|--------------------------|
| 1   | 4.65  | -0.12 |                          |
| 2   | -4.65 | -0.12 |                          |
| 3   | 0.00  |       |                          |
|     | 0.00  | -0.24 | : Som van de reacties    |
|     | 0.00  | 0.24  | : Som van de belastingen |

**BELASTINGEN**

B.G:13 Wind loodrecht overdruk A



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Onderdeel: Spant 14 en 19

**STAAFBELASTINGEN**

B.G:13 Wind loodrecht overdruk A

| Staaftype    | Index | q1/p/m | q2    | A     | B     | $\Psi_0$ | $\Psi_1$ | $\Psi_2$ |
|--------------|-------|--------|-------|-------|-------|----------|----------|----------|
| 1 1:QZLokaal | Qw8   | 0.59   | 0.59  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 3 1:QZLokaal | Qw8   | 0.59   | 0.59  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 2 1:QZLokaal | Qw9   | -0.59  | -0.59 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 1 1:QZLokaal | Qw13  | 2.36   | 2.36  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 2 1:QZLokaal | Qw14  | -2.36  | -2.36 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 3 1:QZLokaal | Qw15  | 1.16   | 1.16  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 3 1:QZLokaal | Qw17  | 0.26   | 0.26  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |

**REACTIES**

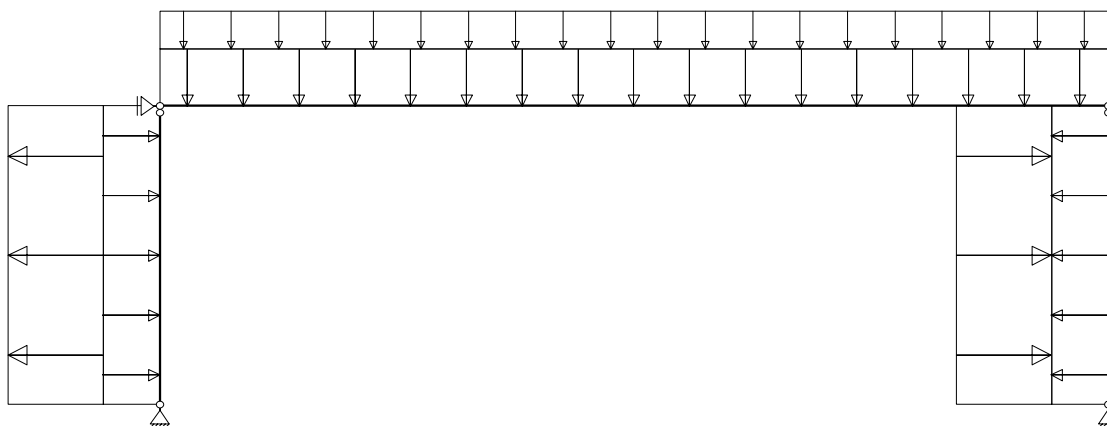
1e orde

B.G:13 Wind loodrecht overdruk A

| Kn. | X     | Z      | M                        |
|-----|-------|--------|--------------------------|
| 1   | 9.31  | -20.09 |                          |
| 2   | -9.31 | -20.09 |                          |
| 3   | 0.00  |        |                          |
|     | 0.00  | -40.17 | : Som van de reacties    |
|     | 0.00  | 40.17  | : Som van de belastingen |

**BELASTINGEN**

B.G:14 Wind loodrecht onderdruk B

**STAAFBELASTINGEN**

B.G:14 Wind loodrecht onderdruk B

| Staaftype    | Index | q1/p/m | q2    | A     | B     | $\Psi_0$ | $\Psi_1$ | $\Psi_2$ |
|--------------|-------|--------|-------|-------|-------|----------|----------|----------|
| 1 1:QZLokaal | Qw1   | -0.89  | -0.89 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 3 1:QZLokaal | Qw1   | -0.89  | -0.89 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 2 1:QZLokaal | Qw2   | 0.89   | 0.89  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 1 1:QZLokaal | Qw18  | 1.48   | 1.48  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 2 1:QZLokaal | Qw19  | -1.48  | -1.48 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 3 1:QZLokaal | Qw10  | -0.59  | -0.59 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |

**REACTIES**

1e orde

B.G:14 Wind loodrecht onderdruk B

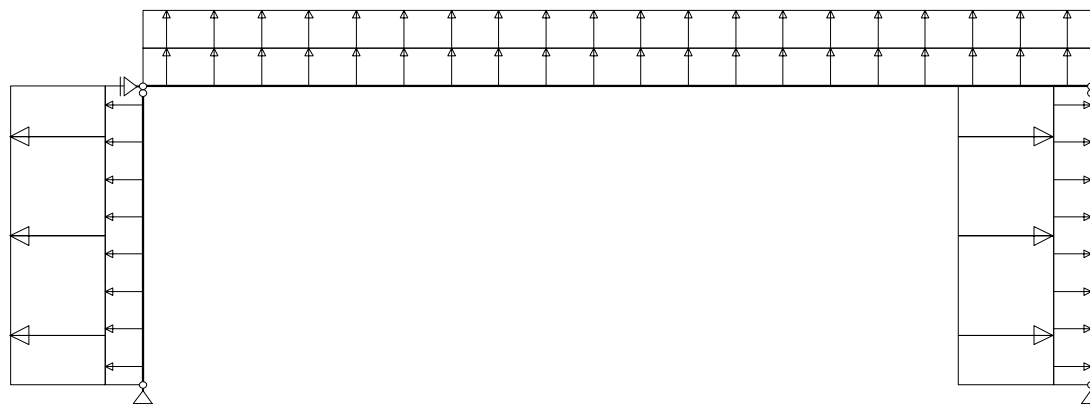
| Kn. | X     | Z      | M                        |
|-----|-------|--------|--------------------------|
| 1   | 1.86  | 14.77  |                          |
| 2   | -1.86 | 14.77  |                          |
| 3   | 0.00  |        |                          |
|     | 0.00  | 29.54  | : Som van de reacties    |
|     | 0.00  | -29.54 | : Som van de belastingen |

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**BELASTINGEN**

B.G:15 Wind loodrecht overdruk B

**STAAFBELASTINGEN**

B.G:15 Wind loodrecht overdruk B

| Staat | Type       | Index | q1/p/m | q2    | A     | B     | $\psi_0$ | $\psi_1$ | $\psi_2$ |
|-------|------------|-------|--------|-------|-------|-------|----------|----------|----------|
| 1     | 1:QZLokaal | Qw8   | 0.59   | 0.59  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 3     | 1:QZLokaal | Qw8   | 0.59   | 0.59  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 2     | 1:QZLokaal | Qw9   | -0.59  | -0.59 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 1     | 1:QZLokaal | Qw18  | 1.48   | 1.48  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 2     | 1:QZLokaal | Qw19  | -1.48  | -1.48 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 3     | 1:QZLokaal | Qw6   | 0.59   | 0.59  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |

**REACTIES**

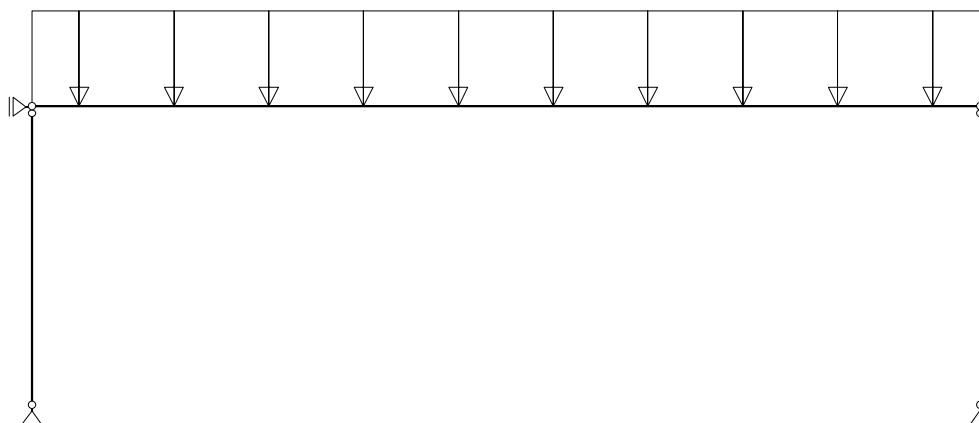
1e orde

B.G:15 Wind loodrecht overdruk B

| Kn. | X     | Z      | M                        |
|-----|-------|--------|--------------------------|
| 1   | 6.51  | -11.82 |                          |
| 2   | -6.51 | -11.82 |                          |
| 3   | 0.00  |        |                          |
|     | 0.00  | -23.63 | : Som van de reacties    |
|     | 0.00  | 23.63  | : Som van de belastingen |

**BELASTINGEN**

B.G:16 Sneeuw A



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**STAAFBELASTINGEN**

B.G:16 Sneeuw A

| Staaft Type   | Index | q1/p/m | q2    | A     | B     | $\Psi_0$ | $\Psi_1$ | $\Psi_2$ |
|---------------|-------|--------|-------|-------|-------|----------|----------|----------|
| 3 3:QZgeProj. | Qs1   | -2.80  | -2.80 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |

**REACTIES**

1e orde

B.G:16 Sneeuw A

| Kn. | X    | Z      | M                        |
|-----|------|--------|--------------------------|
| 1   | 0.00 | 28.00  |                          |
| 2   | 0.00 | 28.00  |                          |
| 3   | 0.00 |        |                          |
|     | 0.00 | 56.00  | : Som van de reacties    |
|     | 0.00 | -56.00 | : Som van de belastingen |

**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 |
| 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 |

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**BEREKENINGSTATUS**

Controlerende berekening

B.C. Iteratie Status

|    |                          |
|----|--------------------------|
| 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 |
| 50 | 3 Nauwkeurigheid bereikt |
| 51 | 3 Nauwkeurigheid bereikt |
| 52 | 3 Nauwkeurigheid bereikt |
| 53 | 3 Nauwkeurigheid bereikt |
| 54 | 3 Nauwkeurigheid bereikt |
| 55 | 3 Nauwkeurigheid bereikt |
| 56 | 3 Nauwkeurigheid bereikt |
| 57 | 3 Nauwkeurigheid bereikt |
| 58 | 3 Nauwkeurigheid bereikt |
| 59 | 3 Nauwkeurigheid bereikt |
| 60 | 3 Nauwkeurigheid bereikt |
| 61 | 3 Nauwkeurigheid bereikt |
| 62 | 3 Nauwkeurigheid bereikt |
| 63 | 3 Nauwkeurigheid bereikt |

**BELASTINGCOMBINATIES**

| BC Type | BG | Gen. | Factor | BG | Gen. | Factor | BG | Gen. | Factor | BG | Gen. | Factor |
|---------|----|------|--------|----|------|--------|----|------|--------|----|------|--------|
|---------|----|------|--------|----|------|--------|----|------|--------|----|------|--------|

|          |   |      |      |    |      |      |  |  |  |  |  |  |
|----------|---|------|------|----|------|------|--|--|--|--|--|--|
| 1 Fund.  | 1 | Perm | 1.22 |    |      |      |  |  |  |  |  |  |
| 2 Fund.  | 1 | Perm | 0.90 |    |      |      |  |  |  |  |  |  |
| 3 Fund.  | 1 | Perm | 1.08 | 2  | Extr | 1.35 |  |  |  |  |  |  |
| 4 Fund.  | 1 | Perm | 1.08 | 3  | Extr | 1.35 |  |  |  |  |  |  |
| 5 Fund.  | 1 | Perm | 1.08 | 4  | Extr | 1.35 |  |  |  |  |  |  |
| 6 Fund.  | 1 | Perm | 1.08 | 5  | Extr | 1.35 |  |  |  |  |  |  |
| 7 Fund.  | 1 | Perm | 1.08 | 6  | Extr | 1.35 |  |  |  |  |  |  |
| 8 Fund.  | 1 | Perm | 1.08 | 7  | Extr | 1.35 |  |  |  |  |  |  |
| 9 Fund.  | 1 | Perm | 1.08 | 8  | Extr | 1.35 |  |  |  |  |  |  |
| 10 Fund. | 1 | Perm | 1.08 | 9  | Extr | 1.35 |  |  |  |  |  |  |
| 11 Fund. | 1 | Perm | 1.08 | 10 | Extr | 1.35 |  |  |  |  |  |  |
| 12 Fund. | 1 | Perm | 1.08 | 11 | Extr | 1.35 |  |  |  |  |  |  |
| 13 Fund. | 1 | Perm | 1.08 | 12 | Extr | 1.35 |  |  |  |  |  |  |
| 14 Fund. | 1 | Perm | 1.08 | 13 | Extr | 1.35 |  |  |  |  |  |  |
| 15 Fund. | 1 | Perm | 1.08 | 14 | Extr | 1.35 |  |  |  |  |  |  |
| 16 Fund. | 1 | Perm | 1.08 | 15 | Extr | 1.35 |  |  |  |  |  |  |
| 17 Fund. | 1 | Perm | 1.08 | 16 | Extr | 1.35 |  |  |  |  |  |  |

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**BELASTINGCOMBINATIES**

| BC Type  | BG | Gen. | Factor | BG      | Gen. | Factor | BG | Gen. | Factor | BG | Gen. | Factor |
|----------|----|------|--------|---------|------|--------|----|------|--------|----|------|--------|
| 18 Fund. | 1  | Perm | 0.90   | 2 Extr  | 1.35 |        |    |      |        |    |      |        |
| 19 Fund. | 1  | Perm | 0.90   | 3 Extr  | 1.35 |        |    |      |        |    |      |        |
| 20 Fund. | 1  | Perm | 0.90   | 4 Extr  | 1.35 |        |    |      |        |    |      |        |
| 21 Fund. | 1  | Perm | 0.90   | 5 Extr  | 1.35 |        |    |      |        |    |      |        |
| 22 Fund. | 1  | Perm | 0.90   | 6 Extr  | 1.35 |        |    |      |        |    |      |        |
| 23 Fund. | 1  | Perm | 0.90   | 7 Extr  | 1.35 |        |    |      |        |    |      |        |
| 24 Fund. | 1  | Perm | 0.90   | 8 Extr  | 1.35 |        |    |      |        |    |      |        |
| 25 Fund. | 1  | Perm | 0.90   | 9 Extr  | 1.35 |        |    |      |        |    |      |        |
| 26 Fund. | 1  | Perm | 0.90   | 10 Extr | 1.35 |        |    |      |        |    |      |        |
| 27 Fund. | 1  | Perm | 0.90   | 11 Extr | 1.35 |        |    |      |        |    |      |        |
| 28 Fund. | 1  | Perm | 0.90   | 12 Extr | 1.35 |        |    |      |        |    |      |        |
| 29 Fund. | 1  | Perm | 0.90   | 13 Extr | 1.35 |        |    |      |        |    |      |        |
| 30 Fund. | 1  | Perm | 0.90   | 14 Extr | 1.35 |        |    |      |        |    |      |        |
| 31 Fund. | 1  | Perm | 0.90   | 15 Extr | 1.35 |        |    |      |        |    |      |        |
| 32 Fund. | 1  | Perm | 0.90   | 16 Extr | 1.35 |        |    |      |        |    |      |        |
| 33 Kar.  | 1  | Perm | 1.00   | 2 Extr  | 1.00 |        |    |      |        |    |      |        |
| 34 Kar.  | 1  | Perm | 1.00   | 3 Extr  | 1.00 |        |    |      |        |    |      |        |
| 35 Kar.  | 1  | Perm | 1.00   | 4 Extr  | 1.00 |        |    |      |        |    |      |        |
| 36 Kar.  | 1  | Perm | 1.00   | 5 Extr  | 1.00 |        |    |      |        |    |      |        |
| 37 Kar.  | 1  | Perm | 1.00   | 6 Extr  | 1.00 |        |    |      |        |    |      |        |
| 38 Kar.  | 1  | Perm | 1.00   | 7 Extr  | 1.00 |        |    |      |        |    |      |        |
| 39 Kar.  | 1  | Perm | 1.00   | 8 Extr  | 1.00 |        |    |      |        |    |      |        |
| 40 Kar.  | 1  | Perm | 1.00   | 9 Extr  | 1.00 |        |    |      |        |    |      |        |
| 41 Kar.  | 1  | Perm | 1.00   | 10 Extr | 1.00 |        |    |      |        |    |      |        |
| 42 Kar.  | 1  | Perm | 1.00   | 11 Extr | 1.00 |        |    |      |        |    |      |        |
| 43 Kar.  | 1  | Perm | 1.00   | 12 Extr | 1.00 |        |    |      |        |    |      |        |
| 44 Kar.  | 1  | Perm | 1.00   | 13 Extr | 1.00 |        |    |      |        |    |      |        |
| 45 Kar.  | 1  | Perm | 1.00   | 14 Extr | 1.00 |        |    |      |        |    |      |        |
| 46 Kar.  | 1  | Perm | 1.00   | 15 Extr | 1.00 |        |    |      |        |    |      |        |
| 47 Kar.  | 1  | Perm | 1.00   | 16 Extr | 1.00 |        |    |      |        |    |      |        |
| 48 Quas. | 1  | Perm | 1.00   |         |      |        |    |      |        |    |      |        |
| 49 Freq. | 1  | Perm | 1.00   |         |      |        |    |      |        |    |      |        |
| 50 Freq. | 1  | Perm | 1.00   | 4 psi1  | 1.00 |        |    |      |        |    |      |        |
| 51 Freq. | 1  | Perm | 1.00   | 5 psi1  | 1.00 |        |    |      |        |    |      |        |
| 52 Freq. | 1  | Perm | 1.00   | 6 psi1  | 1.00 |        |    |      |        |    |      |        |
| 53 Freq. | 1  | Perm | 1.00   | 7 psi1  | 1.00 |        |    |      |        |    |      |        |
| 54 Freq. | 1  | Perm | 1.00   | 8 psi1  | 1.00 |        |    |      |        |    |      |        |
| 55 Freq. | 1  | Perm | 1.00   | 9 psi1  | 1.00 |        |    |      |        |    |      |        |
| 56 Freq. | 1  | Perm | 1.00   | 10 psi1 | 1.00 |        |    |      |        |    |      |        |
| 57 Freq. | 1  | Perm | 1.00   | 11 psi1 | 1.00 |        |    |      |        |    |      |        |
| 58 Freq. | 1  | Perm | 1.00   | 12 psi1 | 1.00 |        |    |      |        |    |      |        |
| 59 Freq. | 1  | Perm | 1.00   | 13 psi1 | 1.00 |        |    |      |        |    |      |        |
| 60 Freq. | 1  | Perm | 1.00   | 14 psi1 | 1.00 |        |    |      |        |    |      |        |
| 61 Freq. | 1  | Perm | 1.00   | 15 psi1 | 1.00 |        |    |      |        |    |      |        |
| 62 Freq. | 1  | Perm | 1.00   | 16 psi1 | 1.00 |        |    |      |        |    |      |        |
| 63 Blij. | 1  | Perm | 1.00   |         |      |        |    |      |        |    |      |        |

**GUNSTIGE WERKING PERMANENTE BELASTINGEN**

BC Staven met gunstige werking

- 1 Geen
- 2 Alle staven de factor:0.90
- 3 Geen
- 4 Geen
- 5 Geen



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**GUNSTIGE WERKING PERMANENTE BELASTINGEN**

## BC Staven met gunstige werking

6 Geen  
 7 Geen  
 8 Geen  
 9 Geen  
 10 Geen  
 11 Geen  
 12 Geen  
 13 Geen  
 14 Geen  
 15 Geen  
 16 Geen  
 17 Geen  
 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  
 25 Alle staven de factor:0.90  
 26 Alle staven de factor:0.90  
 27 Alle staven de factor:0.90  
 28 Alle staven de factor:0.90  
 29 Alle staven de factor:0.90  
 30 Alle staven de factor:0.90  
 31 Alle staven de factor:0.90  
 32 Alle staven de factor:0.90

**REACTIES** 2e orde B.C:1 Fundamenteel B (6.10a)

| Kn. | X     | Z      | M                        |
|-----|-------|--------|--------------------------|
| 1   | 0.00  | 34.17  |                          |
| 2   | -0.00 | 34.17  |                          |
| 3   | 0.00  |        |                          |
|     | 0.00  | 68.33  | : Som van de reacties    |
|     | 0.00  | -68.33 | : Som van de belastingen |

**REACTIES** 2e orde B.C:2 Fundamenteel B (6.10a)

| Kn. | X     | Z      | M                        |
|-----|-------|--------|--------------------------|
| 1   | 0.00  | 25.31  |                          |
| 2   | -0.00 | 25.31  |                          |
| 3   | 0.00  |        |                          |
|     | 0.00  | 50.62  | : Som van de reacties    |
|     | 0.00  | -50.62 | : Som van de belastingen |

**REACTIES** 2e orde B.C:3 Fundamenteel B (6.10b)

| Kn. | X     | Z      | M                        |
|-----|-------|--------|--------------------------|
| 1   | 0.00  | 37.12  |                          |
| 2   | -0.00 | 37.12  |                          |
| 3   | 0.00  |        |                          |
|     | 0.00  | 74.24  | : Som van de reacties    |
|     | 0.00  | -74.24 | : Som van de belastingen |

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| <b>REACTIES</b> |       | 2e orde | B.C:4 Fundamenteel B (6.10b) |  |
|-----------------|-------|---------|------------------------------|--|
| Kn.             | X     | Z       | M                            |  |
| 1               | 0.00  | 31.38   |                              |  |
| 2               | -0.00 | 31.38   |                              |  |
| 3               | 0.00  |         |                              |  |
|                 | 0.00  | 62.77   | : Som van de reacties        |  |
|                 | 0.00  | -62.77  | : Som van de belastingen     |  |

| <b>REACTIES</b> |        | 2e orde | B.C:5 Fundamenteel B (6.10b) |  |
|-----------------|--------|---------|------------------------------|--|
| Kn.             | X      | Z       | M                            |  |
| 1               | -13.81 | 21.34   |                              |  |
| 2               | -2.51  | 32.30   |                              |  |
| 3               | -16.45 |         |                              |  |
|                 | -32.77 | 53.64   | : Som van de reacties        |  |
|                 | 32.77  | -53.64  | : Som van de belastingen     |  |

| <b>REACTIES</b> |        | 2e orde | B.C:6 Fundamenteel B (6.10b) |  |
|-----------------|--------|---------|------------------------------|--|
| Kn.             | X      | Z       | M                            |  |
| 1               | -7.53  | 1.40    |                              |  |
| 2               | -8.79  | 12.36   |                              |  |
| 3               | -16.37 |         |                              |  |
|                 | -32.69 | 13.76   | : Som van de reacties        |  |
|                 | 32.69  | -13.76  | : Som van de belastingen     |  |

| <b>REACTIES</b> |        | 2e orde | B.C:7 Fundamenteel B (6.10b) |  |
|-----------------|--------|---------|------------------------------|--|
| Kn.             | X      | Z       | M                            |  |
| 1               | -13.81 | 28.83   |                              |  |
| 2               | -2.52  | 46.67   |                              |  |
| 3               | -16.61 |         |                              |  |
|                 | -32.93 | 75.49   | : Som van de reacties        |  |
|                 | 32.93  | -75.49  | : Som van de belastingen     |  |

| <b>REACTIES</b> |        | 2e orde | B.C:8 Fundamenteel B (6.10b) |  |
|-----------------|--------|---------|------------------------------|--|
| Kn.             | X      | Z       | M                            |  |
| 1               | -7.53  | 8.89    |                              |  |
| 2               | -8.79  | 26.73   |                              |  |
| 3               | -16.47 |         |                              |  |
|                 | -32.80 | 35.62   | : Som van de reacties        |  |
|                 | 32.80  | -35.62  | : Som van de belastingen     |  |

| <b>REACTIES</b> |        | 2e orde | B.C:9 Fundamenteel B (6.10b) |  |
|-----------------|--------|---------|------------------------------|--|
| Kn.             | X      | Z       | M                            |  |
| 1               | 2.51   | 32.30   |                              |  |
| 2               | 13.81  | 21.34   |                              |  |
| 3               | 16.46  |         |                              |  |
|                 | 32.77  | 53.64   | : Som van de reacties        |  |
|                 | -32.77 | -53.64  | : Som van de belastingen     |  |

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| <b>REACTIES</b> |        | 2e orde | B.C:10 Fundamenteel B (6.10b) |  |
|-----------------|--------|---------|-------------------------------|--|
| Kn.             | X      | Z       | M                             |  |
| 1               | 8.79   | 12.36   |                               |  |
| 2               | 7.53   | 1.40    |                               |  |
| 3               | 16.37  |         |                               |  |
|                 | 32.69  | 13.76   | : Som van de reacties         |  |
|                 | -32.69 | -13.76  | : Som van de belastingen      |  |

| <b>REACTIES</b> |        | 2e orde | B.C:11 Fundamenteel B (6.10b) |  |
|-----------------|--------|---------|-------------------------------|--|
| Kn.             | X      | Z       | M                             |  |
| 1               | 2.51   | 46.67   |                               |  |
| 2               | 13.80  | 28.83   |                               |  |
| 3               | 16.62  |         |                               |  |
|                 | 32.94  | 75.50   | : Som van de reacties         |  |
|                 | -32.94 | -75.50  | : Som van de belastingen      |  |

| <b>REACTIES</b> |        | 2e orde | B.C:12 Fundamenteel B (6.10b) |  |
|-----------------|--------|---------|-------------------------------|--|
| Kn.             | X      | Z       | M                             |  |
| 1               | 8.79   | 26.73   |                               |  |
| 2               | 7.53   | 8.89    |                               |  |
| 3               | 16.48  |         |                               |  |
|                 | 32.80  | 35.62   | : Som van de reacties         |  |
|                 | -32.80 | -35.62  | : Som van de belastingen      |  |

| <b>REACTIES</b> |       | 2e orde | B.C:13 Fundamenteel B (6.10b) |  |
|-----------------|-------|---------|-------------------------------|--|
| Kn.             | X     | Z       | M                             |  |
| 1               | 6.28  | 30.21   |                               |  |
| 2               | -6.28 | 30.21   |                               |  |
| 3               | 0.00  |         |                               |  |
|                 | 0.00  | 60.42   | : Som van de reacties         |  |
|                 | -0.00 | -60.42  | : Som van de belastingen      |  |

| <b>REACTIES</b> |        | 2e orde | B.C:14 Fundamenteel B (6.10b) |  |
|-----------------|--------|---------|-------------------------------|--|
| Kn.             | X      | Z       | M                             |  |
| 1               | 12.55  | 3.25    |                               |  |
| 2               | -12.55 | 3.25    |                               |  |
| 3               | -0.00  |         |                               |  |
|                 | -0.00  | 6.51    | : Som van de reacties         |  |
|                 | 0.00   | -6.51   | : Som van de belastingen      |  |

| <b>REACTIES</b> |       | 2e orde | B.C:15 Fundamenteel B (6.10b) |  |
|-----------------|-------|---------|-------------------------------|--|
| Kn.             | X     | Z       | M                             |  |
| 1               | 2.51  | 50.31   |                               |  |
| 2               | -2.52 | 50.31   |                               |  |
| 3               | 0.01  |         |                               |  |
|                 | 0.00  | 100.62  | : Som van de reacties         |  |
|                 | -0.00 | -100.62 | : Som van de belastingen      |  |

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| <b>REACTIES</b> |       | 2e orde | B.C:16 Fundamenteel B (6.10b) |  |
|-----------------|-------|---------|-------------------------------|--|
| Kn.             | X     | Z       | M                             |  |
| 1               | 8.79  | 14.42   |                               |  |
| 2               | -8.79 | 14.42   |                               |  |
| 3               | 0.00  |         |                               |  |
|                 | -0.00 | 28.84   | : Som van de reacties         |  |
|                 | 0.00  | -28.84  | : Som van de belastingen      |  |

| <b>REACTIES</b> |       | 2e orde | B.C:17 Fundamenteel B (6.10b) |  |
|-----------------|-------|---------|-------------------------------|--|
| Kn.             | X     | Z       | M                             |  |
| 1               | 0.00  | 68.17   |                               |  |
| 2               | -0.02 | 68.17   |                               |  |
| 3               | 0.02  |         |                               |  |
|                 | 0.00  | 136.34  | : Som van de reacties         |  |
|                 | 0.00  | -136.34 | : Som van de belastingen      |  |

| <b>REACTIES</b> |       | 2e orde | B.C:18 Fundamenteel B (6.10b) |  |
|-----------------|-------|---------|-------------------------------|--|
| Kn.             | X     | Z       | M                             |  |
| 1               | 0.00  | 32.06   |                               |  |
| 2               | -0.00 | 32.06   |                               |  |
| 3               | 0.00  |         |                               |  |
|                 | 0.00  | 64.12   | : Som van de reacties         |  |
|                 | 0.00  | -64.12  | : Som van de belastingen      |  |

| <b>REACTIES</b> |       | 2e orde | B.C:19 Fundamenteel B (6.10b) |  |
|-----------------|-------|---------|-------------------------------|--|
| Kn.             | X     | Z       | M                             |  |
| 1               | 0.00  | 26.32   |                               |  |
| 2               | -0.00 | 26.32   |                               |  |
| 3               | 0.00  |         |                               |  |
|                 | 0.00  | 52.64   | : Som van de reacties         |  |
|                 | 0.00  | -52.64  | : Som van de belastingen      |  |

| <b>REACTIES</b> |        | 2e orde | B.C:20 Fundamenteel B (6.10b) |  |
|-----------------|--------|---------|-------------------------------|--|
| Kn.             | X      | Z       | M                             |  |
| 1               | -13.81 | 16.28   |                               |  |
| 2               | -2.51  | 27.24   |                               |  |
| 3               | -16.43 |         |                               |  |
|                 | -32.75 | 43.52   | : Som van de reacties         |  |
|                 | 32.75  | -43.52  | : Som van de belastingen      |  |

| <b>REACTIES</b> |        | 2e orde | B.C:21 Fundamenteel B (6.10b) |  |
|-----------------|--------|---------|-------------------------------|--|
| Kn.             | X      | Z       | M                             |  |
| 1               | -7.53  | -3.66   |                               |  |
| 2               | -8.79  | 7.30    |                               |  |
| 3               | -16.35 |         |                               |  |
|                 | -32.67 | 3.64    | : Som van de reacties         |  |
|                 | 32.67  | -3.64   | : Som van de belastingen      |  |

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**REACTIES** 2e orde B.C:22 Fundamenteel B (6.10b)

| Kn. | X      | Z      | M                        |
|-----|--------|--------|--------------------------|
| 1   | -13.81 | 23.77  |                          |
| 2   | -2.52  | 41.61  |                          |
| 3   | -16.57 |        |                          |
|     | -32.90 | 65.37  | : Som van de reacties    |
|     | 32.90  | -65.37 | : Som van de belastingen |

**REACTIES** 2e orde B.C:23 Fundamenteel B (6.10b)

| Kn. | X      | Z      | M                        |
|-----|--------|--------|--------------------------|
| 1   | -7.53  | 3.83   |                          |
| 2   | -8.79  | 21.67  |                          |
| 3   | -16.44 |        |                          |
|     | -32.76 | 25.49  | : Som van de reacties    |
|     | 32.76  | -25.49 | : Som van de belastingen |

**REACTIES** 2e orde B.C:24 Fundamenteel B (6.10b)

| Kn. | X      | Z      | M                        |
|-----|--------|--------|--------------------------|
| 1   | 2.51   | 27.24  |                          |
| 2   | 13.81  | 16.28  |                          |
| 3   | 16.43  |        |                          |
|     | 32.75  | 43.52  | : Som van de reacties    |
|     | -32.75 | -43.52 | : Som van de belastingen |

**REACTIES** 2e orde B.C:25 Fundamenteel B (6.10b)

| Kn. | X      | Z     | M                        |
|-----|--------|-------|--------------------------|
| 1   | 8.79   | 7.30  |                          |
| 2   | 7.53   | -3.66 |                          |
| 3   | 16.35  |       |                          |
|     | 32.67  | 3.64  | : Som van de reacties    |
|     | -32.67 | -3.64 | : Som van de belastingen |

**REACTIES** 2e orde B.C:26 Fundamenteel B (6.10b)

| Kn. | X      | Z      | M                        |
|-----|--------|--------|--------------------------|
| 1   | 2.51   | 41.61  |                          |
| 2   | 13.81  | 23.77  |                          |
| 3   | 16.58  |        |                          |
|     | 32.90  | 65.38  | : Som van de reacties    |
|     | -32.90 | -65.38 | : Som van de belastingen |

**REACTIES** 2e orde B.C:27 Fundamenteel B (6.10b)

| Kn. | X      | Z      | M                        |
|-----|--------|--------|--------------------------|
| 1   | 8.79   | 21.67  |                          |
| 2   | 7.53   | 3.83   |                          |
| 3   | 16.44  |        |                          |
|     | 32.76  | 25.49  | : Som van de reacties    |
|     | -32.76 | -25.49 | : Som van de belastingen |

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**REACTIES** 2e orde B.C:28 Fundamenteel B (6.10b)

| Kn. | X     | Z      | M                        |
|-----|-------|--------|--------------------------|
| 1   | 6.28  | 25.15  |                          |
| 2   | -6.28 | 25.15  |                          |
| 3   | 0.00  |        |                          |
|     | 0.00  | 50.30  | : Som van de reacties    |
|     | -0.00 | -50.30 | : Som van de belastingen |

**REACTIES** 2e orde B.C:29 Fundamenteel B (6.10b)

| Kn. | X      | Z     | M                        |
|-----|--------|-------|--------------------------|
| 1   | 12.56  | -1.81 |                          |
| 2   | -12.56 | -1.81 |                          |
| 3   | 0.00   |       |                          |
|     | -0.00  | -3.62 | : Som van de reacties    |
|     | 0.00   | 3.62  | : Som van de belastingen |

**REACTIES** 2e orde B.C:30 Fundamenteel B (6.10b)

| Kn. | X     | Z      | M                        |
|-----|-------|--------|--------------------------|
| 1   | 2.51  | 45.25  |                          |
| 2   | -2.52 | 45.25  |                          |
| 3   | 0.01  |        |                          |
|     | 0.00  | 90.49  | : Som van de reacties    |
|     | -0.00 | -90.49 | : Som van de belastingen |

**REACTIES** 2e orde B.C:31 Fundamenteel B (6.10b)

| Kn. | X     | Z      | M                        |
|-----|-------|--------|--------------------------|
| 1   | 8.79  | 9.36   |                          |
| 2   | -8.79 | 9.36   |                          |
| 3   | -0.00 |        |                          |
|     | -0.00 | 18.71  | : Som van de reacties    |
|     | 0.00  | -18.71 | : Som van de belastingen |

**REACTIES** 2e orde B.C:32 Fundamenteel B (6.10b)

| Kn. | X     | Z       | M                        |
|-----|-------|---------|--------------------------|
| 1   | 0.00  | 63.11   |                          |
| 2   | -0.02 | 63.11   |                          |
| 3   | 0.02  |         |                          |
|     | 0.00  | 126.22  | : Som van de reacties    |
|     | 0.00  | -126.22 | : Som van de belastingen |

