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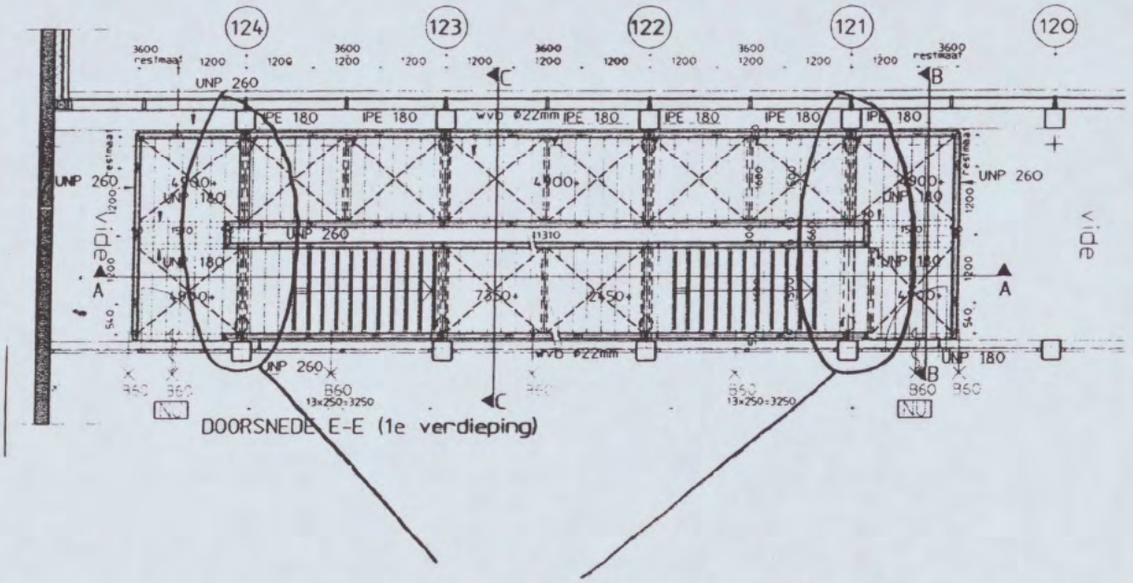
# Cantilever dwarsliggers.




Dwarsliggers (HEA 100).

In tegenstelling tot de consoles op as (123) en (122) zijn de dwarsliggers op as (124) en (121) wél doorgaand.

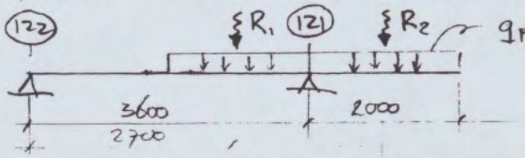
Windbelasting op de gevel wordt ter plaatse van de dwarsliggers afgevoerd naar de achterliggende constructie

De dwarsliggers worden belast met windbelasting en eigen gewicht + variabele belasting uit het bordes en de trappen

## Sterkte

Het model van het bordes wordt toegepast. De belasting uit de trap wordt als puntlast op de dwarsligger gezet.

Het eind van het veld is een overstek.




$q_{pb} = 2{,}28$ kN/m
$q_{vb} = 2{,}75$ kN/m

$R_{1,pb}$ $\frac{1}{2} \cdot 3,6 \cdot 2,28 = 4,1$ kN  $R_{1,vb} = \frac{1}{2} \cdot 3,6 \cdot 2,75 = 5,0$ kN
$R_{2,pb}$ $2,0 \cdot 2,28 = 4,6$ kN.  $R_{2,vb} = 2,0 \cdot 2,75 = 5,5$ kN.

Oplegreactie op as (121) (= dwarsbalk).

pb. $\frac{2,7 \cdot 4,1 + 4,6 \cdot 4,6}{3,6} = 9,0$ kN

vb $\frac{2,7 \cdot 5,0 + 4,6 \cdot 5,5}{3,6} = 10,8$ kN

(BGT).

$V_{z;s;d} = 52,4$ kN.

$V_{z;pl;d} = 0,58 \cdot f_{y;d} \cdot A_w = 0,58 \cdot 235 \cdot (6 \cdot 171) = 140$ kN

$V_{z;s;d} \leq 0,5 \cdot V_{z;pl;d}$ ( 52,4 kN $\leq$ 70 kN).

$N_{s;d} = 114,0$ kN.

$N_{pl;d} = A \cdot f_{y;d} = 4525 \cdot 235 = 1064$ kN.

$N_{s;d} \leq 0,5 \cdot a_1 \cdot N_{pl;d}$.  Bepaal $a_1$. $a = \frac{A - 2 b_f \cdot t_f}{A}$

$114,0 \leq 0,5 \cdot 0,25 \cdot 1064$

$114,0 \leq 133,0$ kN

$= \frac{4525 - 2 \cdot 180 \cdot 9,5}{4525}$

$= 0,25$.

Controleer $\frac{M_{y;s;d}}{M_{y;pl;d}} \leq 1$

$M_{y;s;d} = 45,3$ kNm

$M_{y;pl;d} = f_{y;d} \cdot W_{el} = 235 \cdot 293,6 \cdot 10^3 = 69,0$ kNm.

$\frac{M_{y;s;d}}{M_{y;pl;d}} = \frac{45,3}{69,0} = 0,66$ ( $\leq 1$ ) Voldoet.

## Stijfheid.

$u_{rep} = 10,4$ mm. $\left(= \frac{1}{350}\ell\right)$. $\leq \frac{1}{280}\cdot\ell$ Voldoet.

## Stabiliteit

Centrale op knik. Grootste ongesteunde lengte zit tussen de twee randprofielen van een trapboom.

$l_{buc} = 1680$ mm.

$\lambda_{rel} = \frac{\lambda_y}{\lambda_e}$ $\quad \lambda_y = \frac{1680}{74,5} = 22,6$ $\quad \lambda_e = 93,9$ $\Big\}$ $\lambda_{rel} = 0,24$ kromme c $\Big\}$ $\omega_{buc} = 0,97$

Met $N_{c;s;d} = 114,0$ kN
$M_{y;d} = 45,3$ kNm

Er moet gelden.

$$1,1 \cdot \left( \frac{N_{c;s;d}}{\omega_{buc} \cdot N_{pl;d}} + \frac{M_{y;d}}{M_{y;u;d}} \right) \leq 1.$$

$$1,1 \cdot \left( \frac{114 \cdot 10^3}{0,97 \cdot 4525 \cdot 235} + \frac{45,3 \cdot 10^6}{235 \cdot 293,6 \cdot 10^3} \right) \leq 1.$$

$$1,1 \cdot \left( 0,11 + 0,66 \right) \leq 1$$

$$0,85. \leq 1. \quad \text{Voldoet.}$$

# Consok - Kolom verbinding.

De consoles ondersteunen het bordes aan de buitengevelzijde. Aan de binnenpuizijde ondersteunen de consoles de traptomen.

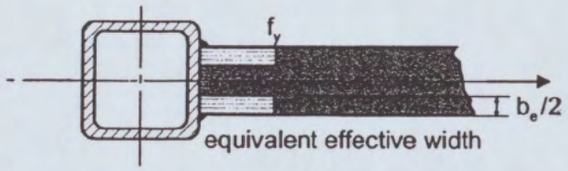
De consoles zijn momentvast verbonden aan de kolommen.

Uit ESA volgt dat ter plaatse van de aansluiting gelat:

$M_{y,d}$ = 48,8 kNm
$V_{z,d}$ = 50,1 kN.
$N_d$ = 45 kN (door wind, alleen op buitengevel).

De verbinding wordt gecontroleerd op

* Capaciteit van de ligger, met in acht neming van de meewerkende breedte van de kolom.
* Plastisch vervormen van de kolom bij de aansluiting met de flenzen van de console.
* Plastisch vervormen van de kolom lijven (zijkant kolom).
* Pons van de kolom (punching shear).

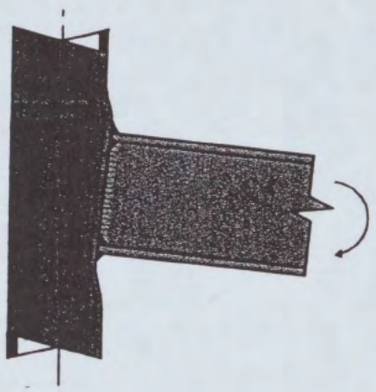



De meewerkende breedte wordt bepaald met

$$b_e = \frac{10 \cdot f_{y0} \cdot t_0}{\frac{b_0}{t_0} \cdot f_{y1} \cdot t_1} \cdot b_1$$

met $t_0$ = wanddikte kolom
$t_1$ = flensdikte ligger
$b_0$ = breedte kolom
$b_1$ = breedte ligger.

Het plastisch vervormen van de kolom wordt bepaald met onderstaand model. De ligger wordt vervangen voorzien door 2 flensen (figuur rechts). Dit is een conservatieve aanname.





yield line pattern (with web)



yield line pattern (without web)

De capaciteit van de kolom wordt bepaald met:

$$N = f_{y0} \cdot A_0^2 \left( \frac{4}{\sqrt{1-\beta}} \right) \quad \text{(per flens)}.$$

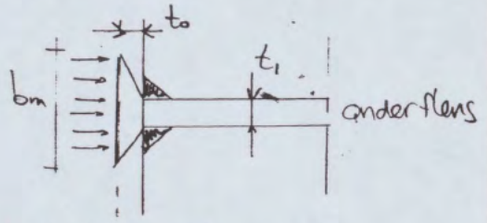
met $A_0 = 16{,}0$ mm

$$\beta = \frac{b_1}{b_0} = \frac{180}{350}$$

Voor de zijwand geldt:

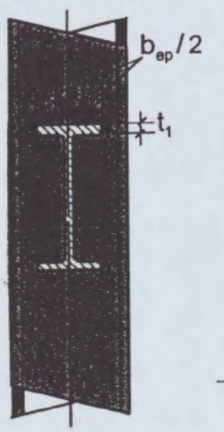
$$N = 2 \cdot f_{y0} \cdot A_0 \, b_m$$

$$b_m = A_1 + 5t_0$$




Het ponsen van de kolom wordt bepaald met

$$N = \frac{f_{y0}}{\sqrt{3}} \cdot t_0 \cdot (2b_e + 2t_1).$$






## Capaciteit ligger

Bepaal meewerkende breedte.

$$b_e = \frac{10 \cdot f_{yo} \cdot A_o}{\frac{b_o}{t_o} \cdot f_{y1} \cdot A_1} \cdot b_1$$

$$b_e = \frac{10 \cdot 235 \cdot 16{,}0}{\frac{350}{16} \cdot 235 \quad 9{,}5} \cdot 180 = 138{,}6 \text{ mm}$$

De capaciteit is $N = f_{y1} \cdot A_1 \cdot b_e$

$= 235 \cdot 9.5 \cdot 138.6$

$= 309{,}4$ kN.

Uit ESA volgt

$M_{y;d} = 48{,}8$ kNm.

$z = 171 - 9.5 = 161{,}5$ mm

$N_d = \frac{M_{y;d}}{z} = \frac{48.8 \cdot 10^6}{161{,}5} = 302{,}2$ kN.

Unity Check $\frac{N_d}{N} \leq 1$

$\frac{302{,}2}{309{,}4} = 0{,}98$ Voldoet.

Aan de buitengevel geldt bovendien

$N_{d;wind} = 45$ kN.

Over 2 flenzen levert dit additioneel aan $N_d$ $\frac{45}{2} = 22{,}5$ kN

$N_{d;totaal} = 302{,}2 + 22{,}5 = 324{,}7$ kN.

Unity Check $\frac{324.7}{309{,}4} = 1{,}05$.

Er vindt een overschrijding van de vloeispanning plaats. De overschrijding bedraagt 5%.

Er dient opgemerkt te worden dat de variabele belastingen (wind en variabel op bordes/trap) allebei voor vol zijn aangenomen (momentfaan = 1).

Volgens NEN 6702 mag ook voor wind een momentaanfactor 0,2 worden aangehouden, als het bordes/trap volbelast is.

In dat geval is $N_{d;wind} = 0{,}2 \cdot 45 = 9$ kN

Per flens $\frac{9}{2} = 4.5$ kN.

In dat geval is $N_{d;totaal} = 302{,}2 + 4.5 = 306{,}7$ kN.

Unity Check levert op $\frac{306{,}7}{309{,}3} = 0{,}99 \; (\leq 1)$.

Voldoet.