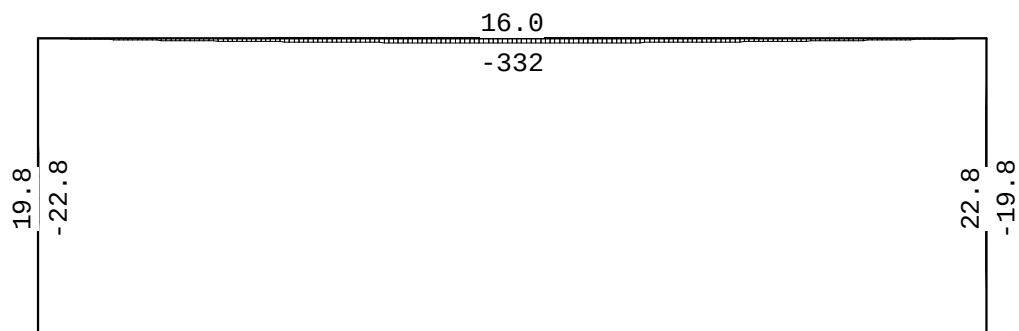
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**OMHULLENDE VAN DE FUNDAMENTELE COMBINATIES****MOMENTEN**

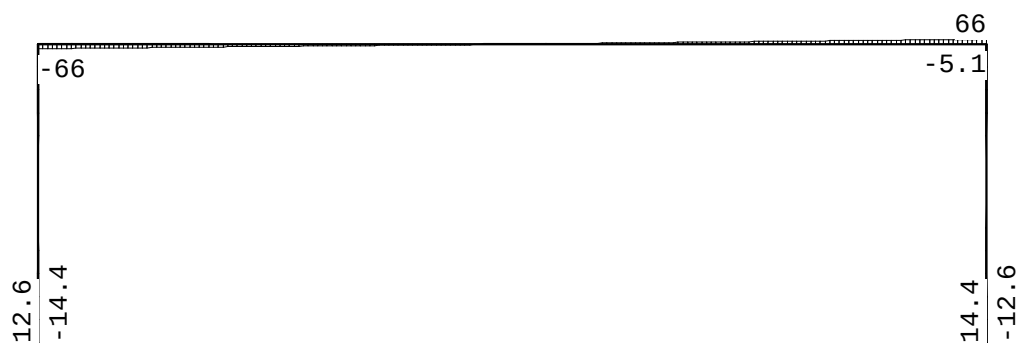
2e orde

Fundamentele combinatie

**DWARSKRACHTEN**

2e orde

Fundamentele combinatie



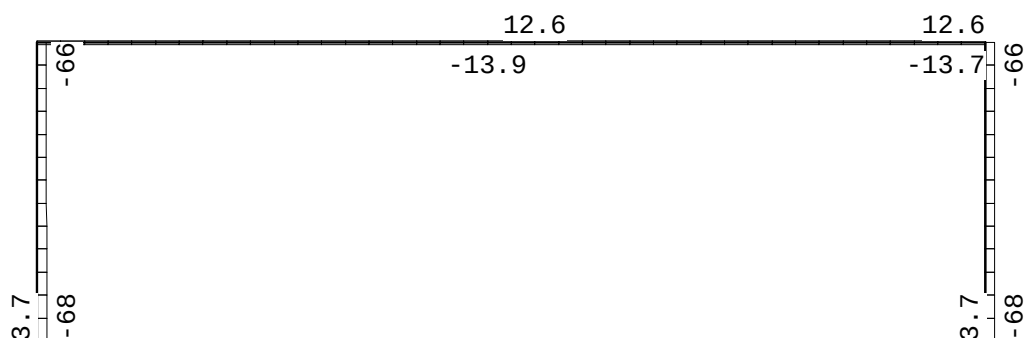
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**NORMAALKRACHTEN**

2e orde

Fundamentele combinatie

**STAAFKRACHTEN**

2e orde

Fundamentele combinatie

| St. | Kn.    | Pos. | NXi/NXj |       | DZi/DZj |       | MYi/MYj |       |
|-----|--------|------|---------|-------|---------|-------|---------|-------|
|     |        |      | Min     | Max   | Min     | Max   | Min     | Max   |
| 1   | 1      |      | -68.17  | 3.74  | -14.44  | 12.61 | -0.00   | 0.00  |
| 1   | 2.908  |      | -67.40  | 4.36  | -1.20   | 0.97  | -22.84  | 19.75 |
| 1   | 2.908  |      | -67.40  | 4.36  | -1.06   | 0.97  | -22.84  | 19.75 |
| 1   | 3.392  |      | -67.27  | 4.47  | -0.97   | 1.07  | -22.84  | 19.75 |
| 1   | 3.392  |      | -67.27  | 4.47  | -0.97   | 1.21  | -22.84  | 19.75 |
| 1   | 3      |      | -66.49  | 5.14  | -12.59  | 14.42 | 0.00    | 0.00  |
| 2   | 2      |      | -68.17  | 3.74  | -12.61  | 14.44 | -0.00   | 0.00  |
| 2   | 2.908  |      | -67.40  | 4.36  | -0.97   | 1.20  | -19.75  | 22.84 |
| 2   | 2.908  |      | -67.40  | 4.36  | -0.97   | 1.06  | -19.75  | 22.84 |
| 2   | 3.392  |      | -67.27  | 4.47  | -1.07   | 0.97  | -19.75  | 22.84 |
| 2   | 3.392  |      | -67.27  | 4.47  | -1.21   | 0.97  | -19.75  | 22.84 |
| 2   | 4      |      | -66.49  | 5.14  | -14.42  | 12.59 | 0.00    | 0.00  |
| 3   | 3      |      | -13.71  | 12.57 | -66.48  | 5.06  | -0.00   | 0.00  |
| 3   | 8.100  |      | -13.93  | 12.58 | -12.87  | 0.61  | -320.27 | 15.37 |
| 3   | 10.000 |      | -13.94  | 12.58 | -3.64   | 3.65  | -332.41 | 15.95 |
| 3   | 11.900 |      | -13.90  | 12.58 | -0.61   | 12.94 | -320.27 | 15.37 |
| 3   | 4      |      | -13.72  | 12.57 | -5.05   | 66.48 | -0.00   | 0.00  |

**REACTIES**

2e orde

Fundamentele combinatie

| Kn. | X-min  | X-max | Z-min | Z-max | M-min | M-max |
|-----|--------|-------|-------|-------|-------|-------|
| 1   | -13.81 | 12.56 | -3.66 | 68.17 |       |       |
| 2   | -12.56 | 13.81 | -3.66 | 68.17 |       |       |
| 3   | -16.61 | 16.62 |       |       |       |       |



Project...: 180114 Uitbreiding Venster Techniek

Onderdeel: Spant 14 en 19

**STAALPROFIELEN - ALGEMENE GEGEVENS**

|                                                |             |
|------------------------------------------------|-------------|
| Stabiliteit: Classificatie gehele constructie: | Ongeschoord |
| Doorbuiging en verplaatsing:                   |             |
| Aantal bouwlagen:                              | 1           |
| Gebouwtype:                                    | Overig      |
| Toel. horiz. verplaatsing gehele gebouw:       | h/300       |
| Kleinste gevelhoogte [m]:                      | 0.0         |

**MATERIAAL**

| Mat nr. | Profielnaam | Vloeisp. [N/mm <sup>2</sup> ] | Productie methode | Min. drsn. klasse |
|---------|-------------|-------------------------------|-------------------|-------------------|
| 1       | HEA140      | 235                           | Gewalst           | 1                 |
| 2       | IPE500      | 235                           | Gewalst           | 1                 |

Partiële veiligheidsfactoren:

|           |   |      |           |   |      |
|-----------|---|------|-----------|---|------|
| Gamma M;0 | : | 1.00 | Gamma M;1 | : | 1.00 |
|-----------|---|------|-----------|---|------|

**KNIKSTABILITEIT**

| Staafl | $l_{sys}$ [m] | Classif. y sterke as | $l_{knik;y}$ [m] | Extra aanp. y [kN] | Classif. z zwakke as | $l_{knik;z}$ [m] | Extra aanp. z [kN] |
|--------|---------------|----------------------|------------------|--------------------|----------------------|------------------|--------------------|
| 1      | 6.300         | Ongeschoord          | 2e orde          |                    | Geschoord            | 6.300            | 0.0                |
| 2      | 6.300         | Ongeschoord          | 2e orde          |                    | Geschoord            | 6.300            | 0.0                |
| 3      | 20.000        | Ongeschoord          | 2e orde          |                    | Geschoord            | 5.000*           | 0.0                |

\* Door gebruiker gedefinieerde kniklengte

**KIPSTABILITEIT**

| Staafl | Plts. aangr. | l gaffel [m]                 | Kipsteunafstanden [m] |
|--------|--------------|------------------------------|-----------------------|
| 1      | 1.0*h        | boven: 6.30<br>onder: 6.30   | 6,3<br>6,3            |
| 2      | 1.0*h        | boven: 6.30<br>onder: 6.30   | 6,3<br>6,3            |
| 3      | 1.0*h        | boven: 20.00<br>onder: 20.00 | 0<br>20               |

**TOETSING SPANNINGEN**

| Staafl | Mat nr. | BC | Sit | Kl | Plaats | Norm    | Artikel | Formule | Hoogste toetsing U.C. [N/mm <sup>2</sup> ] | Opm. |
|--------|---------|----|-----|----|--------|---------|---------|---------|--------------------------------------------|------|
| 1      | 1       | 7  | 1   | 1  | Staafl | EN3-1-1 | 6.3.3   | (6.62)  | 0.973 229                                  | 47   |
| 2      | 1       | 11 | 1   | 1  | Staafl | EN3-1-1 | 6.3.3   | (6.62)  | 0.871 205                                  | 47   |
| 3      | 2       | 17 | 1   | 1  | My-max | EN3-1-1 | 6.2.9.1 | (6.31)  | 0.645 152                                  |      |

Opmerkingen:

[ 47] Bij verlopende normaalkracht wordt de grootste drukkracht genomen.

**TOETSING DOORBUIGING**

| Staafl | Soort | Mtg | Lengte [m] | Overst I J | Zeeg [mm]  | $u_{tot}$ [mm] | BC | Sit  | u [mm] | Toelaatbaar [mm] | *l    |
|--------|-------|-----|------------|------------|------------|----------------|----|------|--------|------------------|-------|
| 3      | Dak   | db  | 20.00      | N N        | 50.0-112.3 | 47             | 1  | Eind | -62.3  | -80.0            | 0.004 |
|        |       | db  |            |            |            | 47             | 1  | Bijk | -57.6  | -80.0            | 0.004 |

**TOETSING HORIZONTALE VERPLAATSING**

| Staafl | BC | Sit | Lengte [m] | $u_{eind}$ [mm] | Toelaatbaar [mm] | [h/] |
|--------|----|-----|------------|-----------------|------------------|------|
| 1      | 37 | 1   | 6.300      | -32.1           | 42.0             | 150  |
| 2      | 41 | 1   | 6.300      | 32.1            | 42.0             | 150  |

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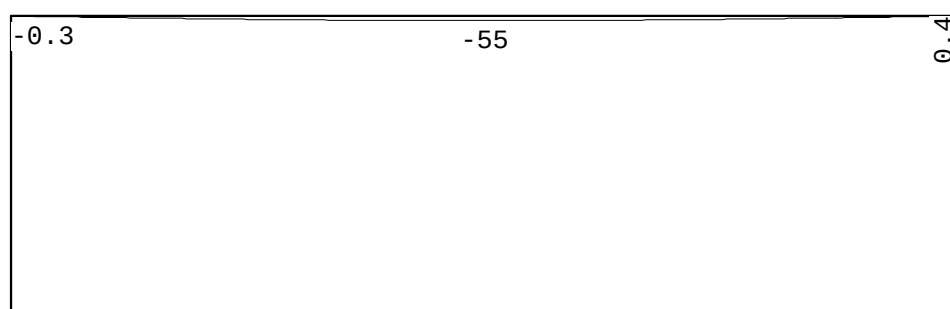
Onderdeel: Spant 14 en 19

**TOETSING HOR. VERPLAATSING GLOBAAL**

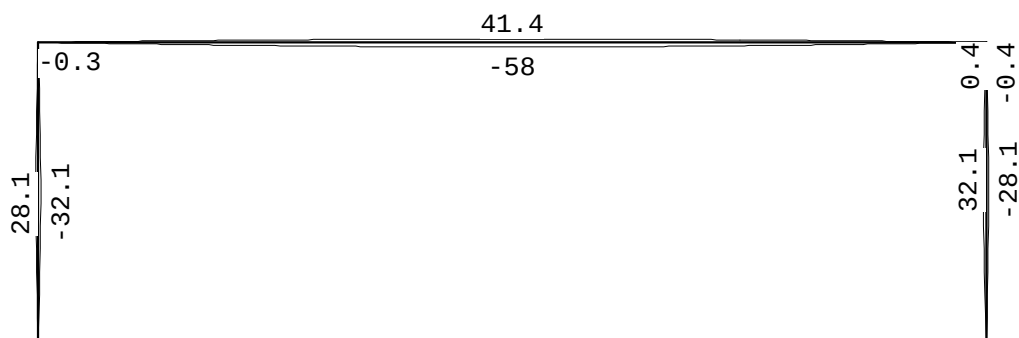
Er is een maximale horizontale verplaatsing van -0.0016 [m] gevonden bij knoop 4 en combinatie 47; belastingsituatie 1, iter:3 (combinatietype 2). Bij een hoogte van 6.300 [m] levert dit  $h/4028$  (toel.:  $h/300$ ).

**VERVORMINGEN w1**

Blijvende combinatie

**VERVORMINGEN w<sub>bij</sub>**

Karakteristieke combinatie

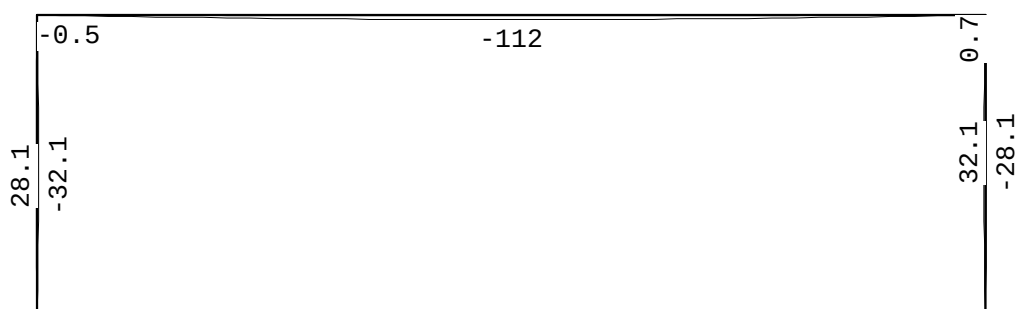


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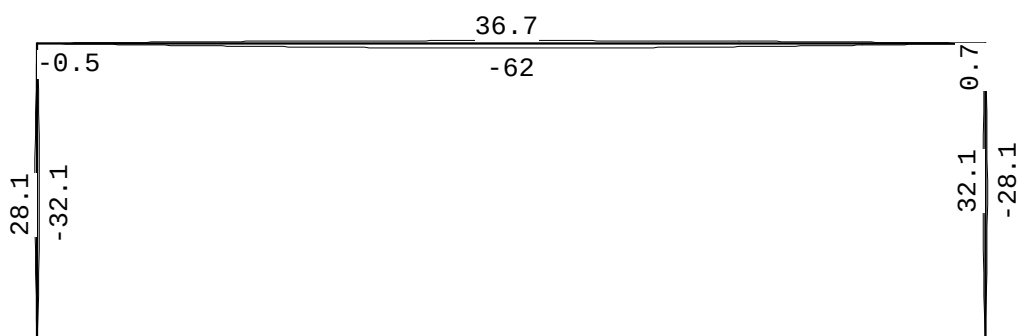
Onderdeel: Spant 14 en 19

**VERVORMINGEN  $W_{tot}$** 

Karakteristieke combinatie

**VERVORMINGEN  $W_{max}$** 

Karakteristieke combinatie

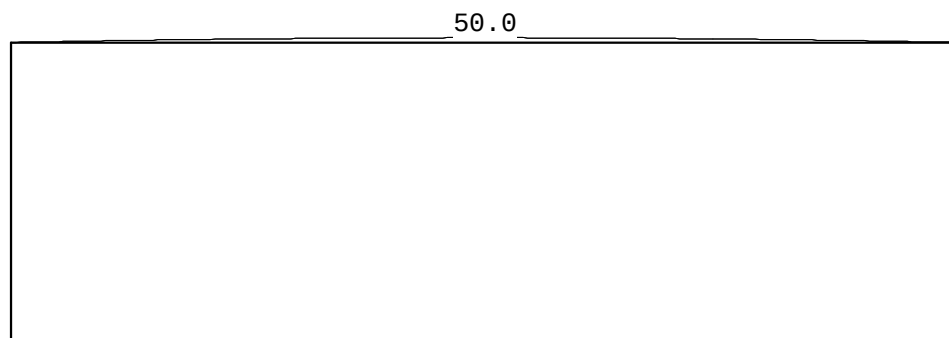


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Onderdeel: Spant 14 en 19

**ZEEG wc**

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Project...: 180114 Uitbreiding Venster Techniek

Onderdeel: Spant 20

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

Datum....: 28/08/2018

Bestand...: F:\Projecten\2018\180114 Uitbreiding Venstertechniek te  
Zelhem\Constructief CIBIS\spant as 20.rww

Belastingbreedte.: 2.500

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

Theorieën voor de bepaling van de krachtsverdeling:

1) Losse belastinggevallen:

Lineaire-elasticiteitstheorie

2) Uiterste grenstoestand:

Geometrisch niet lineair alle staven.

Fysisch lineair alle staven.

3) Gebruiksgrenstoestand:

Geometrisch niet lineair alle staven.

Fysisch lineair alle staven.

Maximum aantal iteraties.....: 50

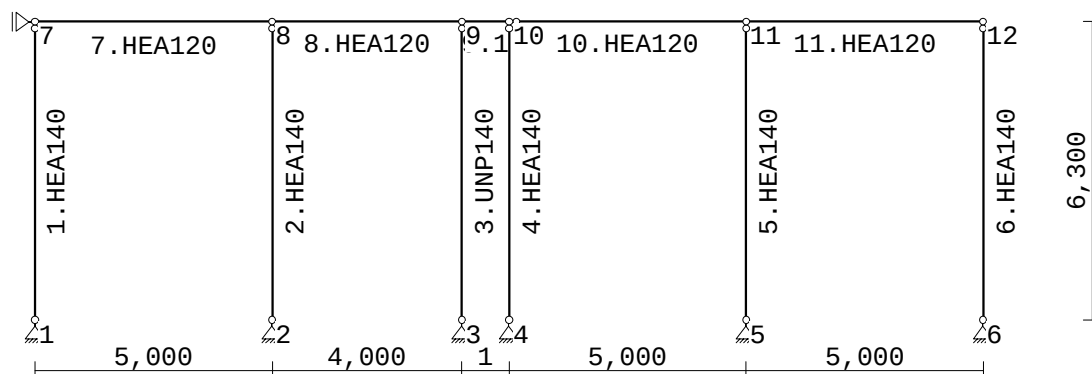
Max.deellengte kolommen/wanden: 0.500 Max.deellengte balken/vloeren: 0.500

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) |
| Staal       | NEN-EN 1993-1-1:2006 | C2:2009 | NB:2011(nl) |

**GEOMETRIE****MATERIALEN**

| Mt | Omschrijving | E-modulus[N/mm <sup>2</sup> ] | S.M. | Pois. | Uitz. coëff |
|----|--------------|-------------------------------|------|-------|-------------|
| 1  | S235         | 210000                        | 78.5 | 0.30  | 1.2000e-05  |

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Onderdeel: Spant 20

**PROFIELEN [mm]**

| Prof. | Omschrijving | Materiaal | Oppervlak  | Traagheid  | Vormf. |
|-------|--------------|-----------|------------|------------|--------|
| 1     | HEA120       | 1:S235    | 2.5340e+03 | 6.0600e+06 | 0.00   |
| 2     | HEA140       | 1:S235    | 3.1420e+03 | 1.0330e+07 | 0.00   |
| 3     | UNP140       | 1:S235    | 2.0370e+03 | 6.0500e+06 | 0.00   |

**PROFIELEN vervolg [mm]**

| Prof. | Staaftype | Breedte | Hoogte | e    | Type | b1 | h1 | b2 | h2 |
|-------|-----------|---------|--------|------|------|----|----|----|----|
| 1     | 0:Normaal | 120     | 114    | 57.0 |      |    |    |    |    |
| 2     | 0:Normaal | 140     | 133    | 66.5 |      |    |    |    |    |
| 3     | 0:Normaal | 60      | 140    | 70.0 |      |    |    |    |    |

**PROFIELVORMEN [mm]**

1 HEA120



2 HEA140



3 UNP140

**KNOPEN**

| Knoop | X      | Z     | Knoop | X      | Z     |
|-------|--------|-------|-------|--------|-------|
| 1     | 0.000  | 0.000 | 6     | 20.000 | 0.000 |
| 2     | 5.000  | 0.000 | 7     | 0.000  | 6.300 |
| 3     | 9.000  | 0.000 | 8     | 5.000  | 6.300 |
| 4     | 10.000 | 0.000 | 9     | 9.000  | 6.300 |
| 5     | 15.000 | 0.000 | 10    | 10.000 | 6.300 |
| 11    | 15.000 | 6.300 |       |        |       |
| 12    | 20.000 | 6.300 |       |        |       |

**STAVEN**

| St. | ki | kj | Profiel  | Aansl.i | Aansl.j | Lengte | Opm. |
|-----|----|----|----------|---------|---------|--------|------|
| 1   | 1  | 7  | 2:HEA140 | NDM     | ND-     | 6.300  |      |
| 2   | 2  | 8  | 2:HEA140 | NDM     | ND-     | 6.300  |      |
| 3   | 3  | 9  | 3:UNP140 | NDM     | ND-     | 6.300  |      |
| 4   | 4  | 10 | 2:HEA140 | NDM     | ND-     | 6.300  |      |
| 5   | 5  | 11 | 2:HEA140 | NDM     | ND-     | 6.300  |      |
| 6   | 6  | 12 | 2:HEA140 | NDM     | ND-     | 6.300  |      |
| 7   | 7  | 8  | 1:HEA120 | NDM     | NDM     | 5.000  |      |
| 8   | 8  | 9  | 1:HEA120 | NDM     | NDM     | 4.000  |      |
| 9   | 9  | 10 | 1:HEA120 | NDM     | NDM     | 1.000  |      |
| 10  | 10 | 11 | 1:HEA120 | ND-     | NDM     | 5.000  |      |
| 11  | 11 | 12 | 1:HEA120 | NDM     | NDM     | 5.000  |      |

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Onderdeel: Spant 20

**VASTE STEUNPUNTEN**

| Nr. | knoop | Kode | XZR 1=vast 0=vrij | Hoek |
|-----|-------|------|-------------------|------|
| 1   | 1     | 110  |                   | 0.00 |
| 2   | 2     | 110  |                   | 0.00 |
| 3   | 3     | 110  |                   | 0.00 |
| 4   | 4     | 110  |                   | 0.00 |
| 5   | 5     | 110  |                   | 0.00 |
| 6   | 6     | 110  |                   | 0.00 |
| 7   | 7     | 100  |                   | 0.00 |

**BELASTINGGENERATIE ALGEMEEN.**

|                              |       |                         |      |
|------------------------------|-------|-------------------------|------|
| Betrouwbaarheidsklasse.....: | 1     | Referentieperiode.....: | 50   |
| Gebouwdiepte.....:           | 40.00 | Gebouwhoogte.....:      | 6.30 |
| Niveau aansl.terrein.....:   | 0.00  | E.g. scheid.w. [kN/m2]: | 1.20 |

**WIND**

|                                    |           |                         |        |
|------------------------------------|-----------|-------------------------|--------|
| Terrein categorie ...[4.3.2]....:  | Onbebouwd |                         |        |
| Windgebied .....                   | 3         | Vb,0 ..[4.2].....:      | 24.500 |
| Positie spant in het gebouw....:   | 6.000     | Kr ....[4.3.2].....:    | 0.209  |
| z0 .....[4.3.2]....:               | 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 :  | 0.70 |

**STAFTYPEN**

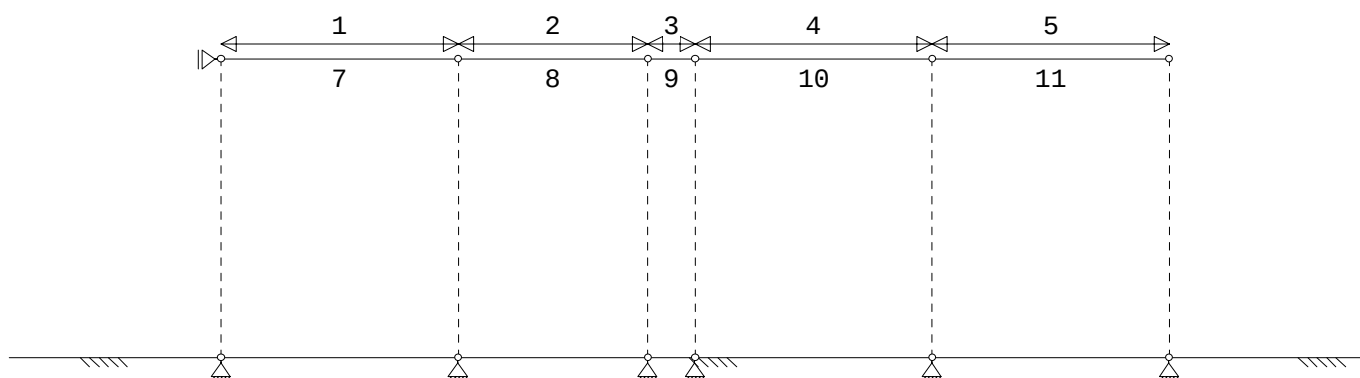
| Type             | staven |
|------------------|--------|
| 4:Wand / kolom.  | : 2-5  |
| 5:Linker gevel.  | : 1    |
| 6:Rechter gevel. | : 6    |
| 7:Dak.           | : 7-11 |

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Onderdeel: Spant 20

**LASTVELDEN**

Veranderlijke belastingen door personen

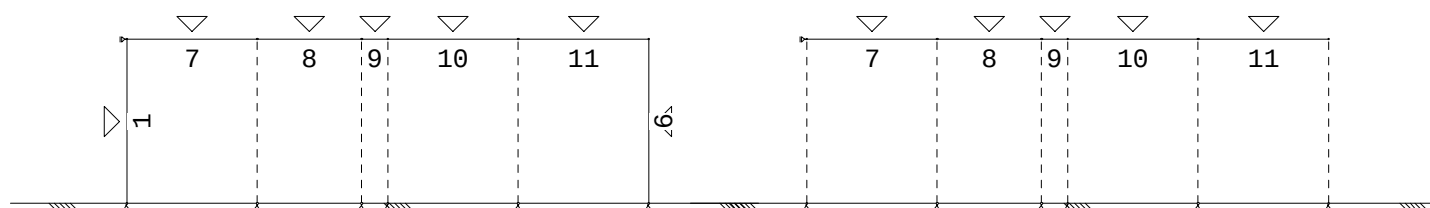
**LASTVELDEN**

| Nr | Balk | Veld  | Gebruiksfunctie                                         | Psi-t |
|----|------|-------|---------------------------------------------------------|-------|
| 1  | 7-11 | 7-7   | Dak niet toegankelijk voor dagelijks gebruik. Tabel 6.9 | 1.00  |
| 2  | 7-11 | 8-8   | Dak niet toegankelijk voor dagelijks gebruik. Tabel 6.9 | 1.00  |
| 3  | 7-11 | 9-9   | Dak niet toegankelijk voor dagelijks gebruik. Tabel 6.9 | 1.00  |
| 4  | 7-11 | 10-10 | Dak niet toegankelijk voor dagelijks gebruik. Tabel 6.9 | 1.00  |
| 5  | 7-11 | 11-11 | Dak niet toegankelijk voor dagelijks gebruik. Tabel 6.9 | 1.00  |

**LASTVELDEN**

Wind staven

Sneeuw staven

**WIND DAKTYPES**

| Nr. | Staaft Type   | reductie bij<br>wind van links | reductie bij<br>wind van Rechts | Cpe volgens art: |
|-----|---------------|--------------------------------|---------------------------------|------------------|
| 1   | 1 Gevel       | 1.000                          | 1.000                           | 7.2.2            |
| 2   | 7-11 Plat dak | 1.000                          | 1.000                           | 7.2.3            |
| 3   | 6 Gevel       | 1.000                          | 1.000                           | 7.2.2            |



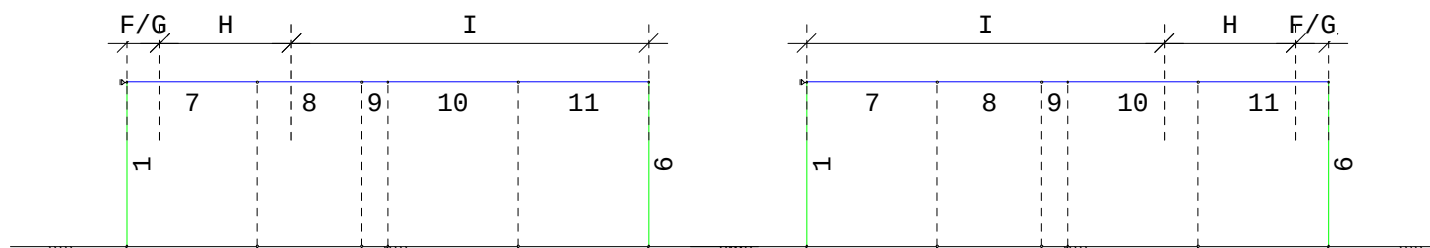
Project...: 180114 Uitbreiding Venster Techniek

Onderdeel: Spant 20

**WIND ZONES**

Wind van links

Wind van rechts

**WIND VAN LINKS ZONES**

| Nr. | Staat | Positie | Lengte | Zone |
|-----|-------|---------|--------|------|
| 1   | 1     | 0.000   | 6.300  | D    |
| 2   | 7-11  | 0.000   | 1.260  | F/G  |
| 3   | 7-11  | 1.260   | 5.040  | H    |
| 4   | 7-11  | 6.300   | 13.700 | I    |
| 5   | 6     | 0.000   | 6.300  | E    |

**WIND VAN RECHTS ZONES**

| Nr. | Staat | Positie | Lengte | Zone |
|-----|-------|---------|--------|------|
| 1   | 6     | 0.000   | 6.300  | D    |
| 2   | 7-11  | 0.000   | 1.260  | F/G  |
| 3   | 7-11  | 1.260   | 5.040  | H    |
| 4   | 7-11  | 6.300   | 13.700 | I    |
| 5   | 1     | 0.000   | 6.300  | E    |

**Wind indexen**

| Index | CsCd | Cpe/Cpi | qp    | breedte | reductie | Qw     | Zone | Hoek(en) |
|-------|------|---------|-------|---------|----------|--------|------|----------|
| Qw1   |      | 0.300   | 0.591 | 2.500   |          | -0.443 | -i   |          |
| Qw2   |      | -0.300  | 0.591 | 2.500   |          | 0.443  | -i   |          |
| Qw3   | 1.00 | 0.800   | 0.591 | 2.500   |          | -1.182 | D    |          |
| Qw4   | 1.00 | -1.200  | 0.591 | 2.500   |          | 1.772  | G    | 0.0      |
| Qw5   | 1.00 | -0.700  | 0.591 | 2.500   |          | 1.034  | H    | 0.0      |
| Qw6   | 1.00 | -0.200  | 0.591 | 2.500   |          | 0.295  | I    | 0.0      |
| Qw7   | 1.00 | 0.500   | 0.591 | 2.500   |          | -0.738 | E    |          |
| Qw8   |      | -0.200  | 0.591 | 2.500   |          | 0.295  | +i   |          |
| Qw9   |      | 0.200   | 0.591 | 2.500   |          | -0.295 | +i   |          |
| Qw10  | 1.00 | 0.200   | 0.591 | 2.500   |          | -0.295 | I    | 0.0      |
| Qw11  | 1.00 | -0.800  | 0.591 | 2.500   |          | 1.182  | D    |          |
| Qw12  | 1.00 | -0.500  | 0.591 | 2.500   |          | 0.738  | E    |          |
| Qw13  | 1.00 | -0.800  | 0.591 | 2.500   |          | 1.182  | B    |          |
| Qw14  | 1.00 | 0.800   | 0.591 | 2.500   |          | -1.182 | B    |          |
| Qw15  | 1.00 | -0.700  | 0.591 | 1.550   |          | 0.641  | H    | 0.0      |
| Qw16  | 1.00 | 0.200   | 0.591 | 0.950   |          | -0.112 | I    | 0.0      |
| Qw17  | 1.00 | -0.200  | 0.591 | 0.950   |          | 0.112  | I    | 0.0      |
| Qw18  | 1.00 | -0.500  | 0.591 | 2.500   |          | 0.738  | C    |          |
| Qw19  | 1.00 | 0.500   | 0.591 | 2.500   |          | -0.738 | C    |          |

**SNEEUW DAKTYPEN**

Staat artikel

7-11 5.3.2 Lessenaarsdak

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Onderdeel: Spant 20

**Sneeuw indexen**

| Index | art   | $\mu$ | $s_k$ | red. posfac | breedte | $Q_s$ | hoek |
|-------|-------|-------|-------|-------------|---------|-------|------|
| Qs1   | 5.3.2 | 0.800 | 0.70  | 1.00        | 2.500   | 1.400 | 0.0  |