## Plastisch vervormen van kolom

Voor het plastisch vervormen van de kolom ter plaatse van de flens aansluiting geldt

$$N = f_{y0} \cdot t_0^2 \left( \frac{4}{\sqrt{1-\beta}} \right)$$

met $t_0 = 16.0$ mm

$$\beta = \frac{b_1}{b_0} = \frac{180}{350} = 0{,}51$$

$$N = 235 \cdot 16.0^2 \cdot \left( \frac{4}{\sqrt{1-0{,}51}} \right) = 343{,}8 \text{ kN}.$$

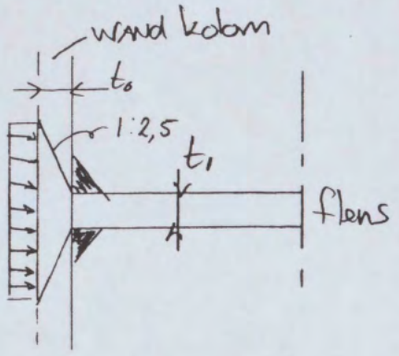
Dit is de grenskracht waarbij de kolom plastisch gaat vervormen.

Unity Check $\frac{324{,}7}{343{,}8} = 0{,}94 \; (\leq 1)$ Voldoet.

NB. Dit is conservatief. De belasting ($N_{d;totaal}$) is inclusief de volle windbelasting.

Voor het plastisch vervormen van de zijwanden van de kolom geldt:

$N = 2 \cdot f_{y0} \cdot t_0 \cdot b_m$




Voor $b_m$ : $b_m = t_1 + 5t_0$

$b_m = 9.5 + 5 \cdot 16.0$

$b_m = 89,5$ mm

$N = 2 \cdot 235 \cdot 160 \cdot 89.5 = 673$ kN

Unity Check $\frac{324.7}{673} = 0,48$ $(\leq 1)$.

Voldoet.

Pons van de kolom

Voor het ponsen van de kolom ter plaatse van de flens aansluiting geldt:

$N = \frac{f_{y0}}{\sqrt{3}} \cdot t_0 (2b_e + 2t_1)$.

$N = \frac{235}{\sqrt{3}} \cdot 16.0 \cdot (2 \cdot 138,6 + 2 \cdot 9,5)$

$N = 643$ kN.

Unity Check $\frac{324.7}{643} = 0,50$ $(\leq 1)$.

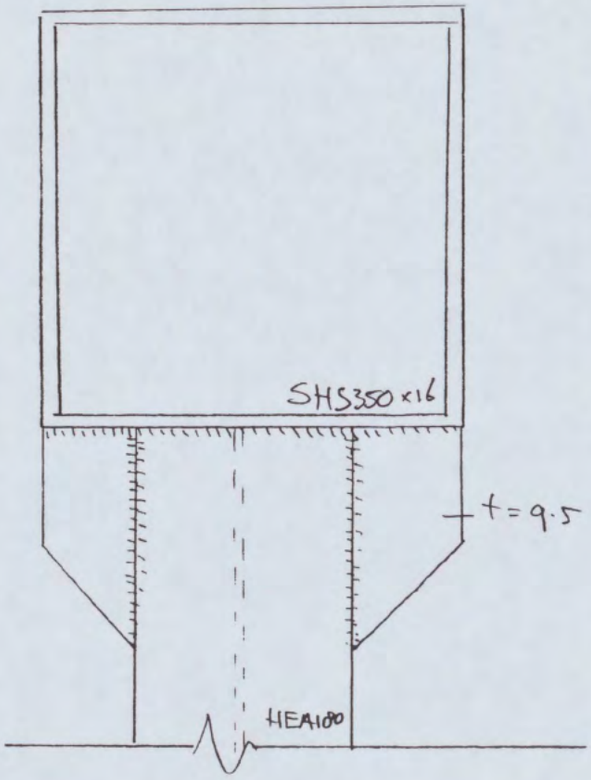
Voldoet.

## Controle rotatie console

Bij controle van de rotatie van de console onder invloed van de belasting blijkt dat de wand van de kolom te slap is. Hierdoor ontstaat een te grote zakking van de console tgv de rotatie ter plaatse van de aansluiting

Dit wordt ondervangen door de flenzen van de ligger (console) te verbreden door het plassen van platen volgens afbeelding.

De druk- en trekkracht uit de flenzen van de console worden hierdoor direct ingeleid in de twee lijven van de kolom. Deze zijn dermate stijf dat er vrijwel uitgegaan van een rotatieloze aansluiting.



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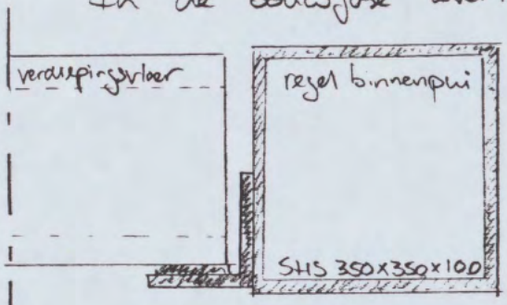
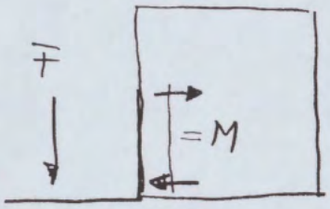
# Controle binnenpui

De binnenpui (op as 10) is een balkrooster met kolommen SHS 350x350x16.0 en regels SHS 350x350x10.0. De pui wordt belast met de belasting uit het trappenhuis en de verdiepingsvloeren.

De verdiepingsvloeren worden ter plaatse van de regels opgelegd op aangeboste hoekstalen.

In de bouwfase levert dit een moment in de regel.




De kier tussen vloerplaat en regel wordt opgevuld waardoor in de gebruiksfase geen extra moment in de regel worden veroorzaakt, ten gevolge van de excentrische belasting.

De pui wordt in 2 delen gecontroleerd, de regels los van de kolommen.

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## Controle regels.

De regels worden belast met de verdiepingsvloeren. Deze vloeren zijn op een aangelast hoekprofiel opgelegd.

Uit "Gewichtsberekening deel3: Atrium hoorn" pag. 3.1 volgt:

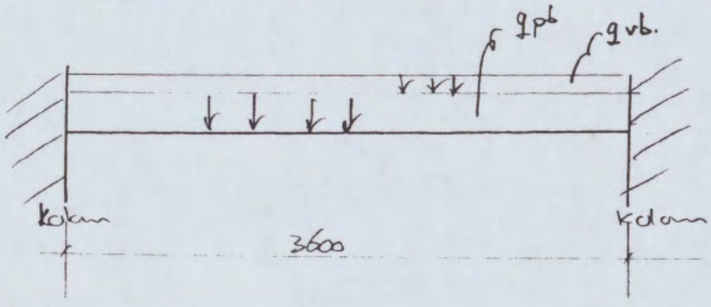
Permanent

| | | | |
|---|---|---|---|
| Overloop verdiepingsvloer | | | |
| eg vloer (h = 200) | = | 3,50 | kN/m² |
| druklaag | = | 1,20 | kN/m² |
| Staalconstructie | = | 0,30 | kN/m² |
| Tegels + leidingen | = | 0,30 | kN/m² |
| | | 5,30 | kN/m² |

Variabel.

| | | | |
|---|---|---|---|
| Standaard verdieping | = | 4,50 | kN/m² |
| | | 4,50 | kN/m² |

Afstand hoeken 2 kolommen: 3600mm. De regel is star verbonden met de kolommen




Bepaling rekenwaarde

$q_{pb;d}$ = 1,2 · 5,30 = 6,40 kN/m²

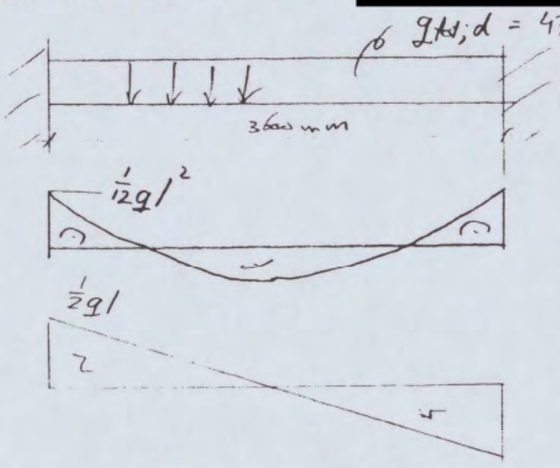
$q_{vb;d}$ = 1,5 · 4,50 = 6,80 kN/m²

Veldbreedte bedraagt 3.6m waardoor q-belasten worden

$q_{pb;d}$ = 3.6 · 6.4 = 23.04 kN/m

$q_{vb;d}$ = 3.6 · 6.8 = 24,5 kN/m

$q_{tot;d}$ 47.54 kN/m




Sterkte

Er geldt $V_{z;pl;a} = 0{,}577 \cdot \frac{h}{b \cdot h} \cdot A \cdot f_{y;d}$

$= 0{,}577 \cdot \frac{350}{350 \cdot 350} \cdot 13500 \cdot 235$

$= 915$ kN.

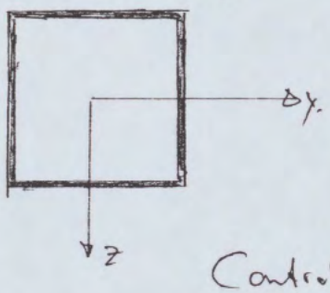
$V_{z;a} = \frac{1}{2} g \cdot l = \frac{1}{2} \cdot 36 \cdot 47.5 = 85{,}6$ kN $\leq 915$ kN.

Dus controleer volgens interactie formule (N = klein)

$$\frac{M_{y;a}}{M_{y;pl;d}} \leq 1.$$

$M_{y;d} = \frac{1}{12} \cdot g \cdot l^2 = \frac{1}{12} \cdot 47.54 \cdot 3.6^2 = 51{,}3$ kNm

Ook hier geldt dat het moment slechts met de lijven van de kolom opgenomen kan worden.




$W_y = 2 \cdot \frac{1}{6} \cdot b \cdot h^2 = 2 \cdot \frac{1}{6} \cdot 10 \cdot 350^2$

$= 4{,}08 \cdot 10^5$ mm$^3$

$M_{y;pl;a} = W_y \cdot f_{y;d} = 4{,}08 \cdot 10^5 \cdot 235$

$= 95.6$ kNm

Controle $\frac{M_{y;d}}{M_{y;pl;d}} = \frac{51{,}3}{95.6} = 0{,}54$ ( $< 1$ ).

Voldoet.

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## Stijfheid

Voor de doorbuiging moet gelden:

$u_{rep} \leq 0{,}004 \cdot l = 0{,}004 \cdot 3600 = 14{,}4$ mm.

$$u_{rep} = \frac{q \cdot l^4}{384 \cdot EI}$$

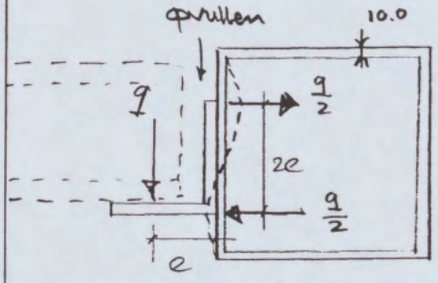
$q_{tot}$ (in BGT) $= (5{,}3 + 4{,}50) \cdot 3.6\,m = 35{,}3$ kN/m

$$u_{rep} = \frac{35.3 \cdot 3600^4}{384 \cdot 210 \cdot 10^3 \cdot 2{,}500 \cdot 10^8} = 0{,}3 \text{ mm}$$

Controle $\frac{0{,}3}{14{,}4} = 0{,}02$ $(\leq 1)$

Voldoet.

Tevens moet gecontroleerd worden of de wand van de koker stijf genoeg is.




Uit een modellering in ESA blijkt dat de kokerwand voldoende stijf.

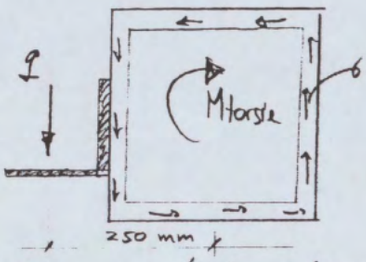
$u_{rep} \approx 0$ mm

NB. Hier wordt alleen de permanente belasting in rekening gebracht. In de bouwfase wordt de koker gevuld waardoor verdere rotatie van de regel wordt voorkomen.

Het torsiemoment wordt ter plaatse van de starre verbinding met de kolom overgedragen op de flens van de koker (kolom).