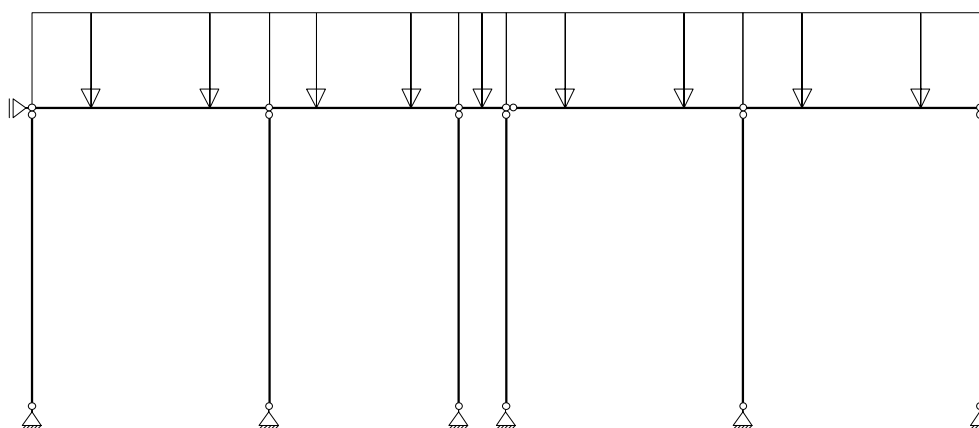
**BELASTINGGEVALLEN**

| B.G. | Omschrijving                     | Type |
|------|----------------------------------|------|
|      | 1 Permanente belasting EGZ=-1.00 | 1    |
| g    | 2 Ver. bel. pers. ed. (p_rep)    | 2    |
| g    | 3 Ver. bel. pers. ed. (F-rep)    | 3    |
| g    | 4 Wind van links onderdruk A     | 7    |
| g    | 5 Wind van links overdruk A      | 8    |
| g    | 6 Wind van links onderdruk B     | 9    |
| g    | 7 Wind van links overdruk B      | 10   |
| g    | 8 Wind van rechts onderdruk A    | 11   |
| g    | 9 Wind van rechts overdruk A     | 12   |
| g    | 10 Wind van rechts onderdruk B   | 13   |
| g    | 11 Wind van rechts overdruk B    | 14   |
| g    | 12 Wind loodrecht onderdruk A    | 15   |
| g    | 13 Wind loodrecht overdruk A     | 16   |
| g    | 14 Wind loodrecht onderdruk B    | 45   |
| g    | 15 Wind loodrecht overdruk B     | 46   |
| g    | 16 Sneeuw A                      | 22   |
| g    | = gegenereerd belastinggeval     |      |

**BELASTINGEN**

B.G:1 Permanente belasting

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

**STAAFBELASTINGEN**

B.G:1 Permanente belasting

| Staat | Type       | q1/p/m | q2    | A     | B     | $\psi_0$ | $\psi_1$ | $\psi_2$ |
|-------|------------|--------|-------|-------|-------|----------|----------|----------|
| 7     | 5:QZGloaal | -0.88  | -0.88 | 0.000 | 0.000 |          |          |          |
| 8     | 5:QZGloaal | -0.88  | -0.88 | 0.000 | 0.000 |          |          |          |
| 9     | 5:QZGloaal | -0.88  | -0.88 | 0.000 | 0.000 |          |          |          |
| 10    | 5:QZGloaal | -0.88  | -0.88 | 0.000 | 0.000 |          |          |          |
| 11    | 5:QZGloaal | -0.88  | -0.88 | 0.000 | 0.000 |          |          |          |

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Onderdeel: Spant 20

**REACTIES**

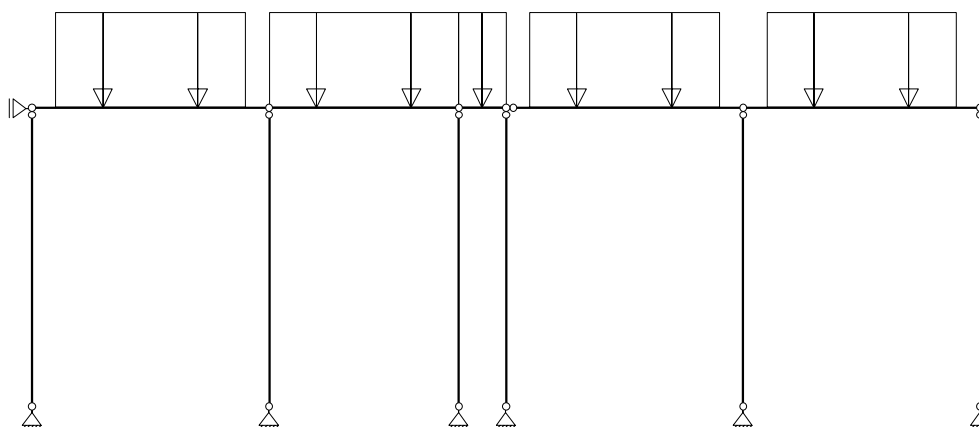
1e orde

B.G:1 Permanente belasting

| Kn. | X    | Z      | M                        |
|-----|------|--------|--------------------------|
| 1   | 0.00 | 3.72   |                          |
| 2   | 0.00 | 7.45   |                          |
| 3   | 0.00 | 3.87   |                          |
| 4   | 0.00 | 3.45   |                          |
| 5   | 0.00 | 8.29   |                          |
| 6   | 0.00 | 3.58   |                          |
| 7   | 0.00 |        |                          |
|     | 0.00 | 30.36  | : Som van de reacties    |
|     | 0.00 | -30.36 | : Som van de belastingen |

**BELASTINGEN**

B.G:2 Ver. bel. pers. ed. (p\_rep)

**STAAFBELASTINGEN**

B.G:2 Ver. bel. pers. ed. (p\_rep)

| Staat | Type        | q1/p/m | q2    | A     | B     | $\psi_0$ | $\psi_1$ | $\psi_2$ |
|-------|-------------|--------|-------|-------|-------|----------|----------|----------|
| 7     | 3:QZgeProj. | -2.50  | -2.50 | 0.500 | 0.500 | 0.0      | 0.0      | 0.0      |
| 8     | 3:QZgeProj. | -2.50  | -2.50 | 0.000 | 0.000 | 0.0      | 0.0      | 0.0      |
| 9     | 3:QZgeProj. | -2.50  | -2.50 | 0.000 | 0.000 | 0.0      | 0.0      | 0.0      |
| 10    | 3:QZgeProj. | -2.50  | -2.50 | 0.500 | 0.500 | 0.0      | 0.0      | 0.0      |
| 11    | 3:QZgeProj. | -2.50  | -2.50 | 0.500 | 0.500 | 0.0      | 0.0      | 0.0      |

**VERANDERLIJKE BELASTING SITUATIES**

| Nr | Lastvelden extreem | Lastvelden momentaan |
|----|--------------------|----------------------|
| 1  | 2, 4               |                      |
| 2  | 1, 3, 5            |                      |
| 3  | 2, 3, 5            |                      |
| 4  | 1, 2, 4, 5         |                      |
| 5  | 1, 3, 4            |                      |

Project...: 180114 Uitbreiding Venster Techniek

Onderdeel: Spant 20

**REACTIES**

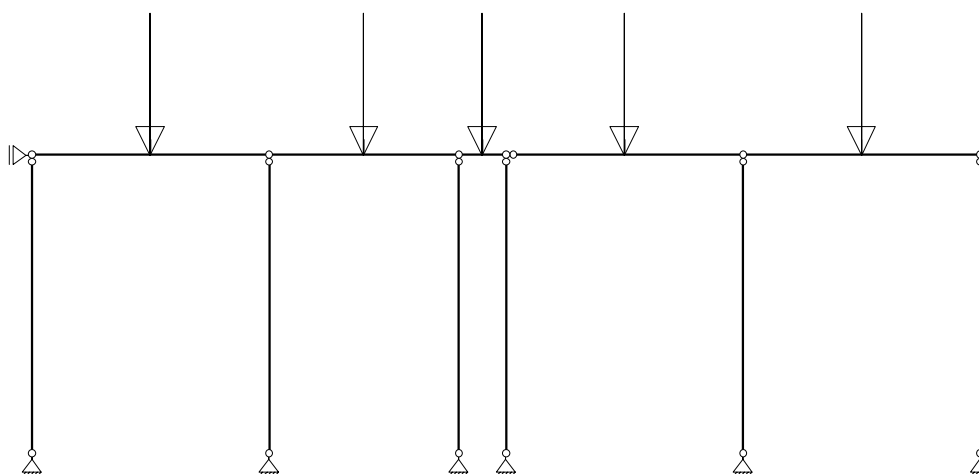
1e orde

B.G:2 Ver. bel. pers. ed. (p\_rep)

| Kn. | X-min | X-max | Z-min | Z-max | M-min | M-max |
|-----|-------|-------|-------|-------|-------|-------|
| 1   | 0.00  | 0.00  | -0.30 | 4.11  |       |       |
| 2   | 0.00  | 0.00  | 4.84  | 12.29 |       |       |
| 3   | 0.00  | 0.00  | -1.94 | 10.02 |       |       |
| 4   | 0.00  | 0.00  | -2.80 | 7.14  |       |       |
| 5   | 0.00  | 0.00  | 6.47  | 12.94 |       |       |
| 6   | 0.00  | 0.00  | -0.74 | 4.26  |       |       |
| 7   | 0.00  | 0.00  |       |       |       |       |

**BELASTINGEN**

B.G:3 Ver. bel. pers. ed. (F-rep)

**STAAFBELASTINGEN**

B.G:3 Ver. bel. pers. ed. (F-rep)

| Staaftype | Type          | q1/p/m | q2 | A     | B | $\psi_0$ | $\psi_1$ | $\psi_2$ |
|-----------|---------------|--------|----|-------|---|----------|----------|----------|
| 7         | 10:PZGeprojl. | -1.50  |    | 2.500 |   | 0.0      | 0.0      | 0.0      |
| 8         | 10:PZGeprojl. | -1.50  |    | 2.000 |   | 0.0      | 0.0      | 0.0      |
| 9         | 10:PZGeprojl. | -1.50  |    | 0.500 |   | 0.0      | 0.0      | 0.0      |
| 10        | 10:PZGeprojl. | -1.50  |    | 2.500 |   | 0.0      | 0.0      | 0.0      |
| 11        | 10:PZGeprojl. | -1.50  |    | 2.500 |   | 0.0      | 0.0      | 0.0      |

**VERANDERLIJKE BELASTING SITUATIES**

| Nr | Lastvelden extreem | Lastvelden momentaan |
|----|--------------------|----------------------|
| 1  | 1                  |                      |
| 2  | 2                  |                      |
| 3  | 3                  |                      |
| 4  | 4                  |                      |
| 5  | 5                  |                      |

**REACTIES**

1e orde

B.G:3 Ver. bel. pers. ed. (F-rep)

| Kn. | X-min | X-max | Z-min | Z-max | M-min | M-max |
|-----|-------|-------|-------|-------|-------|-------|
| 1   | 0.00  | 0.00  | -0.07 | 0.58  |       |       |
| 2   | 0.00  | 0.00  | -0.02 | 1.21  |       |       |
| 3   | 0.00  | 0.00  | -0.62 | 1.59  |       |       |
| 4   | 0.00  | 0.00  | -0.74 | 0.70  |       |       |
| 5   | 0.00  | 0.00  | -0.00 | 1.03  |       |       |
| 6   | 0.00  | 0.00  | -0.14 | 0.61  |       |       |

Project...: 180114 Uitbreiding Venster Techniek

Onderdeel: Spant 20

**REACTIES**

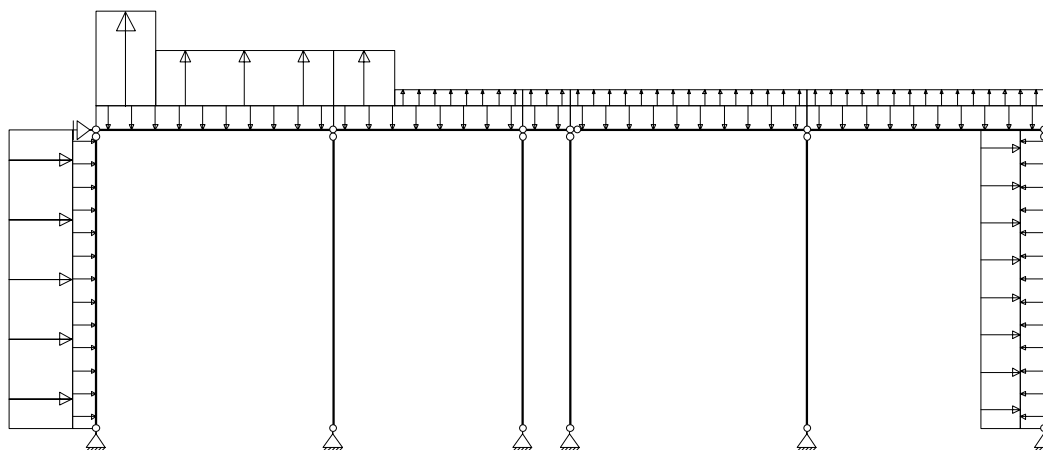
1e orde

B.G:3 Ver. bel. pers. ed. (F-rep)

| Kn. | X-min | X-max | Z-min | Z-max | M-min | M-max |
|-----|-------|-------|-------|-------|-------|-------|
| 7   | 0.00  | 0.00  |       |       |       |       |

**BELASTINGEN**

B.G:4 Wind van links onderdruk A

**STAAFBELASTINGEN**

B.G:4 Wind van links onderdruk A

| Staal | Type       | Index | q1/p/m | q2    | A     | B     | $\psi_0$ | $\psi_1$ | $\psi_2$ |
|-------|------------|-------|--------|-------|-------|-------|----------|----------|----------|
| 1     | 1:QZLokaal | Qw1   | -0.44  | -0.44 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 7     | 1:QZLokaal | Qw1   | -0.44  | -0.44 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 8     | 1:QZLokaal | Qw1   | -0.44  | -0.44 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 9     | 1:QZLokaal | Qw1   | -0.44  | -0.44 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 10    | 1:QZLokaal | Qw1   | -0.44  | -0.44 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 11    | 1:QZLokaal | Qw1   | -0.44  | -0.44 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 6     | 1:QZLokaal | Qw2   | 0.44   | 0.44  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 1     | 1:QZLokaal | Qw3   | -1.18  | -1.18 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 7     | 1:QZLokaal |       | 0.00   | 0.00  | 0.000 | 3.740 | 0.0      | 0.2      | 0.0      |
| 7     | 1:QZLokaal | Qw4   | 1.77   | 1.77  | 0.000 | 3.740 | 0.0      | 0.2      | 0.0      |
| 7     | 1:QZLokaal | Qw5   | 1.03   | 1.03  | 1.260 | 0.000 | 0.0      | 0.2      | 0.0      |
| 8     | 1:QZLokaal | Qw5   | 1.03   | 1.03  | 0.000 | 2.700 | 0.0      | 0.2      | 0.0      |
| 8     | 1:QZLokaal | Qw6   | 0.30   | 0.30  | 1.300 | 0.000 | 0.0      | 0.2      | 0.0      |
| 9     | 1:QZLokaal | Qw6   | 0.30   | 0.30  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 10    | 1:QZLokaal | Qw6   | 0.30   | 0.30  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 11    | 1:QZLokaal | Qw6   | 0.30   | 0.30  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 6     | 1:QZLokaal | Qw7   | -0.74  | -0.74 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |

**REACTIES**

1e orde

B.G:4 Wind van links onderdruk A

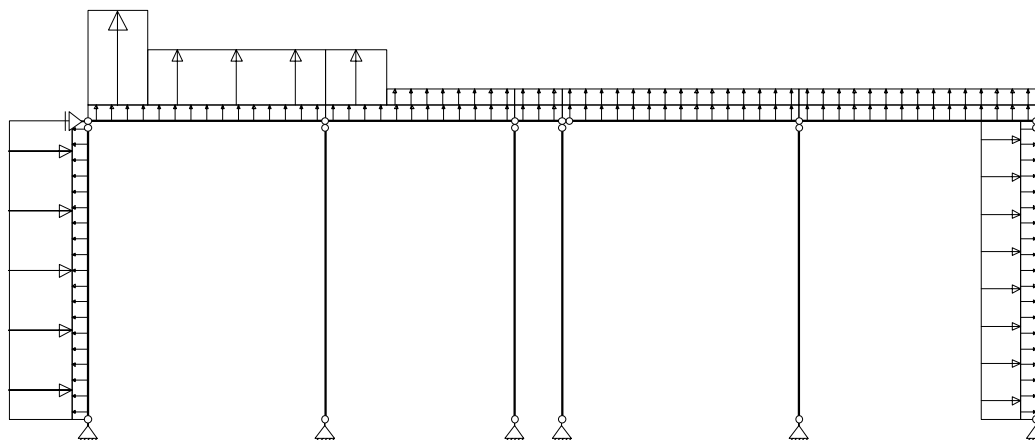
| Kn. | X      | Z     | M                        |
|-----|--------|-------|--------------------------|
| 1   | -5.12  | -2.02 |                          |
| 2   | 0.00   | -2.84 |                          |
| 3   | 0.00   | 1.21  |                          |
| 4   | 0.00   | -0.17 |                          |
| 5   | 0.00   | 0.92  |                          |
| 6   | -0.93  | 0.28  |                          |
| 7   | -6.05  |       |                          |
|     | -12.10 | -2.63 | : Som van de reacties    |
|     | 12.10  | 2.63  | : Som van de belastingen |

Project...: 180114 Uitbreiding Venster Techniek

Onderdeel: Spant 20

**BELASTINGEN**

B.G:5 Wind van links overdruk A

**STAAFBELASTINGEN**

B.G:5 Wind van links overdruk A

| Staaftype | Type       | Index | q1/p/m | q2    | A     | B     | $\psi_0$ | $\psi_1$ | $\psi_2$ |
|-----------|------------|-------|--------|-------|-------|-------|----------|----------|----------|
| 1         | 1:QZLokaal | Qw8   | 0.30   | 0.30  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 7         | 1:QZLokaal | Qw8   | 0.30   | 0.30  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 8         | 1:QZLokaal | Qw8   | 0.30   | 0.30  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 9         | 1:QZLokaal | Qw8   | 0.30   | 0.30  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 10        | 1:QZLokaal | Qw8   | 0.30   | 0.30  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 11        | 1:QZLokaal | Qw8   | 0.30   | 0.30  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 6         | 1:QZLokaal | Qw9   | -0.30  | -0.30 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 1         | 1:QZLokaal | Qw3   | -1.18  | -1.18 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 7         | 1:QZLokaal |       | 0.00   | 0.00  | 0.000 | 3.740 | 0.0      | 0.2      | 0.0      |
| 7         | 1:QZLokaal | Qw4   | 1.77   | 1.77  | 0.000 | 3.740 | 0.0      | 0.2      | 0.0      |
| 7         | 1:QZLokaal | Qw5   | 1.03   | 1.03  | 1.260 | 0.000 | 0.0      | 0.2      | 0.0      |
| 8         | 1:QZLokaal | Qw5   | 1.03   | 1.03  | 0.000 | 2.700 | 0.0      | 0.2      | 0.0      |
| 8         | 1:QZLokaal | Qw6   | 0.30   | 0.30  | 1.300 | 0.000 | 0.0      | 0.2      | 0.0      |
| 9         | 1:QZLokaal | Qw6   | 0.30   | 0.30  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 10        | 1:QZLokaal | Qw6   | 0.30   | 0.30  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 11        | 1:QZLokaal | Qw6   | 0.30   | 0.30  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 6         | 1:QZLokaal | Qw7   | -0.74  | -0.74 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |

**REACTIES**

1e orde

B.G:5 Wind van links overdruk A

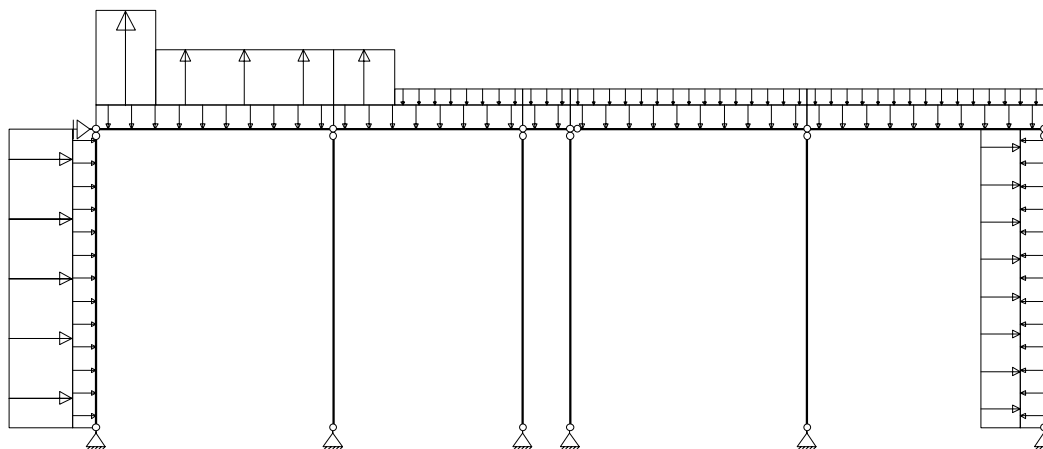
| Kn. | X      | Z      | M                        |
|-----|--------|--------|--------------------------|
| 1   | -2.79  | -3.50  |                          |
| 2   | 0.00   | -6.88  |                          |
| 3   | 0.00   | -0.75  |                          |
| 4   | 0.00   | -1.47  |                          |
| 5   | 0.00   | -3.69  |                          |
| 6   | -3.26  | -1.11  |                          |
| 7   | -6.05  |        |                          |
|     | -12.10 | -17.40 | : Som van de reacties    |
|     | 12.10  | 17.40  | : Som van de belastingen |

Project...: 180114 Uitbreiding Venster Techniek

Onderdeel: Spant 20

**BELASTINGEN**

B.G:6 Wind van links onderdruk B

**STAAFBELASTINGEN**

B.G:6 Wind van links onderdruk B

| Staat | Type       | Index | q1/p/m | q2    | A     | B     | $\psi_0$ | $\psi_1$ | $\psi_2$ |
|-------|------------|-------|--------|-------|-------|-------|----------|----------|----------|
| 1     | 1:QZLokaal | Qw1   | -0.44  | -0.44 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 7     | 1:QZLokaal | Qw1   | -0.44  | -0.44 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 8     | 1:QZLokaal | Qw1   | -0.44  | -0.44 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 9     | 1:QZLokaal | Qw1   | -0.44  | -0.44 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 10    | 1:QZLokaal | Qw1   | -0.44  | -0.44 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 11    | 1:QZLokaal | Qw1   | -0.44  | -0.44 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 6     | 1:QZLokaal | Qw2   | 0.44   | 0.44  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 1     | 1:QZLokaal | Qw3   | -1.18  | -1.18 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 7     | 1:QZLokaal |       | 0.00   | 0.00  | 0.000 | 3.740 | 0.0      | 0.2      | 0.0      |
| 7     | 1:QZLokaal | Qw4   | 1.77   | 1.77  | 0.000 | 3.740 | 0.0      | 0.2      | 0.0      |
| 7     | 1:QZLokaal | Qw5   | 1.03   | 1.03  | 1.260 | 0.000 | 0.0      | 0.2      | 0.0      |
| 8     | 1:QZLokaal | Qw5   | 1.03   | 1.03  | 0.000 | 2.700 | 0.0      | 0.2      | 0.0      |
| 8     | 1:QZLokaal | Qw10  | -0.30  | -0.30 | 1.300 | 0.000 | 0.0      | 0.2      | 0.0      |
| 9     | 1:QZLokaal | Qw10  | -0.30  | -0.30 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 10    | 1:QZLokaal | Qw10  | -0.30  | -0.30 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 11    | 1:QZLokaal | Qw10  | -0.30  | -0.30 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 6     | 1:QZLokaal | Qw7   | -0.74  | -0.74 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |

**REACTIES**

1e orde

B.G:6 Wind van links onderdruk B

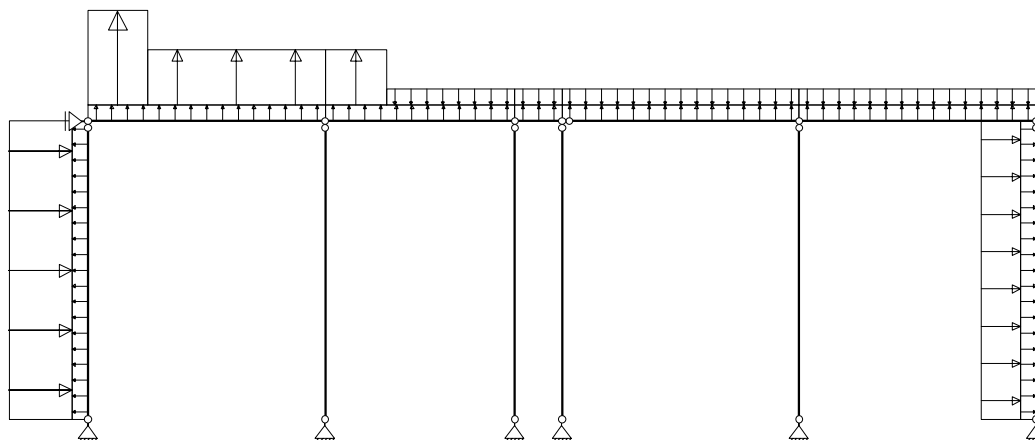
| Kn.    | X     | Z     | M                        |
|--------|-------|-------|--------------------------|
| 1      | -5.12 | -2.06 |                          |
| 2      | 0.00  | -2.37 |                          |
| 3      | 0.00  | 3.32  |                          |
| 4      | 0.00  | 0.57  |                          |
| 5      | 0.00  | 4.61  |                          |
| 6      | -0.93 | 1.39  |                          |
| 7      | -6.05 |       |                          |
| -12.10 |       | 5.46  | : Som van de reacties    |
| 12.10  |       | -5.46 | : Som van de belastingen |

Project...: 180114 Uitbreiding Venster Techniek

Onderdeel: Spant 20

**BELASTINGEN**

B.G:7 Wind van links overdruk B

**STAAFBELASTINGEN**

B.G:7 Wind van links overdruk B

| Staaftype | Type       | Index | q1/p/m | q2    | A     | B     | $\psi_0$ | $\psi_1$ | $\psi_2$ |
|-----------|------------|-------|--------|-------|-------|-------|----------|----------|----------|
| 1         | 1:QZLokaal | Qw8   | 0.30   | 0.30  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 7         | 1:QZLokaal | Qw8   | 0.30   | 0.30  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 8         | 1:QZLokaal | Qw8   | 0.30   | 0.30  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 9         | 1:QZLokaal | Qw8   | 0.30   | 0.30  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 10        | 1:QZLokaal | Qw8   | 0.30   | 0.30  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 11        | 1:QZLokaal | Qw8   | 0.30   | 0.30  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 6         | 1:QZLokaal | Qw9   | -0.30  | -0.30 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 1         | 1:QZLokaal | Qw3   | -1.18  | -1.18 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 7         | 1:QZLokaal |       | 0.00   | 0.00  | 0.000 | 3.740 | 0.0      | 0.2      | 0.0      |
| 7         | 1:QZLokaal | Qw4   | 1.77   | 1.77  | 0.000 | 3.740 | 0.0      | 0.2      | 0.0      |
| 7         | 1:QZLokaal | Qw5   | 1.03   | 1.03  | 1.260 | 0.000 | 0.0      | 0.2      | 0.0      |
| 8         | 1:QZLokaal | Qw5   | 1.03   | 1.03  | 0.000 | 2.700 | 0.0      | 0.2      | 0.0      |
| 8         | 1:QZLokaal | Qw10  | -0.30  | -0.30 | 1.300 | 0.000 | 0.0      | 0.2      | 0.0      |
| 9         | 1:QZLokaal | Qw10  | -0.30  | -0.30 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 10        | 1:QZLokaal | Qw10  | -0.30  | -0.30 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 11        | 1:QZLokaal | Qw10  | -0.30  | -0.30 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 6         | 1:QZLokaal | Qw7   | -0.74  | -0.74 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |

**REACTIES** 1e orde

B.G:7 Wind van links overdruk B

| Kn. | X      | Z     | M                        |
|-----|--------|-------|--------------------------|
| 1   | -2.79  | -3.54 |                          |
| 2   | 0.00   | -6.40 |                          |
| 3   | 0.00   | 1.37  |                          |
| 4   | 0.00   | -0.72 |                          |
| 5   | 0.00   | -0.00 |                          |
| 6   | -3.26  | 0.00  |                          |
| 7   | -6.05  |       |                          |
|     | -12.10 | -9.31 | : Som van de reacties    |
|     | 12.10  | 9.31  | : Som van de belastingen |

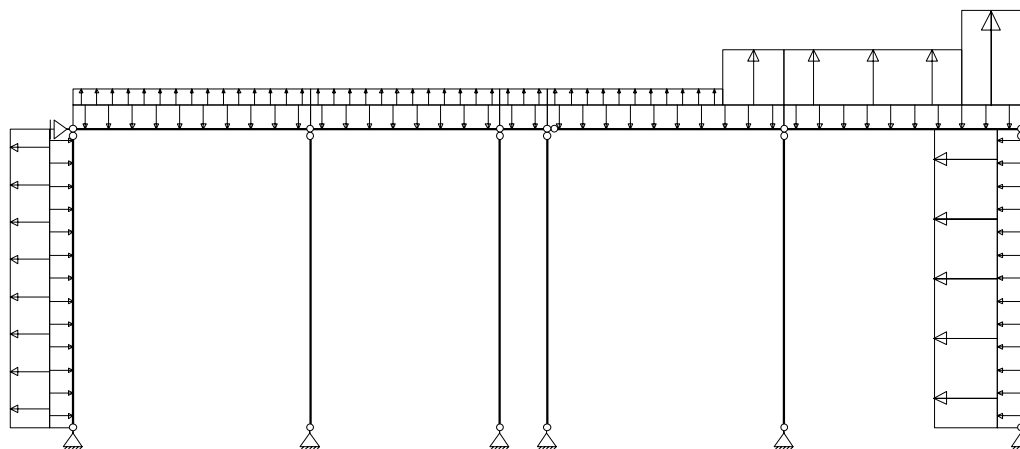


Project...: 180114 Uitbreiding Venster Techniek

Onderdeel: Spant 20

**BELASTINGEN**

B.G:8 Wind van rechts onderdruk A

**STAAFBELASTINGEN**

B.G:8 Wind van rechts onderdruk A

| Staat | Type       | Index | q1/p/m | q2    | A     | B     | $\psi_0$ | $\psi_1$ | $\psi_2$ |
|-------|------------|-------|--------|-------|-------|-------|----------|----------|----------|
| 1     | 1:QZLokaal | Qw1   | -0.44  | -0.44 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 7     | 1:QZLokaal | Qw1   | -0.44  | -0.44 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 8     | 1:QZLokaal | Qw1   | -0.44  | -0.44 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 9     | 1:QZLokaal | Qw1   | -0.44  | -0.44 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 10    | 1:QZLokaal | Qw1   | -0.44  | -0.44 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 11    | 1:QZLokaal | Qw1   | -0.44  | -0.44 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 6     | 1:QZLokaal | Qw2   | 0.44   | 0.44  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 6     | 1:QZLokaal | Qw11  | 1.18   | 1.18  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 11    | 1:QZLokaal |       | 0.00   | 0.00  | 3.740 | 0.000 | 0.0      | 0.2      | 0.0      |
| 11    | 1:QZLokaal | Qw4   | 1.77   | 1.77  | 3.740 | 0.000 | 0.0      | 0.2      | 0.0      |
| 11    | 1:QZLokaal | Qw5   | 1.03   | 1.03  | 0.000 | 1.260 | 0.0      | 0.2      | 0.0      |
| 10    | 1:QZLokaal | Qw5   | 1.03   | 1.03  | 3.700 | 0.000 | 0.0      | 0.2      | 0.0      |
| 10    | 1:QZLokaal | Qw6   | 0.30   | 0.30  | 0.000 | 1.300 | 0.0      | 0.2      | 0.0      |
| 9     | 1:QZLokaal | Qw6   | 0.30   | 0.30  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 8     | 1:QZLokaal | Qw6   | 0.30   | 0.30  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 7     | 1:QZLokaal | Qw6   | 0.30   | 0.30  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 1     | 1:QZLokaal | Qw12  | 0.74   | 0.74  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |

**REACTIES**

1e orde

B.G:8 Wind van rechts onderdruk A

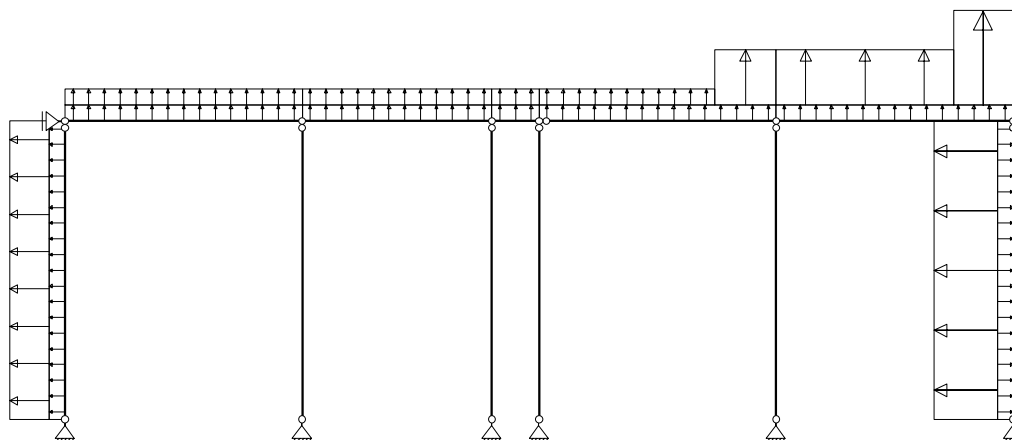
| Kn. | X      | Z     | M                        |
|-----|--------|-------|--------------------------|
| 1   | 0.93   | 0.30  |                          |
| 2   | 0.00   | 0.81  |                          |
| 3   | 0.00   | 0.39  |                          |
| 4   | 0.00   | 0.44  |                          |
| 5   | 0.00   | -2.49 |                          |
| 6   | 5.12   | -2.08 |                          |
| 7   | 6.05   |       |                          |
|     | 12.10  | -2.63 | : Som van de reacties    |
|     | -12.10 | 2.63  | : Som van de belastingen |

Project...: 180114 Uitbreiding Venster Techniek

Onderdeel: Spant 20

**BELASTINGEN**

B.G:9 Wind van rechts overdruk A

**STAAFBELASTINGEN**

B.G:9 Wind van rechts overdruk A

| Staat | Type       | Index | q1/p/m | q2    | A     | B     | $\psi_0$ | $\psi_1$ | $\psi_2$ |
|-------|------------|-------|--------|-------|-------|-------|----------|----------|----------|
| 1     | 1:QZLokaal | Qw8   | 0.30   | 0.30  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 7     | 1:QZLokaal | Qw8   | 0.30   | 0.30  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 8     | 1:QZLokaal | Qw8   | 0.30   | 0.30  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 9     | 1:QZLokaal | Qw8   | 0.30   | 0.30  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 10    | 1:QZLokaal | Qw8   | 0.30   | 0.30  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 11    | 1:QZLokaal | Qw8   | 0.30   | 0.30  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 6     | 1:QZLokaal | Qw9   | -0.30  | -0.30 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 6     | 1:QZLokaal | Qw11  | 1.18   | 1.18  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 11    | 1:QZLokaal |       | 0.00   | 0.00  | 3.740 | 0.000 | 0.0      | 0.2      | 0.0      |
| 11    | 1:QZLokaal | Qw4   | 1.77   | 1.77  | 3.740 | 0.000 | 0.0      | 0.2      | 0.0      |
| 11    | 1:QZLokaal | Qw5   | 1.03   | 1.03  | 0.000 | 1.260 | 0.0      | 0.2      | 0.0      |
| 10    | 1:QZLokaal | Qw5   | 1.03   | 1.03  | 3.700 | 0.000 | 0.0      | 0.2      | 0.0      |
| 10    | 1:QZLokaal | Qw6   | 0.30   | 0.30  | 0.000 | 1.300 | 0.0      | 0.2      | 0.0      |
| 9     | 1:QZLokaal | Qw6   | 0.30   | 0.30  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 8     | 1:QZLokaal | Qw6   | 0.30   | 0.30  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 7     | 1:QZLokaal | Qw6   | 0.30   | 0.30  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 1     | 1:QZLokaal | Qw12  | 0.74   | 0.74  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |

**REACTIES**

1e orde

B.G:9 Wind van rechts overdruk A

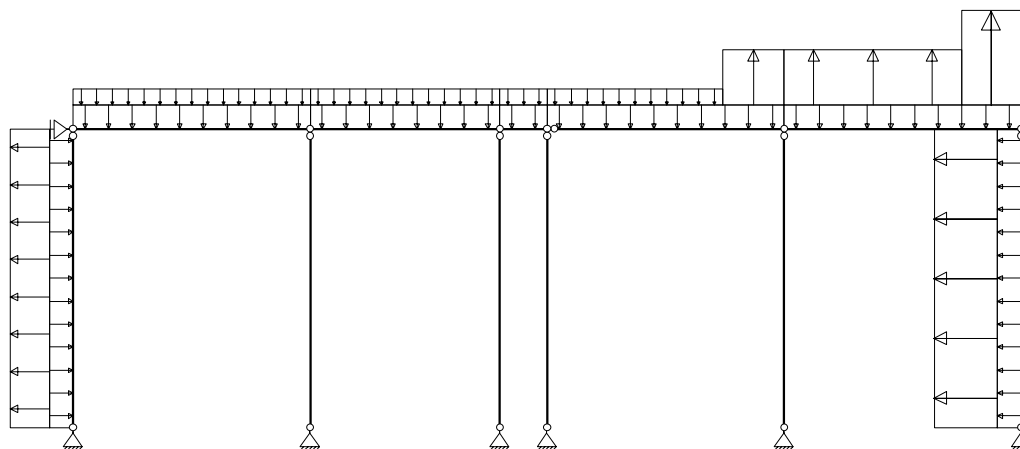
| Kn. | X      | Z      | M                        |
|-----|--------|--------|--------------------------|
| 1   | 3.26   | -1.18  |                          |
| 2   | 0.00   | -3.23  |                          |
| 3   | 0.00   | -1.56  |                          |
| 4   | 0.00   | -0.86  |                          |
| 5   | 0.00   | -7.10  |                          |
| 6   | 2.79   | -3.46  |                          |
| 7   | 6.05   |        |                          |
|     | 12.10  | -17.40 | : Som van de reacties    |
|     | -12.10 | 17.40  | : Som van de belastingen |

Project...: 180114 Uitbreiding Venster Techniek

Onderdeel: Spant 20

**BELASTINGEN**

B.G:10 Wind van rechts onderdruk B

**STAAFBELASTINGEN**

B.G:10 Wind van rechts onderdruk B

| Staat | Type       | Index | q1/p/m | q2    | A     | B     | $\psi_0$ | $\psi_1$ | $\psi_2$ |
|-------|------------|-------|--------|-------|-------|-------|----------|----------|----------|
| 1     | 1:QZLokaal | Qw1   | -0.44  | -0.44 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 7     | 1:QZLokaal | Qw1   | -0.44  | -0.44 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 8     | 1:QZLokaal | Qw1   | -0.44  | -0.44 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 9     | 1:QZLokaal | Qw1   | -0.44  | -0.44 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 10    | 1:QZLokaal | Qw1   | -0.44  | -0.44 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 11    | 1:QZLokaal | Qw1   | -0.44  | -0.44 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 6     | 1:QZLokaal | Qw2   | 0.44   | 0.44  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 6     | 1:QZLokaal | Qw11  | 1.18   | 1.18  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 11    | 1:QZLokaal |       | 0.00   | 0.00  | 3.740 | 0.000 | 0.0      | 0.2      | 0.0      |
| 11    | 1:QZLokaal | Qw4   | 1.77   | 1.77  | 3.740 | 0.000 | 0.0      | 0.2      | 0.0      |
| 11    | 1:QZLokaal | Qw5   | 1.03   | 1.03  | 0.000 | 1.260 | 0.0      | 0.2      | 0.0      |
| 10    | 1:QZLokaal | Qw5   | 1.03   | 1.03  | 3.700 | 0.000 | 0.0      | 0.2      | 0.0      |
| 10    | 1:QZLokaal | Qw10  | -0.30  | -0.30 | 0.000 | 1.300 | 0.0      | 0.2      | 0.0      |
| 9     | 1:QZLokaal | Qw10  | -0.30  | -0.30 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 8     | 1:QZLokaal | Qw10  | -0.30  | -0.30 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 7     | 1:QZLokaal | Qw10  | -0.30  | -0.30 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 1     | 1:QZLokaal | Qw12  | 0.74   | 0.74  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |

**REACTIES**

1e orde

B.G:10 Wind van rechts onderdruk B

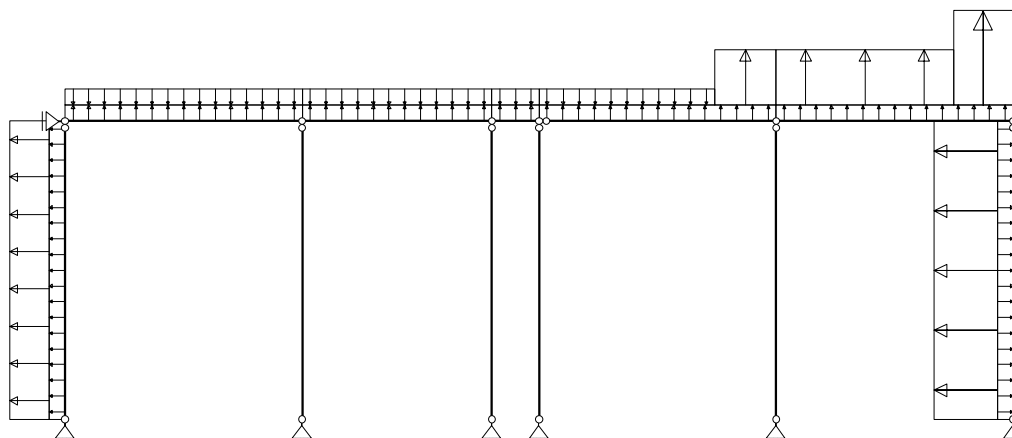
| Kn.    | X    | Z     | M                        |
|--------|------|-------|--------------------------|
| 1      | 0.93 | 1.48  |                          |
| 2      | 0.00 | 4.03  |                          |
| 3      | 0.00 | 1.96  |                          |
| 4      | 0.00 | 1.60  |                          |
| 5      | 0.00 | -1.39 |                          |
| 6      | 5.12 | -2.22 |                          |
| 7      | 6.05 |       |                          |
| 12.10  |      | 5.46  | : Som van de reacties    |
| -12.10 |      | -5.46 | : Som van de belastingen |

Project...: 180114 Uitbreiding Venster Techniek

Onderdeel: Spant 20

**BELASTINGEN**

B.G:11 Wind van rechts overdruk B

**STAAFBELASTINGEN**

B.G:11 Wind van rechts overdruk B

| Staat | Type       | Index | q1/p/m | q2    | A     | B     | $\psi_0$ | $\psi_1$ | $\psi_2$ |
|-------|------------|-------|--------|-------|-------|-------|----------|----------|----------|
| 1     | 1:QZLokaal | Qw8   | 0.30   | 0.30  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 7     | 1:QZLokaal | Qw8   | 0.30   | 0.30  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 8     | 1:QZLokaal | Qw8   | 0.30   | 0.30  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 9     | 1:QZLokaal | Qw8   | 0.30   | 0.30  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 10    | 1:QZLokaal | Qw8   | 0.30   | 0.30  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 11    | 1:QZLokaal | Qw8   | 0.30   | 0.30  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 6     | 1:QZLokaal | Qw9   | -0.30  | -0.30 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 6     | 1:QZLokaal | Qw11  | 1.18   | 1.18  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 11    | 1:QZLokaal |       | 0.00   | 0.00  | 3.740 | 0.000 | 0.0      | 0.2      | 0.0      |
| 11    | 1:QZLokaal | Qw4   | 1.77   | 1.77  | 3.740 | 0.000 | 0.0      | 0.2      | 0.0      |
| 11    | 1:QZLokaal | Qw5   | 1.03   | 1.03  | 0.000 | 1.260 | 0.0      | 0.2      | 0.0      |
| 10    | 1:QZLokaal | Qw5   | 1.03   | 1.03  | 3.700 | 0.000 | 0.0      | 0.2      | 0.0      |
| 10    | 1:QZLokaal | Qw10  | -0.30  | -0.30 | 0.000 | 1.300 | 0.0      | 0.2      | 0.0      |
| 9     | 1:QZLokaal | Qw10  | -0.30  | -0.30 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 8     | 1:QZLokaal | Qw10  | -0.30  | -0.30 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 7     | 1:QZLokaal | Qw10  | -0.30  | -0.30 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 1     | 1:QZLokaal | Qw12  | 0.74   | 0.74  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |

**REACTIES**

1e orde

B.G:11 Wind van rechts overdruk B

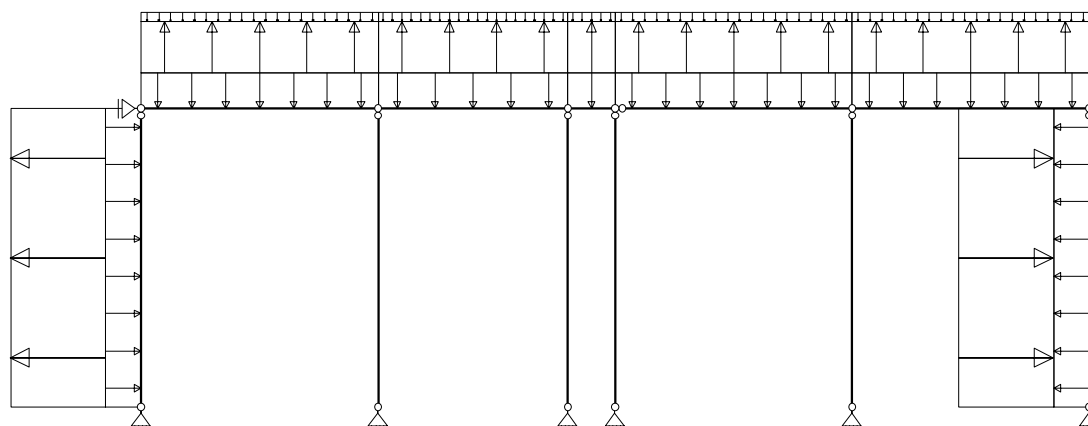
| Kn. | X      | Z     | M                        |
|-----|--------|-------|--------------------------|
| 1   | 3.26   | 0.00  |                          |
| 2   | 0.00   | -0.00 |                          |
| 3   | 0.00   | 0.00  |                          |
| 4   | 0.00   | 0.30  |                          |
| 5   | 0.00   | -6.00 |                          |
| 6   | 2.79   | -3.61 |                          |
| 7   | 6.05   |       |                          |
|     |        |       |                          |
|     | 12.10  | -9.31 | : Som van de reacties    |
|     | -12.10 | 9.31  | : Som van de belastingen |

Project...: 180114 Uitbreiding Venster Techniek

Onderdeel: Spant 20

**BELASTINGEN**

B.G:12 Wind loodrecht onderdruk A

**STAAFBELASTINGEN**

B.G:12 Wind loodrecht onderdruk A

| Staat | Type       | Index | q1/p/m | q2    | A     | B     | $\Psi_0$ | $\Psi_1$ | $\Psi_2$ |
|-------|------------|-------|--------|-------|-------|-------|----------|----------|----------|
| 1     | 1:QZLokaal | Qw1   | -0.44  | -0.44 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 7     | 1:QZLokaal | Qw1   | -0.44  | -0.44 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 8     | 1:QZLokaal | Qw1   | -0.44  | -0.44 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 9     | 1:QZLokaal | Qw1   | -0.44  | -0.44 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 10    | 1:QZLokaal | Qw1   | -0.44  | -0.44 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 11    | 1:QZLokaal | Qw1   | -0.44  | -0.44 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 6     | 1:QZLokaal | Qw2   | 0.44   | 0.44  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 1     | 1:QZLokaal | Qw13  | 1.18   | 1.18  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 6     | 1:QZLokaal | Qw14  | -1.18  | -1.18 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 7     | 1:QZLokaal | Qw15  | 0.64   | 0.64  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 7     | 1:QZLokaal | Qw16  | -0.11  | -0.11 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 8     | 1:QZLokaal | Qw15  | 0.64   | 0.64  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 8     | 1:QZLokaal | Qw16  | -0.11  | -0.11 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 9     | 1:QZLokaal | Qw15  | 0.64   | 0.64  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 9     | 1:QZLokaal | Qw16  | -0.11  | -0.11 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 10    | 1:QZLokaal | Qw15  | 0.64   | 0.64  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 10    | 1:QZLokaal | Qw16  | -0.11  | -0.11 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 11    | 1:QZLokaal | Qw15  | 0.64   | 0.64  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 11    | 1:QZLokaal | Qw16  | -0.11  | -0.11 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |

**REACTIES**

1e orde

B.G:12 Wind loodrecht onderdruk A

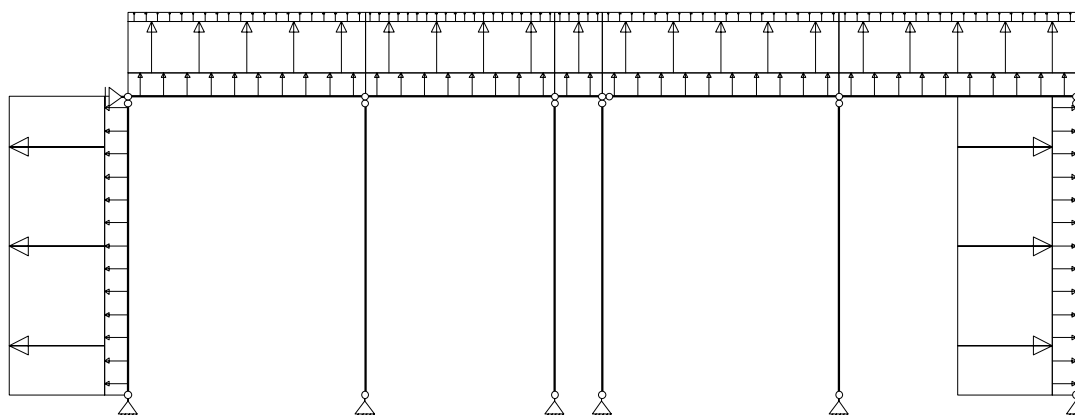
| Kn. | X     | Z     | M                        |
|-----|-------|-------|--------------------------|
| 1   | 2.33  | -0.17 |                          |
| 2   | 0.00  | -0.47 |                          |
| 3   | 0.00  | -0.23 |                          |
| 4   | 0.00  | -0.15 |                          |
| 5   | 0.00  | -0.54 |                          |
| 6   | -2.33 | -0.16 |                          |
| 7   | 0.00  |       |                          |
|     | 0.00  | -1.71 | : Som van de reacties    |
|     | 0.00  | 1.71  | : Som van de belastingen |

Project...: 180114 Uitbreiding Venster Techniek

Onderdeel: Spant 20

**BELASTINGEN**

B.G:13 Wind loodrecht overdruk A

**STAAFBELASTINGEN**

B.G:13 Wind loodrecht overdruk A

| Staat | Type       | Index | q1/p/m | q2    | A     | B     | $\psi_0$ | $\psi_1$ | $\psi_2$ |
|-------|------------|-------|--------|-------|-------|-------|----------|----------|----------|
| 1     | 1:QZLokaal | Qw8   | 0.30   | 0.30  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 7     | 1:QZLokaal | Qw8   | 0.30   | 0.30  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 8     | 1:QZLokaal | Qw8   | 0.30   | 0.30  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 9     | 1:QZLokaal | Qw8   | 0.30   | 0.30  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 10    | 1:QZLokaal | Qw8   | 0.30   | 0.30  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 11    | 1:QZLokaal | Qw8   | 0.30   | 0.30  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 6     | 1:QZLokaal | Qw9   | -0.30  | -0.30 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 1     | 1:QZLokaal | Qw13  | 1.18   | 1.18  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 6     | 1:QZLokaal | Qw14  | -1.18  | -1.18 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 7     | 1:QZLokaal | Qw15  | 0.64   | 0.64  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 7     | 1:QZLokaal | Qw17  | 0.11   | 0.11  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 8     | 1:QZLokaal | Qw15  | 0.64   | 0.64  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 8     | 1:QZLokaal | Qw17  | 0.11   | 0.11  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 9     | 1:QZLokaal | Qw15  | 0.64   | 0.64  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 9     | 1:QZLokaal | Qw17  | 0.11   | 0.11  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 10    | 1:QZLokaal | Qw15  | 0.64   | 0.64  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 10    | 1:QZLokaal | Qw17  | 0.11   | 0.11  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 11    | 1:QZLokaal | Qw15  | 0.64   | 0.64  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 11    | 1:QZLokaal | Qw17  | 0.11   | 0.11  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |

**REACTIES** 1e orde

B.G:13 Wind loodrecht overdruk A

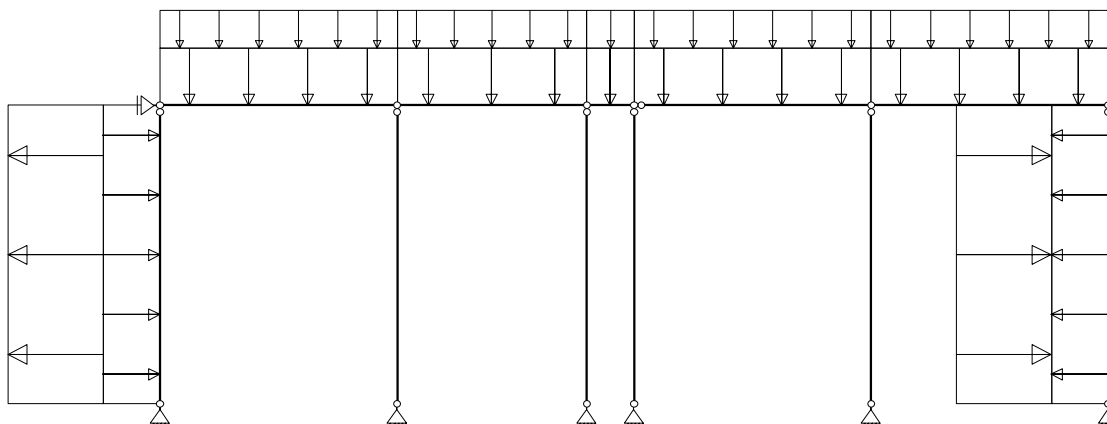
| Kn.  | X     | Z      | M                        |
|------|-------|--------|--------------------------|
| 1    | 4.65  | -2.10  |                          |
| 2    | 0.00  | -5.73  |                          |
| 3    | 0.00  | -2.78  |                          |
| 4    | 0.00  | -1.84  |                          |
| 5    | 0.00  | -6.55  |                          |
| 6    | -4.65 | -1.97  |                          |
| 7    | 0.00  |        |                          |
| 0.00 |       | -20.97 | : Som van de reacties    |
| 0.00 |       | 20.97  | : Som van de belastingen |

Project...: 180114 Uitbreiding Venster Techniek

Onderdeel: Spant 20

**BELASTINGEN**

B.G:14 Wind loodrecht onderdruk B

**STAAFBELASTINGEN**

B.G:14 Wind loodrecht onderdruk B

| Staad | Type       | Index | q1/p/m | q2    | A     | B     | $\psi_0$ | $\psi_1$ | $\psi_2$ |
|-------|------------|-------|--------|-------|-------|-------|----------|----------|----------|
| 1     | 1:QZLokaal | Qw1   | -0.44  | -0.44 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 7     | 1:QZLokaal | Qw1   | -0.44  | -0.44 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 8     | 1:QZLokaal | Qw1   | -0.44  | -0.44 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 9     | 1:QZLokaal | Qw1   | -0.44  | -0.44 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 10    | 1:QZLokaal | Qw1   | -0.44  | -0.44 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 11    | 1:QZLokaal | Qw1   | -0.44  | -0.44 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 6     | 1:QZLokaal | Qw2   | 0.44   | 0.44  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 1     | 1:QZLokaal | Qw18  | 0.74   | 0.74  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 6     | 1:QZLokaal | Qw19  | -0.74  | -0.74 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 7     | 1:QZLokaal | Qw10  | -0.30  | -0.30 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 8     | 1:QZLokaal | Qw10  | -0.30  | -0.30 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 9     | 1:QZLokaal | Qw10  | -0.30  | -0.30 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 10    | 1:QZLokaal | Qw10  | -0.30  | -0.30 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 11    | 1:QZLokaal | Qw10  | -0.30  | -0.30 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |

**REACTIES**

1e orde

B.G:14 Wind loodrecht onderdruk B

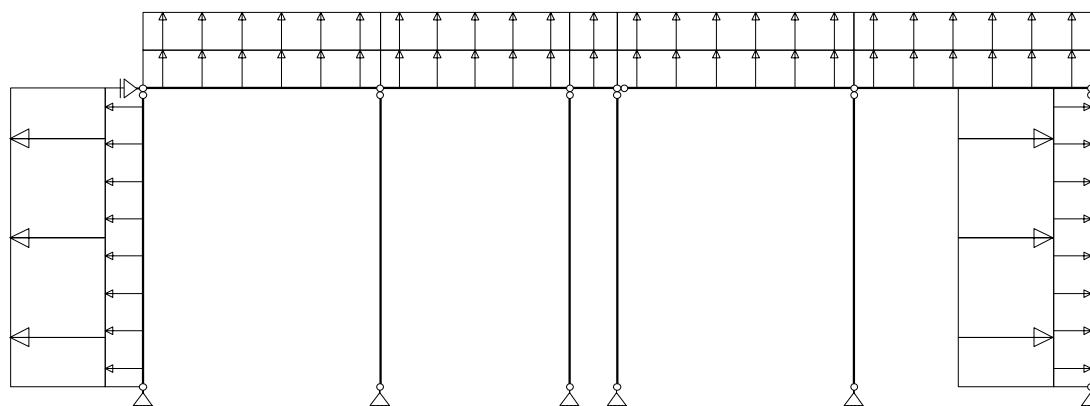
| Kn. | X     | Z      | M                        |
|-----|-------|--------|--------------------------|
| 1   | 0.93  | 1.48   |                          |
| 2   | 0.00  | 4.03   |                          |
| 3   | 0.00  | 1.96   |                          |
| 4   | 0.00  | 1.30   |                          |
| 5   | 0.00  | 4.61   |                          |
| 6   | -0.93 | 1.39   |                          |
| 7   | 0.00  |        |                          |
|     | 0.00  | 14.77  | : Som van de reacties    |
|     | 0.00  | -14.77 | : Som van de belastingen |

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Onderdeel: Spant 20

**BELASTINGEN**

B.G:15 Wind loodrecht overdruk B

**STAAFBELASTINGEN**

B.G:15 Wind loodrecht overdruk B

| Staafl | Type       | Index | q1/p/m | q2    | A     | B     | $\psi_0$ | $\psi_1$ | $\psi_2$ |
|--------|------------|-------|--------|-------|-------|-------|----------|----------|----------|
| 1      | 1:QZLokaal | Qw8   | 0.30   | 0.30  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 7      | 1:QZLokaal | Qw8   | 0.30   | 0.30  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 8      | 1:QZLokaal | Qw8   | 0.30   | 0.30  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 9      | 1:QZLokaal | Qw8   | 0.30   | 0.30  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 10     | 1:QZLokaal | Qw8   | 0.30   | 0.30  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 11     | 1:QZLokaal | Qw8   | 0.30   | 0.30  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 6      | 1:QZLokaal | Qw9   | -0.30  | -0.30 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 1      | 1:QZLokaal | Qw18  | 0.74   | 0.74  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 6      | 1:QZLokaal | Qw19  | -0.74  | -0.74 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 7      | 1:QZLokaal | Qw6   | 0.30   | 0.30  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 8      | 1:QZLokaal | Qw6   | 0.30   | 0.30  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 9      | 1:QZLokaal | Qw6   | 0.30   | 0.30  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 10     | 1:QZLokaal | Qw6   | 0.30   | 0.30  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 11     | 1:QZLokaal | Qw6   | 0.30   | 0.30  | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |

**REACTIES**

1e orde

B.G:15 Wind loodrecht overdruk B

| Kn. | X     | Z      | M                        |
|-----|-------|--------|--------------------------|
| 1   | 3.26  | -1.18  |                          |
| 2   | 0.00  | -3.23  |                          |
| 3   | 0.00  | -1.57  |                          |
| 4   | 0.00  | -1.04  |                          |
| 5   | 0.00  | -3.69  |                          |
| 6   | -3.26 | -1.11  |                          |
| 7   | 0.00  |        |                          |
|     | 0.00  | -11.82 | : Som van de reacties    |
|     | 0.00  | 11.82  | : Som van de belastingen |

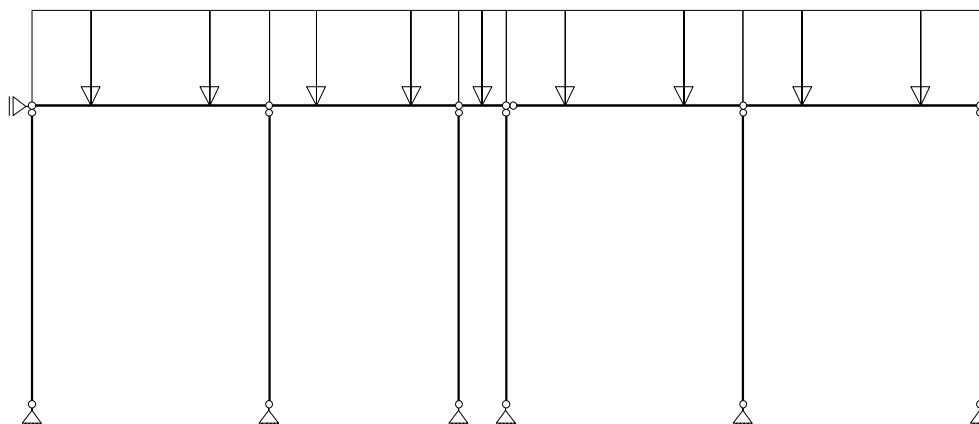


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Onderdeel: Spant 20

**BELASTINGEN**

B.G:16 Sneeuw A

**STAAFBELASTINGEN**

B.G:16 Sneeuw A

| Staat | Type        | Index | q1/p/m | q2    | A     | B     | $\psi_0$ | $\psi_1$ | $\psi_2$ |
|-------|-------------|-------|--------|-------|-------|-------|----------|----------|----------|
| 7     | 3:QZgeProj. | Qs1   | -1.40  | -1.40 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 8     | 3:QZgeProj. | Qs1   | -1.40  | -1.40 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 9     | 3:QZgeProj. | Qs1   | -1.40  | -1.40 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 10    | 3:QZgeProj. | Qs1   | -1.40  | -1.40 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |
| 11    | 3:QZgeProj. | Qs1   | -1.40  | -1.40 | 0.000 | 0.000 | 0.0      | 0.2      | 0.0      |

**REACTIES**

1e orde

B.G:16 Sneeuw A

| Kn. | X    | Z      | M                        |
|-----|------|--------|--------------------------|
| 1   | 0.00 | 2.80   |                          |
| 2   | 0.00 | 7.65   |                          |
| 3   | 0.00 | 3.71   |                          |
| 4   | 0.00 | 2.46   |                          |
| 5   | 0.00 | 8.75   |                          |
| 6   | 0.00 | 2.63   |                          |
| 7   | 0.00 |        |                          |
|     | 0.00 | 28.00  | : Som van de reacties    |
|     | 0.00 | -28.00 | : Som van de belastingen |

**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 |

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**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 |
| 50   | 3        | Nauwkeurigheid bereikt |
| 51   | 3        | Nauwkeurigheid bereikt |
| 52   | 3        | Nauwkeurigheid bereikt |
| 53   | 3        | Nauwkeurigheid bereikt |
| 54   | 3        | Nauwkeurigheid bereikt |
| 55   | 3        | Nauwkeurigheid bereikt |
| 56   | 3        | Nauwkeurigheid bereikt |
| 57   | 3        | Nauwkeurigheid bereikt |
| 58   | 3        | Nauwkeurigheid bereikt |

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Onderdeel: Spant 20

**BEREKENINGSTATUS**

Controlerende berekening

**B.C. Iteratie Status**

|    |                          |
|----|--------------------------|
| 59 | 3 Nauwkeurigheid bereikt |
| 60 | 3 Nauwkeurigheid bereikt |
| 61 | 3 Nauwkeurigheid bereikt |
| 62 | 3 Nauwkeurigheid bereikt |
| 63 | 3 Nauwkeurigheid bereikt |

**BELASTINGCOMBINATIES**

| BC Type | BG Gen. Factor | BG Gen. Factor | BG Gen. Factor | BG Gen. Factor |
|---------|----------------|----------------|----------------|----------------|
|---------|----------------|----------------|----------------|----------------|

|          |        |      |         |      |
|----------|--------|------|---------|------|
| 1 Fund.  | 1 Perm | 1.22 |         |      |
| 2 Fund.  | 1 Perm | 0.90 |         |      |
| 3 Fund.  | 1 Perm | 1.08 | 2 Extr  | 1.35 |
| 4 Fund.  | 1 Perm | 1.08 | 3 Extr  | 1.35 |
| 5 Fund.  | 1 Perm | 1.08 | 4 Extr  | 1.35 |
| 6 Fund.  | 1 Perm | 1.08 | 5 Extr  | 1.35 |
| 7 Fund.  | 1 Perm | 1.08 | 6 Extr  | 1.35 |
| 8 Fund.  | 1 Perm | 1.08 | 7 Extr  | 1.35 |
| 9 Fund.  | 1 Perm | 1.08 | 8 Extr  | 1.35 |
| 10 Fund. | 1 Perm | 1.08 | 9 Extr  | 1.35 |
| 11 Fund. | 1 Perm | 1.08 | 10 Extr | 1.35 |
| 12 Fund. | 1 Perm | 1.08 | 11 Extr | 1.35 |
| 13 Fund. | 1 Perm | 1.08 | 12 Extr | 1.35 |
| 14 Fund. | 1 Perm | 1.08 | 13 Extr | 1.35 |
| 15 Fund. | 1 Perm | 1.08 | 14 Extr | 1.35 |
| 16 Fund. | 1 Perm | 1.08 | 15 Extr | 1.35 |
| 17 Fund. | 1 Perm | 1.08 | 16 Extr | 1.35 |
| 18 Fund. | 1 Perm | 0.90 | 2 Extr  | 1.35 |
| 19 Fund. | 1 Perm | 0.90 | 3 Extr  | 1.35 |
| 20 Fund. | 1 Perm | 0.90 | 4 Extr  | 1.35 |
| 21 Fund. | 1 Perm | 0.90 | 5 Extr  | 1.35 |
| 22 Fund. | 1 Perm | 0.90 | 6 Extr  | 1.35 |
| 23 Fund. | 1 Perm | 0.90 | 7 Extr  | 1.35 |
| 24 Fund. | 1 Perm | 0.90 | 8 Extr  | 1.35 |
| 25 Fund. | 1 Perm | 0.90 | 9 Extr  | 1.35 |
| 26 Fund. | 1 Perm | 0.90 | 10 Extr | 1.35 |
| 27 Fund. | 1 Perm | 0.90 | 11 Extr | 1.35 |
| 28 Fund. | 1 Perm | 0.90 | 12 Extr | 1.35 |
| 29 Fund. | 1 Perm | 0.90 | 13 Extr | 1.35 |
| 30 Fund. | 1 Perm | 0.90 | 14 Extr | 1.35 |
| 31 Fund. | 1 Perm | 0.90 | 15 Extr | 1.35 |
| 32 Fund. | 1 Perm | 0.90 | 16 Extr | 1.35 |
| 33 Kar.  | 1 Perm | 1.00 | 2 Extr  | 1.00 |
| 34 Kar.  | 1 Perm | 1.00 | 3 Extr  | 1.00 |
| 35 Kar.  | 1 Perm | 1.00 | 4 Extr  | 1.00 |
| 36 Kar.  | 1 Perm | 1.00 | 5 Extr  | 1.00 |
| 37 Kar.  | 1 Perm | 1.00 | 6 Extr  | 1.00 |
| 38 Kar.  | 1 Perm | 1.00 | 7 Extr  | 1.00 |
| 39 Kar.  | 1 Perm | 1.00 | 8 Extr  | 1.00 |
| 40 Kar.  | 1 Perm | 1.00 | 9 Extr  | 1.00 |
| 41 Kar.  | 1 Perm | 1.00 | 10 Extr | 1.00 |
| 42 Kar.  | 1 Perm | 1.00 | 11 Extr | 1.00 |
| 43 Kar.  | 1 Perm | 1.00 | 12 Extr | 1.00 |
| 44 Kar.  | 1 Perm | 1.00 | 13 Extr | 1.00 |
| 45 Kar.  | 1 Perm | 1.00 | 14 Extr | 1.00 |
| 46 Kar.  | 1 Perm | 1.00 | 15 Extr | 1.00 |

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Onderdeel: Spant 20

**BELASTINGCOMBINATIES**

| BC Type  | BG Gen. Factor | BG Gen. Factor | BG Gen. Factor | BG Gen. Factor |
|----------|----------------|----------------|----------------|----------------|
| 47 Kar.  | 1 Perm 1.00    | 16 Extr 1.00   |                |                |
| 48 Quas. | 1 Perm 1.00    |                |                |                |
| 49 Freq. | 1 Perm 1.00    |                |                |                |
| 50 Freq. | 1 Perm 1.00    | 4 psi1 1.00    |                |                |
| 51 Freq. | 1 Perm 1.00    | 5 psi1 1.00    |                |                |
| 52 Freq. | 1 Perm 1.00    | 6 psi1 1.00    |                |                |
| 53 Freq. | 1 Perm 1.00    | 7 psi1 1.00    |                |                |
| 54 Freq. | 1 Perm 1.00    | 8 psi1 1.00    |                |                |
| 55 Freq. | 1 Perm 1.00    | 9 psi1 1.00    |                |                |
| 56 Freq. | 1 Perm 1.00    | 10 psi1 1.00   |                |                |
| 57 Freq. | 1 Perm 1.00    | 11 psi1 1.00   |                |                |
| 58 Freq. | 1 Perm 1.00    | 12 psi1 1.00   |                |                |
| 59 Freq. | 1 Perm 1.00    | 13 psi1 1.00   |                |                |
| 60 Freq. | 1 Perm 1.00    | 14 psi1 1.00   |                |                |
| 61 Freq. | 1 Perm 1.00    | 15 psi1 1.00   |                |                |
| 62 Freq. | 1 Perm 1.00    | 16 psi1 1.00   |                |                |
| 63 Blij. | 1 Perm 1.00    |                |                |                |