De spanning door de torsie bedraagt

$$\frac{M_{torsie;d}}{W_{torsie;d}} = \sigma_{torsie;d}.$$




Het torsiemoment wordt door de hele doorsnede opgenomen.

$$M_{torsie} = q_{torsie;d} \cdot e = \left(5{,}30 \cdot 3{,}6\right)_{perm.} \cdot 1{,}2 \cdot 0{,}25 = 5{,}7 \text{ kNm.}$$

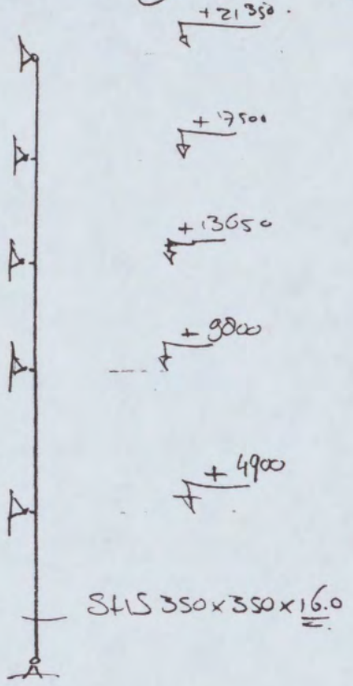
$$W_{torsie;d} = 2 \cdot b_m \cdot h_m \cdot t = 2 \cdot 340 \cdot 340 \cdot 10 = 2{,}312 \cdot 10^6 \text{ mm}^3$$

$$\sigma_{torsie;d} = \frac{5{,}7 \cdot 10^6}{2{,}312 \cdot 10^6} = 2{,}5 \text{ N/mm}^2$$

Deze spanning wordt meegenomen wanneer de gecombineerde spanning in de kolom wordt bepaald.

# Conische kolommen.

Doordat de regels horizontaal gesteund zijn door de verdiepingvloeren, is de kolom te schematiseren als een doorgaande ligger op meerdere steunpunten.




Belastingen:

De kolom op as 10-123 is het zwaarst belast, mede door de dakbelasting.

Uit "Gewichtsberekening deel 3: Atrium hoorn" volgt dat: (pag. 4a.15).

| | | |
|---|---|---|
| qb | dak | 352.5 kN |
| vb | dak | 308.8 kN. |

$N_d = 1,2 \cdot 352,5 + 1,5 \cdot 308,8 = 1006,2$ kN.

Per verdieping moet in rekening worden gebracht:

Permanent

| | | | |
|---|---|---|---|
| eg Glas | 3,6 · 4,9 | 0,5 | = 2 · 8,8 kN (verd 1+2) |
| | 3,6 · 3,45 | · 0,5 | = 2 · 6,2 kN (verd 3+4) |
| eg regel | 3,6 · | 1,0 | = 3,6 kN. |
| eg verdiepingsvloer. | 3,6 · 3,6 | 5,3 | = 68,7 kN. |
| eg trap/bordes. | 2 · 8,2 | | = 16,4 kN. |
| | | (per verdieping) | 118,7 kN. |

Variabel

| | | | |
|---|---|---|---|
| VAR verd. vloer | 3,6 · 3,6 · 4,5 | = | 58,3 |
| var trap | 2 · 9,9 | = | 19,8 |
| var dak. | ( zit al in Nd uit dat. ) | | |
| | | | 78,1 kN. |

Als de variabele dakbelasting momentaanfactor $\psi = 1$ heeft, mag voor de andere variabele belasting $\psi = 0,5$ worden genomen.

Maximale drukkracht in kolom (onderin)

| | | | |
|---|---|---|---|
| Nd | | = | 1006,2 kN |
| perm | 1,2 · 4 · 118,7 | = | 569,8 kN |
| var | 1,5 · 4 · 78,1 · 0,5 | = | 234,3 kN |
| | | $N_{d;max}$ = | 1810,3 kN |

Voor horizontale belasting wordt aerdruk in rekening gebracht.

Volgens NEN 6702 geldt

$C_{pi} = 0,3$ (druk)
$C_{pi} = -0,3$ (onderdruk)

$C_{pi;tot} = 0,6$.

$P_w = C_{pi} \cdot C_{dim} \cdot p_w$

$0,6 \cdot 0,92 \cdot 1,13$

$P_w = 0,62$ kN/m²

## Controles

Sterkte.

Controle op gecombineerde spanning.

$\sigma_{N;d} = \frac{N_{d;totaal}}{A_{koker}} = \frac{1810,3 \cdot 10^3}{21100} = 85,8$ N/mm²

$\sigma_{M;druk;d} = \frac{M_{d;druk}}{W_{koker}} = \frac{8,0 \cdot 10^6}{2,225 \cdot 10^6} = 3,6$ N/mm²

$M_{d;druk} = \frac{1}{10} \cdot q \cdot l^2 = \frac{1}{10} \cdot (0,62 \cdot 3,6) \cdot 4,9^2 \cdot 1,5$

$= 8,0$ kNm.

$W_{koker} = 2,225 \cdot 10^6$ mm³

$\sigma_{M;regels;d} = \frac{M_{d;regel}}{W_{ligg}} = \frac{51,3 \cdot 10^6}{2 \cdot \frac{1}{6} \cdot 10 \cdot 550^2} = 125,6$ N/mm² (zie ook controle regel).

$\sigma_{M;wrig;d} =$ 2,5 N/mm² (zie controle regels).

## Gecombineerde spanning.

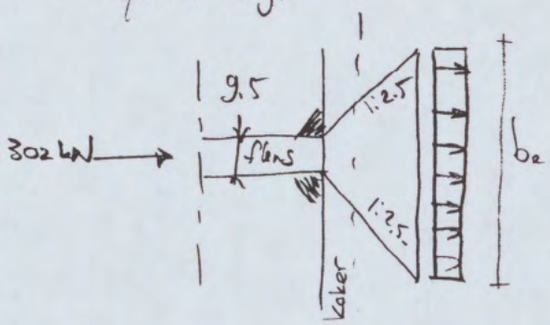
Vlak van aanwijzing met regels.

$\sigma_{N;d}$ uit kolom = 85,8 N/mm²
$\sigma_{M;wring;d}$ uit torsie regel = 2,5 N/mm²
$\sigma_{M;console;d}$ uit console = 106 N/mm².

$\sigma_{M;console}$ is geboseerd op Md console = 48,8 kNm
Trek en drukkracht in boven en onderflens van console

$$\frac{Md;console}{h} = \frac{40.8 \cdot 10^6}{(171-9.5)} = 302\ kN.$$

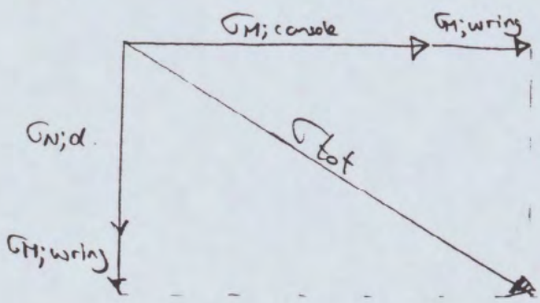
Flensen waren verbreed waardoor deze kracht direct in de liven werkt opgenomen, volgens onderstaande spreiding.




$b_e = t_f + 5t_o = 9.5 + 5 \cdot 16.0$
$= 89.5$ mm
Wanddikte 16.0 mm

$$\sigma_{M\,console} = \frac{302\ kN}{(89.5 \cdot 16{,}0) \cdot 2} = 106\ N/mm^2$$

## Gecombineerde spanning:




$$\sigma_{tot} = \sqrt{(106+2.5)^2 + (85{,}8+2{,}5)^2}$$
$= 139.9\ N/mm^2$. $(\leq 235)$

Voldaet.
(de invloed van de dwarskracht is klein t.o.v. moment).

ARCADIS

*Infrastructuur, gebouwen, milieu, communications*

Werknr.

Onderdeel Trappenhuis Atrium Zuid Naam [redacted] Datum 12-12-05 Pag.

Vlak van aansluiting console

$\sigma_{w;d}$ uit kolom $\sigma = 85,8 \ N/mm^2$

$\sigma_{M;d}$ uit regel $\sigma = \frac{M_{y;d}}{W_{z\text{-}gem}} = \frac{51.3 \cdot 10^6}{2 \cdot \frac{1}{6} \cdot 10 \cdot 350^2} = 125,6 \ N/mm^2$

Gecombineerde spanning:

$\sigma_{tot} = \sqrt{85,8^2 + 125,6^2} = 152,1 \ N/mm^2 \ (\leq 235)$.

Voldoet.

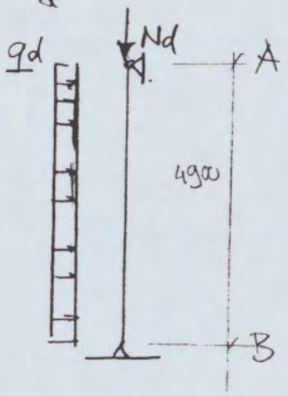
Stijfheid.

De grootste ongesteunde lengte is 4900 mm.

Eis is dat $u_{rep} \leq 0,004 \cdot l = 0,004 \cdot 4900 = 19,6$ mm.

Horizontale belasting uit overdrak in trappenhuis.

$q = \quad \cdot p_H \cdot 3,6 = \quad \cdot 0,62 \cdot 3,6 = 2,2 \ kN/m$




$u_{rep} = \frac{5}{384} \frac{q \cdot l^4}{EI}$

$= \frac{5}{384} \cdot \frac{2,2 \cdot 4900^4}{20 \cdot 10^3 \cdot 3,094 \cdot 10^9} = 9,2$ mm.

$9,2 \leq 19,6$ mm Voldoet.

NB. A is in werkelijkheid geen scharnier maar een verende oplegging. daarzeven de kolom een doorgaande ligger is op meer steunpunten. Een veer zou de doorbuiging gunstig beïnvloeden.

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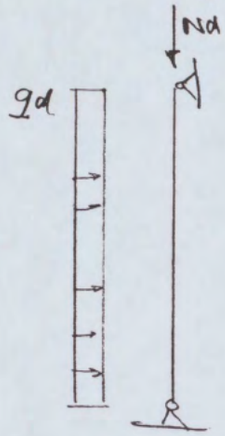
## Stabiliteit

De kolom wordt gecontroleerd op stabiliteit.

De langste ongesteunde lengte is 4900 mm




$q_d = 1{,}5 \cdot 2{,}2 = 3{,}3$ kN/m.

$N_d = 1810{,}3$ kN.

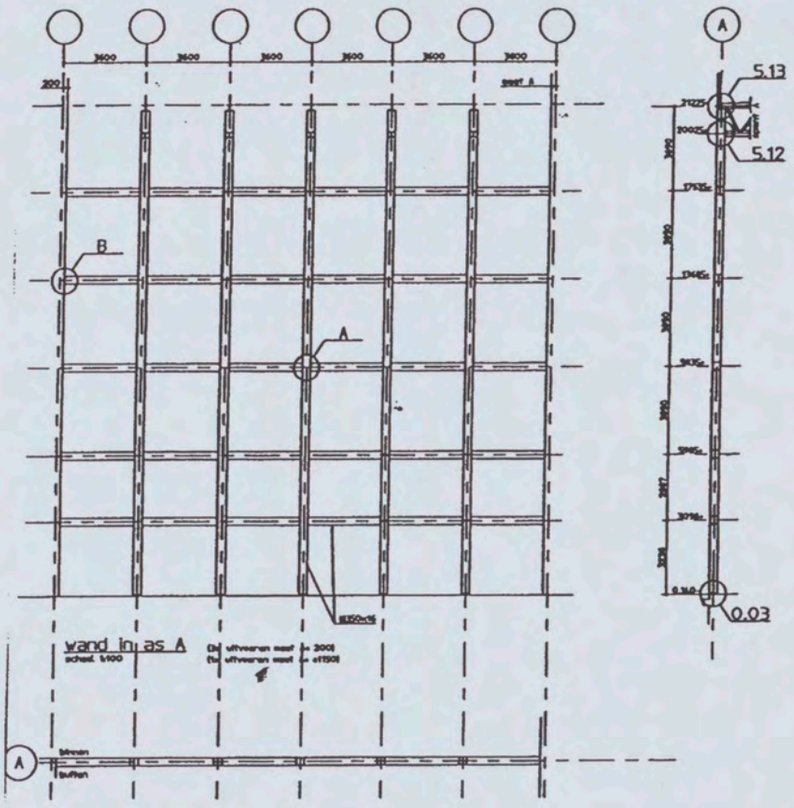
Bepaal slankheid.

$\lambda_{rel} = \frac{\lambda_y}{\lambda_e}$ $\quad \lambda_y = \frac{4900}{135.85} = 35{,}3$ $\quad \lambda_e = 93{,}9$

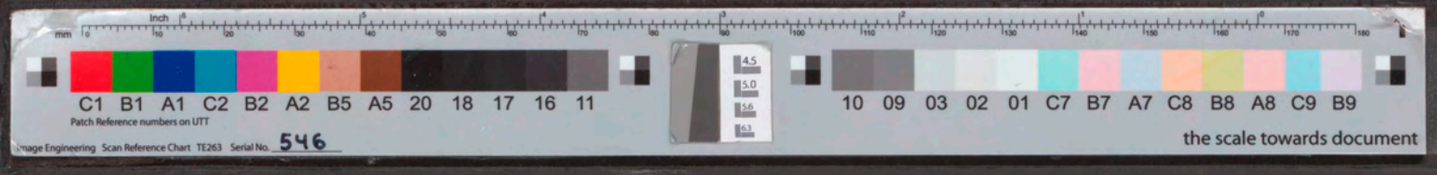
$\lambda_{rel} = 0{,}38$. kromme a $\Rightarrow$ 0,96.

Geen knikgevaar.

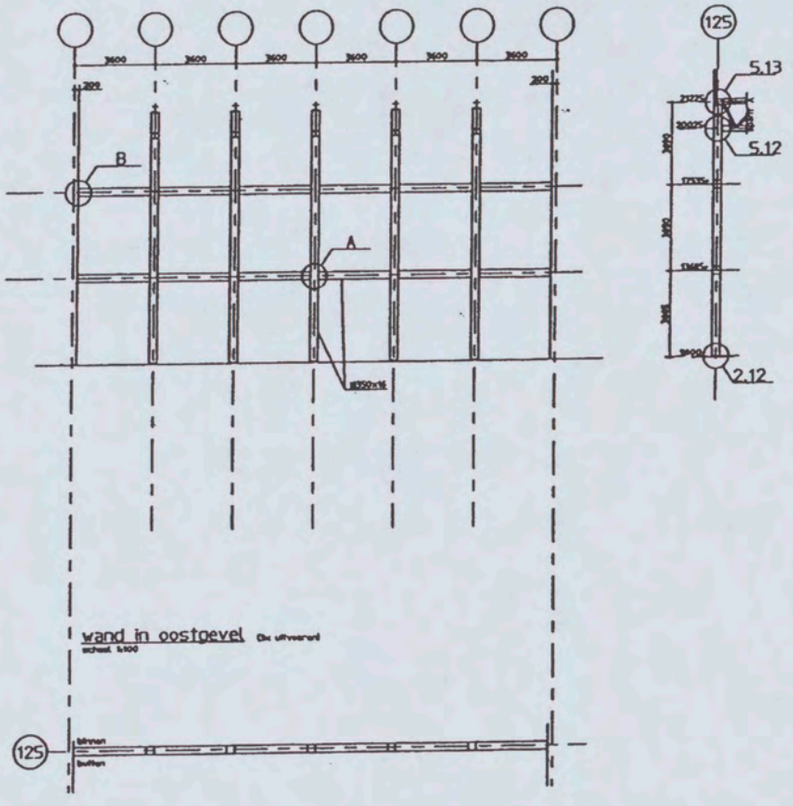
# BIJLAGE 1 Bestektekening wand in as A




Tekening CB5001A

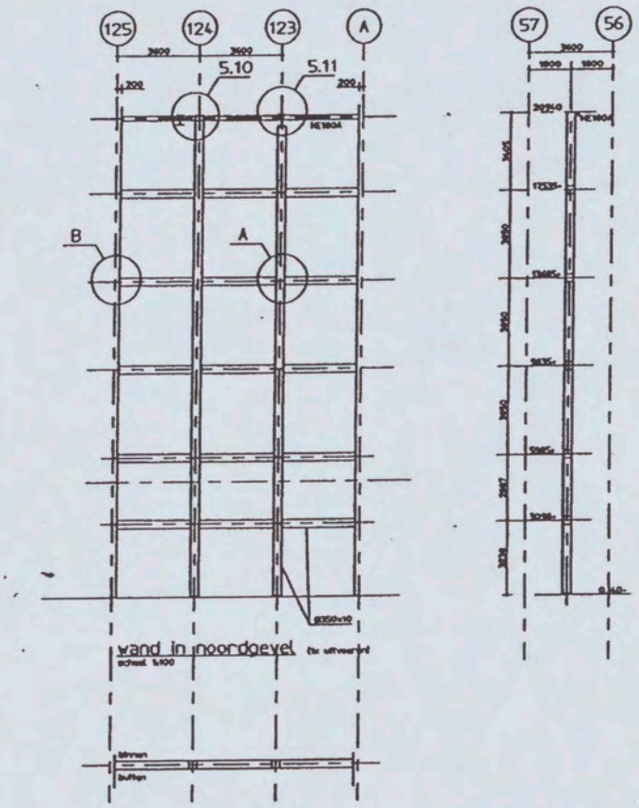

C1 B1 A1 C2 B2 A2 B5 A5 20 18 17 16 11
Patch Reference numbers on UTT
Image Engineering Scan Reference Chart TE263 Serial No. 546
10 09 03 02 01 C7 B7 A7 C8 B8 A8 C9 B9
the scale towards document

# BIJLAGE 2 Bestektekening gevels in oostzijde




Tekening CB5001A

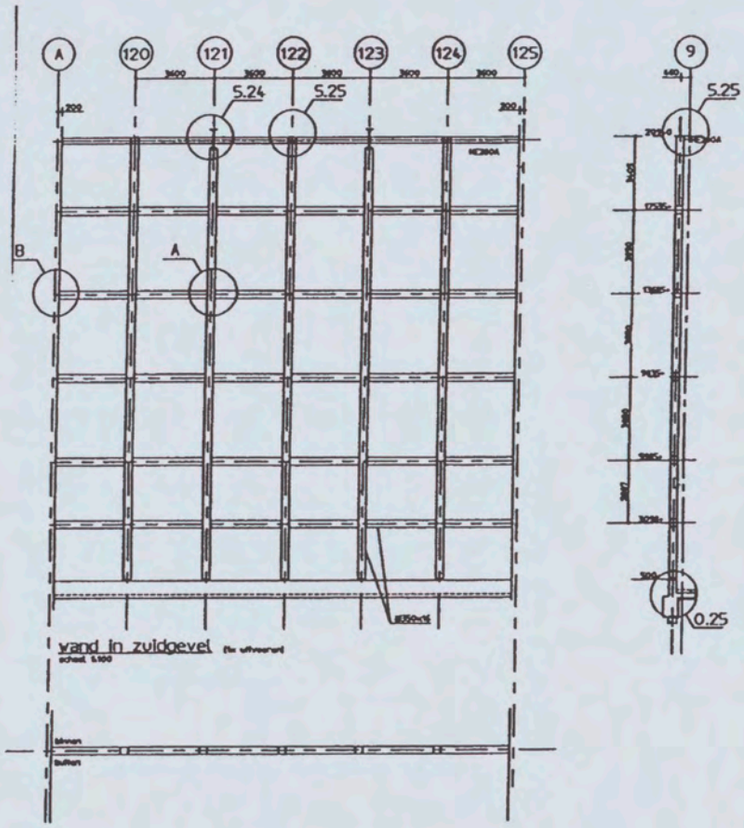
# BIJLAGE 3 Bestektekening gevel in noordzijde




Tekening CB5001A

C1 B1 A1 C2 B2 A2 B5 A5 20 18 17 16 11
10 09 03 02 01 C7 B7 A7 C8 B8 A8 C9 B9
Patch Reference numbers on UTT
nage Engineering Scan Reference Chart TE263 Serial No. 546
the scale towards document

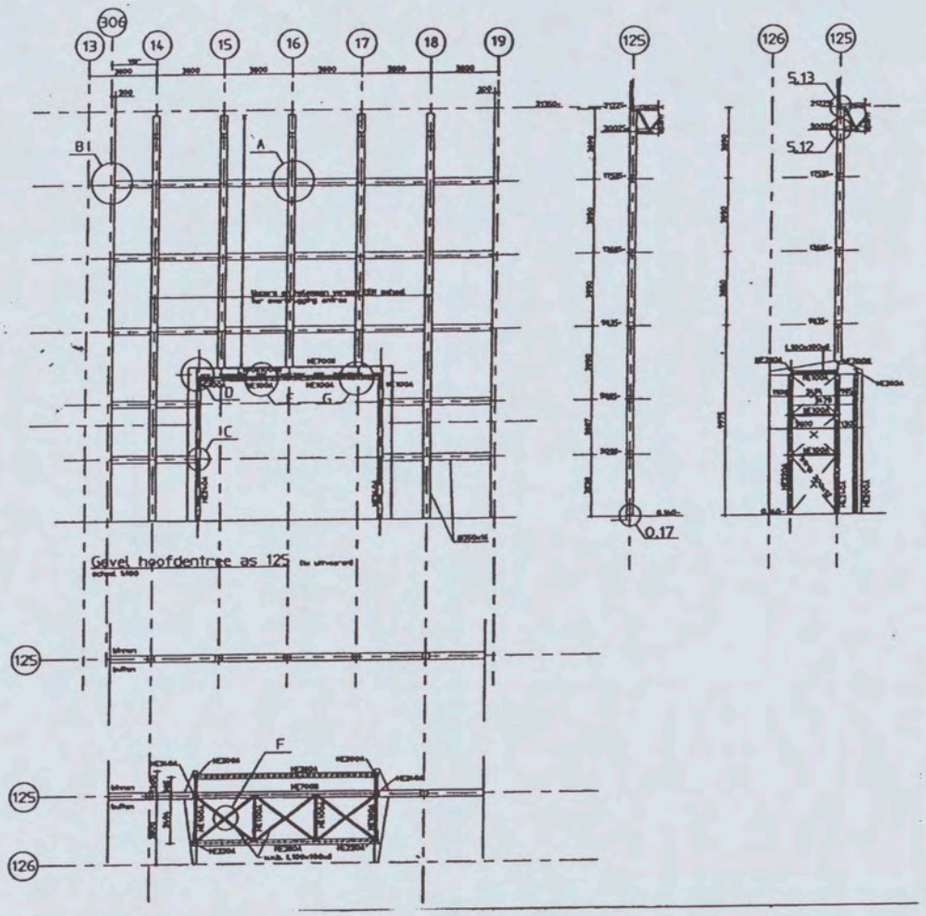
# BIJLAGE 4 Bestektekening gevel in zuidzijde



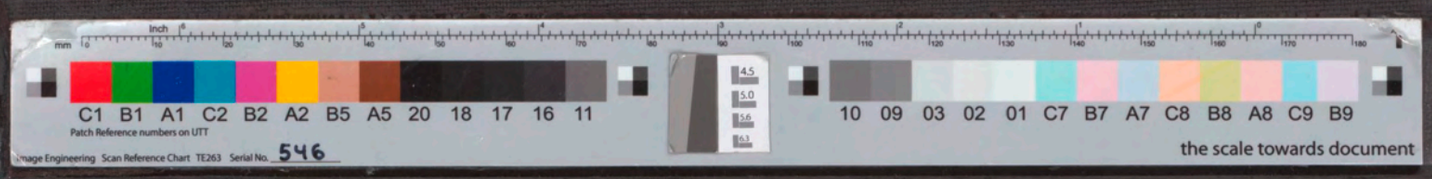

Tekening CB5001A

C1 B1 A1 C2 B2 A2 B5 A5 20 18 17 16 11
10 09 03 02 01 C7 B7 A7 C8 B8 A8 C9 B9
4.5 5.0 5.6 6.3
the scale towards document
Patch Reference numbers on LITT
Image Engineering Scan Reference Chart TE263 Serial No. 546

# BIJLAGE 5 Bestektekening gevel met hoofdentree




Tekening CB5001A


C1 B1 A1 C2 B2 A2 B5 A5 20 18 17 16 11
Patch Reference numbers on UTT
Image Engineering Scan Reference Chart TE263 Serial No. 546
10 09 03 02 01 C7 B7 A7 C8 B8 A8 C9 B9
the scale towards document

# BIJLAGE 6 ESA Prima Win output gevels in as A



## Inhoudsopgave

Basisgegevens , gebruikte materialen

Materialenlijst

Doorsnede-eig. , standaard , gebruikte profielen

Groep van variabele lasten

Belastinggevallen

Combinaties

Verslag berekening.

Geometrie

EG glas

EG dak

VB dak

Wind druk

Wind zuiging

Interne krachten in staven (alles), UGT. comb (alles), extremen.

Reacties (alles), UGT. comb (alles), lokale extremen.

Vervorming in staven (alles), GGT. combi (alles), globale extremen.