**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 Geen                        |
| 15 Geen                        |
| 16 Geen                        |
| 17 Geen                        |
| 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  |
| 25 Alle staven de factor:0.90  |
| 26 Alle staven de factor:0.90  |
| 27 Alle staven de factor:0.90  |
| 28 Alle staven de factor:0.90  |
| 29 Alle staven de factor:0.90  |
| 30 Alle staven de factor:0.90  |
| 31 Alle staven de factor:0.90  |
| 32 Alle staven de factor:0.90  |

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Onderdeel: Spant 20

| <b>REACTIES</b> |       | 2e orde | B.C:1 Fundamenteel B (6.10a) |                          |
|-----------------|-------|---------|------------------------------|--------------------------|
| Kn.             | X     | Z       | M                            |                          |
| 1               | 0.00  | 4.51    |                              |                          |
| 2               | -0.00 | 9.05    |                              |                          |
| 3               | -0.00 | 4.70    |                              |                          |
| 4               | -0.00 | 4.19    |                              |                          |
| 5               | -0.00 | 10.08   |                              |                          |
| 6               | -0.00 | 4.35    |                              |                          |
| 7               | 0.00  |         |                              |                          |
|                 |       | 0.00    | 36.88                        | : Som van de reacties    |
|                 |       | 0.00    | -36.88                       | : Som van de belastingen |

| <b>REACTIES</b> |       | 2e orde | B.C:2 Fundamenteel B (6.10a) |                          |
|-----------------|-------|---------|------------------------------|--------------------------|
| Kn.             | X     | Z       | M                            |                          |
| 1               | 0.00  | 3.34    |                              |                          |
| 2               | -0.00 | 6.70    |                              |                          |
| 3               | -0.00 | 3.48    |                              |                          |
| 4               | -0.00 | 3.11    |                              |                          |
| 5               | -0.00 | 7.46    |                              |                          |
| 6               | -0.00 | 3.22    |                              |                          |
| 7               | 0.00  |         |                              |                          |
|                 |       | 0.00    | 27.32                        | : Som van de reacties    |
|                 |       | 0.00    | -27.32                       | : Som van de belastingen |

| <b>REACTIES</b> |       | 2e orde | B.C:3 Fundamenteel B (6.10b) |       |       |       |
|-----------------|-------|---------|------------------------------|-------|-------|-------|
| Kn.             | X-min | X-max   | Z-min                        | Z-max | M-min | M-max |
| 1               | 0.00  | 0.00    | 3.61                         | 9.56  |       |       |
| 2               | -0.00 | -0.00   | 14.58                        | 24.63 |       |       |
| 3               | -0.00 | -0.00   | 1.56                         | 17.70 |       |       |
| 4               | -0.00 | 0.00    | -0.05                        | 13.36 |       |       |
| 5               | -0.00 | -0.00   | 17.69                        | 26.43 |       |       |
| 6               | -0.00 | -0.00   | 2.87                         | 9.62  |       |       |
| 7               | 0.00  | 0.00    |                              |       |       |       |

| <b>REACTIES</b> |       | 2e orde | B.C:4 Fundamenteel B (6.10b) |       |       |       |
|-----------------|-------|---------|------------------------------|-------|-------|-------|
| Kn.             | X-min | X-max   | Z-min                        | Z-max | M-min | M-max |
| 1               | 0.00  | 0.00    | 3.92                         | 4.80  |       |       |
| 2               | -0.00 | -0.00   | 8.02                         | 9.68  |       |       |
| 3               | -0.00 | -0.00   | 3.34                         | 6.32  |       |       |
| 4               | -0.00 | -0.00   | 2.73                         | 4.67  |       |       |
| 5               | -0.00 | -0.00   | 8.96                         | 10.35 |       |       |
| 6               | -0.00 | -0.00   | 3.67                         | 4.69  |       |       |
| 7               | 0.00  | 0.00    |                              |       |       |       |

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Onderdeel: Spant 20

| <b>REACTIES</b> 2e orde B.C:5 Fundamenteel B (6.10b) |        |        |                          |
|------------------------------------------------------|--------|--------|--------------------------|
| Kn.                                                  | X      | Z      | M                        |
| 1                                                    | -6.91  | 1.28   |                          |
| 2                                                    | 0.00   | 4.21   |                          |
| 3                                                    | 0.00   | 5.79   |                          |
| 4                                                    | 0.00   | 3.50   |                          |
| 5                                                    | 0.00   | 10.20  |                          |
| 6                                                    | -1.26  | 4.24   |                          |
| 7                                                    | -8.17  |        |                          |
|                                                      |        |        |                          |
|                                                      | -16.33 | 29.23  | : Som van de reacties    |
|                                                      | 16.33  | -29.23 | : Som van de belastingen |

| <b>REACTIES</b> 2e orde B.C:6 Fundamenteel B (6.10b) |        |       |                          |
|------------------------------------------------------|--------|-------|--------------------------|
| Kn.                                                  | X      | Z     | M                        |
| 1                                                    | -3.77  | -0.71 |                          |
| 2                                                    | -0.00  | -1.24 |                          |
| 3                                                    | 0.00   | 3.15  |                          |
| 4                                                    | 0.00   | 1.75  |                          |
| 5                                                    | 0.00   | 3.98  |                          |
| 6                                                    | -4.39  | 2.37  |                          |
| 7                                                    | -8.17  |       |                          |
|                                                      |        |       |                          |
|                                                      | -16.33 | 9.30  | : Som van de reacties    |
|                                                      | 16.33  | -9.30 | : Som van de belastingen |

| <b>REACTIES</b> 2e orde B.C:7 Fundamenteel B (6.10b) |        |        |                          |
|------------------------------------------------------|--------|--------|--------------------------|
| Kn.                                                  | X      | Z      | M                        |
| 1                                                    | -6.91  | 1.22   |                          |
| 2                                                    | 0.00   | 4.86   |                          |
| 3                                                    | 0.00   | 8.65   |                          |
| 4                                                    | 0.00   | 4.51   |                          |
| 5                                                    | 0.00   | 15.18  |                          |
| 6                                                    | -1.26  | 5.74   |                          |
| 7                                                    | -8.17  |        |                          |
|                                                      |        |        |                          |
|                                                      | -16.33 | 40.16  | : Som van de reacties    |
|                                                      | 16.33  | -40.16 | : Som van de belastingen |

| <b>REACTIES</b> 2e orde B.C:8 Fundamenteel B (6.10b) |        |        |                          |
|------------------------------------------------------|--------|--------|--------------------------|
| Kn.                                                  | X      | Z      | M                        |
| 1                                                    | -3.77  | -0.77  |                          |
| 2                                                    | -0.00  | -0.59  |                          |
| 3                                                    | 0.00   | 6.01   |                          |
| 4                                                    | 0.00   | 2.76   |                          |
| 5                                                    | 0.00   | 8.96   |                          |
| 6                                                    | -4.39  | 3.87   |                          |
| 7                                                    | -8.17  |        |                          |
|                                                      |        |        |                          |
|                                                      | -16.33 | 20.22  | : Som van de reacties    |
|                                                      | 16.33  | -20.22 | : Som van de belastingen |

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| <b>REACTIES</b> 2e orde B.C:9 Fundamenteel B (6.10b) |        |        |                          |
|------------------------------------------------------|--------|--------|--------------------------|
| Kn.                                                  | X      | Z      | M                        |
| 1                                                    | 1.26   | 4.41   |                          |
| 2                                                    | -0.00  | 9.14   |                          |
| 3                                                    | -0.00  | 4.70   |                          |
| 4                                                    | -0.00  | 4.32   |                          |
| 5                                                    | -0.00  | 5.61   |                          |
| 6                                                    | 6.91   | 1.06   |                          |
| 7                                                    | 8.17   |        |                          |
| <hr/>                                                |        |        |                          |
|                                                      | 16.33  | 29.23  | : Som van de reacties    |
|                                                      | -16.33 | -29.23 | : Som van de belastingen |

| <b>REACTIES</b> 2e orde B.C:10 Fundamenteel B (6.10b) |        |       |                          |
|-------------------------------------------------------|--------|-------|--------------------------|
| Kn.                                                   | X      | Z     | M                        |
| 1                                                     | 4.39   | 2.41  |                          |
| 2                                                     | -0.00  | 3.69  |                          |
| 3                                                     | -0.00  | 2.06  |                          |
| 4                                                     | -0.00  | 2.57  |                          |
| 5                                                     | 0.00   | -0.63 |                          |
| 6                                                     | 3.77   | -0.81 |                          |
| 7                                                     | 8.17   |       |                          |
| <hr/>                                                 |        |       |                          |
|                                                       | 16.33  | 9.30  | : Som van de reacties    |
|                                                       | -16.33 | -9.30 | : Som van de belastingen |

| <b>REACTIES</b> 2e orde B.C:11 Fundamenteel B (6.10b) |        |        |                          |
|-------------------------------------------------------|--------|--------|--------------------------|
| Kn.                                                   | X      | Z      | M                        |
| 1                                                     | 1.26   | 6.00   |                          |
| 2                                                     | -0.00  | 13.50  |                          |
| 3                                                     | -0.00  | 6.81   |                          |
| 4                                                     | -0.00  | 5.89   |                          |
| 5                                                     | -0.00  | 7.10   |                          |
| 6                                                     | 6.91   | 0.86   |                          |
| 7                                                     | 8.18   |        |                          |
| <hr/>                                                 |        |        |                          |
|                                                       | 16.34  | 40.16  | : Som van de reacties    |
|                                                       | -16.34 | -40.16 | : Som van de belastingen |

| <b>REACTIES</b> 2e orde B.C:12 Fundamenteel B (6.10b) |        |        |                          |
|-------------------------------------------------------|--------|--------|--------------------------|
| Kn.                                                   | X      | Z      | M                        |
| 1                                                     | 4.39   | 4.01   |                          |
| 2                                                     | -0.00  | 8.05   |                          |
| 3                                                     | -0.00  | 4.17   |                          |
| 4                                                     | -0.00  | 4.14   |                          |
| 5                                                     | -0.00  | 0.86   |                          |
| 6                                                     | 3.77   | -1.01  |                          |
| 7                                                     | 8.17   |        |                          |
| <hr/>                                                 |        |        |                          |
|                                                       | 16.33  | 20.22  | : Som van de reacties    |
|                                                       | -16.33 | -20.22 | : Som van de belastingen |

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| <b>REACTIES</b> |       | 2e orde | B.C:13 Fundamenteel B (6.10b) |                          |
|-----------------|-------|---------|-------------------------------|--------------------------|
| Kn.             | X     | Z       | M                             |                          |
| 1               | 3.14  | 3.78    |                               |                          |
| 2               | 0.00  | 7.41    |                               |                          |
| 3               | 0.00  | 3.87    |                               |                          |
| 4               | 0.00  | 3.53    |                               |                          |
| 5               | 0.00  | 8.23    |                               |                          |
| 6               | -3.14 | 3.65    |                               |                          |
| 7               | -0.00 |         |                               |                          |
|                 |       | 0.00    | 30.47                         | : Som van de reacties    |
|                 |       | -0.00   | -30.47                        | : Som van de belastingen |

| <b>REACTIES</b> |       | 2e orde | B.C:14 Fundamenteel B (6.10b) |                          |
|-----------------|-------|---------|-------------------------------|--------------------------|
| Kn.             | X     | Z       | M                             |                          |
| 1               | 6.28  | 1.17    |                               |                          |
| 2               | -0.00 | 0.32    |                               |                          |
| 3               | -0.00 | 0.41    |                               |                          |
| 4               | 0.00  | 1.24    |                               |                          |
| 5               | -0.00 | 0.12    |                               |                          |
| 6               | -6.28 | 1.21    |                               |                          |
| 7               | 0.00  |         |                               |                          |
|                 |       | -0.00   | 4.47                          | : Som van de reacties    |
|                 |       | 0.00    | -4.47                         | : Som van de belastingen |

| <b>REACTIES</b> |       | 2e orde | B.C:15 Fundamenteel B (6.10b) |                          |
|-----------------|-------|---------|-------------------------------|--------------------------|
| Kn.             | X     | Z       | M                             |                          |
| 1               | 1.26  | 6.01    |                               |                          |
| 2               | -0.00 | 13.49   |                               |                          |
| 3               | -0.00 | 6.82    |                               |                          |
| 4               | -0.00 | 5.48    |                               |                          |
| 5               | -0.00 | 15.18   |                               |                          |
| 6               | -1.26 | 5.74    |                               |                          |
| 7               | 0.00  |         |                               |                          |
|                 |       | -0.00   | 52.72                         | : Som van de reacties    |
|                 |       | 0.00    | -52.72                        | : Som van de belastingen |

| <b>REACTIES</b> |       | 2e orde | B.C:16 Fundamenteel B (6.10b) |                          |
|-----------------|-------|---------|-------------------------------|--------------------------|
| Kn.             | X     | Z       | M                             |                          |
| 1               | 4.39  | 2.41    |                               |                          |
| 2               | 0.00  | 3.69    |                               |                          |
| 3               | 0.00  | 2.06    |                               |                          |
| 4               | 0.00  | 2.33    |                               |                          |
| 5               | 0.00  | 3.98    |                               |                          |
| 6               | -4.39 | 2.37    |                               |                          |
| 7               | -0.00 |         |                               |                          |
|                 |       | 0.00    | 16.83                         | : Som van de reacties    |
|                 |       | -0.00   | -16.83                        | : Som van de belastingen |



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| <b>REACTIES</b> |       | 2e orde | B.C:17 Fundamenteel B (6.10b) |                          |
|-----------------|-------|---------|-------------------------------|--------------------------|
| Kn.             | X     | Z       | M                             |                          |
| 1               | 0.00  | 7.80    |                               |                          |
| 2               | -0.00 | 18.37   |                               |                          |
| 3               | -0.00 | 9.19    |                               |                          |
| 4               | -0.00 | 7.05    |                               |                          |
| 5               | -0.00 | 20.77   |                               |                          |
| 6               | -0.00 | 7.41    |                               |                          |
| 7               | 0.00  |         |                               |                          |
|                 |       | 0.00    | 70.58                         | : Som van de reacties    |
|                 |       | 0.00    | -70.58                        | : Som van de belastingen |

| <b>REACTIES</b> |       | 2e orde | B.C:18 Fundamenteel B (6.10b) |       |       |       |
|-----------------|-------|---------|-------------------------------|-------|-------|-------|
| Kn.             | X-min | X-max   | Z-min                         | Z-max | M-min | M-max |
| 1               | 0.00  | 0.00    | 2.94                          | 8.89  |       |       |
| 2               | -0.00 | -0.00   | 13.24                         | 23.29 |       |       |
| 3               | -0.00 | -0.00   | 0.86                          | 17.00 |       |       |
| 4               | -0.00 | 0.00    | -0.67                         | 12.74 |       |       |
| 5               | -0.00 | -0.00   | 16.20                         | 24.94 |       |       |
| 6               | -0.00 | -0.00   | 2.23                          | 8.98  |       |       |
| 7               | 0.00  | 0.00    |                               |       |       |       |

| <b>REACTIES</b> |       | 2e orde | B.C:19 Fundamenteel B (6.10b) |       |       |       |
|-----------------|-------|---------|-------------------------------|-------|-------|-------|
| Kn.             | X-min | X-max   | Z-min                         | Z-max | M-min | M-max |
| 1               | 0.00  | 0.00    | 3.25                          | 4.13  |       |       |
| 2               | -0.00 | -0.00   | 6.68                          | 8.34  |       |       |
| 3               | -0.00 | -0.00   | 2.64                          | 5.63  |       |       |
| 4               | -0.00 | -0.00   | 2.11                          | 4.05  |       |       |
| 5               | -0.00 | -0.00   | 7.46                          | 8.86  |       |       |
| 6               | -0.00 | -0.00   | 3.03                          | 4.04  |       |       |
| 7               | 0.00  | 0.00    |                               |       |       |       |

| <b>REACTIES</b> |       | 2e orde | B.C:20 Fundamenteel B (6.10b) |                          |
|-----------------|-------|---------|-------------------------------|--------------------------|
| Kn.             | X     | Z       | M                             |                          |
| 1               | -6.91 | 0.62    |                               |                          |
| 2               | 0.00  | 2.87    |                               |                          |
| 3               | 0.00  | 5.10    |                               |                          |
| 4               | 0.00  | 2.88    |                               |                          |
| 5               | 0.00  | 8.71    |                               |                          |
| 6               | -1.26 | 3.60    |                               |                          |
| 7               | -8.17 |         |                               |                          |
|                 |       | -16.33  | 23.77                         | : Som van de reacties    |
|                 |       | 16.33   | -23.77                        | : Som van de belastingen |

Onderdeel: Spant 20

B.C:21 Fundamenteel B (6.10b)

**REACTIES** 2e orde B.C:22 Fundamenteel B (6.10b)

**REACTIES** 2e orde B.C:23 Fundamenteel B (6.10b)

**REACTIES** 2e orde B.C:24 Fundamenteel B (6.10b)

| Kn. | X      | Z      | M                        |
|-----|--------|--------|--------------------------|
| 1   | 1.26   | 3.74   |                          |
| 2   | -0.00  | 7.80   |                          |
| 3   | -0.00  | 4.00   |                          |
| 4   | -0.00  | 3.70   |                          |
| 5   | -0.00  | 4.11   |                          |
| 6   | 6.91   | 0.41   |                          |
| 7   | 8.17   |        |                          |
|     | 16.33  | 23.77  | : Som van de reacties    |
|     | -16.33 | -23.77 | : Som van de belastingen |

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| <b>REACTIES</b> 2e orde B.C:25 Fundamenteel B (6.10b) |        |       |                          |
|-------------------------------------------------------|--------|-------|--------------------------|
| Kn.                                                   | X      | Z     | M                        |
| 1                                                     | 4.39   | 1.74  |                          |
| 2                                                     | -0.00  | 2.35  |                          |
| 3                                                     | -0.00  | 1.36  |                          |
| 4                                                     | -0.00  | 1.95  |                          |
| 5                                                     | 0.00   | -2.12 |                          |
| 6                                                     | 3.77   | -1.45 |                          |
| 7                                                     | 8.17   |       |                          |
|                                                       |        |       |                          |
|                                                       | 16.33  | 3.83  | : Som van de reacties    |
|                                                       | -16.33 | -3.83 | : Som van de belastingen |

| <b>REACTIES</b> 2e orde B.C:26 Fundamenteel B (6.10b) |        |        |                          |
|-------------------------------------------------------|--------|--------|--------------------------|
| Kn.                                                   | X      | Z      | M                        |
| 1                                                     | 1.26   | 5.34   |                          |
| 2                                                     | -0.00  | 12.16  |                          |
| 3                                                     | -0.00  | 6.11   |                          |
| 4                                                     | -0.00  | 5.27   |                          |
| 5                                                     | -0.00  | 5.60   |                          |
| 6                                                     | 6.91   | 0.21   |                          |
| 7                                                     | 8.18   |        |                          |
|                                                       |        |        |                          |
|                                                       | 16.34  | 34.70  | : Som van de reacties    |
|                                                       | -16.34 | -34.70 | : Som van de belastingen |

| <b>REACTIES</b> 2e orde B.C:27 Fundamenteel B (6.10b) |        |        |                          |
|-------------------------------------------------------|--------|--------|--------------------------|
| Kn.                                                   | X      | Z      | M                        |
| 1                                                     | 4.39   | 3.34   |                          |
| 2                                                     | -0.00  | 6.71   |                          |
| 3                                                     | -0.00  | 3.48   |                          |
| 4                                                     | -0.00  | 3.52   |                          |
| 5                                                     | 0.00   | -0.63  |                          |
| 6                                                     | 3.77   | -1.65  |                          |
| 7                                                     | 8.17   |        |                          |
|                                                       |        |        |                          |
|                                                       | 16.33  | 14.76  | : Som van de reacties    |
|                                                       | -16.33 | -14.76 | : Som van de belastingen |

| <b>REACTIES</b> 2e orde B.C:28 Fundamenteel B (6.10b) |       |        |                          |
|-------------------------------------------------------|-------|--------|--------------------------|
| Kn.                                                   | X     | Z      | M                        |
| 1                                                     | 3.14  | 3.11   |                          |
| 2                                                     | 0.00  | 6.07   |                          |
| 3                                                     | 0.00  | 3.17   |                          |
| 4                                                     | 0.00  | 2.90   |                          |
| 5                                                     | 0.00  | 6.74   |                          |
| 6                                                     | -3.14 | 3.00   |                          |
| 7                                                     | -0.00 |        |                          |
|                                                       |       |        |                          |
|                                                       | 0.00  | 25.01  | : Som van de reacties    |
|                                                       | -0.00 | -25.01 | : Som van de belastingen |

Onderdeel: Spant 20

B.C:29 Fundamenteel B (6.10b)

**REACTIES** 2e orde B.C:30 Fundamenteel B (6.10b)

**REACTIES** 2e orde B.C:31 Fundamenteel B (6.10b)

**REACTIES** 2e orde B.C:32 Fundamenteel B (6.10b)

| Kn. | X     | Z      | M                        |
|-----|-------|--------|--------------------------|
| 1   | 0.00  | 7.13   |                          |
| 2   | -0.00 | 17.03  |                          |
| 3   | -0.00 | 8.49   |                          |
| 4   | -0.00 | 6.43   |                          |
| 5   | -0.00 | 19.27  |                          |
| 6   | -0.00 | 6.77   |                          |
| 7   | 0.00  |        |                          |
|     | 0.00  | 65.12  | : Som van de reacties    |
|     | 0.00  | -65.12 | : Som van de belastingen |

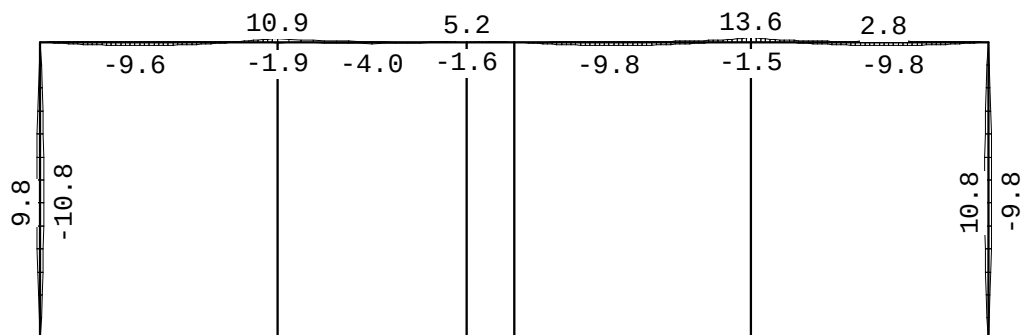
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**OMHULLENDE VAN DE FUNDAMENTELE COMBINATIES****MOMENTEN**

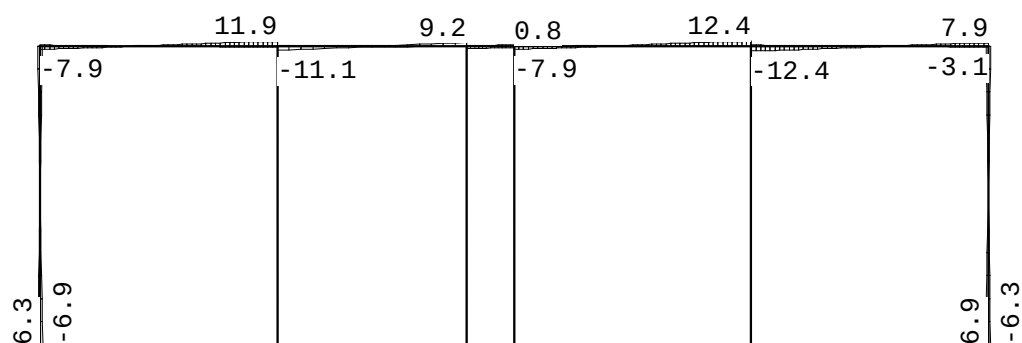
2e orde

Fundamentele combinatie

**DWARSKRACHTEN**

2e orde

Fundamentele combinatie



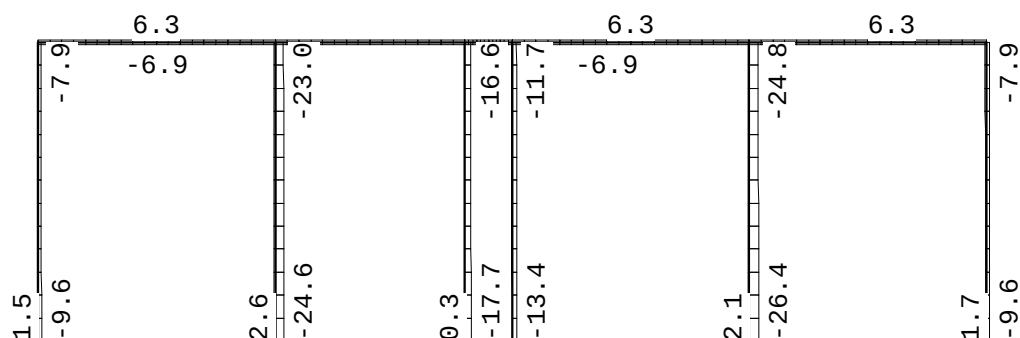
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**NORMAALKRACHTEN**

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     |      | -9.56   | 3  | 1.46 | 23 | -6.92   | 5  | 6.29  | 14 | 0.00    | 1  | 0.00  | 1  |
| 1   | 2.908 |      | -8.79   | 3  | 2.10 | 23 | -0.53   | 5  | 0.48  | 14 | -10.83  | 5  | 9.84  | 14 |
| 1   | 3.392 |      | -8.66   | 3  | 2.21 | 23 | -0.49   | 14 | 0.53  | 5  | -10.82  | 5  | 9.84  | 14 |
| 1   | 7     |      | -7.88   | 3  | 2.86 | 23 | -6.28   | 14 | 6.91  | 5  | 0.00    | 5  | 0.00  | 21 |
| 2   | 2     |      | -24.63  | 3  | 2.58 | 21 | -0.00   | 14 | 0.00  | 3  | 0.00    | 1  | 0.00  | 1  |
| 2   | 8     |      | -22.95  | 3  | 3.97 | 21 | -0.00   | 3  | 0.00  | 14 | 0.00    | 9  | 0.00  | 18 |
| 3   | 3     |      | -17.70  | 3  | 0.28 | 29 | -0.00   | 14 | 0.00  | 3  | 0.00    | 1  | 0.00  | 1  |
| 3   | 9     |      | -16.61  | 3  | 1.19 | 29 | -0.00   | 3  | 0.00  | 14 | 0.00    | 11 | 0.00  | 3  |
| 4   | 4     |      | -13.36  | 3  | 0.67 | 18 | -0.00   | 14 | 0.00  | 11 | 0.00    | 1  | 0.00  | 1  |
| 4   | 10    |      | -11.68  | 3  | 2.07 | 18 | -0.00   | 11 | 0.00  | 14 | 0.00    | 3  | 0.00  | 9  |
| 5   | 5     |      | -26.43  | 3  | 2.12 | 25 | -0.00   | 14 | 0.00  | 3  | 0.00    | 1  | 0.00  | 1  |
| 5   | 11    |      | -24.75  | 3  | 3.52 | 25 | -0.00   | 3  | 0.00  | 14 | 0.00    | 3  | 0.00  | 18 |
| 6   | 6     |      | -9.62   | 3  | 1.67 | 27 | -6.29   | 14 | 6.92  | 9  | 0.00    | 1  | 0.00  | 1  |
| 6   | 2.908 |      | -8.85   | 3  | 2.31 | 27 | -0.48   | 14 | 0.53  | 9  | -9.84   | 14 | 10.82 | 9  |
| 6   | 3.392 |      | -8.72   | 3  | 2.42 | 27 | -0.53   | 9  | 0.49  | 14 | -9.84   | 14 | 10.82 | 9  |
| 6   | 12    |      | -7.94   | 3  | 3.07 | 27 | -6.91   | 9  | 6.28  | 14 | 0.00    | 14 | 0.00  | 25 |
| 7   | 7     |      | -6.91   | 24 | 6.28 | 29 | -7.88   | 3  | 2.83  | 23 | 0.00    | 1  | 0.00  | 1  |
| 7   | 1.700 |      | -6.91   | 9  | 6.29 | 29 | -1.85   | 3  | 0.18  | 23 | -9.15   | 3  | 2.27  | 23 |
| 7   | 1.800 |      | -6.91   | 9  | 6.29 | 29 | -1.40   | 3  | 0.21  | 18 | -9.32   | 3  | 2.28  | 23 |
| 7   | 2.000 |      | -6.91   | 9  | 6.29 | 29 | -0.79   | 4  | 0.40  | 18 | -9.64   | 3  | 2.27  | 23 |
| 7   | 2.400 |      | -6.91   | 9  | 6.29 | 29 | -0.45   | 21 | 1.73  | 3  | -9.38   | 3  | 2.18  | 23 |
| 7   | 3.700 |      | -6.91   | 9  | 6.29 | 29 | -1.52   | 21 | 7.64  | 3  | -3.78   | 3  | 0.99  | 23 |
| 7   | 4.200 |      | -6.91   | 24 | 6.28 | 29 | -1.93   | 21 | 9.91  | 3  | -0.18   | 29 | 2.20  | 3  |
| 7   | 8     |      | -6.91   | 24 | 6.28 | 14 | -2.59   | 21 | 11.85 | 3  | -1.88   | 21 | 10.94 | 3  |
| 8   | 8     |      | -6.93   | 11 | 6.28 | 14 | -11.10  | 3  | 1.39  | 21 | -1.88   | 21 | 10.94 | 3  |
| 8   | 0.500 |      | -6.92   | 11 | 6.28 | 14 | -8.83   | 3  | 0.97  | 21 | -1.31   | 21 | 6.58  | 3  |
| 8   | 1.500 |      | -6.92   | 11 | 6.28 | 14 | -4.29   | 3  | 0.42  | 29 | -3.51   | 3  | 2.84  | 18 |
| 8   | 2.000 |      | -6.92   | 11 | 6.28 | 14 | -2.61   | 3  | 0.43  | 21 | -4.04   | 3  | 1.47  | 18 |
| 8   | 2.000 |      | -6.92   | 11 | 6.28 | 14 | -2.61   | 3  | 0.69  | 19 | -4.04   | 3  | 1.47  | 18 |

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**STAAFKRACHTEN** 2e orde Fundamentele combinatie

| St. | Kn.   | Pos. | NXi/NXj |    | DZi/DZj |    | MYi/MYj |    |
|-----|-------|------|---------|----|---------|----|---------|----|
|     |       |      | Min     | BC | Max     | BC | Min     | BC |
| 8   | 3.000 |      | -6.92   | 11 | 6.28    | 14 | -1.55   | 18 |
| 8   | 3.500 |      | -6.92   | 11 | 6.28    | 14 | -1.06   | 18 |
| 8   | 9     |      | -6.92   | 11 | 6.28    | 14 | -0.69   | 29 |
| 9   | 9     |      | -6.92   | 11 | 6.28    | 14 | -7.46   | 3  |
| 9   | 10    |      | -6.92   | 11 | 6.28    | 14 | -4.58   | 3  |
| 10  | 10    |      | -6.91   | 24 | 6.28    | 14 | -7.94   | 3  |
| 10  | 1.200 |      | -6.91   | 9  | 6.29    | 29 | -4.18   | 3  |
| 10  | 2.000 |      | -6.91   | 9  | 6.29    | 29 | -0.70   | 19 |
| 10  | 2.300 |      | -6.91   | 9  | 6.29    | 29 | -0.41   | 19 |
| 10  | 2.500 |      | -6.91   | 9  | 6.29    | 29 | -0.27   | 29 |
| 10  | 4.200 |      | -6.91   | 24 | 6.28    | 14 | -1.03   | 29 |
| 10  | 11    |      | -6.91   | 24 | 6.28    | 14 | -1.38   | 29 |
| 11  | 11    |      | -6.91   | 11 | 6.28    | 14 | -12.38  | 3  |
| 11  | 0.800 |      | -6.91   | 9  | 6.28    | 29 | -10.43  | 3  |
| 11  | 1.800 |      | -6.91   | 9  | 6.29    | 29 | -5.89   | 3  |
| 11  | 2.600 |      | -6.91   | 9  | 6.29    | 29 | -2.26   | 3  |
| 11  | 2.800 |      | -6.91   | 9  | 6.29    | 29 | -1.37   | 3  |
| 11  | 3.000 |      | -6.91   | 9  | 6.29    | 29 | -1.14   | 3  |
| 11  | 3.500 |      | -6.91   | 9  | 6.29    | 29 | -0.63   | 18 |
| 11  | 12    |      | -6.91   | 9  | 6.28    | 14 | -3.06   | 27 |

**REACTIES** 2e orde Fundamentele combinatie

| Kn. | X-min | X-max | Z-min | Z-max | M-min | M-max |
|-----|-------|-------|-------|-------|-------|-------|
| 1   | -6.91 | 6.28  | -1.44 | 9.56  |       |       |
| 2   | -0.00 | 0.00  | -2.58 | 24.63 |       |       |
| 3   | -0.00 | 0.00  | -0.28 | 17.70 |       |       |
| 4   | -0.00 | 0.00  | -0.67 | 13.36 |       |       |
| 5   | -0.00 | 0.00  | -2.12 | 26.43 |       |       |
| 6   | -6.28 | 6.91  | -1.65 | 9.62  |       |       |
| 7   | -8.17 | 8.18  |       |       |       |       |

Project...: 180114 Uitbreiding Venster Techniek

Onderdeel: Spant 20

**STAALPROFIELEN - ALGEMENE GEGEVENS**

Stabiliteit: Classificatie gehele constructie: Ongeschoord  
 Doorbuiging en verplaatsing:  
     Aantal bouwlagen: 1  
     Gebouwtype: Overig  
     Toel. horiz. verplaatsing gehele gebouw: h/300  
     Kleinste gevelhoogte [m]: 0.0

**MATERIAAL**

| Mat nr. | Profielnaam | Vloeisp. [N/mm <sup>2</sup> ] | Productie methode | Min. drsn. klasse |
|---------|-------------|-------------------------------|-------------------|-------------------|
| 1       | HEA120      | 235                           | Gewalst           | 1                 |
| 2       | HEA140      | 235                           | Gewalst           | 1                 |
| 3       | UNP140      | 235                           | Gewalst           | 1                 |

Partiële veiligheidsfactoren:

Gamma M;0 : 1.00      Gamma M;1 : 1.00

**KNIKSTABILITEIT**

| Staafl | l <sub>sys</sub> [m] | Classif. y sterke as | l <sub>knik;y</sub> [m] | Extra        | Classif. z zwakke as | l <sub>knik;z</sub> [m] | Extra        |
|--------|----------------------|----------------------|-------------------------|--------------|----------------------|-------------------------|--------------|
|        |                      |                      |                         | aanp. y [kN] |                      |                         | aanp. z [kN] |
| 1      | 6.300                | Ongeschoord          | 2e orde                 |              | Geschoord            | 6.300                   | 0.0          |
| 2      | 6.300                | Ongeschoord          | 2e orde                 |              | Geschoord            | 6.300                   | 0.0          |
| 3      | 6.300                | Ongeschoord          | 2e orde                 |              | Geschoord            | 6.300                   | 0.0          |
| 4      | 6.300                | Ongeschoord          | 2e orde                 |              | Geschoord            | 6.300                   | 0.0          |
| 5      | 6.300                | Ongeschoord          | 2e orde                 |              | Geschoord            | 6.300                   | 0.0          |
| 6      | 6.300                | Ongeschoord          | 2e orde                 |              | Geschoord            | 6.300                   | 0.0          |
| 7      | 5.000                | Ongeschoord          | 2e orde                 |              | Geschoord            | 5.000                   | 0.0          |
| 8      | 4.000                | Ongeschoord          | 2e orde                 |              | Geschoord            | 4.000                   | 0.0          |
| 9      | 1.000                | Ongeschoord          | 2e orde                 |              | Geschoord            | 1.000                   | 0.0          |
| 10     | 5.000                | Ongeschoord          | 2e orde                 |              | Geschoord            | 5.000                   | 0.0          |
| 11     | 5.000                | Ongeschoord          | 2e orde                 |              | Geschoord            | 5.000                   | 0.0          |

**KIPSTABILITEIT**

| Staafl | Plts. aangr. | l gaffel [m] |      | Kipsteunafstanden [m] |  |
|--------|--------------|--------------|------|-----------------------|--|
| 1      | 1.0*h        | boven:       | 6.30 | 6,3                   |  |
|        |              | onder:       | 6.30 | 6,3                   |  |
| 2      | 1.0*h        | boven:       | 6.30 | 6,3                   |  |
|        |              | onder:       | 6.30 | 6,3                   |  |
| 3      | 1.0*h        | boven:       | 6.30 | 6,3                   |  |
|        |              | onder:       | 6.30 | 6,3                   |  |
| 4      | 1.0*h        | boven:       | 6.30 | 6,3                   |  |
|        |              | onder:       | 6.30 | 6,3                   |  |
| 5      | 1.0*h        | boven:       | 6.30 | 6,3                   |  |
|        |              | onder:       | 6.30 | 6,3                   |  |
| 6      | 1.0*h        | boven:       | 6.30 | 6,3                   |  |
|        |              | onder:       | 6.30 | 6,3                   |  |
| 7      | 1.0*h        | boven:       | 5.00 | 5.000                 |  |
|        |              | onder:       | 5.00 | 5.000                 |  |
| 8      | 1.0*h        | boven:       | 4.00 | 4                     |  |
|        |              | onder:       | 4.00 | 4                     |  |
| 9      | 1.0*h        | boven:       | 1.00 | 1                     |  |
|        |              | onder:       | 1.00 | 1                     |  |



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Onderdeel: Spant 20

**KIPSTABILITEIT**

| Staafl | Plts.<br>aangr. | l gaffel<br>[m]  | Kipsteunafstanden<br>[m] |
|--------|-----------------|------------------|--------------------------|
| 10     | 1.0*h           | boven:<br>onder: | 5.00 5<br>5.00 5         |
| 11     | 1.0*h           | boven:<br>onder: | 5.00 5<br>5.00 5         |

**TOETSING SPANNINGEN**

| Staafl | Mat nr. | BC | Sit | Kl | Plaats | Norm    | Artikel | Formule | Hoogste toetsing<br>U.C. [N/mm <sup>2</sup> ] |     | Opm.       |
|--------|---------|----|-----|----|--------|---------|---------|---------|-----------------------------------------------|-----|------------|
| 1      | 2       | 5  | 1   | 1  | Staafl | EN3-1-1 | 6.3.3   | (6.62)  | 0.393                                         | 92  | 47         |
| 2      | 2       | 3  | 4   | 1  | Staafl | EN3-1-1 | 6.3.1.1 | (6.47z) | 0.157                                         | 37  | 47         |
| 3      | 3       | 3  | 3   | 1  | Staafl | EN3-1-1 | 6.3.1.1 | (6.47z) | 0.612                                         | 144 | 47, 18, 40 |
| 4      | 2       | 3  | 5   | 1  | Staafl | EN3-1-1 | 6.3.1.1 | (6.47z) | 0.085                                         | 20  | 47         |
| 5      | 2       | 3  | 4   | 1  | Staafl | EN3-1-1 | 6.3.1.1 | (6.47z) | 0.168                                         | 40  | 47         |
| 6      | 2       | 14 | 1   | 1  | Staafl | EN3-1-1 | 6.3.3   | (6.62)  | 0.357                                         | 84  | 47         |
| 7      | 1       | 3  | 4   | 1  | Staafl | EN3-1-1 | 6.3.2   | (6.54)  | 0.477                                         | 112 | 46         |
| 8      | 1       | 3  | 4   | 1  | Staafl | EN3-1-1 | 6.3.2   | (6.54)  | 0.425                                         | 100 |            |
| 9      | 1       | 3  | 3   | 1  | Begin  | EN3-1-1 | 6.2.8   | (6.30)  | 0.185                                         | 43  |            |
| 10     | 1       | 3  | 4   | 1  | Staafl | EN3-1-1 | 6.3.2   | (6.54)  | 0.543                                         | 128 | 46         |
| 11     | 1       | 3  | 4   | 1  | Staafl | EN3-1-1 | 6.3.2   | (6.54)  | 0.543                                         | 128 | 46         |

Opmerkingen:

[ 18] Eulerse torsiekracht N cr;T is onbekend. De toetsing op torsie volgens EC3 1.1/NB 6.3.1.4 (2) is niet uitgevoerd.

[ 40] Eulerse torsieknikkraft N cr;TF is onbekend. De toetsing op torsieknik volgens EC3 1.1/NB 6.3.1.4 (2) is niet uitgevoerd.

[ 46] T.b.v. kip is een equivalente Q-last berekend.

[ 47] Bij verlopende normaalkraft wordt de grootste drukkracht genomen.

**TOETSING DOORBUIGING**

| Staafl | Soort | Mtg | Lengte<br>[m] | Overst<br>I J | Zeeg<br>[mm] | u <sub>tot</sub><br>[mm] | BC | Sit    | u<br>[mm] | Toelaatbaar<br>[mm] | *l    |
|--------|-------|-----|---------------|---------------|--------------|--------------------------|----|--------|-----------|---------------------|-------|
| 7      | Dak   | db  | 5.00          | N N           | 0.0          | -13.4                    | 33 | 5 Eind | -13.4     | -20.0               | 0.004 |
|        |       | db  |               |               |              |                          | 33 | 5 Bijk | -9.8      | -20.0               | 0.004 |
| 8      | Dak   | db  | 4.00          | N N           | 0.0          | -3.0                     | 33 | 1 Eind | -3.0      | -16.0               | 0.004 |
|        |       | db  |               |               |              |                          | 33 | 1 Bijk | -2.8      | -16.0               | 0.004 |
| 9      | Dak   | db  | 1.00          | N N           | 0.0          | -0.2                     | 33 | 3 Eind | -0.2      | -4.0                | 0.004 |
|        |       | db  |               |               |              |                          | 33 | 3 Bijk | -0.2      | -4.0                | 0.004 |
| 10     | Dak   | db  | 5.00          | N N           | 0.0          | -13.5                    | 33 | 1 Eind | -13.5     | -20.0               | 0.004 |
|        |       | db  |               |               |              |                          | 33 | 1 Bijk | -10.7     | -20.0               | 0.004 |
| 11     | Dak   | db  | 5.00          | N N           | 0.0          | -13.5                    | 33 | 3 Eind | -13.5     | -20.0               | 0.004 |
|        |       | db  |               |               |              |                          | 33 | 3 Bijk | -10.7     | -20.0               | 0.004 |

**TOETSING HORIZONTALE VERPLAATSING**

| Staafl | BC | Sit | Lengte<br>[m] | u <sub>eind</sub><br>[mm] | Toelaatbaar<br>[mm] | [h/] |
|--------|----|-----|---------------|---------------------------|---------------------|------|
| 1      | 35 | 1   | 6.300         | -15.3                     | 42.0                | 150  |
| 2      | 33 | 5   | 6.300         | 0.1                       | 42.0                | 150  |
| 3      | 41 | 1   | 6.300         | 0.1                       | 42.0                | 150  |
| 4      | 41 | 1   | 6.300         | 0.1                       | 42.0                | 150  |
| 5      | 41 | 1   | 6.300         | 0.2                       | 42.0                | 150  |

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**TOETSING HORIZONTALE VERPLAATSING**

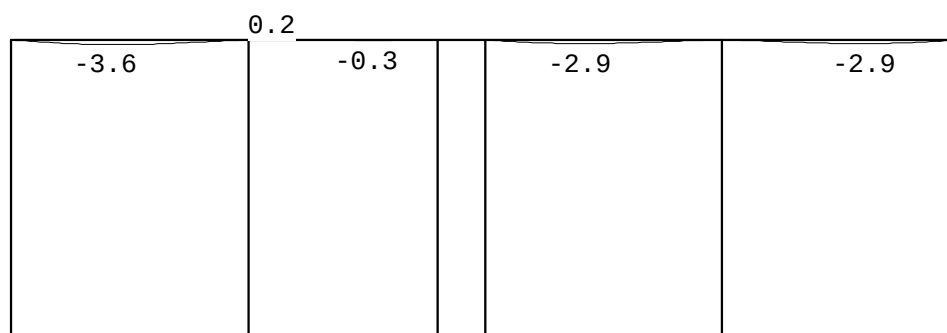
| Staafl | BC | Sit | Lengte<br>[m] | $u_{eind}$<br>[mm] | Toelaatbaar<br>[mm] | [h/] |
|--------|----|-----|---------------|--------------------|---------------------|------|
| 6      | 39 | 1   | 6.300         | 15.3               | 42.0                | 150  |

**TOETSING HOR. VERPLAATSING GLOBAAL**

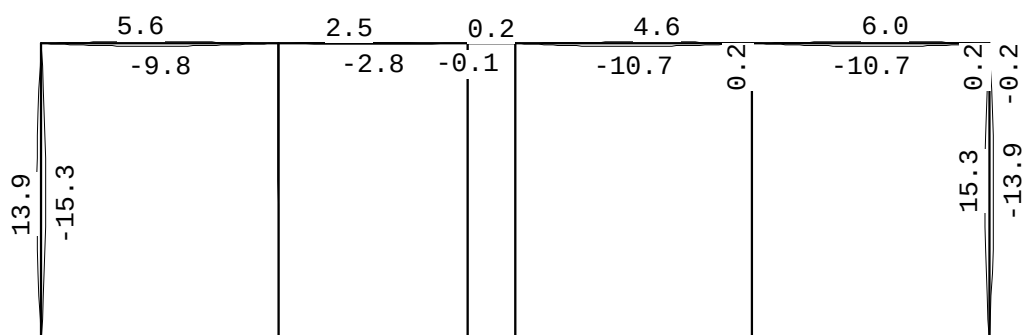
Er is een maximale horizontale verplaatsing van -0.0002 [m] gevonden bij knoop 12 en combinatie 41; belastingsituatie 1, iter:3 (combinatietype 2). Bij een hoogte van 6.300 [m] levert dit h / 26835 (toel.: h / 300).

**VERVORMINGEN w1**

Blijvende combinatie

**VERVORMINGEN w<sub>bij</sub>**

Karakteristieke combinatie

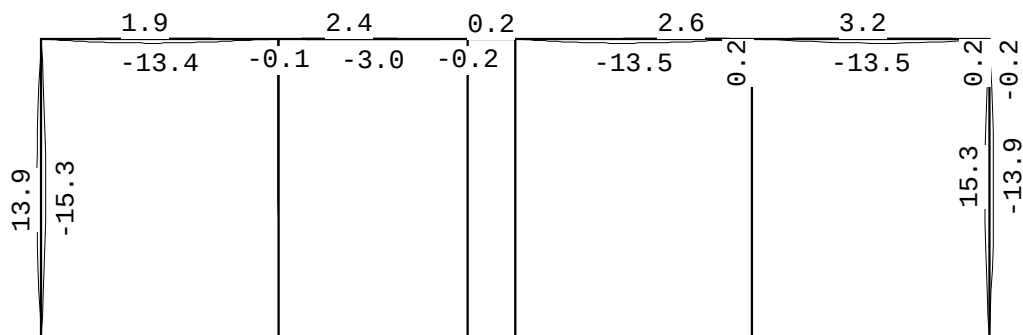


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**VERVORMINGEN  $w_{max}$** 

Karakteristieke combinatie



Technosoft Liggers release 6.26

29 aug 2018

Project.....: 180114 - Uitbreiding Venster Techniek

Onderdeel....: fundering

Constructeur.: Stephan

Opdrachtgever: -

Dimensies....: kN/m/rad

Datum.....: 28/08/2018

Bestand.....: f:\projecten\2018\180114 uitbreiding venstertechniek te zelhem\  
constructief cibis\fundering.dlw

Betrouwbaarheidsklasse : 1 Referentieperiode : 50  
 Toevallige inklemmingen begin : geen Toevallige inklemming eind : geen  
 Herverdelen van momenten : nee Maximale deellengte : 0.000  
 Ouderdom bij belasten : 28 Relatieve vochtigheid : 50%  
 Doorbuigingen(beton) zijn dmv gecorrigeerde stijfheden berekend.

Fysisch lineair : Er is gerekend met de e-modulus uit de materiaaltabel.

Fys.NLE.kort : Er is gerekend met een gecorrigeerde e-modulus (korte duur).

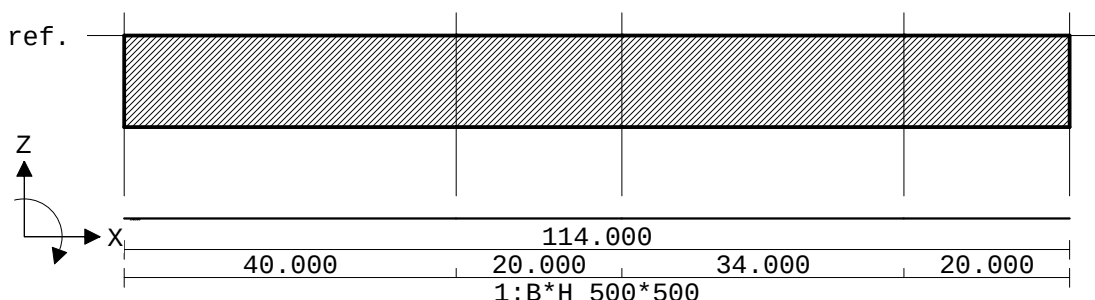
Deze e-mod. is berekend mbv de krachten uit de fysisch lineair berekening.

**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) |
| Beton       | NEN-EN 1992-1-1:2011(nl) | C2/A1:2015(nl) | NB:2016(nl) |

**GEOMETRIE**

Ligger:1

**VELDLENGTEN**

Ligger:1

| Veld | Vanaf | Tot     | Lengte  |
|------|-------|---------|---------|
| 1    | 0.000 | 114.000 | 114.000 |

**MATERIALEN**

| Mt | Omschrijving | E-modulus[N/mm2] | S.M. | Pois. | Uitz. coëff |
|----|--------------|------------------|------|-------|-------------|
| 1  | C20/25       | 7480             | 25.0 | 0.20  | 1.00000e-05 |

**MATERIALEN vervolg**

| Mt | Omschrijving | Cement | Kruipfac. |
|----|--------------|--------|-----------|
| 1  | C20/25       | N      | 3.01      |

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Onderdeel.....: fundering

**PROFIELEN [mm]**

| Prof. | Omschrijving | Materiaal | Oppervlak  | Traagheid  | Vormf. |
|-------|--------------|-----------|------------|------------|--------|
| 1     | B*H 500*500  | 1:C20/25  | 2.5000e+05 | 5.2083e+09 | 0.00   |

**PROFIELEN vervolg [mm]**

| Prof. | Staaftype | Breedte | Hoogte | e     | Type | b1 | h1 | b2 | h2 |
|-------|-----------|---------|--------|-------|------|----|----|----|----|
| 1     | 0:Normaal | 500     | 500    | 250.0 | 0:RH |    |    |    |    |

**DOORSNEDEN**

Ligger:1

| sector | Vanaf  | Tot     | Lengte | Profiel begin | z-begin | Profiel eind  | z-eind |
|--------|--------|---------|--------|---------------|---------|---------------|--------|
| 1      | 0.000  | 40.000  | 40.000 | 1:B*H 500*500 | 0.000   | 1:B*H 500*500 | 0.000  |
| 2      | 40.000 | 60.000  | 20.000 | 1:B*H 500*500 | 0.000   | 1:B*H 500*500 | 0.000  |
| 3      | 60.000 | 94.000  | 34.000 | 1:B*H 500*500 | 0.000   | 1:B*H 500*500 | 0.000  |
| 4      | 94.000 | 114.000 | 20.000 | 1:B*H 500*500 | 0.000   | 1:B*H 500*500 | 0.000  |

| sector | Vanaf  | Tot     | Lengte | Eindcode    | Bedding | Br. [mm] |
|--------|--------|---------|--------|-------------|---------|----------|
| 1      | 0.000  | 40.000  | 40.000 | 0:Scharnier | 5000    | 500      |
| 2      | 40.000 | 60.000  | 20.000 | 0:Scharnier | 5000    | 500      |
| 3      | 60.000 | 94.000  | 34.000 | 0:Scharnier | 5000    | 500      |
| 4      | 94.000 | 114.000 | 20.000 | 1:Vast      | 5000    | 500      |

**PROFIELVORMEN [mm]**

1 B\*H 500\*500

**BELASTINGGEVALLEN**

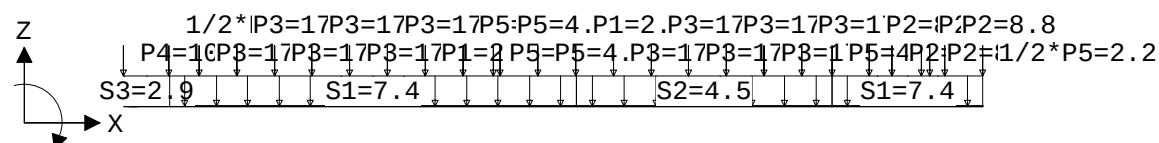
| B.G. | Omschrijving    | Belast/onbelast    | $\psi_0$ | $\psi_1$ | $\psi_2$ | e.g.  |
|------|-----------------|--------------------|----------|----------|----------|-------|
| 1    | Permanent       | 2:Permanent EN1991 |          |          |          | -1.00 |
| 2    | Veranderlijk    | 0:Alles tegelijk   | 1.00     | 0.90     | 0.80     | 0.00  |
| 3    | Wind van links  | 0:Alles tegelijk   | 0.00     | 0.00     | 0.00     | 0.00  |
| 4    | Wind van rechts | 0:Alles tegelijk   | 0.00     | 0.00     | 0.00     | 0.00  |

**BELASTINGGEVALLEN**

| B.G. | Omschrijving    | Type                           |
|------|-----------------|--------------------------------|
| 1    | Permanent       | 1 Permanente belasting         |
| 2    | Veranderlijk    | 2 Ver. bel. pers. ed. (p_rep)  |
| 3    | Wind van links  | 7 Wind van links onderdruk A   |
| 4    | Wind van rechts | 11 Wind van rechts onderdruk A |

**VELDBELASTINGEN**

Ligger:1 B.G:1 Permanent



Project.....: 180114 - Uitbreiding Venster Techniek

Onderdeel.....: fundering

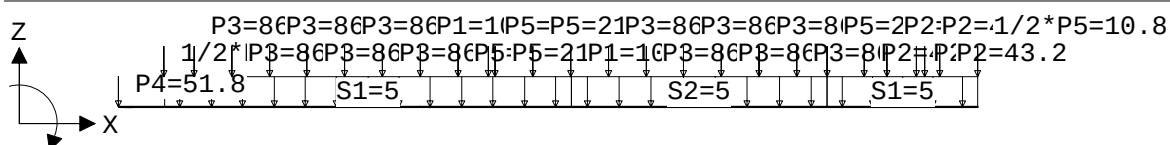
**VELDBELASTINGEN**

Ligger:1 B.G:1 Permanent

| Last Ref. | Type       | Omschrijving | q1/p/m  | q2     | psi | Afstand | Lengte |
|-----------|------------|--------------|---------|--------|-----|---------|--------|
| 1         | 8:Puntlast | P4           | -10.500 |        |     | 0.000   |        |
| 2         | 8:Puntlast | 1/2*P5       | -2.200  |        |     | 6.000   |        |
| 3         | 8:Puntlast | P3           | -17.500 |        |     | 10.000  |        |
| 4         | 8:Puntlast | P3           | -17.500 |        |     | 15.000  |        |
| 5         | 8:Puntlast | P3           | -17.500 |        |     | 20.000  |        |
| 6         | 8:Puntlast | P3           | -17.500 |        |     | 25.000  |        |
| 7         | 8:Puntlast | P3           | -17.500 |        |     | 30.000  |        |
| 8         | 8:Puntlast | P3           | -17.500 |        |     | 35.000  |        |
| 9         | 8:Puntlast | P1           | -2.200  |        |     | 40.000  |        |
| 10        | 8:Puntlast | P5           | -4.400  |        |     | 45.000  |        |
| 11        | 8:Puntlast | P5           | -4.400  |        |     | 49.000  |        |
| 12        | 8:Puntlast | P5           | -4.400  |        |     | 50.000  |        |
| 13        | 8:Puntlast | P5           | -4.400  |        |     | 55.000  |        |
| 14        | 8:Puntlast | P1           | -2.200  |        |     | 60.000  |        |
| 15        | 8:Puntlast | P3           | -17.500 |        |     | 65.000  |        |
| 16        | 8:Puntlast | P3           | -17.500 |        |     | 70.000  |        |
| 17        | 8:Puntlast | P3           | -17.500 |        |     | 75.000  |        |
| 18        | 8:Puntlast | P3           | -17.500 |        |     | 80.000  |        |
| 19        | 8:Puntlast | P3           | -17.500 |        |     | 85.000  |        |
| 20        | 8:Puntlast | P3           | -17.500 |        |     | 90.000  |        |
| 21        | 8:Puntlast | P5           | -4.400  |        |     | 94.000  |        |
| 22        | 8:Puntlast | P2           | -8.800  |        |     | 99.000  |        |
| 23        | 8:Puntlast | P2           | -8.800  |        |     | 102.000 |        |
| 24        | 8:Puntlast | P2           | -8.800  |        |     | 105.900 |        |
| 25        | 8:Puntlast | P2           | -8.800  |        |     | 107.000 |        |
| 26        | 8:Puntlast | P2           | -8.800  |        |     | 109.000 |        |
| 27        | 8:Puntlast | 1/2*P5       | -2.200  |        |     | 114.000 |        |
| 28        | 1:q-last   | S3           | -2.900  | -2.900 |     | 0.000   | 6.000  |
| 29        | 1:q-last   | S1           | -7.400  | -7.400 |     | 6.000   | 54.000 |
| 30        | 1:q-last   | S2           | -4.500  | -4.500 |     | 60.000  | 34.000 |
| 31        | 1:q-last   | S1           | -7.400  | -7.400 |     | 94.000  | 20.000 |

**VELDBELASTINGEN**

Ligger:1 B.G:2 Veranderlijk

**VELDBELASTINGEN**

Ligger:1 B.G:2 Veranderlijk

| Last Ref. | Type       | Omschrijving | q1/p/m  | q2 | psi | Afstand | Lengte |
|-----------|------------|--------------|---------|----|-----|---------|--------|
| 1         | 8:Puntlast | P4           | -51.800 |    |     | 0.000   |        |
| 2         | 8:Puntlast | 1/2*P5       | -10.800 |    |     | 6.000   |        |
| 3         | 8:Puntlast | P3           | -86.400 |    |     | 10.000  |        |
| 4         | 8:Puntlast | P3           | -86.400 |    |     | 15.000  |        |
| 5         | 8:Puntlast | P3           | -86.400 |    |     | 20.000  |        |
| 6         | 8:Puntlast | P3           | -86.400 |    |     | 25.000  |        |
| 7         | 8:Puntlast | P3           | -86.400 |    |     | 30.000  |        |
| 8         | 8:Puntlast | P3           | -86.400 |    |     | 35.000  |        |
| 9         | 8:Puntlast | P1           | -10.800 |    |     | 40.000  |        |
| 10        | 8:Puntlast | P5           | -21.600 |    |     | 45.000  |        |
| 11        | 8:Puntlast | P5           | -21.600 |    |     | 49.000  |        |
| 12        | 8:Puntlast | P5           | -21.600 |    |     | 50.000  |        |
| 13        | 8:Puntlast | P5           | -21.600 |    |     | 55.000  |        |

Project.....: 180114 - Uitbreiding Venster Techniek

Onderdeel.....: fundering

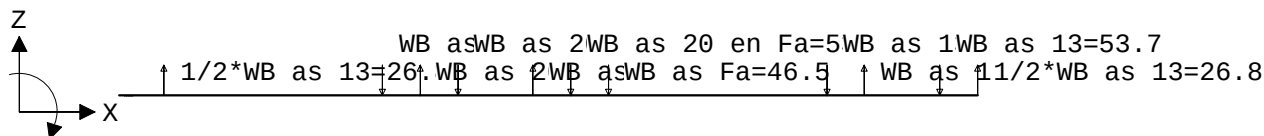
**VELDBELASTINGEN**

Ligger:1 B.G:2 Veranderlijk

| Last Ref. | Type       | Omschrijving | q1/p/m  | q2     | psi | Afstand | Lengte |
|-----------|------------|--------------|---------|--------|-----|---------|--------|
| 14        | 8:Puntlast | P1           | -10.800 |        |     | 60.000  |        |
| 15        | 8:Puntlast | P3           | -86.400 |        |     | 65.000  |        |
| 16        | 8:Puntlast | P3           | -86.400 |        |     | 70.000  |        |
| 17        | 8:Puntlast | P3           | -86.400 |        |     | 75.000  |        |
| 18        | 8:Puntlast | P3           | -86.400 |        |     | 80.000  |        |
| 19        | 8:Puntlast | P3           | -86.400 |        |     | 85.000  |        |
| 20        | 8:Puntlast | P3           | -86.400 |        |     | 90.000  |        |
| 21        | 8:Puntlast | P5           | -21.600 |        |     | 94.000  |        |
| 22        | 8:Puntlast | P2           | -43.200 |        |     | 99.000  |        |
| 23        | 8:Puntlast | P2           | -43.200 |        |     | 102.000 |        |
| 24        | 8:Puntlast | P2           | -43.200 |        |     | 105.900 |        |
| 25        | 8:Puntlast | P2           | -43.200 |        |     | 107.000 |        |
| 26        | 8:Puntlast | P2           | -43.200 |        |     | 109.000 |        |
| 27        | 8:Puntlast | 1/2*P5       | -10.800 |        |     | 114.000 |        |
| 28        | 1:q-last   | S1           | -5.000  | -5.000 |     | 6.000   | 54.000 |
| 29        | 1:q-last   | S2           | -5.000  | -5.000 |     | 60.000  | 34.000 |
| 30        | 1:q-last   | S1           | -5.000  | -5.000 |     | 94.000  | 20.000 |

**VELDBELASTINGEN**

Ligger:1 B.G:3 Wind van links

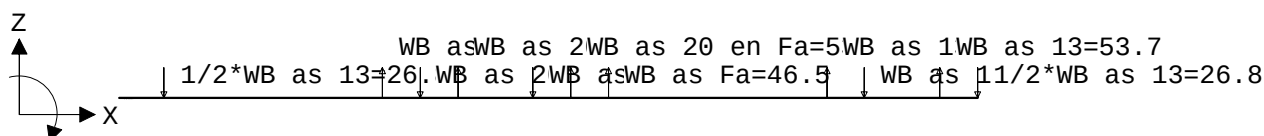
**VELDBELASTINGEN**

Ligger:1 B.G:3 Wind van links

| Last Ref. | Type       | Omschrijving   | q1/p/m  | q2 | psi | Afstand | Lengte |
|-----------|------------|----------------|---------|----|-----|---------|--------|
| 1         | 8:Puntlast | 1/2*WB as 13   | 26.800  |    |     | 6.000   |        |
| 2         | 8:Puntlast | WB as J        | -46.500 |    |     | 35.000  |        |
| 3         | 8:Puntlast | WB as 20 en J  | 53.700  |    |     | 40.000  |        |
| 4         | 8:Puntlast | WB as 20       | -53.700 |    |     | 45.000  |        |
| 5         | 8:Puntlast | WB as 20       | 53.700  |    |     | 55.000  |        |
| 6         | 8:Puntlast | WB as 20 en Fa | -53.700 |    |     | 60.000  |        |
| 7         | 8:Puntlast | WB as Fa       | -46.500 |    |     | 65.000  |        |
| 8         | 8:Puntlast | WB as 13       | -53.700 |    |     | 94.000  |        |
| 9         | 8:Puntlast | WB as 13       | 53.700  |    |     | 99.000  |        |
| 10        | 8:Puntlast | WB as 13       | -53.700 |    |     | 109.000 |        |
| 11        | 8:Puntlast | 1/2*WB as 13   | 26.800  |    |     | 114.000 |        |

**VELDBELASTINGEN**

Ligger:1 B.G:4 Wind van rechts



Project.....: 180114 - Uitbreiding Venster Techniek

Onderdeel.....: fundering

**VELDBELASTINGEN**

Ligger:1 B.G:4 Wind van rechts

| Last Ref. | Type       | Omschrijving   | q1/p/m  | q2 | psi | Afstand | Lengte |
|-----------|------------|----------------|---------|----|-----|---------|--------|
| 1         | 8:Puntlast | 1/2*WB as 13   | -26.800 |    |     | 6.000   |        |
| 2         | 8:Puntlast | WB as J        | 46.500  |    |     | 35.000  |        |
| 3         | 8:Puntlast | WB as 20 en J  | -53.700 |    |     | 40.000  |        |
| 4         | 8:Puntlast | WB as 20       | 53.700  |    |     | 45.000  |        |
| 5         | 8:Puntlast | WB as 20       | -53.700 |    |     | 55.000  |        |
| 6         | 8:Puntlast | WB as 20 en Fa | 53.700  |    |     | 60.000  |        |
| 7         | 8:Puntlast | WB as Fa       | 46.500  |    |     | 65.000  |        |
| 8         | 8:Puntlast | WB as 13       | 53.700  |    |     | 94.000  |        |
| 9         | 8:Puntlast | WB as 13       | -53.700 |    |     | 99.000  |        |
| 10        | 8:Puntlast | WB as 13       | 53.700  |    |     | 109.000 |        |
| 11        | 8:Puntlast | 1/2*WB as 13   | -26.800 |    |     | 114.000 |        |

**BELASTINGCOMBINATIES**

| BC Type  | BG | Gen. | Factor | BG | Gen. | Factor | BG | Gen. | Factor | BG | Gen. | Factor |
|----------|----|------|--------|----|------|--------|----|------|--------|----|------|--------|
| 1 Fund.  | 1  | Perm | 1.22   |    |      |        |    |      |        |    |      |        |
| 2 Fund.  | 1  | Perm | 0.90   |    |      |        |    |      |        |    |      |        |
| 3 Fund.  | 1  | Perm | 1.22   | 2  | psi0 | 1.35   |    |      |        |    |      |        |
| 4 Fund.  | 1  | Perm | 1.08   | 2  | Extr | 1.35   |    |      |        |    |      |        |
| 5 Fund.  | 1  | Perm | 1.08   | 3  | Extr | 1.35   |    |      |        |    |      |        |
| 6 Fund.  | 1  | Perm | 1.08   | 4  | Extr | 1.35   |    |      |        |    |      |        |
| 7 Fund.  | 1  | Perm | 0.90   | 2  | Extr | 1.35   |    |      |        |    |      |        |
| 8 Fund.  | 1  | Perm | 0.90   | 2  | psi0 | 1.35   |    |      |        |    |      |        |
| 9 Fund.  | 1  | Perm | 0.90   | 3  | Extr | 1.35   |    |      |        |    |      |        |
| 10 Fund. | 1  | Perm | 0.90   | 4  | Extr | 1.35   |    |      |        |    |      |        |
| 11 Fund. | 1  | Perm | 1.08   | 3  | Extr | 1.35   | 2  | psi0 | 1.35   |    |      |        |
| 12 Fund. | 1  | Perm | 1.08   | 4  | Extr | 1.35   | 2  | psi0 | 1.35   |    |      |        |
| 13 Fund. | 1  | Perm | 0.90   | 3  | Extr | 1.35   | 2  | psi0 | 1.35   |    |      |        |
| 14 Fund. | 1  | Perm | 0.90   | 4  | Extr | 1.35   | 2  | psi0 | 1.35   |    |      |        |
| 15 Kar.  | 1  | Perm | 1.00   | 2  | Extr | 1.00   |    |      |        |    |      |        |
| 16 Kar.  | 1  | Perm | 1.00   | 3  | Extr | 1.00   |    |      |        |    |      |        |
| 17 Kar.  | 1  | Perm | 1.00   | 4  | Extr | 1.00   |    |      |        |    |      |        |
| 18 Kar.  | 1  | Perm | 1.00   | 3  | Extr | 1.00   | 2  | psi0 | 1.00   |    |      |        |
| 19 Kar.  | 1  | Perm | 1.00   | 4  | Extr | 1.00   | 2  | psi0 | 1.00   |    |      |        |
| 20 Quas. | 1  | Perm | 1.00   |    |      |        |    |      |        |    |      |        |
| 21 Quas. | 1  | Perm | 1.00   | 2  | psi2 | 1.00   |    |      |        |    |      |        |
| 22 Freq. | 1  | Perm | 1.00   |    |      |        |    |      |        |    |      |        |
| 23 Freq. | 1  | Perm | 1.00   | 2  | psi1 | 1.00   |    |      |        |    |      |        |
| 24 Blij. | 1  | Perm | 1.00   |    |      |        |    |      |        |    |      |        |

**GUNSTIGE WERKING PERMANENTE BELASTINGEN**

BC Velden met gunstige werking

- 1 Geen
- 2 Alle velden de factor:0.90
- 3 Geen
- 4 Geen
- 5 Geen
- 6 Geen
- 7 Alle velden de factor:0.90
- 8 Alle velden de factor:0.90
- 9 Alle velden de factor:0.90
- 10 Alle velden de factor:0.90
- 11 Geen
- 12 Geen