## Basisgegevens
## Structuurtype : Raamwerk XYZ

| | |
|---|---|
| Aantal knopen: | 54 |
| Aantal staven: | 65 |
| Aantal 1D macro's: | 10 |
| Aantal randlijnen: | 0 |
| Aantal 2D macro's: | 0 |
| Aantal profielen: | 5 |
| Aantal belastingsgev.: | 6 |
| Aantal materialen: | 1 |

## Materiaal

Naam
S235

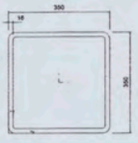
| | |
|---|---|
| Treksterkte | 360.000 MPa |
| Vloeigrens | 235.000 MPa |
| E-modulus | 210000.00 MPa |
| Poisson coëff. | 0.30 |
| Specifiek gewicht | 0.000 kg/mm^3 |
| Uitzettingscoëff. | 1.2e-005 mm/mm.K |

## Materialenlijst
## Groep staven:
## 1/65

| nr. | Naam | Kwaliteit | Eenh. gewicht kg/mm | Lengte mm | Massa kg |
|---|---|---|---|---|---|
| 4 | SHS350/350/16.0 | S235 | 0.17 | 214825.00 | 35582.54 |

Totaal gewicht van constructie: 35582.54 kg
Verfoppervlakte: 300754994.88 mm^2

## Profielen



**SHS350/350/16.0**

Doorsnedenr. 4 - SHS350/350/16.0
Materiaal : 7 - S235

| | | | | | |
|---|---|---|---|---|---|
| A | : | 2.110000e+004 mm^2 | | | |
| Ay/A | : | 0.500 | Az/A | : | 0.500 |
| Iy | : | 3.894000e+008 mm^4 | Iz | : | 3.894000e+008 mm^4 |
| Iyz | : | 2.710505e-007 mm^4 | It | : | 6.099000e+008 mm^4 |
| Iw | : | 7.002917e+012 mm^6 | | | |
| Wely | : | 2.225000e+006 mm^3 | Welz | : | 2.225000e+006 mm^3 |
| Wply | : | 2.604152e+006 mm^3 | Wplz | : | 2.604152e+006 mm^3 |
| cy | : | 175.00 mm | cz | : | 175.00 mm |

| | | | |
|---|---|---|---|
| A : | 2.110000e+004 mm^2 | | |
| iy : | 135.85 mm | iz : | 135.85 mm |
| dy : | 0.00 mm | dz : | 0.00 mm |
| Omtrek : | | 1400.00 mm | |

Controletype: Kokerprofiel

| | | | |
|---|---|---|---|
| Hoogte | 350.00 mm | Breedte | 350.00 mm |
| Lijfdikte | 16.00 mm | | |

## Groep van variabele lasten

| Naam | Omschrijving |
|---|---|
| Wind | NEN - momentaan factor = 1.00 |
| dak | NEN - momentaan factor = 1.00 |

## Belastinggevallen

| B G | Naam | Omschrijving |
|---|---|---|
| 1 | EG glas | Permanent - Lasten |
| 2 | EG Dak | Permanent - Lasten |
| 3 | vb dak | Variabel - dak<br>Korte termijn |
| 4 | wind in | Variabel - Wind |
| 5 | wind uit | Variabel - Wind |
| 6 | EG constructie | Eigengewicht. Richting -Z |

## Combinaties

| Combi | Norm | BG | coëff |
|---|---|---|---|
| 1. | NEN - UGT | 1 EG glas | 1.00 |
| | | 2 EG Dak | 1.00 |
| | | 3 vb dak | 1.00 |
| | | 4 wind in | 1.00 |
| | | 6 EG constructie | 1.00 |
| 2. | NEN - GGT | 1 EG glas | 1.00 |
| | | 2 EG Dak | 1.00 |
| | | 3 vb dak | 1.00 |
| | | 4 wind in | 1.00 |

| Combi | Norm | BG | coëff |
|---|---|---|---|
| | | 6 EG constructie | 1.00 |
| 3.wind uit | NEN - UGT | 1 EG glas | 1.00 |
| | | 2 EG Dak | 1.00 |
| | | 3 vb dak | 1.00 |
| | | 5 wind uit | 1.00 |
| | | 6 EG constructie | 1.00 |
| 4.wind uit | NEN - GGT | 1 EG glas | 1.00 |
| | | 2 EG Dak | 1.00 |
| | | 3 vb dak | 1.00 |
| | | 5 wind uit | 1.00 |
| | | 6 EG constructie | 1.00 |

Regels voor het genereren van uiterste combinaties:
1 : 1.35*BG1 / 1.35*BG2 / 1.35*BG6
2 : 0.90*BG1 / 0.90*BG2 / 0.90*BG6
3 : 1.20*BG1 / 1.20*BG2 / 1.50*BG3 / 1.50*BG4 / 1.20*BG6
4 : 1.20*BG1 / 1.20*BG2 / 1.50*BG3 / 1.50*BG4 / 1.20*BG6
5 : 0.90*BG1 / 0.90*BG2 / 1.50*BG3 / 1.50*BG4 / 0.90*BG6
6 : 0.90*BG1 / 0.90*BG2 / 1.50*BG3 / 1.50*BG4 / 0.90*BG6
7 : 1.35*BG1 / 1.35*BG2 / 1.35*BG6
8 : 0.90*BG1 / 0.90*BG2 / 0.90*BG6
9 : 1.20*BG1 / 1.20*BG2 / 1.50*BG3 / 1.50*BG5 / 1.20*BG6
10 : 1.20*BG1 / 1.20*BG2 / 1.50*BG3 / 1.50*BG5 / 1.20*BG6
11 : 0.90*BG1 / 0.90*BG2 / 1.50*BG3 / 1.50*BG5 / 0.90*BG6
12 : 0.90*BG1 / 0.90*BG2 / 1.50*BG3 / 1.50*BG5 / 0.90*BG6

Regels voor het genereren van gebruiks combinaties:
1 : 1.00*BG1 / 1.00*BG2 / 1.00*BG6
2 : 1.00*BG1 / 1.00*BG2 / 1.00*BG3 / 1.00*BG4 / 1.00*BG6
3 : 1.00*BG1 / 1.00*BG2 / 1.00*BG3 / 1.00*BG4 / 1.00*BG6
4 : 1.00*BG1 / 1.00*BG2 / 1.00*BG6
5 : 1.00*BG1 / 1.00*BG2 / 1.00*BG3 / 1.00*BG5 / 1.00*BG6
6 : 1.00*BG1 / 1.00*BG2 / 1.00*BG3 / 1.00*BG5 / 1.00*BG6

Lijst van alle UGT combinaties
1/ 2 : +0.90*BG1+0.90*BG2+0.90*BG6
2/ 3 : +1.20*BG1+1.20*BG2+1.20*BG6
3/ 1 : +1.35*BG1+1.35*BG2+1.35*BG6
4/ 5 : +0.90*BG1+0.90*BG2+1.50*BG3+0.90*BG6
5/ 5 : +0.90*BG1+0.90*BG2+1.50*BG4+0.90*BG6
6/ 11 : +0.90*BG1+0.90*BG2+1.50*BG5+0.90*BG6
7/ 3 : +1.20*BG1+1.20*BG2+1.50*BG3+1.20*BG6
8/ 3 : +1.20*BG1+1.20*BG2+1.50*BG4+1.20*BG6
9/ 9 : +1.20*BG1+1.20*BG2+1.50*BG5+1.20*BG6
10/ 5 : +0.90*BG1+0.90*BG2+1.50*BG3+1.50*BG4+0.90*BG6
11/ 11 : +0.90*BG1+0.90*BG2+1.50*BG3+1.50*BG5+0.90*BG6
12/ 3 : +1.20*BG1+1.20*BG2+1.50*BG3+1.50*BG4+1.20*BG6





13/ 9 : +1.20*BG1+1.20*BG2+1.50*BG3+1.50*BG5+1.20*BG6

Lijst van alle GGT combinaties
1/ 1 : +1.00*BG1+1.00*BG2+1.00*BG6
2/ 2 : +1.00*BG1+1.00*BG2+1.00*BG3+1.00*BG6
3/ 2 : +1.00*BG1+1.00*BG2+1.00*BG4+1.00*BG6
4/ 5 : +1.00*BG1+1.00*BG2+1.00*BG5+1.00*BG6
5/ 2 : +1.00*BG1+1.00*BG2+1.00*BG3+1.00*BG4+1.00*BG6
6/ 5 : +1.00*BG1+1.00*BG2+1.00*BG3+1.00*BG5+1.00*BG6

## Verslag berekening.

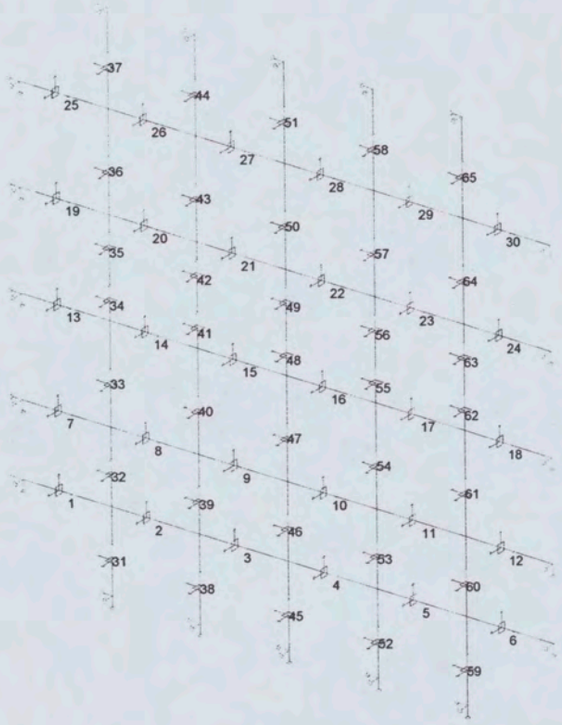
## Lineaire berekening

| | |
|---|---|
| Aantal 2D elementen | 0 |
| Aantal 1D elementen | 65 |
| Aantal netknopen | 54 |
| Aantal vergelijkingen | 324 |
| Belastinggevallen | BG 1 EG glas |
| | BG 2 EG Dak |
| | BG 3 vb dak |
| | BG 4 wind in |
| | BG 5 wind uit |
| | BG 6 EG constructie |
| Start berekening | 19.12.2005 09:31 |
| Einde berekening | 19.12.2005 09:31 |

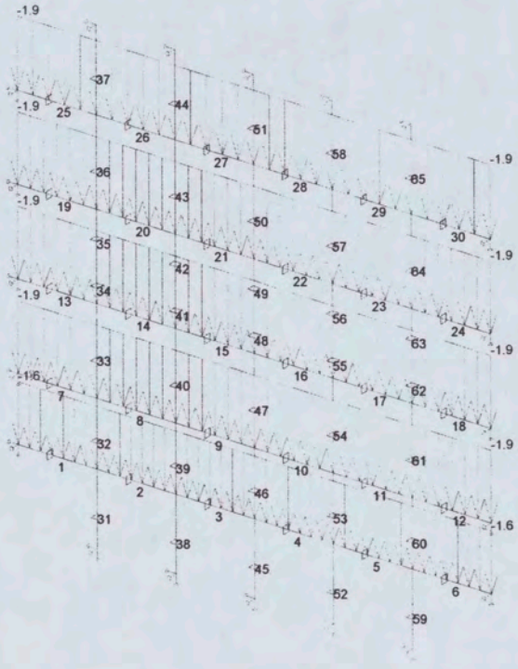
## Som van lasten en reacties.

| | | | X | Y | Z |
|---|---|---|---|---|---|
| belastinggeval | 1 | last | 0.0 | 0.0 | -195.5 |
| | | knoopreacties | 0.0 | 0.0 | 195.5 |
| | | lijnreactions | 0.0 | 0.0 | 0.0 |
| | | contact 1D | 0.0 | 0.0 | 0.0 |
| | | contact 2D | 0.0 | 0.0 | 0.0 |
| belastinggeval | 2 | last | 0.0 | 0.0 | -575.0 |
| | | knoopreacties | 0.0 | 0.0 | 575.0 |
| | | lijnreactions | 0.0 | 0.0 | 0.0 |
| | | contact 1D | 0.0 | 0.0 | 0.0 |
| | | contact 2D | 0.0 | 0.0 | 0.0 |
| belastinggeval | 3 | last | 0.0 | 0.0 | -340.5 |
| | | knoopreacties | 0.0 | 0.0 | 340.5 |
| | | lijnreactions | 0.0 | 0.0 | 0.0 |
| | | contact 1D | 0.0 | 0.0 | 0.0 |
| | | contact 2D | 0.0 | 0.0 | 0.0 |

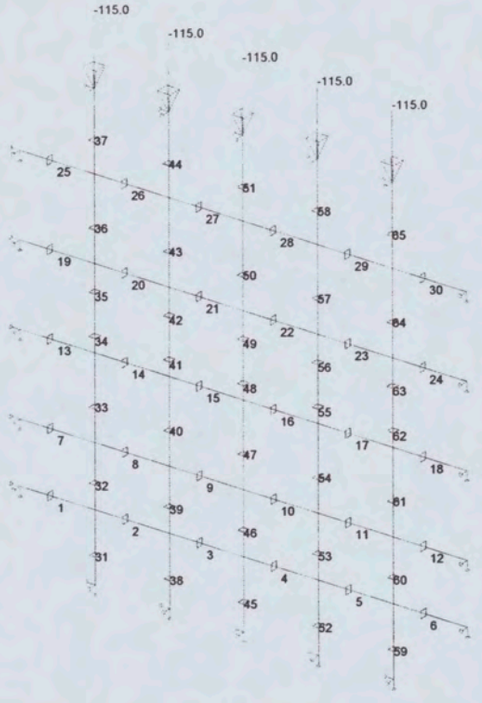
| | | | X | Y | Z |
|---|---|---|---|---|---|
| belastinggeval | 4 | last | 0.0 | 526.1 | 0.0 |
| | | knoopreacties | 0.0 | -526.1 | 0.0 |
| | | lijnreactions | 0.0 | 0.0 | 0.0 |
| | | contact 1D | 0.0 | 0.0 | 0.0 |
| | | contact 2D | 0.0 | 0.0 | 0.0 |
| belastinggeval | 5 | last | 0.0 | -336.9 | 0.0 |
| | | knoopreacties | 0.0 | 336.9 | 0.0 |
| | | lijnreactions | 0.0 | 0.0 | 0.0 |
| | | contact 1D | 0.0 | 0.0 | 0.0 |
| | | contact 2D | 0.0 | 0.0 | 0.0 |
| belastinggeval | 6 | last | 0.0 | 0.0 | -355.8 |
| | | knoopreacties | 0.0 | 0.0 | 355.8 |
| | | lijnreactions | 0.0 | 0.0 | 0.0 |
| | | contact 1D | 0.0 | 0.0 | 0.0 |
| | | contact 2D | 0.0 | 0.0 | 0.0 |



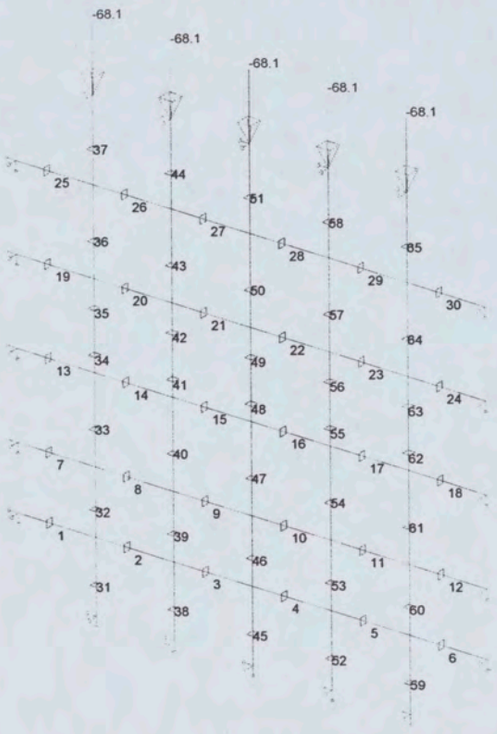

Geometrie



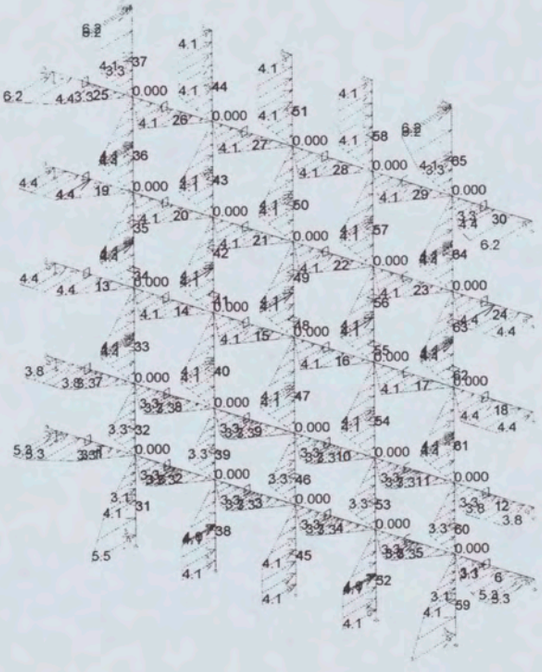

EG glas



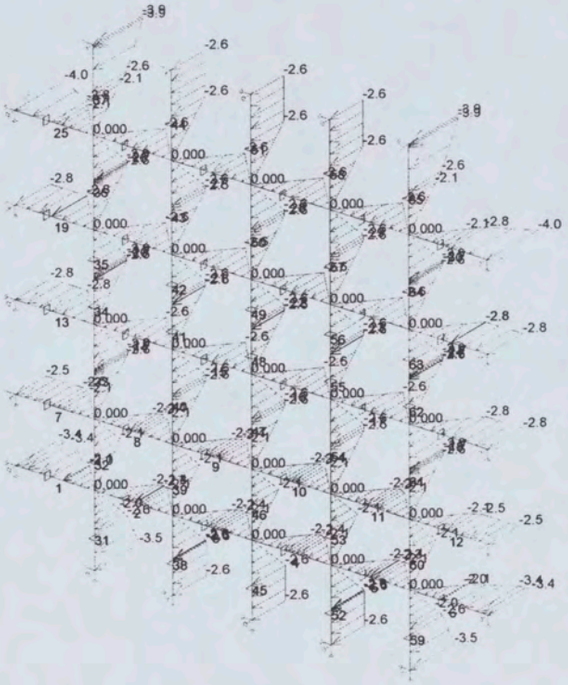

EG dak




VB dak



Wind druk



Wind zuiging

## Interne krachten in staven. Extremen per staaf

Lineair statisch - extreme van alle combinaties

Groep van staven:1/65

Groep van UGT combi:1/13

| staaf | doorsn. | combi | dx [mm] | N [kN] | Vy [kN] | Vz [kN] | Mx [kNm] | My [kNm] | Mz [kNm] |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 4 | 13 | 0.0 | **-0.14** | 6.48 | -10.42 | 0.00 | 0.00 | 0.00 |
| | | 3 | | -0.08 | **6.96** | -0.00 | 0.00 | 0.00 | 0.00 |
| | | | 3600.0 | -0.08 | **-8.87** | -0.00 | -0.00 | -0.00 | **-3.43** |
| | | 5 | 0.0 | -0.06 | 4.64 | **16.27** | 0.00 | 0.00 | 0.00 |
| | | 6 | | -0.06 | 4.64 | **-10.42** | 0.00 | 0.00 | 0.00 |
| | | 12 | 2400.0 | -0.14 | -2.89 | 0.35 | 0.00 | **18.00** | 4.31 |
| | | 13 | | -0.14 | -2.89 | -0.23 | -0.00 | **-11.52** | 4.31 |
| | | 3 | 1500.0 | -0.08 | 0.37 | -0.00 | -0.00 | 0.00 | **5.49** |
| 2 | | 12 | 0.0 | **0.90** | 6.97 | -0.59 | 65.86 | 85.68 | -3.95 |
| | | 3 | | 0.60 | **7.88** | 0.00 | -0.00 | -0.00 | -4.60 |
| | | | 3600.0 | 0.60 | **-7.95** | 0.00 | -0.00 | -0.00 | **-4.73** |
| | | 6 | | 0.40 | -5.30 | **7.33** | -42.18 | -40.98 | -3.15 |
| | | 5 | | 0.40 | -5.30 | **-11.45** | 65.86 | 64.00 | -3.15 |
| | | | 0.0 | 0.40 | 5.25 | -0.59 | **65.86** | **85.68** | -3.07 |
| | | 6 | | 0.40 | 5.25 | 0.38 | **-42.18** | **-54.86** | -3.07 |
| | | 3 | 1800.0 | 0.60 | -0.04 | 0.00 | -0.00 | -0.00 | **2.46** |
| 3 | | 12 | 0.0 | **0.89** | 7.00 | 0.42 | 24.89 | 98.94 | -4.16 |
| | | 3 | | 0.58 | **7.89** | 0.00 | -0.00 | -0.00 | -4.70 |

| staaf | doorsn. | combi | dx [mm] | N [kN] | Vy [kN] | Vz [kN] | Mx [kNm] | My [kNm] | Mz [kNm] |
|---|---|---|---|---|---|---|---|---|---|
| | | | 3600.0 | 0.58 | **-7.94** | 0.00 | -0.00 | -0.00 | **-4.80** |
| | | 6 | | 0.39 | -5.29 | **6.69** | -15.94 | -51.79 | -3.20 |
| | | 5 | | 0.39 | -5.29 | **-10.45** | 24.89 | 80.88 | -3.20 |
| | | | 0.0 | 0.39 | 5.26 | 0.42 | **24.89** | 98.94 | -3.13 |
| | | 6 | | 0.39 | 5.26 | -0.27 | **-15.94** | -63.35 | -3.13 |
| | | 5 | 600.0 | 0.39 | 3.50 | -0.20 | 24.89 | **99.06** | -0.51 |
| | | 6 | | 0.39 | 3.50 | 0.13 | -15.94 | **-63.44** | -0.51 |
| | | 3 | 1800.0 | 0.58 | -0.03 | 0.00 | -0.00 | -0.00 | **2.37** |
| 4 | | 12 | 0.0 | **0.92** | 7.07 | 10.45 | -24.89 | 80.88 | -4.28 |
| | | 3 | | 0.60 | **7.94** | -0.00 | 0.00 | -0.00 | **-4.79** |
| | | | 3600.0 | 0.60 | **-7.89** | -0.00 | 0.00 | -0.00 | -4.70 |
| | | 5 | 0.0 | 0.40 | 5.29 | **10.45** | **-24.89** | 80.88 | -3.20 |
| | | 6 | | 0.40 | 5.29 | **-6.69** | **15.94** | -51.79 | -3.20 |
| | | 5 | 3000.0 | 0.40 | -3.50 | 0.20 | -24.89 | **99.06** | -0.51 |
| | | 6 | | 0.40 | -3.50 | -0.13 | 15.94 | **-63.44** | -0.51 |
| | | 3 | 1800.0 | 0.60 | 0.02 | -0.00 | 0.00 | -0.00 | **2.37** |
| 5 | | 12 | 0.0 | **0.98** | 7.10 | 11.45 | -65.86 | 64.00 | -4.18 |
| | | 3 | | 0.65 | **7.95** | -0.00 | 0.00 | -0.00 | **-4.72** |
| | | | 3600.0 | 0.65 | **-7.88** | -0.00 | 0.00 | -0.00 | -4.60 |
| | | 5 | 0.0 | 0.43 | 5.30 | **11.45** | **-65.86** | 64.00 | -3.15 |
| | | 6 | | 0.43 | 5.30 | **-7.33** | **42.18** | -40.98 | -3.15 |
| | | 5 | 3600.0 | 0.43 | -5.25 | 0.59 | -65.86 | **85.68** | -3.07 |
| | | 6 | | 0.43 | -5.25 | -0.38 | 42.18 | **-54.86** | -3.07 |
| | | 3 | 1800.0 | 0.65 | 0.03 | -0.00 | 0.00 | -0.00 | **2.46** |
| 6 | | | 0.0 | -0.00 | **8.87** | 0.00 | 0.00 | -0.00 | **-3.43** |
| | | | 3600.0 | -0.00 | **-6.96** | 0.00 | 0.00 | 0.00 | -0.00 |
| | | 6 | | -0.00 | -4.64 | **10.42** | 0.00 | 0.00 | -0.00 |
| | | 5 | | -0.00 | -4.64 | **-16.27** | 0.00 | 0.00 | -0.00 |
| | | 12 | 1200.0 | -0.00 | 2.89 | -0.35 | -0.00 | **18.00** | 4.31 |
| | | 13 | | -0.00 | 2.89 | 0.23 | 0.00 | **-11.52** | 4.31 |
| | | 3 | 2100.0 | -0.00 | -0.37 | 0.00 | 0.00 | 0.00 | **5.49** |
| 7 | | 12 | 0.0 | **0.13** | 7.80 | 45.32 | 0.00 | -0.00 | -0.00 |
| | | 3 | | 0.08 | **8.13** | -0.00 | 0.00 | 0.00 | -0.00 |
| | | | 3600.0 | 0.08 | **-8.91** | -0.00 | -0.00 | -0.00 | **-1.39** |
| | | 5 | 0.0 | 0.05 | 5.42 | **45.32** | 0.00 | -0.00 | -0.00 |
| | | 6 | | 0.05 | 5.42 | **-29.02** | 0.00 | -0.00 | -0.00 |
| | | 5 | 3600.0 | 0.05 | -5.94 | 29.54 | 0.00 | **128.73** | -0.93 |
| | | 6 | | 0.05 | -5.94 | -18.91 | -0.00 | **-82.43** | -0.93 |
| | | 13 | 1800.0 | 0.13 | 0.23 | -22.39 | -0.00 | -46.27 | **7.22** |
| 8 | | 12 | 0.0 | **0.43** | 7.34 | 19.11 | 40.87 | 95.87 | -3.74 |
| | | 3 | | 0.36 | **8.33** | -0.00 | -0.00 | -0.00 | -4.50 |
| | | | 3600.0 | 0.36 | **-8.71** | -0.00 | -0.00 | -0.00 | **-5.19** |
| | | 5 | 0.0 | 0.24 | 5.55 | **19.11** | **40.87** | 95.87 | -3.00 |
| | | 6 | | 0.24 | 5.55 | **-12.24** | **-26.17** | -61.39 | -3.00 |
| | | 5 | 3600.0 | 0.24 | -5.81 | 8.25 | 40.87 | **145.12** | -3.46 |
| | | 6 | | 0.24 | -5.81 | -5.28 | -26.17 | **-92.93** | -3.46 |
| | | 3 | 1800.0 | 0.36 | -0.19 | -0.00 | -0.00 | -0.00 | **2.82** |