Project.....: 180114 - Uitbreiding Venster Techniek

Onderdeel....: fundering

**GUNSTIGE WERKING PERMANENTE BELASTINGEN**

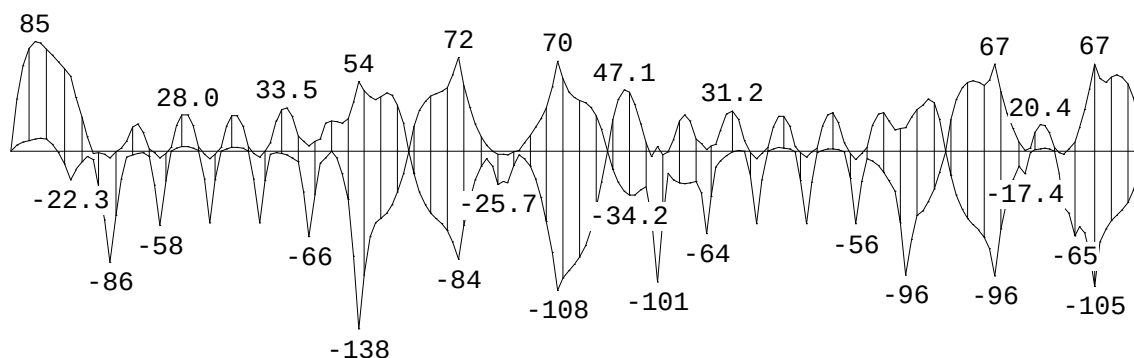
BC Velden met gunstige werking

13 Alle velden de factor:0.90

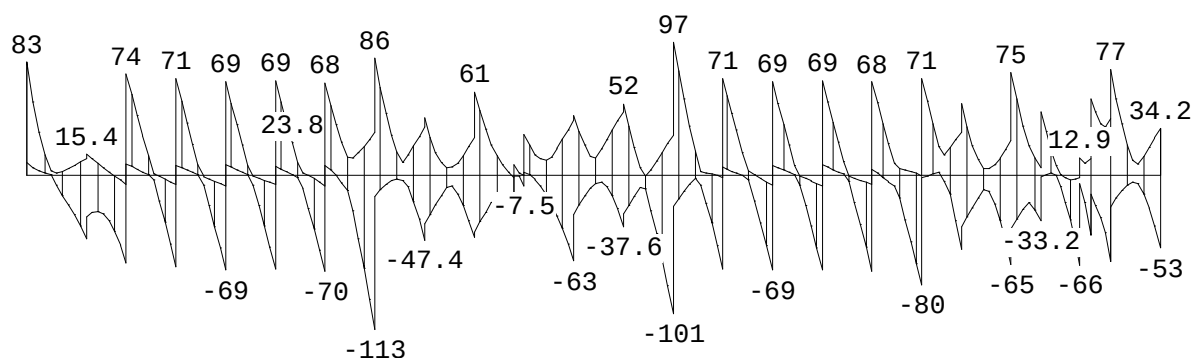
14 Alle velden de factor:0.90

**OMHULLENDE VAN DE FUNDAMENTELE COMBINATIES****MOMENTEN** Fysisch lineair

Ligger:1 Fundamentele combinatie

**DWARSKRACHTEN** Fysisch lineair

Ligger:1 Fundamentele combinatie

**TUSSENPUTTEN** Fysisch lineair

Ligger:1 Fundamentele combinatie

| Veld | Pos.  | Grondspan. [N/mm2] |       | Dwarskr |       | Moment |       |
|------|-------|--------------------|-------|---------|-------|--------|-------|
|      |       | min.               | max.  | min.    | max.  | min.   | max.  |
| 1    | 0.000 | 0.025              | 0.130 | 9.45    | 82.69 | 0.00   | 0.00  |
| 1    | 0.480 | 0.024              | 0.112 | 6.42    | 59.57 | 3.58   | 32.48 |
| 1    | 0.960 | 0.023              | 0.095 | 4.12    | 40.53 | 6.01   | 55.75 |
| 1    | 1.440 | 0.022              | 0.080 | 2.53    | 25.03 | 7.59   | 71.30 |
| 1    | 1.920 | 0.019              | 0.066 | 1.41    | 12.69 | 8.58   | 80.50 |
| 1    | 2.400 | 0.016              | 0.056 | 0.39    | 3.37  | 9.25   | 84.62 |
| 1    | 2.700 | 0.015              | 0.052 | -3.31   | 2.57  | 9.69   | 84.24 |
| 1    | 3.000 | 0.013              | 0.048 | -7.01   | 1.78  | 10.12  | 83.86 |
| 1    | 3.500 | 0.011              | 0.044 | -13.37  | 2.85  | 9.24   | 79.83 |
| 1    | 4.000 | 0.010              | 0.043 | -19.23  | 4.34  | 6.37   | 75.86 |
| 1    | 4.500 | 0.009              | 0.044 | -25.07  | 6.15  | 1.87   | 71.76 |
| 1    | 5.000 | 0.008              | 0.046 | -31.32  | 8.19  | -4.28  | 67.46 |
| 1    | 5.500 | 0.008              | 0.050 | -38.34  | 10.34 | -12.27 | 62.85 |
| 1    | 6.000 | 0.008              | 0.055 | -46.42  | 12.45 | -22.30 | 57.76 |
| 1    | 6.000 | 0.008              | 0.055 | -30.42  | 15.39 | -22.30 | 57.76 |
| 1    | 6.381 | 0.010              | 0.059 | -28.30  | 13.29 | -17.03 | 46.84 |

Project.....: 180114 - Uitbreiding Venster Techniek

Onderdeel.....: fundering

**TUSSENpunten** Fysisch lineair

Ligger:1 Fundamentele combinatie

| Veld | Pos.   | Grondspan. [N/mm2] |       | Dwarskr |       | Moment |       |
|------|--------|--------------------|-------|---------|-------|--------|-------|
|      |        | min.               | max.  | min.    | max.  | min.   | max.  |
| 1    | 6.762  | 0.011              | 0.063 | -26.94  | 11.15 | -12.37 | 36.32 |
| 1    | 7.143  | 0.013              | 0.068 | -26.35  | 8.96  | -8.33  | 26.19 |
| 1    | 7.429  | 0.014              | 0.071 | -27.25  | 7.33  | -6.32  | 18.56 |
| 1    | 7.714  | 0.016              | 0.074 | -28.16  | 5.69  | -4.31  | 10.92 |
| 1    | 8.000  | 0.017              | 0.078 | -30.53  | 4.09  | -5.43  | 4.55  |
| 1    | 8.286  | 0.019              | 0.081 | -32.89  | 2.49  | -6.55  | -1.81 |
| 1    | 8.571  | 0.020              | 0.085 | -36.74  | 0.95  | -16.97 | -1.55 |
| 1    | 8.857  | 0.022              | 0.088 | -40.58  | -0.59 | -27.40 | -1.28 |
| 1    | 9.238  | 0.024              | 0.092 | -47.53  | -2.55 | -44.76 | -2.07 |
| 1    | 9.619  | 0.025              | 0.095 | -55.37  | -4.47 | -64.34 | -3.40 |
| 1    | 10.000 | 0.027              | 0.099 | -64.11  | -6.33 | -86.12 | -5.29 |
| 1    | 10.000 | 0.027              | 0.099 | 8.19    | 73.79 | -86.12 | -5.29 |
| 1    | 10.463 | 0.028              | 0.101 | 7.11    | 61.43 | -56.00 | -1.52 |
| 1    | 10.926 | 0.029              | 0.101 | 5.36    | 48.81 | -31.12 | 1.36  |
| 1    | 11.389 | 0.030              | 0.102 | 3.54    | 36.37 | -13.31 | 5.12  |
| 1    | 11.852 | 0.030              | 0.102 | 1.84    | 24.07 | -4.20  | 11.37 |
| 1    | 12.315 | 0.031              | 0.102 | -0.10   | 12.02 | -2.54  | 18.86 |
| 1    | 12.778 | 0.031              | 0.102 | -3.35   | 1.24  | -1.55  | 20.79 |
| 1    | 13.055 | 0.031              | 0.103 | -10.97  | 0.29  | -1.47  | 17.75 |
| 1    | 13.333 | 0.031              | 0.103 | -18.58  | -0.66 | -1.38  | 14.71 |
| 1    | 13.333 | 0.031              | 0.103 | -18.58  | -0.66 | -1.38  | 14.71 |
| 1    | 13.750 | 0.031              | 0.105 | -30.27  | -2.16 | -3.26  | 4.93  |
| 1    | 14.167 | 0.031              | 0.106 | -42.17  | -3.70 | -15.05 | 0.10  |
| 1    | 14.584 | 0.031              | 0.107 | -54.36  | -5.26 | -34.09 | -2.50 |
| 1    | 15.000 | 0.031              | 0.107 | -66.90  | -6.85 | -57.72 | -5.59 |
| 1    | 15.000 | 0.031              | 0.107 | 7.45    | 71.00 | -57.72 | -5.59 |
| 1    | 15.463 | 0.031              | 0.106 | 5.98    | 57.10 | -28.92 | -2.55 |
| 1    | 15.926 | 0.031              | 0.104 | 4.54    | 43.54 | -7.72  | 1.38  |
| 1    | 16.389 | 0.031              | 0.103 | 3.14    | 30.37 | 1.06   | 11.31 |
| 1    | 16.852 | 0.030              | 0.101 | 1.78    | 17.59 | 2.47   | 22.37 |
| 1    | 17.315 | 0.030              | 0.100 | -0.63   | 6.17  | 3.20   | 27.95 |
| 1    | 17.778 | 0.030              | 0.100 | -7.28   | -0.80 | 3.24   | 28.00 |
| 1    | 18.223 | 0.030              | 0.101 | -19.20  | -2.18 | 2.49   | 21.46 |
| 1    | 18.667 | 0.031              | 0.102 | -31.32  | -3.54 | 1.15   | 9.91  |
| 1    | 19.111 | 0.031              | 0.103 | -43.69  | -4.91 | -8.51  | 1.03  |
| 1    | 19.556 | 0.031              | 0.104 | -56.32  | -6.33 | -28.62 | -3.13 |
| 1    | 20.000 | 0.031              | 0.105 | -69.17  | -7.79 | -55.78 | -6.19 |
| 1    | 20.000 | 0.031              | 0.105 | 7.71    | 68.73 | -55.78 | -6.19 |
| 1    | 20.463 | 0.031              | 0.104 | 6.20    | 55.38 | -27.68 | -2.93 |
| 1    | 20.926 | 0.031              | 0.103 | 4.74    | 42.30 | -7.32  | 1.30  |
| 1    | 21.389 | 0.031              | 0.101 | 3.33    | 29.56 | 0.98   | 11.17 |
| 1    | 21.852 | 0.030              | 0.100 | 1.92    | 17.13 | 2.23   | 21.97 |
| 1    | 22.315 | 0.030              | 0.099 | -0.57   | 6.03  | 2.88   | 27.41 |
| 1    | 22.778 | 0.030              | 0.099 | -7.24   | -0.57 | 2.97   | 27.45 |
| 1    | 23.223 | 0.030              | 0.100 | -18.92  | -1.76 | 2.37   | 21.02 |
| 1    | 23.667 | 0.030              | 0.101 | -30.89  | -2.96 | 0.99   | 9.70  |
| 1    | 24.111 | 0.030              | 0.103 | -43.17  | -4.17 | -8.65  | 1.25  |
| 1    | 24.556 | 0.030              | 0.104 | -55.75  | -5.39 | -28.61 | -2.37 |
| 1    | 25.000 | 0.030              | 0.105 | -68.58  | -6.62 | -55.47 | -4.96 |
| 1    | 25.000 | 0.030              | 0.105 | 6.84    | 69.32 | -55.47 | -4.96 |
| 1    | 25.417 | 0.030              | 0.104 | 5.24    | 57.61 | -30.90 | -1.48 |
| 1    | 25.833 | 0.030              | 0.103 | 3.65    | 46.12 | -12.43 | 3.04  |
| 1    | 26.250 | 0.030              | 0.102 | 2.09    | 34.86 | -1.95  | 10.73 |
| 1    | 26.667 | 0.030              | 0.101 | 0.56    | 23.80 | -1.29  | 23.71 |

Project.....: 180114 - Uitbreiding Venster Techniek

Onderdeel.....: fundering

**TUSSENpunten** Fysisch lineair

Ligger:1 Fundamentele combinatie

| Veld | Pos.   | Grondspan. [N/mm2] |       | Dwarskr |       | Moment  |       |
|------|--------|--------------------|-------|---------|-------|---------|-------|
|      |        | min.               | max.  | min.    | max.  | min.    | max.  |
| 1    | 26.667 | 0.030              | 0.101 | 0.56    | 23.83 | -1.39   | 22.90 |
| 1    | 27.037 | 0.030              | 0.100 | -0.73   | 14.28 | -1.54   | 29.07 |
| 1    | 27.407 | 0.030              | 0.100 | -4.12   | 6.87  | -2.05   | 32.58 |
| 1    | 27.778 | 0.031              | 0.100 | -9.59   | 1.60  | -2.90   | 33.45 |
| 1    | 28.222 | 0.030              | 0.101 | -21.35  | 0.16  | -4.71   | 28.06 |
| 1    | 28.666 | 0.030              | 0.102 | -33.24  | -1.47 | -7.07   | 17.66 |
| 1    | 29.111 | 0.029              | 0.104 | -45.29  | -3.33 | -17.69  | 10.04 |
| 1    | 29.555 | 0.028              | 0.106 | -57.57  | -5.48 | -38.63  | 6.96  |
| 1    | 30.000 | 0.027              | 0.107 | -70.24  | -7.94 | -66.20  | 4.13  |
| 1    | 30.000 | 0.027              | 0.107 | 7.10    | 67.67 | -66.20  | 4.13  |
| 1    | 30.444 | 0.025              | 0.108 | 4.73    | 54.39 | -40.24  | 6.81  |
| 1    | 30.889 | 0.023              | 0.108 | 1.54    | 42.75 | -19.07  | 8.56  |
| 1    | 31.333 | 0.021              | 0.109 | -2.23   | 32.14 | -7.63   | 14.16 |
| 1    | 31.777 | 0.018              | 0.111 | -6.47   | 22.25 | -4.14   | 21.84 |
| 1    | 32.222 | 0.016              | 0.112 | -11.21  | 13.07 | -0.16   | 23.31 |
| 1    | 32.500 | 0.014              | 0.114 | -18.55  | 12.99 | -2.83   | 22.92 |
| 1    | 32.777 | 0.013              | 0.115 | -25.88  | 12.90 | -5.50   | 22.53 |
| 1    | 33.055 | 0.011              | 0.117 | -36.18  | 14.78 | -11.56  | 21.93 |
| 1    | 33.333 | 0.010              | 0.119 | -46.47  | 16.66 | -17.62  | 21.32 |
| 1    | 33.750 | 0.008              | 0.121 | -62.65  | 20.04 | -32.51  | 23.95 |
| 1    | 34.166 | 0.006              | 0.123 | -79.20  | 23.71 | -59.42  | 31.40 |
| 1    | 34.583 | 0.006              | 0.124 | -95.96  | 27.56 | -95.48  | 41.98 |
| 1    | 35.000 | 0.006              | 0.123 | -112.76 | 31.51 | -137.81 | 54.02 |
| 1    | 35.000 | 0.006              | 0.123 | -15.51  | 85.55 | -137.81 | 54.02 |
| 1    | 35.416 | 0.007              | 0.118 | -11.78  | 69.55 | -106.67 | 48.61 |
| 1    | 35.833 | 0.010              | 0.111 | -8.46   | 54.69 | -81.34  | 44.48 |
| 1    | 36.250 | 0.013              | 0.103 | -5.68   | 41.21 | -63.78  | 41.48 |
| 1    | 36.666 | 0.017              | 0.093 | -3.56   | 29.33 | -55.93  | 39.46 |
| 1    | 36.944 | 0.020              | 0.086 | -3.04   | 23.31 | -54.04  | 40.87 |
| 1    | 37.222 | 0.023              | 0.079 | -2.51   | 17.29 | -52.15  | 42.27 |
| 1    | 37.500 | 0.016              | 0.077 | -3.08   | 13.39 | -50.13  | 43.70 |
| 1    | 37.777 | 0.009              | 0.074 | -3.65   | 9.49  | -48.11  | 45.14 |
| 1    | 38.222 |                    | 0.078 | -7.43   | 13.70 | -43.00  | 43.54 |
| 1    | 38.666 |                    | 0.083 | -14.92  | 18.84 | -35.67  | 38.58 |
| 1    | 39.111 |                    | 0.089 | -24.45  | 24.30 | -26.08  | 29.85 |
| 1    | 39.555 |                    | 0.095 | -35.23  | 29.76 | -14.34  | 17.05 |
| 1    | 40.000 |                    | 0.102 | -47.40  | 35.23 | -0.69   | -0.07 |
| 1    | 40.000 |                    | 0.102 | -35.26  | 42.21 | 0.00    | 0.00  |
| 1    | 40.444 |                    | 0.091 | -29.80  | 30.56 | -14.16  | 15.38 |
| 1    | 40.889 |                    | 0.081 | -24.34  | 21.14 | -26.04  | 26.54 |
| 1    | 41.333 |                    | 0.071 | -18.88  | 13.83 | -35.64  | 34.26 |
| 1    | 41.778 |                    | 0.062 | -13.59  | 8.57  | -42.99  | 39.31 |
| 1    | 42.222 | 0.010              | 0.054 | -8.80   | 5.34  | -48.13  | 42.39 |
| 1    | 42.500 | 0.014              | 0.057 | -8.29   | 5.60  | -50.18  | 43.47 |
| 1    | 42.778 | 0.018              | 0.059 | -7.77   | 5.86  | -52.23  | 44.55 |
| 1    | 43.222 | 0.011              | 0.067 | -12.45  | 8.35  | -55.34  | 45.97 |
| 1    | 43.667 | 0.005              | 0.075 | -18.75  | 12.11 | -59.43  | 48.01 |
| 1    | 44.111 | 0.001              | 0.081 | -26.48  | 16.88 | -65.07  | 53.02 |
| 1    | 44.556 |                    | 0.086 | -35.43  | 22.25 | -72.96  | 61.55 |
| 1    | 45.000 |                    | 0.090 | -45.37  | 27.71 | -83.90  | 72.35 |
| 1    | 45.000 |                    | 0.090 | -41.13  | 61.04 | -83.90  | 72.35 |
| 1    | 45.457 |                    | 0.091 | -35.27  | 50.11 | -62.75  | 55.29 |
| 1    | 45.914 |                    | 0.091 | -29.59  | 39.13 | -45.34  | 40.64 |
| 1    | 46.371 |                    | 0.090 | -24.00  | 28.99 | -31.25  | 28.58 |

Project.....: 180114 - Uitbreiding Venster Techniek

Onderdeel.....: fundering

**TUSSENpunten** Fysisch lineair

Ligger:1 Fundamentele combinatie

| Veld | Pos.   | Grondspan. [N/mm2] |       | Dwarskr |       | Moment  |       |
|------|--------|--------------------|-------|---------|-------|---------|-------|
|      |        | min.               | max.  | min.    | max.  | min.    | max.  |
| 1    | 46.829 | 0.002              | 0.088 | -19.45  | 20.49 | -20.15  | 18.88 |
| 1    | 47.286 | 0.006              | 0.087 | -17.98  | 14.29 | -11.89  | 10.86 |
| 1    | 47.571 | 0.008              | 0.085 | -18.62  | 10.97 | -8.78   | 7.62  |
| 1    | 47.857 | 0.011              | 0.084 | -19.27  | 7.66  | -5.68   | 4.37  |
| 1    | 48.238 | 0.014              | 0.082 | -21.25  | 4.06  | -9.78   | 1.53  |
| 1    | 48.619 | 0.018              | 0.080 | -23.84  | 0.90  | -16.45  | -0.76 |
| 1    | 49.000 | 0.021              | 0.077 | -27.02  | -1.83 | -25.71  | -2.51 |
| 1    | 49.000 | 0.021              | 0.077 | -0.39   | 7.68  | -25.71  | -2.51 |
| 1    | 49.500 | 0.026              | 0.074 | -0.66   | 1.87  | -23.43  | -2.24 |
| 1    | 50.000 | 0.028              | 0.073 | -7.51   | 0.06  | -24.35  | -2.74 |
| 1    | 50.000 | 0.028              | 0.073 | 2.11    | 29.70 | -24.35  | -2.74 |
| 1    | 50.370 | 0.025              | 0.072 | 1.11    | 24.65 | -15.48  | -1.37 |
| 1    | 50.741 | 0.022              | 0.072 | -0.59   | 19.82 | -8.26   | -0.30 |
| 1    | 51.111 | 0.019              | 0.074 | -3.00   | 15.21 | -2.70   | 0.47  |
| 1    | 51.481 | 0.016              | 0.075 | -6.27   | 13.20 | -4.68   | 4.27  |
| 1    | 51.852 | 0.012              | 0.077 | -9.96   | 11.76 | -7.68   | 8.29  |
| 1    | 52.222 | 0.009              | 0.079 | -14.06  | 10.90 | -11.71  | 12.51 |
| 1    | 52.685 | 0.005              | 0.081 | -20.16  | 13.05 | -19.88  | 17.57 |
| 1    | 53.148 | 0.002              | 0.083 | -26.91  | 17.58 | -30.94  | 23.03 |
| 1    | 53.611 |                    | 0.085 | -34.15  | 23.04 | -45.13  | 29.27 |
| 1    | 54.074 |                    | 0.087 | -42.49  | 28.73 | -62.60  | 38.67 |
| 1    | 54.537 |                    | 0.088 | -52.29  | 34.43 | -83.43  | 52.82 |
| 1    | 55.000 |                    | 0.087 | -62.60  | 40.16 | -107.55 | 69.80 |
| 1    | 55.000 |                    | 0.087 | -28.43  | 43.81 | -107.55 | 69.80 |
| 1    | 55.444 |                    | 0.084 | -22.97  | 34.46 | -100.21 | 58.68 |
| 1    | 55.889 | 0.000              | 0.079 | -17.57  | 25.99 | -94.79  | 49.84 |
| 1    | 56.333 | 0.005              | 0.073 | -12.73  | 18.64 | -90.55  | 43.97 |
| 1    | 56.778 | 0.007              | 0.066 | -8.82   | 13.52 | -86.68  | 40.83 |
| 1    | 57.222 |                    | 0.058 | -6.12   | 12.54 | -82.23  | 39.25 |
| 1    | 57.500 |                    | 0.055 | -5.65   | 15.95 | -77.80  | 38.24 |
| 1    | 57.778 |                    | 0.053 | -5.19   | 19.36 | -73.37  | 37.23 |
| 1    | 58.222 |                    | 0.059 | -7.50   | 24.82 | -63.24  | 34.55 |
| 1    | 58.667 |                    | 0.068 | -12.00  | 30.28 | -50.85  | 30.19 |
| 1    | 59.111 |                    | 0.077 | -18.52  | 35.74 | -36.17  | 23.45 |
| 1    | 59.556 |                    | 0.086 | -27.02  | 41.21 | -19.22  | 13.64 |
| 1    | 60.000 |                    | 0.097 | -37.60  | 46.67 | -0.00   | 0.00  |
| 1    | 60.000 |                    | 0.097 | -28.29  | 52.09 | 0.00    | 0.00  |
| 1    | 60.417 |                    | 0.094 | -23.45  | 39.93 | -10.44  | 18.30 |
| 1    | 60.833 |                    | 0.093 | -18.61  | 28.14 | -19.10  | 32.20 |
| 1    | 61.250 |                    | 0.091 | -13.78  | 16.63 | -25.96  | 41.79 |
| 1    | 61.667 |                    | 0.091 | -8.94   | 5.30  | -31.02  | 47.14 |
| 1    | 61.944 |                    | 0.092 | -9.43   | 2.33  | -32.61  | 46.50 |
| 1    | 62.222 |                    | 0.092 | -9.92   | -0.63 | -34.20  | 45.87 |
| 1    | 62.639 |                    | 0.095 | -21.80  | 2.81  | -33.89  | 38.47 |
| 1    | 63.056 |                    | 0.098 | -34.21  | 7.19  | -31.79  | 28.48 |
| 1    | 63.472 |                    | 0.101 | -47.23  | 12.02 | -29.31  | 17.32 |
| 1    | 63.889 |                    | 0.105 | -60.93  | 16.86 | -27.84  | 6.41  |
| 1    | 64.167 |                    | 0.107 | -70.76  | 20.09 | -39.37  | 1.19  |
| 1    | 64.444 |                    | 0.110 | -80.59  | 23.31 | -50.90  | -4.02 |
| 1    | 64.722 |                    | 0.111 | -90.94  | 26.39 | -76.15  | -0.19 |
| 1    | 65.000 |                    | 0.112 | -101.30 | 29.48 | -101.39 | 3.65  |
| 1    | 65.000 |                    | 0.112 | -22.49  | 97.02 | -101.39 | 3.65  |
| 1    | 65.278 |                    | 0.112 | -19.80  | 86.53 | -77.36  | 0.37  |

Project.....: 180114 - Uitbreiding Venster Techniek

Onderdeel.....: fundering

**TUSSENpunten** Fysisch lineair

Ligger:1 Fundamentele combinatie

| Veld | Pos.   | Grondspan. [N/mm2] |       | Dwarskr |       | Moment |       |
|------|--------|--------------------|-------|---------|-------|--------|-------|
|      |        | min.               | max.  | min.    | max.  | min.   | max.  |
| 1    | 65.556 |                    | 0.112 | -17.12  | 76.05 | -53.33 | -2.91 |
| 1    | 65.833 |                    | 0.110 | -14.43  | 65.83 | -35.31 | -1.85 |
| 1    | 66.111 |                    | 0.109 | -11.74  | 55.62 | -17.30 | -0.80 |
| 1    | 66.481 |                    | 0.106 | -8.16   | 42.62 | -20.65 | 5.50  |
| 1    | 66.852 | 0.003              | 0.104 | -4.94   | 29.94 | -23.08 | 13.60 |
| 1    | 67.222 | 0.007              | 0.102 | -2.08   | 17.59 | -24.59 | 23.52 |
| 1    | 67.500 | 0.010              | 0.101 | -4.60   | 10.27 | -24.78 | 25.93 |
| 1    | 67.778 | 0.013              | 0.099 | -7.11   | 2.95  | -24.96 | 28.33 |
| 1    | 68.148 | 0.016              | 0.099 | -15.81  | 2.00  | -24.56 | 25.07 |
| 1    | 68.519 | 0.019              | 0.098 | -25.07  | 1.48  | -24.07 | 18.66 |
| 1    | 68.889 | 0.022              | 0.098 | -34.90  | 1.38  | -23.50 | 9.09  |
| 1    | 69.259 | 0.024              | 0.098 | -45.87  | 0.66  | -29.32 | 7.01  |
| 1    | 69.630 | 0.025              | 0.099 | -56.98  | -0.29 | -42.78 | 4.45  |
| 1    | 70.000 | 0.026              | 0.099 | -68.24  | -1.47 | -63.86 | 1.39  |
| 1    | 70.000 | 0.026              | 0.099 | 6.29    | 70.72 | -63.86 | 1.39  |
| 1    | 70.444 | 0.026              | 0.099 | 4.54    | 57.99 | -35.26 | 3.79  |
| 1    | 70.889 | 0.026              | 0.097 | 2.96    | 45.37 | -12.30 | 5.45  |
| 1    | 71.333 | 0.025              | 0.095 | 1.55    | 33.01 | -7.87  | 15.69 |
| 1    | 71.333 | 0.025              | 0.095 | 1.55    | 33.01 | -7.87  | 15.70 |
| 1    | 71.741 | 0.025              | 0.094 | 0.38    | 21.96 | -4.91  | 24.13 |
| 1    | 72.148 | 0.025              | 0.093 | -1.17   | 12.01 | -2.50  | 29.32 |
| 1    | 72.556 | 0.025              | 0.093 | -3.12   | 3.16  | -0.66  | 31.25 |
| 1    | 72.861 | 0.025              | 0.093 | -10.96  | 1.83  | -0.10  | 27.90 |
| 1    | 73.167 | 0.025              | 0.093 | -18.81  | 0.49  | 0.46   | 24.56 |
| 1    | 73.625 | 0.025              | 0.094 | -30.84  | -1.46 | 0.08   | 12.28 |
| 1    | 74.084 | 0.025              | 0.096 | -43.18  | -3.39 | -9.82  | 3.35  |
| 1    | 74.542 | 0.025              | 0.097 | -55.92  | -5.28 | -28.72 | -2.55 |
| 1    | 75.000 | 0.025              | 0.098 | -69.16  | -7.13 | -56.08 | -5.73 |
| 1    | 75.000 | 0.025              | 0.098 | 7.25    | 68.74 | -56.08 | -5.73 |
| 1    | 75.445 | 0.025              | 0.097 | 5.92    | 55.91 | -29.10 | -2.37 |
| 1    | 75.889 | 0.025              | 0.096 | 4.59    | 43.32 | -8.90  | 1.02  |
| 1    | 76.334 | 0.025              | 0.094 | 3.27    | 31.02 | 0.77   | 9.22  |
| 1    | 76.778 | 0.025              | 0.093 | 1.96    | 19.03 | 1.96   | 20.57 |
| 1    | 77.223 | 0.025              | 0.092 | 0.65    | 7.30  | 2.62   | 27.03 |
| 1    | 77.500 | 0.025              | 0.092 | -3.34   | 3.26  | 2.57   | 27.07 |
| 1    | 77.778 | 0.025              | 0.092 | -7.33   | -0.78 | 2.53   | 27.10 |
| 1    | 78.223 | 0.025              | 0.093 | -19.07  | -2.10 | 1.72   | 20.78 |
| 1    | 78.667 | 0.025              | 0.094 | -31.06  | -3.43 | 0.33   | 9.58  |
| 1    | 79.111 | 0.026              | 0.096 | -43.35  | -4.79 | -9.42  | 1.51  |
| 1    | 79.556 | 0.026              | 0.097 | -55.92  | -6.18 | -29.53 | -1.73 |
| 1    | 80.000 | 0.026              | 0.098 | -68.74  | -7.60 | -56.16 | -4.71 |
| 1    | 80.000 | 0.026              | 0.098 | 7.66    | 69.16 | -56.16 | -4.71 |
| 1    | 80.445 | 0.026              | 0.097 | 6.17    | 56.34 | -29.40 | -1.47 |
| 1    | 80.889 | 0.026              | 0.096 | 4.73    | 43.74 | -8.75  | 1.35  |
| 1    | 81.333 | 0.026              | 0.094 | 3.33    | 31.43 | -0.22  | 10.74 |
| 1    | 81.778 | 0.025              | 0.093 | 1.99    | 19.39 | 0.98   | 22.04 |
| 1    | 82.222 | 0.025              | 0.093 | 0.10    | 8.18  | 1.61   | 28.31 |
| 1    | 82.667 | 0.025              | 0.093 | -4.17   | -0.49 | 1.70   | 29.62 |
| 1    | 82.667 | 0.025              | 0.093 | -4.33   | -0.50 | 1.67   | 29.37 |
| 1    | 83.133 | 0.025              | 0.093 | -16.79  | -1.79 | 1.04   | 23.80 |
| 1    | 83.600 | 0.025              | 0.095 | -29.54  | -3.02 | -0.12  | 12.71 |
| 1    | 84.066 | 0.024              | 0.097 | -42.62  | -4.21 | -9.01  | 2.92  |
| 1    | 84.533 | 0.024              | 0.098 | -56.12  | -5.37 | -28.37 | -2.96 |

Project.....: 180114 - Uitbreiding Venster Techniek

Onderdeel.....: fundering

**TUSSENpunten** Fysisch lineair

Ligger:1 Fundamentele combinatie

| Veld | Pos.    | Grondspan. [N/mm2] |       | Dwarskr |       | Moment |       |
|------|---------|--------------------|-------|---------|-------|--------|-------|
|      |         | min.               | max.  | min.    | max.  | min.   | max.  |
| 1    | 85.000  | 0.024              | 0.099 | -70.09  | -6.47 | -56.48 | -6.46 |
| 1    | 85.000  | 0.024              | 0.099 | 4.66    | 68.33 | -56.48 | -6.46 |
| 1    | 85.370  | 0.024              | 0.099 | 2.66    | 57.97 | -34.55 | -3.42 |
| 1    | 85.740  | 0.023              | 0.098 | 0.61    | 47.76 | -17.70 | -0.27 |
| 1    | 86.111  | 0.023              | 0.097 | -1.47   | 37.70 | -5.92  | 2.98  |
| 1    | 86.527  | 0.022              | 0.096 | -3.85   | 26.80 | -7.19  | 15.64 |
| 1    | 86.944  | 0.022              | 0.095 | -6.22   | 16.11 | -9.35  | 24.33 |
| 1    | 87.361  | 0.022              | 0.094 | -9.94   | 7.98  | -12.37 | 29.08 |
| 1    | 87.777  | 0.022              | 0.094 | -16.40  | 4.76  | -16.25 | 29.95 |
| 1    | 88.148  | 0.022              | 0.095 | -27.04  | 4.23  | -20.77 | 25.53 |
| 1    | 88.518  | 0.023              | 0.096 | -37.71  | 3.63  | -25.76 | 21.02 |
| 1    | 88.889  | 0.024              | 0.096 | -48.41  | 2.96  | -31.21 | 16.42 |
| 1    | 89.259  | 0.023              | 0.097 | -59.07  | 2.02  | -47.65 | 17.27 |
| 1    | 89.629  | 0.021              | 0.097 | -69.56  | 0.89  | -69.24 | 17.81 |
| 1    | 90.000  | 0.018              | 0.096 | -79.88  | -0.44 | -95.98 | 18.03 |
| 1    | 90.000  | 0.018              | 0.096 | -1.73   | 70.93 | -95.98 | 18.03 |
| 1    | 90.428  | 0.012              | 0.095 | -0.69   | 58.49 | -75.31 | 24.01 |
| 1    | 90.857  | 0.006              | 0.095 | 0.49    | 46.03 | -59.18 | 29.03 |
| 1    | 91.285  |                    | 0.095 | 1.59    | 33.55 | -49.02 | 32.95 |
| 1    | 91.714  |                    | 0.096 | 2.39    | 21.03 | -46.28 | 35.67 |
| 1    | 92.000  |                    | 0.097 | -0.91   | 17.86 | -42.87 | 38.07 |
| 1    | 92.285  |                    | 0.098 | -4.21   | 14.70 | -39.46 | 40.46 |
| 1    | 92.714  |                    | 0.100 | -11.50  | 18.84 | -31.97 | 38.36 |
| 1    | 93.143  |                    | 0.104 | -23.51  | 22.99 | -22.91 | 30.98 |
| 1    | 93.571  |                    | 0.108 | -38.31  | 27.24 | -12.38 | 18.21 |
| 1    | 94.000  |                    | 0.113 | -53.92  | 31.67 | -0.49  | -0.06 |
| 1    | 94.000  |                    | 0.113 | -37.24  | 52.68 | 0.00   | 0.00  |
| 1    | 94.444  |                    | 0.101 | -31.78  | 38.76 | -15.03 | 19.40 |
| 1    | 94.889  |                    | 0.091 | -26.32  | 27.12 | -27.79 | 33.64 |
| 1    | 95.333  |                    | 0.081 | -20.86  | 17.63 | -38.27 | 43.54 |
| 1    | 95.778  |                    | 0.072 | -15.46  | 10.24 | -46.49 | 49.85 |
| 1    | 96.222  | 0.006              | 0.065 | -10.24  | 5.00  | -52.43 | 53.29 |
| 1    | 96.500  | 0.013              | 0.068 | -10.93  | 5.12  | -54.77 | 53.80 |
| 1    | 96.778  | 0.019              | 0.071 | -11.62  | 5.23  | -57.10 | 54.31 |
| 1    | 97.148  | 0.014              | 0.078 | -17.82  | 6.99  | -59.85 | 53.58 |
| 1    | 97.519  | 0.009              | 0.085 | -25.02  | 9.40  | -63.10 | 52.47 |
| 1    | 97.889  | 0.005              | 0.092 | -33.21  | 12.47 | -66.84 | 50.98 |
| 1    | 98.259  | 0.002              | 0.098 | -43.15  | 16.53 | -72.67 | 53.68 |
| 1    | 98.630  |                    | 0.103 | -53.76  | 20.82 | -82.55 | 59.10 |
| 1    | 99.000  |                    | 0.107 | -65.04  | 25.36 | -96.47 | 67.23 |
| 1    | 99.000  |                    | 0.107 | -39.21  | 75.28 | -96.47 | 67.23 |
| 1    | 99.450  |                    | 0.109 | -33.68  | 60.62 | -69.34 | 51.24 |
| 1    | 99.900  |                    | 0.109 | -28.19  | 45.78 | -49.26 | 37.46 |
| 1    | 100.350 | 0.002              | 0.109 | -23.35  | 32.32 | -34.23 | 26.11 |
| 1    | 100.800 | 0.005              | 0.108 | -19.78  | 21.78 | -22.25 | 17.40 |
| 1    | 101.100 | 0.007              | 0.107 | -22.67  | 17.37 | -17.06 | 12.23 |
| 1    | 101.400 | 0.010              | 0.105 | -25.56  | 12.97 | -11.88 | 7.06  |
| 1    | 101.700 | 0.012              | 0.104 | -29.41  | 9.20  | -14.63 | 3.79  |
| 1    | 102.000 | 0.015              | 0.103 | -33.26  | 5.43  | -17.38 | 0.53  |
| 1    | 102.000 | 0.015              | 0.103 | -1.22   | 46.61 | -17.38 | 0.53  |
| 1    | 102.500 | 0.019              | 0.100 | 0.76    | 32.00 | -1.10  | 2.25  |
| 1    | 103.000 | 0.023              | 0.097 | 1.70    | 18.14 | 1.11   | 14.74 |
| 1    | 103.500 | 0.027              | 0.096 | 0.23    | 7.09  | 1.98   | 20.42 |
| 1    | 104.000 | 0.031              | 0.098 | -8.11   | 0.51  | 2.34   | 19.96 |