| staaf | doorsn. | combi | dx | N | Vy | Vz | Mx | My | Mz |
|---|---|---|---|---|---|---|---|---|---|
| | | | [mm] | [kN] | [kN] | [kN] | [kNm] | [kNm] | [kNm] |
| 9 | | 12 | 0.0 | **0.39** | 7.52 | 10.19 | 14.81 | 127.85 | -4.46 |
| | | 3 | | 0.33 | **8.49** | -0.00 | -0.00 | -0.00 | -5.06 |
| | | | 3600.0 | 0.33 | **-8.56** | -0.00 | -0.00 | -0.00 | **-5.19** |
| | | 5 | 0.0 | 0.22 | 5.66 | **10.19** | **14.81** | 127.85 | -3.37 |
| | | 6 | | 0.22 | 5.66 | **-6.53** | **-9.49** | -81.87 | -3.37 |
| | | 5 | 3000.0 | 0.22 | -3.81 | -0.06 | 14.81 | **145.26** | -0.60 |
| | | 6 | | 0.22 | -3.81 | 0.04 | -9.49 | **-93.02** | -0.60 |
| | | 3 | 1800.0 | 0.33 | -0.03 | -0.00 | -0.00 | -0.00 | **2.55** |
| 10 | | 12 | 0.0 | **0.37** | 7.63 | 0.67 | -14.81 | 144.98 | -4.65 |
| | | 3 | | 0.31 | **8.56** | 0.00 | 0.00 | -0.00 | **-5.19** |
| | | | 3600.0 | 0.31 | **-8.48** | 0.00 | 0.00 | -0.00 | -5.06 |
| | | 6 | | 0.21 | -5.66 | **6.53** | 9.49 | -81.87 | -3.37 |
| | | 5 | | 0.21 | -5.66 | **-10.19** | -14.81 | 127.85 | -3.37 |
| | | 6 | 0.0 | 0.21 | 5.71 | -0.43 | **9.49** | -92.84 | -3.46 |
| | | 5 | | 0.21 | 5.71 | 0.67 | **-14.81** | 144.98 | -3.46 |
| | | | 600.0 | 0.21 | 3.81 | 0.06 | -14.81 | **145.26** | -0.60 |
| | | 6 | | 0.21 | 3.81 | -0.04 | 9.49 | **-93.02** | -0.60 |
| | | 3 | 1800.0 | 0.31 | 0.04 | 0.00 | 0.00 | -0.00 | **2.55** |
| 11 | | 12 | 0.0 | **0.36** | 7.81 | -8.25 | -40.87 | 145.12 | -4.59 |
| | | 3 | | 0.32 | **8.71** | 0.00 | 0.00 | -0.00 | **-5.20** |
| | | | 3600.0 | 0.32 | **-8.33** | 0.00 | 0.00 | -0.00 | -4.49 |
| | | 6 | | 0.21 | -5.55 | **12.24** | 26.17 | -61.39 | -3.00 |
| | | 5 | | 0.21 | -5.55 | **-19.11** | -40.87 | 95.87 | -3.00 |
| | | 6 | 0.0 | 0.21 | 5.81 | 5.28 | **26.17** | **-92.93** | -3.46 |
| | | 5 | | 0.21 | 5.81 | -8.25 | **-40.87** | **145.12** | -3.46 |
| | | 3 | 1800.0 | 0.32 | 0.19 | 0.00 | 0.00 | -0.00 | **2.82** |
| 12 | | | 0.0 | -0.00 | **8.91** | 0.00 | 0.00 | -0.00 | **-1.39** |
| | | | 3600.0 | -0.00 | **-8.13** | 0.00 | 0.00 | -0.00 | -0.00 |
| | | 6 | | -0.00 | -5.42 | **29.02** | 0.00 | -0.00 | -0.00 |
| | | 5 | | -0.00 | -5.42 | **-45.32** | 0.00 | -0.00 | -0.00 |
| | | 12 | 0.0 | -0.00 | 7.35 | -29.54 | -0.00 | **128.73** | 0.80 |
| | | 13 | | -0.00 | 7.35 | 18.91 | 0.00 | **-82.43** | 0.80 |
| | | | 1800.0 | -0.00 | -0.22 | 22.39 | 0.00 | -46.27 | **7.22** |
| 13 | | | 0.0 | **-0.01** | 8.86 | -38.22 | -0.00 | -0.00 | 0.00 |
| | | 3 | | -0.01 | **8.95** | -0.00 | -0.00 | -0.00 | 0.00 |
| | | | 3600.0 | -0.01 | **-8.09** | -0.00 | -0.00 | -0.00 | 1.54 |
| | | 5 | 0.0 | -0.01 | 5.97 | **59.68** | 0.00 | 0.00 | 0.00 |
| | | 6 | | -0.01 | 5.97 | **-38.22** | -0.00 | -0.00 | 0.00 |
| | | 12 | 3600.0 | -0.01 | -6.29 | 42.32 | 0.00 | **176.26** | 4.64 |
| | | 13 | | -0.01 | -6.29 | -27.10 | -0.00 | **-112.87** | 4.64 |
| | | | 2100.0 | -0.01 | 0.03 | -29.56 | -0.00 | -70.99 | **9.33** |
| 14 | | 12 | 0.0 | **0.80** | 7.03 | 21.93 | 7.70 | 124.10 | -2.80 |
| | | 3 | | 0.59 | **8.08** | -0.00 | -0.00 | -0.00 | -3.76 |
| | | | 3600.0 | 0.59 | **-8.97** | -0.00 | -0.00 | -0.00 | **-5.36** |
| | | 5 | 0.0 | 0.40 | 5.38 | **21.93** | **7.70** | 124.10 | -2.51 |
| | | 6 | | 0.40 | 5.38 | **-14.04** | **-4.93** | -79.47 | -2.51 |
| | | 5 | 3600.0 | 0.40 | -5.98 | 10.85 | 7.70 | **183.11** | -3.57 |



the scale towards document
Patch Reference numbers on UTT
Image Engineering Scan Reference Chart TE263 Serial No. 546

| staaf | doorsn. | combi | dx [mm] | N [kN] | Vy [kN] | Vz [kN] | Mx [kNm] | My [kNm] | Mz [kNm] |
|---|---|---|---|---|---|---|---|---|---|
| | | 6 | | 0.40 | -5.98 | -6.95 | -4.93 | **-117.26** | -3.57 |
| | | 3 | 1800.0 | 0.59 | -0.45 | -0.00 | -0.00 | -0.00 | **3.11** |
| 15 | | 12 | 0.0 | **0.77** | 7.52 | 10.82 | 2.73 | 158.16 | -4.47 |
| | | 3 | | 0.56 | **8.48** | -0.00 | -0.00 | -0.00 | -5.07 |
| | | | 3600.0 | 0.56 | **-8.56** | -0.00 | -0.00 | -0.00 | **-5.21** |
| | | 5 | 0.0 | 0.38 | 5.66 | **10.82** | **2.73** | 158.16 | -3.38 |
| | | 6 | | 0.38 | 5.66 | **-6.93** | **-1.75** | -101.28 | -3.38 |
| | | 5 | 3300.0 | 0.38 | -4.76 | -0.10 | 2.73 | **177.24** | -1.90 |
| | | 6 | | 0.38 | -4.76 | 0.07 | -1.75 | **-113.50** | -1.90 |
| | | 3 | 1800.0 | 0.56 | -0.04 | -0.00 | -0.00 | -0.00 | **2.53** |
| 16 | | 12 | 0.0 | **0.77** | 7.62 | 0.26 | -2.73 | 177.18 | -4.67 |
| | | 3 | | 0.57 | **8.55** | 0.00 | 0.00 | -0.00 | **-5.20** |
| | | | 3600.0 | 0.57 | **-8.49** | 0.00 | 0.00 | -0.00 | -5.08 |
| | | 6 | | 0.38 | -5.66 | **6.93** | 1.75 | -101.28 | -3.39 |
| | | 5 | | 0.38 | -5.66 | **-10.82** | -2.73 | 158.16 | -3.39 |
| | | 6 | 0.0 | 0.38 | 5.70 | -0.16 | **1.75** | -113.46 | -3.47 |
| | | 5 | | 0.38 | 5.70 | 0.26 | **-2.73** | 177.18 | -3.47 |
| | | | 300.0 | 0.38 | 4.76 | 0.10 | -2.73 | **177.24** | -1.90 |
| | | 6 | | 0.38 | 4.76 | -0.07 | 1.75 | **-113.50** | -1.90 |
| | | 3 | 1800.0 | 0.57 | 0.03 | 0.00 | 0.00 | -0.00 | **2.53** |
| 17 | | 12 | 0.0 | **0.81** | 8.11 | -10.85 | -7.70 | 183.11 | -4.75 |
| | | 3 | | 0.60 | **8.96** | 0.00 | 0.00 | -0.00 | **-5.35** |
| | | | 3600.0 | 0.60 | **-8.08** | 0.00 | 0.00 | -0.00 | -3.77 |
| | | 6 | | 0.40 | -5.39 | **14.04** | 4.93 | -79.47 | -2.51 |
| | | 5 | | 0.40 | -5.39 | **-21.93** | -7.70 | 124.10 | -2.51 |
| | | 6 | 0.0 | 0.40 | 5.97 | 6.95 | **4.93** | **-117.26** | -3.57 |
| | | 5 | | 0.40 | 5.97 | -10.85 | **-7.70** | **183.11** | -3.57 |
| | | 3 | 1800.0 | 0.60 | 0.44 | 0.00 | 0.00 | -0.00 | **3.11** |
| 18 | | | 0.0 | -0.00 | **8.09** | 0.00 | 0.00 | -0.00 | 1.55 |
| | | | 3600.0 | -0.00 | **-8.95** | 0.00 | 0.00 | -0.00 | -0.00 |
| | | 6 | | -0.00 | -5.97 | **38.22** | 0.00 | -0.00 | -0.00 |
| | | 5 | | -0.00 | -5.97 | **-59.68** | 0.00 | 0.00 | -0.00 |
| | | 12 | 0.0 | -0.00 | 6.28 | -42.32 | -0.00 | **176.26** | 4.65 |
| | | 13 | | -0.00 | 6.28 | 27.10 | 0.00 | **-112.87** | 4.65 |
| | | | 1500.0 | -0.00 | -0.03 | 29.56 | 0.00 | -70.99 | **9.34** |
| 19 | | | 0.0 | **-0.26** | 9.92 | -34.15 | -0.00 | -0.00 | -0.00 |
| | | 7 | | -0.26 | **9.92** | -0.00 | -0.00 | -0.00 | -0.00 |
| | | 3 | 3600.0 | -0.18 | **-7.31** | -0.00 | 0.00 | -0.00 | 4.34 |
| | | 5 | 0.0 | -0.12 | 6.48 | **53.32** | -0.00 | 0.00 | -0.00 |
| | | 6 | | -0.12 | 6.48 | **-34.15** | -0.00 | -0.00 | -0.00 |
| | | 12 | 3600.0 | -0.26 | -5.22 | 35.96 | -0.00 | **153.37** | 8.46 |
| | | 13 | | -0.26 | -5.22 | -23.03 | 0.00 | **-98.21** | 8.46 |
| | | | 2400.0 | -0.26 | -0.17 | -24.60 | 0.00 | -69.95 | **11.70** |
| 20 | | 12 | 0.0 | **0.81** | 6.83 | 22.19 | -28.09 | 108.54 | -2.19 |
| | | 3 | | 0.58 | **7.92** | -0.00 | 0.00 | -0.00 | -3.29 |
| | | | 3600.0 | 0.58 | **-9.12** | -0.00 | 0.00 | -0.00 | **-5.46** |
| | | 5 | 0.0 | 0.38 | 5.28 | **22.19** | **-28.09** | 108.54 | -2.19 |