Project.....: 180114 - Uitbreiding Venster Techniek

Onderdeel.....: fundering

**TUSSENpunten** Fysisch lineair

Ligger:1 Fundamentele combinatie

| Veld | Pos.    | Grondspan. [N/mm <sup>2</sup> ] |       | Dwarskr |       | Moment  |       |
|------|---------|---------------------------------|-------|---------|-------|---------|-------|
|      |         | min.                            | max.  | min.    | max.  | min.    | max.  |
| 1    | 104.000 | 0.031                           | 0.098 | -8.11   | 0.51  | 2.34    | 19.96 |
| 1    | 104.475 | 0.028                           | 0.101 | -20.04  | -1.69 | 1.55    | 14.38 |
| 1    | 104.950 | 0.025                           | 0.107 | -32.48  | -3.35 | -0.24   | 2.64  |
| 1    | 105.425 | 0.021                           | 0.114 | -48.06  | -2.95 | -17.32  | -1.50 |
| 1    | 105.900 | 0.018                           | 0.120 | -65.67  | -1.70 | -43.27  | -2.64 |
| 1    | 105.900 | 0.018                           | 0.120 | -6.07   | 12.90 | -43.27  | -2.64 |
| 1    | 106.175 | 0.015                           | 0.123 | -13.01  | 10.81 | -45.68  | -0.61 |
| 1    | 106.450 | 0.013                           | 0.126 | -19.95  | 8.72  | -48.09  | 1.42  |
| 1    | 106.725 | 0.011                           | 0.128 | -31.69  | 10.55 | -56.78  | 4.29  |
| 1    | 107.000 | 0.009                           | 0.130 | -43.44  | 12.38 | -65.47  | 7.17  |
| 1    | 107.000 | 0.009                           | 0.130 | -13.53  | 55.99 | -65.47  | 7.17  |
| 1    | 107.500 | 0.006                           | 0.132 | -21.92  | 46.27 | -58.78  | 18.35 |
| 1    | 108.000 | 0.003                           | 0.132 | -30.91  | 37.82 | -63.18  | 31.89 |
| 1    | 108.500 | 0.001                           | 0.129 | -41.83  | 35.38 | -78.64  | 48.13 |
| 1    | 109.000 | 0.001                           | 0.124 | -62.86  | 41.37 | -104.86 | 67.31 |
| 1    | 109.000 | 0.001                           | 0.124 | -23.21  | 77.46 | -104.86 | 67.31 |
| 1    | 109.370 | 0.002                           | 0.118 | -18.92  | 63.15 | -81.72  | 59.93 |
| 1    | 109.741 | 0.004                           | 0.112 | -14.92  | 49.80 | -66.86  | 55.24 |
| 1    | 110.111 | 0.007                           | 0.104 | -11.20  | 37.42 | -60.29  | 53.26 |
| 1    | 110.481 | 0.011                           | 0.095 | -8.46   | 27.36 | -56.11  | 56.04 |
| 1    | 110.852 | 0.016                           | 0.086 | -6.36   | 18.59 | -52.63  | 57.93 |
| 1    | 111.222 | 0.021                           | 0.076 | -4.91   | 11.11 | -49.83  | 58.95 |
| 1    | 111.500 | 0.016                           | 0.072 | -5.44   | 9.67  | -47.84  | 58.18 |
| 1    | 111.778 | 0.012                           | 0.068 | -5.96   | 8.22  | -45.86  | 57.40 |
| 1    | 112.222 |                                 | 0.074 | -12.23  | 12.62 | -41.12  | 53.09 |
| 1    | 112.667 |                                 | 0.081 | -19.89  | 17.82 | -34.22  | 45.79 |
| 1    | 113.111 |                                 | 0.089 | -29.15  | 23.28 | -25.09  | 34.93 |
| 1    | 113.556 |                                 | 0.098 | -40.18  | 28.74 | -13.68  | 19.89 |
| 1    | 114.000 |                                 | 0.107 | -53.14  | 34.20 | -0.00   | 0.00  |

**PROFIELGEGEVENS Balk**

[N] [mm]

t.b.v. profiel:1 B\*H 500\*500

**Algemeen**

Materiaal : C20/25

Oppervlak : 2.500000e+05

Staaftype : 0: normaal

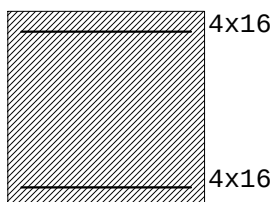
Traagheid : 5.2083e+09

Vormfactor : 0.00

**Doorsnede**

breedte : 500 hoogte : 500 zwaartepunt tov onderkant : 250

Referentie : Boven



Fictieve dikte : 250.0

Breedte lastvlak  $a_b$  6.1(10) : 0

Betonkwaliteit element : C20/25 Kruipcoëf. : 3.010

Treksterkte  $f_{ct,eff}$  art. 7.1(2) :  $f_{ctm,fl}$  ( 2.43 N/mm<sup>2</sup>)

Soort spanningsrekdiagram : Parabolisch - rechthoekig diagram

Doorbuiging volgens art.7.3.4(3): Ja

Langeduur scheurmoment begrensd : Ja

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Onderdeel....: fundering

|                              |   |                                      |                      |   |      |
|------------------------------|---|--------------------------------------|----------------------|---|------|
| Staalkwaliteit hoofdwapening | : | 500                                  | $\varepsilon_{uk}$   | : | 2.50 |
| Soort spanningsrekdiagram    | : | Bi-lineair diagram met klimmende tak |                      |   |      |
| Staalkwaliteit beugels       | : | 500                                  |                      |   |      |
| Bundels toepassen            | : | Ja                                   | Breedte stort sleuf: |   | 50   |
| Geprefabriceerd element      | : | Nee                                  |                      |   |      |

|                                 |   |               |  |               |
|---------------------------------|---|---------------|--|---------------|
| <b>Betondekking</b>             |   | Boven         |  | Onder         |
| Milieu                          | : | XC4           |  | XC4           |
| Gestort tegen bestaand beton    | : | Nee           |  | Nee           |
| Element met plaatgeometrie      | : | Nee           |  | Nee           |
| Specifieke kwaliteitsbeheersing | : | Nee           |  | Nee           |
| Oneffen beton oppervlak         | : | Nee           |  | Nee           |
| Ondergrond                      | : | Glad / N.v.t. |  | Glad / N.v.t. |
| Constructieklasse               | : | S4            |  | S4            |
| Grootste korrel                 | : | 31.5          |  |               |

|                                            |   |          |  |          |
|--------------------------------------------|---|----------|--|----------|
| Hoofdwapening                              | : | 2de laag |  | 2de laag |
| Nominale dekking                           | : | 35       |  | 35       |
| Toegepaste dekking                         | : | 43       |  | 43       |
| Toegepaste zijdekking                      | : | 43       |  |          |
| Gelijkwaardige diameter                    | : | 16       |  | 16       |
| $C_{min,b}$ $C_{min,dur}$ $\Delta C_{dur}$ | : | 16 30 0  |  | 16 30 0  |
| $C_{min}$ $\Delta C_{dev}$ $C_{nom}$       | : | 30 5 35  |  | 30 5 35  |

|                                            |   |           |  |           |
|--------------------------------------------|---|-----------|--|-----------|
| Beugel / Verdeelwapening                   | : | 1ste laag |  | 1ste laag |
| Nominale dekking                           | : | 35        |  | 35        |
| Toegepaste dekking                         | : | 35        |  | 35        |
| Toegepaste zijdekking                      | : | 35        |  |           |
| Gelijkwaardige diameter                    | : | 8         |  | 8         |
| $C_{min,b}$ $C_{min,dur}$ $\Delta C_{dur}$ | : | 8 30 0    |  | 8 30 0    |
| $C_{min}$ $\Delta C_{dev}$ $C_{nom}$       | : | 30 5 35   |  | 30 5 35   |

|                                |   |             |  |             |
|--------------------------------|---|-------------|--|-------------|
| <b>Wapening</b>                |   | Boven       |  | Onder       |
| Basiswapening buitenste laag   | : | 4x16        |  | 4x16        |
| H.o.h.afstand 2e laag          | : | 0           |  | 0           |
| Automatisch verhogen basiswap. | : | Nee         |  | Nee         |
| Art. 7.3.2 minimum wapening    | : | Ja          |  | Ja          |
| Bijlegdiameters                | : | 10;12;16    |  | 10;12;16    |
| Diameter nuttige hoogte        | : | 16.0        |  | 16.0        |
| Min.tussenruimte               | : | 50          |  | 50          |
| Aanhechting                    | : | Automatisch |  | Automatisch |

|                                       |   |                      |                        |     |
|---------------------------------------|---|----------------------|------------------------|-----|
| <b>Beugels</b>                        |   |                      |                        |     |
| Voorkeur h.o.h. afstand               | : | 300;150;100;75;60;50 |                        |     |
| Beugeldiameter                        | : | 8                    |                        |     |
| Betonkwaliteit                        | : | C20/25               |                        |     |
| Breedte t.b.v. dwarskracht            | : | 500                  | Hoogte t.b.v. dwarskr: | 500 |
| Aantal beugelsneden per beugel        | : | 2                    | Ontwerpen              |     |
| Min. hoek betondrukdiagonaal $\theta$ | : | 21.8                 | z berekenen via:       | MRd |

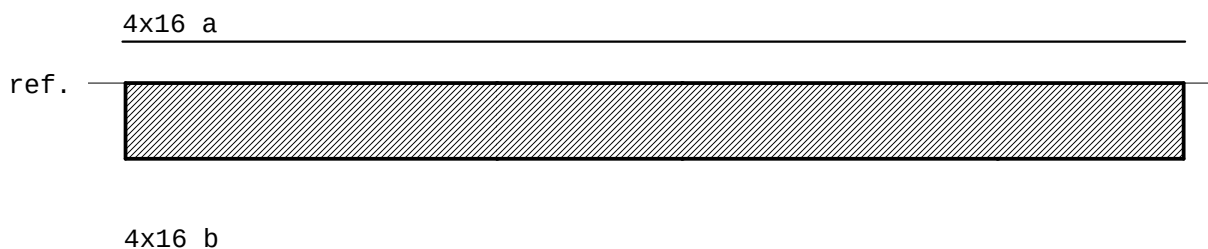


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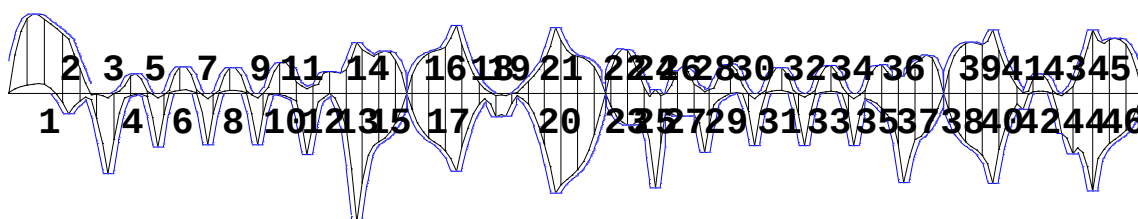
Onderdeel.....: fundering

**Hoofdwapening** Fysisch lineair

Ligger:1 Fundamentele combinatie

**MEd dekkingslijn** Fysisch lineair

Ligger:1 Fundamentele combinatie

**Hoofdwapening**

Ligger:1

| Geb. | Pos.<br>[mm] | $M_{Ed}$<br>[kNm] | z B/O<br>[mm] | Ab<br>[mm <sup>2</sup> ] | Aa<br>[mm <sup>2</sup> ] | Basiswapening<br>+Bijlegwapening | Opm. |
|------|--------------|-------------------|---------------|--------------------------|--------------------------|----------------------------------|------|
| 1    | 2400         | 84.62             | 420 Bov       | 431                      | 805                      | 4x16                             |      |
| 14   | 35000        | -137.81           | 420 Ond       | 716*                     | 805                      | 4x16                             | 54   |

Opmerkingen

[54] \* = Eisen met betrekking tot minimum wapening ten behoeve van gecontroleerde scheurvorming zijn toegepast volgens art. 7.3.2.

**Scheurvorming volgens artikel 7.3.4**

Ligger:1

| Geb. | Pos.<br>[mm] | Zijde | $M_{E,freq}$<br>[kNm] | $S_{r,max}$<br>[mm] | $\varepsilon_{sm} - \varepsilon_{cm}$<br>[%] | $w_k$<br>[mm] | $k_x$ | $w_{max}$<br>[mm] | U.C. | Opm. |
|------|--------------|-------|-----------------------|---------------------|----------------------------------------------|---------------|-------|-------------------|------|------|
| 1    | 2400         | Bov   | 58.62                 | 361                 | 0.522                                        | 0.189         | 1.00  | 0.300             | 0.63 |      |
| 1    | 10000        | Ond   | -57.16                | 361                 | 0.509                                        | 0.184         | 1.00  | 0.300             | 0.61 |      |

**Verloop hoofdwapening**

Ligger:1

| Merk | B/O   | Wapening | Vanaf<br>[mm] | Tot<br>[mm] | Lengte<br>[mm] | $L_{bd,begin}$<br>[mm] | $L_{bd,eind}$<br>[mm] |
|------|-------|----------|---------------|-------------|----------------|------------------------|-----------------------|
| a    | Boven | 4x16     | -357          | 114160      | 114517         | 357                    | 160                   |
| b    | Onder | 4x16     | -160          | 114160      | 114320         | 160                    | 160                   |

Opmerkingen

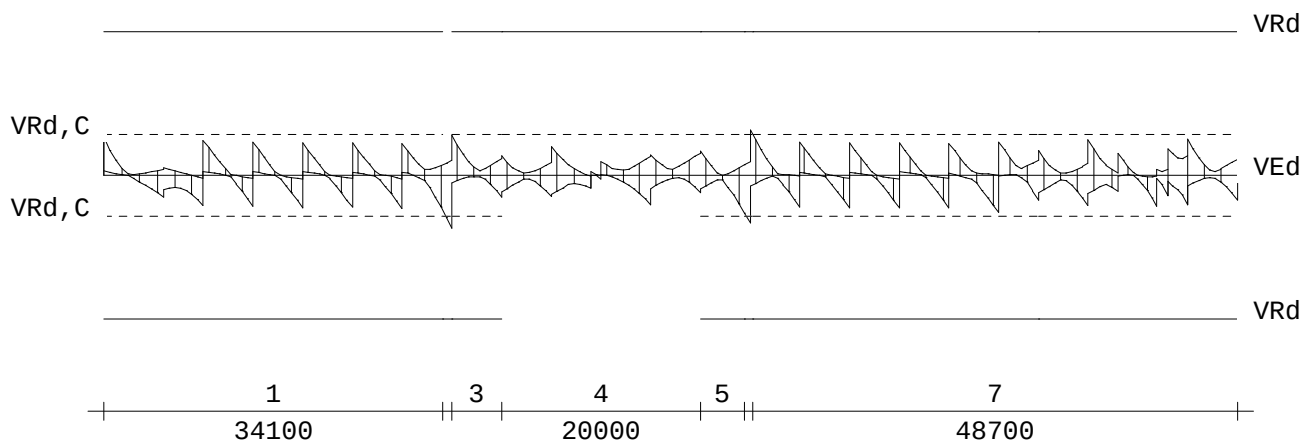
Alle maten zijn inclusief verschuiving van de m-lijn en verankering

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Onderdeel.....: fundering

**DWARSKRACHTEN** Fysisch lineair

Ligger:1 Fundamentele combinatie

**Dwarskrachtwapening**

Ligger:1

| Geb. | Vanaf<br>[mm] | Tot<br>[mm] | Beugels | Lengte<br>[mm] | $A_{sw}$<br>[mm <sup>2</sup> /m] | $V_{Ed}$<br>[kN] | $A_{opg}$<br>[mm <sup>2</sup> ] | Opm. |
|------|---------------|-------------|---------|----------------|----------------------------------|------------------|---------------------------------|------|
| 1    | 0             | 34100       | Ø8-150  | 34100          | 358                              | 83               |                                 |      |
| 2    | 34100         | 35000       | Ø8-150  | 900            | 358                              | 113              |                                 | 6    |
| 3    | 35000         | 40000       | Ø8-150  | 5000           | 358                              | 85               |                                 |      |
| 4    | 40000         | 60000       | Ø8-150  | 20000          | 358                              | 63               |                                 |      |
| 5    | 60000         | 64400       | Ø8-150  | 4400           | 358                              | 79               |                                 |      |
| 6    | 64400         | 65300       | Ø8-150  | 900            | 358                              | 101              |                                 | 6    |
| 7    | 65300         | 114000      | Ø8-150  | 48700          | 358                              | 86               |                                 |      |

Opmerkingen

[6] 9.2.2 (4) 50% van de dwarskrachtwapening moet uit beugels bestaan.

**Schuifspanningen**

Ligger:1

| Geb. | Vanaf<br>[mm] | Tot<br>[mm] | $\theta$<br>[°] | $V_{Ed}$<br>[kN] | $V_{Rd, c}$ | $V_{Rd, s}$ | $V_{Ed} < V_{Rd}$<br>[N/mm <sup>2</sup> ] | $V_{Rd} < V_{Rd, Max}$ | Opm. |
|------|---------------|-------------|-----------------|------------------|-------------|-------------|-------------------------------------------|------------------------|------|
| 1    | 0             | 34100       | 21.8            | 82.54            | 0.39        | 1.37        | 0.37                                      | 1.37                   | 2.38 |
| 2    | 34100         | 35000       | 21.8            | 112.76           | 0.39        | 1.37        | 0.50                                      | 1.37                   | 2.38 |
| 3    | 35000         | 40000       | 21.8            | 85.43            | 0.39        | 1.37        | 0.38                                      | 1.37                   | 2.38 |
| 4    | 40000         | 60000       | 21.8            | 62.60            | 0.39        | 1.37        | 0.28                                      | 1.37                   | 2.38 |
| 5    | 60000         | 64400       | 21.8            | 78.91            | 0.39        | 1.37        | 0.35                                      | 1.37                   | 2.38 |
| 6    | 64400         | 65300       | 21.8            | 101.19           | 0.39        | 1.37        | 0.45                                      | 1.37                   | 2.38 |
| 7    | 65300         | 114000      | 21.8            | 85.58            | 0.39        | 1.37        | 0.38                                      | 1.37                   | 2.38 |

Opmerkingen

[6] 9.2.2 (4) 50% van de dwarskrachtwapening moet uit beugels bestaan.

**Stijfheden**

Ligger:1

| Veld | totaal          | bijkomend Veldlengte<br>[mm] |
|------|-----------------|------------------------------|
| 1    | -17.8(0.0002*L) | -16.8(0.0001*L)              |

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Onderdeel.....: fundering

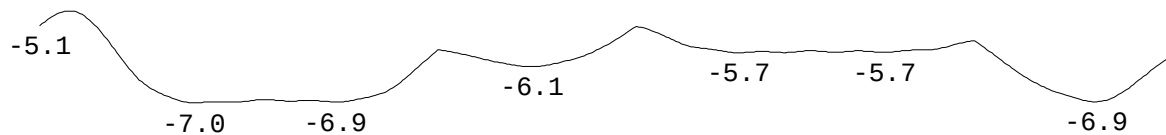
**Stijfheden**

Ligger:1

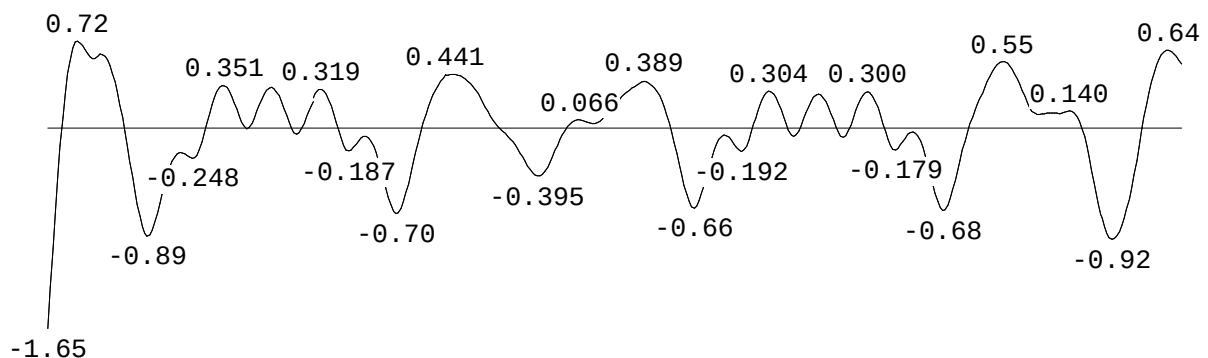
| Veld | totaal          | bijkomend Veldlengte<br>[mm] |
|------|-----------------|------------------------------|
| 1    | -17.8(0.0002*L) | -16.8(0.0001*L) 114000       |

**DOORBUIGINGEN w1** [mm]

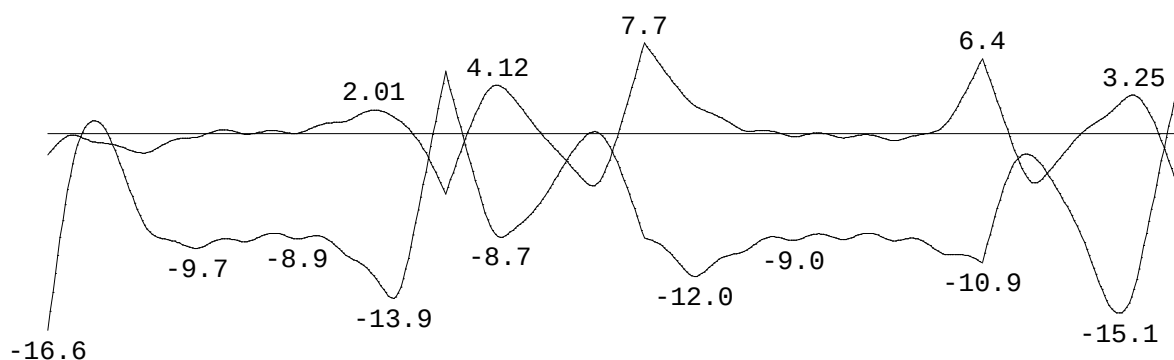
Ligger:1 Blijvende combinatie

**DOORBUIGINGEN w2** [mm]

Ligger:1 Quasi-blijvende combinatie

**DOORBUIGINGEN w<sub>bij</sub>** [mm]

Ligger:1 Karakteristieke combinatie

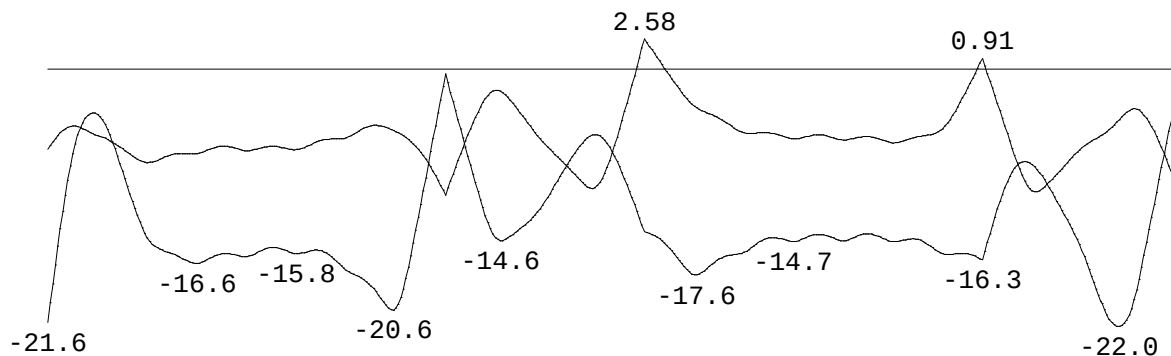


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Onderdeel.....: fundering

**DOORBUIGINGEN Wmax [mm]**

Ligger:1 Karakteristieke combinatie

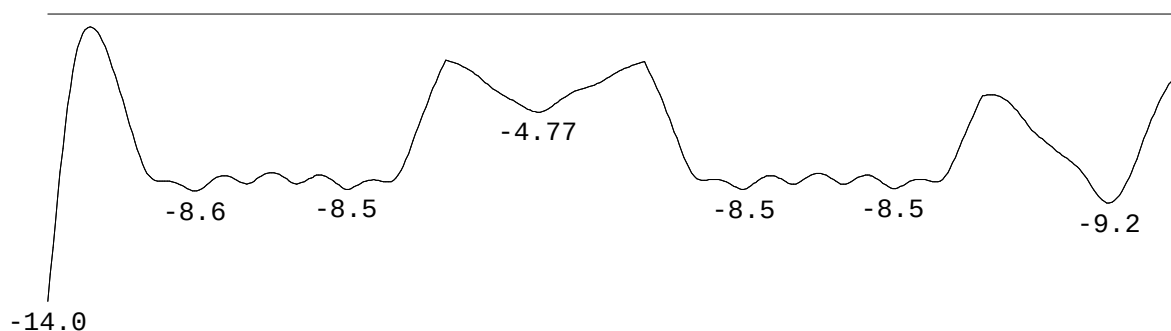
**DOORBUIGINGEN**

Karakteristieke combinatie

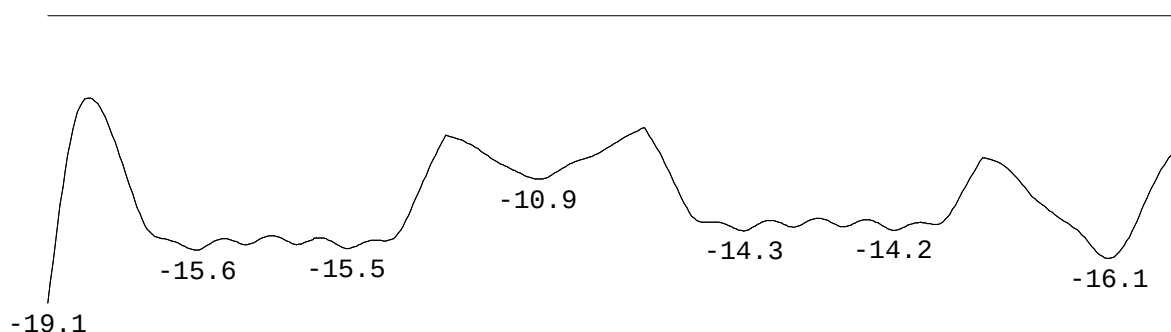
| Veld | Zijde | positie<br>[m] | $l_{rep}$<br>[mm] | $w_1$<br>[mm] | $w_2$<br>[mm] | -- $w_{bij}$ --<br>[mm][ $l_{rep}/$ ] | $w_{tot}$<br>[mm] | $w_c$<br>[mm] | -- $w_{max}$ --<br>[mm][ $l_{rep}/$ ] |
|------|-------|----------------|-------------------|---------------|---------------|---------------------------------------|-------------------|---------------|---------------------------------------|
| 1    | Neg.  | 107.750        | 114000            | -1.1          | -1.3          | -19.4                                 | 5882              | -20.5         | -20.5 5567                            |
| 1    | Pos.  | 60.000         | 114000            | 0.4           | 0.9           | 11.4                                  | 10011             | 11.7          | 11.7 9708                             |

**DOORBUIGINGEN Wbij [mm]**

Ligger:1 Frequente combinatie

**DOORBUIGINGEN Wmax [mm]**

Ligger:1 Frequente combinatie

**DOORBUIGINGEN**

Frequente combinatie

| Veld | Zijde | positie<br>[m] | $l_{rep}$<br>[mm] | $w_1$<br>[mm] | $w_2$<br>[mm] | -- $w_{bij}$ --<br>[mm][ $l_{rep}/$ ] | $w_{tot}$<br>[mm] | $w_c$<br>[mm] | -- $w_{max}$ --<br>[mm][ $l_{rep}/$ ] |
|------|-------|----------------|-------------------|---------------|---------------|---------------------------------------|-------------------|---------------|---------------------------------------|
|------|-------|----------------|-------------------|---------------|---------------|---------------------------------------|-------------------|---------------|---------------------------------------|

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Onderdeel.....: fundering

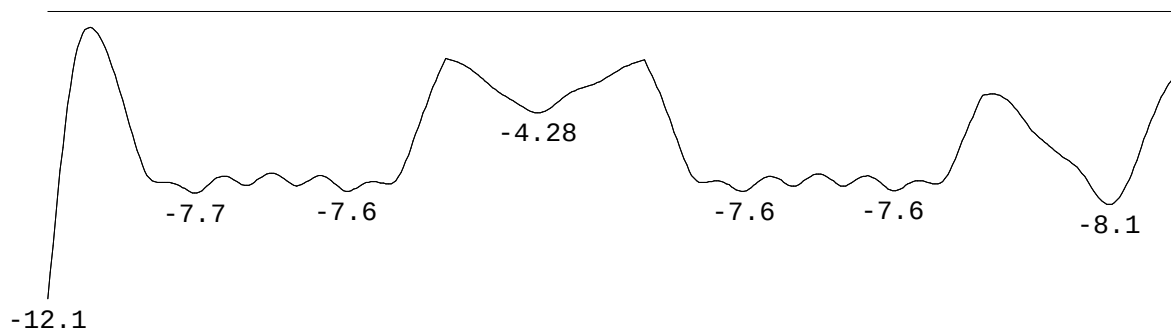
**DOORBUIGINGEN**

Frequente combinatie

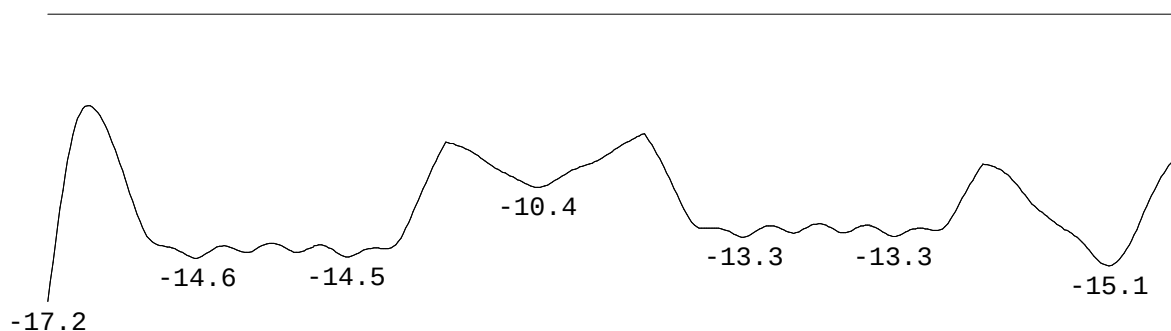
| Veld | Zijde | positie<br>[m] | $l_{rep}$<br>[mm] | $w_1$<br>[mm] | $w_2$<br>[mm] | $w_{bij}$<br>[mm] | $l_{rep}$<br>[mm] | $w_{tot}$<br>[mm] | $w_c$<br>[mm] | $w_{max}$<br>[mm] | $l_{rep}$<br>[mm] |
|------|-------|----------------|-------------------|---------------|---------------|-------------------|-------------------|-------------------|---------------|-------------------|-------------------|
| 1    | Pos.  | 4.250          | 114000            | 0.3           | 2.2           | 12.9              | 8822              | 13.2              |               | 13.2              | 8629              |

**DOORBUIGINGEN  $w_{bij}$  [mm]**

Ligger:1 Quasi-blijvende combinatie

**DOORBUIGINGEN  $w_{max}$  [mm]**

Ligger:1 Quasi-blijvende combinatie

**DOORBUIGINGEN**

Quasi-blijvende combinatie

| Veld | Zijde | positie<br>[m] | $l_{rep}$<br>[mm] | $w_1$<br>[mm] | $w_2$<br>[mm] | $w_{bij}$<br>[mm] | $l_{rep}$<br>[mm] | $w_{tot}$<br>[mm] | $w_c$<br>[mm] | $w_{max}$<br>[mm] | $l_{rep}$<br>[mm] |
|------|-------|----------------|-------------------|---------------|---------------|-------------------|-------------------|-------------------|---------------|-------------------|-------------------|
| 1    | Pos.  | 4.000          | 114000            | 0.3           | 2.2           | 11.1              | 10276             | 11.4              |               | 11.4              | 9990              |