| staaf | doorsn. | combi | dx [mm] | N [kN] | Vy [kN] | Vz [kN] | Mx [kNm] | My [kNm] | Mz [kNm] |
|---|---|---|---|---|---|---|---|---|---|
| | | 6 | | 0.38 | 5.28 | **-14.21** | **17.99** | -69.50 | -2.19 |
| | | 5 | 3600.0 | 0.38 | -6.08 | 11.11 | -28.09 | **168.48** | -3.64 |
| | | 6 | | 0.38 | -6.08 | -7.11 | 17.99 | **-107.89** | -3.64 |
| | | 13 | 1500.0 | 0.81 | 0.52 | -11.75 | 17.99 | -89.59 | **3.32** |
| 21 | | 12 | 0.0 | **0.73** | 7.50 | 10.87 | -10.07 | 145.13 | -4.45 |
| | | 3 | | 0.51 | **8.47** | -0.00 | 0.00 | -0.00 | -5.06 |
| | | | 3600.0 | 0.51 | **-8.57** | -0.00 | 0.00 | -0.00 | **-5.23** |
| | | 5 | 0.0 | 0.34 | 5.65 | **10.87** | **-10.07** | 145.13 | -3.37 |
| | | 6 | | 0.34 | 5.65 | **-6.96** | **6.45** | -92.94 | -3.37 |
| | | 5 | 3300.0 | 0.34 | -4.76 | -0.05 | -10.07 | **164.38** | -1.91 |
| | | 6 | | 0.34 | -4.76 | 0.03 | 6.45 | **-105.26** | -1.91 |
| | | 3 | 1800.0 | 0.51 | -0.05 | -0.00 | 0.00 | -0.00 | **2.53** |
| 22 | | 12 | 0.0 | **0.78** | 7.68 | 0.21 | 10.07 | 164.33 | -4.77 |
| | | 3 | | 0.55 | **8.60** | 0.00 | -0.00 | -0.00 | **-5.28** |
| | | | 3600.0 | 0.55 | **-8.44** | 0.00 | -0.00 | -0.00 | -5.01 |
| | | 6 | | 0.37 | -5.63 | **6.96** | -6.45 | -92.94 | -3.34 |
| | | 5 | | 0.37 | -5.63 | **-10.87** | 10.07 | 145.13 | -3.34 |
| | | | 0.0 | 0.37 | 5.73 | 0.21 | **10.07** | 164.33 | -3.52 |
| | | 6 | | 0.37 | 5.73 | -0.13 | **-6.45** | -105.23 | -3.52 |
| | | 5 | 300.0 | 0.37 | 4.78 | 0.05 | 10.07 | **164.38** | -1.94 |
| | | 6 | | 0.37 | 4.78 | -0.03 | -6.45 | **-105.26** | -1.94 |
| | | 3 | 1800.0 | 0.55 | 0.08 | 0.00 | -0.00 | -0.00 | **2.53** |
| 23 | | 12 | 0.0 | **0.96** | 8.36 | -11.11 | 28.09 | 168.48 | -4.95 |
| | | 3 | | 0.68 | **9.15** | 0.00 | -0.00 | -0.00 | **-5.52** |
| | | | 3600.0 | 0.68 | **-7.89** | 0.00 | -0.00 | -0.00 | -3.23 |
| | | 6 | | 0.46 | -5.26 | **14.21** | -17.99 | -69.50 | -2.16 |
| | | 5 | | 0.46 | -5.26 | **-22.19** | 28.09 | 108.54 | -2.16 |
| | | | 0.0 | 0.46 | 6.10 | -11.11 | **28.09** | **168.48** | -3.68 |
| | | 6 | | 0.46 | 6.10 | 7.11 | **-17.99** | **-107.89** | -3.68 |
| | | 13 | 2100.0 | 0.96 | -0.47 | 11.75 | -17.99 | -89.59 | **3.33** |
| 24 | | 3 | 0.0 | -0.00 | **7.32** | 0.00 | -0.00 | -0.00 | 4.31 |
| | | 13 | 3600.0 | -0.00 | **-9.91** | 34.15 | 0.00 | -0.00 | 0.00 |
| | | 6 | | -0.00 | -6.48 | **34.15** | 0.00 | -0.00 | 0.00 |
| | | 5 | | -0.00 | -6.48 | **-53.32** | 0.00 | 0.00 | -0.00 |
| | | 12 | 0.0 | -0.00 | 5.24 | -35.96 | 0.00 | **153.37** | 8.41 |
| | | 13 | | -0.00 | 5.24 | 23.03 | -0.00 | **-98.21** | 8.41 |
| | | | 1200.0 | -0.00 | 0.19 | 24.60 | -0.00 | -69.95 | **11.67** |
| 25 | | 12 | 0.0 | **0.32** | 10.72 | 21.84 | -0.00 | -0.00 | 0.00 |
| | | 7 | | 0.32 | **10.72** | -0.00 | 0.00 | -0.00 | 0.00 |
| | | 3 | 3600.0 | 0.22 | **-6.97** | -0.00 | 0.00 | -0.00 | 6.03 |
| | | 5 | 0.0 | 0.15 | 6.88 | **21.84** | -0.00 | -0.00 | 0.00 |
| | | 6 | | 0.15 | 6.88 | **-13.98** | 0.00 | -0.00 | 0.00 |
| | | 5 | 3600.0 | 0.15 | -4.65 | 2.17 | -0.00 | **33.00** | 4.02 |
| | | 6 | | 0.15 | -4.65 | -1.39 | 0.00 | **-21.13** | 4.02 |
| | | 13 | 2400.0 | 0.32 | 0.48 | -2.97 | 0.00 | -18.83 | **13.45** |
| 26 | | | 0.0 | **-1.87** | 6.29 | -0.58 | 39.95 | -59.95 | -0.47 |
| | | 3 | | -1.34 | **7.59** | 0.00 | 0.00 | -0.00 | -2.11 |

| staaf | doorsn. | combi | dx [mm] | N [kN] | Vy [kN] | Vz [kN] | Mx [kNm] | My [kNm] | Mz [kNm] |
|---|---|---|---|---|---|---|---|---|---|
| | | | 3600.0 | -1.34 | **-9.70** | 0.00 | 0.00 | -0.00 | **-5.90** |
| | | 6 | | -0.90 | -6.46 | **6.51** | 39.95 | -49.27 | -3.94 |
| | | 5 | | -0.90 | -6.46 | **-10.17** | -62.39 | 76.94 | -3.94 |
| | | 6 | 0.0 | -0.90 | 5.06 | -0.58 | **39.95** | -59.95 | -1.41 |
| | | 5 | | -0.90 | 5.06 | 0.91 | **-62.39** | 93.62 | -1.41 |
| | | 12 | 600.0 | -1.87 | 3.73 | 0.29 | -62.39 | **94.04** | 2.54 |
| | | 13 | | -1.87 | 3.73 | -0.19 | 39.95 | **-60.22** | 2.54 |
| | | | 1500.0 | -1.87 | -0.11 | 1.88 | 39.95 | -59.59 | **4.17** |
| | 27 | | 0.0 | **-1.80** | 7.70 | -0.97 | 15.23 | -68.89 | -4.74 |
| | | 3 | | -1.27 | **8.66** | 0.00 | 0.00 | -0.00 | **-5.30** |
| | | | 3600.0 | -1.27 | **-8.63** | 0.00 | 0.00 | -0.00 | -5.25 |
| | | 6 | | -0.85 | -5.75 | **6.12** | 15.23 | -59.62 | -3.50 |
| | | 5 | | -0.85 | -5.75 | **-9.56** | -23.78 | 93.11 | -3.50 |
| | | 6 | 0.0 | -0.85 | 5.77 | -0.97 | **15.23** | -68.89 | -3.53 |
| | | 5 | | -0.85 | 5.77 | 1.52 | **-23.78** | 107.58 | -3.53 |
| | | 12 | 900.0 | -1.80 | 3.86 | 0.14 | -23.78 | **108.53** | 0.46 |
| | | 13 | | -1.80 | 3.86 | -0.09 | 15.23 | **-69.50** | 0.46 |
| | | 3 | 1800.0 | -1.27 | 0.01 | 0.00 | 0.00 | -0.00 | **2.51** |
| | 28 | 13 | 0.0 | **-1.86** | 7.69 | -6.12 | -15.23 | -59.62 | -4.72 |
| | | 3 | | -1.31 | **8.64** | -0.00 | -0.00 | -0.00 | **-5.27** |
| | | | 3600.0 | -1.31 | **-8.64** | -0.00 | -0.00 | -0.00 | -5.27 |
| | | 5 | 0.0 | -0.88 | 5.76 | **9.56** | **23.78** | 93.11 | -3.51 |
| | | 6 | | -0.88 | 5.76 | **-6.12** | **-15.23** | -59.62 | -3.51 |
| | | 12 | 2700.0 | -1.86 | -3.84 | -0.14 | 23.78 | **108.53** | 0.48 |
| | | 13 | | -1.86 | -3.84 | 0.09 | -15.23 | **-69.50** | 0.48 |
| | | 3 | 1800.0 | -1.31 | 0.00 | -0.00 | -0.00 | -0.00 | **2.51** |
| | 29 | 13 | 0.0 | **-2.06** | 9.09 | -6.51 | -39.95 | -49.27 | -5.50 |
| | | 3 | | -1.48 | **9.71** | -0.00 | -0.00 | -0.00 | **-5.93** |
| | | | 3600.0 | -1.48 | **-7.57** | -0.00 | -0.00 | -0.00 | -2.08 |
| | | 5 | 0.0 | -0.98 | 6.47 | **10.17** | **62.39** | 76.94 | -3.95 |
| | | 6 | | -0.98 | 6.47 | **-6.51** | **-39.95** | -49.27 | -3.95 |
| | | 12 | 3000.0 | -2.06 | -3.71 | -0.29 | 62.39 | **94.04** | 2.56 |
| | | 13 | | -2.06 | -3.71 | 0.19 | -39.95 | **-60.22** | 2.56 |
| | | | 2100.0 | -2.06 | 0.13 | -1.88 | -39.95 | -59.59 | **4.18** |
| | 30 | 3 | 0.0 | 0.00 | **6.97** | 0.00 | -0.00 | -0.00 | 6.01 |
| | | 7 | 3600.0 | 0.00 | **-10.72** | 0.00 | 0.00 | 0.00 | -0.00 |
| | | 6 | | 0.00 | -6.87 | **13.98** | 0.00 | 0.00 | -0.00 |
| | | 5 | | 0.00 | -6.87 | **-21.84** | -0.00 | -0.00 | -0.00 |
| | | | 0.0 | 0.00 | 4.65 | -2.17 | 0.00 | **33.00** | 4.01 |
| | | 6 | | 0.00 | 4.65 | 1.39 | -0.00 | **-21.13** | 4.01 |
| | | 13 | 1200.0 | 0.00 | -0.47 | 2.97 | -0.00 | -18.83 | **13.43** |
| | 31 | 7 | 0.0 | **-348.15** | -0.16 | -0.00 | -0.00 | -0.00 | 0.00 |
| | | 12 | | -348.15 | **-0.16** | 15.41 | -0.00 | -0.00 | 0.00 |
| | | 5 | | -188.64 | -0.06 | **15.41** | -0.00 | -0.00 | 0.00 |
| | | 6 | | -188.64 | -0.06 | **-9.87** | -0.00 | -0.00 | 0.00 |
| | | 12 | 2649.3 | -342.89 | -0.16 | 0.15 | -0.00 | **17.02** | -0.41 |
| | | 13 | | -342.89 | -0.16 | -0.10 | 0.00 | **-10.90** | -0.41 |



the scale towards document
Image Engineering Scan Reference Chart TE263 Serial No. 546
Patch Reference numbers on LITT

| staaf | doorsn. | combi | dx [mm] | N [kN] | Vy [kN] | Vz [kN] | Mx [kNm] | My [kNm] | Mz [kNm] |
|---|---|---|---|---|---|---|---|---|---|
| | | 12 | 3238.0 | -341.72 | -0.16 | -0.44 | -0.00 | 16.87 | **-0.51** |
| 32 | | 7 | 0.0 | **-327.17** | -1.20 | 0.00 | 0.00 | -0.00 | 1.46 |
| | | 13 | | -327.17 | **-1.20** | 1.26 | 44.33 | **-52.98** | **1.46** |
| | | 6 | 2887.0 | -168.34 | -0.51 | **5.82** | 44.33 | -42.76 | -0.88 |
| | | 5 | | -168.34 | -0.51 | **-9.09** | -69.23 | 66.78 | -0.88 |
| | | 6 | 0.0 | -172.65 | -0.51 | 1.26 | **44.33** | -52.98 | 0.60 |
| | | 5 | | -172.65 | -0.51 | -1.96 | **-69.23** | 82.74 | 0.60 |
| | | 12 | | -327.17 | -1.20 | -1.96 | -69.23 | **82.74** | 1.46 |
| | | | 2887.0 | -321.43 | -1.20 | -9.09 | -69.23 | 66.78 | **-2.00** |
| 33 | | 7 | 0.0 | **-306.74** | -1.50 | 0.00 | 0.00 | -0.00 | 2.55 |
| | | 13 | | -306.74 | **-1.50** | -0.85 | 23.29 | -68.93 | **2.55** |
| | | 6 | 3850.0 | -151.11 | -0.70 | **7.24** | 23.29 | -56.63 | -1.52 |
| | | 5 | | -151.11 | -0.70 | **-11.31** | -36.37 | 88.44 | -1.52 |
| | | 6 | 0.0 | -156.85 | -0.70 | -0.85 | **23.29** | -68.93 | 1.19 |
| | | 5 | | -156.85 | -0.70 | 1.33 | **-36.37** | 107.65 | 1.19 |
| | | 12 | 888.5 | -304.97 | -1.50 | -0.02 | -36.37 | **108.43** | 1.22 |
| | | 13 | | -304.97 | -1.50 | 0.01 | 23.29 | **-69.44** | 1.22 |
| | | 12 | 3850.0 | -299.09 | -1.50 | -11.31 | -36.37 | 88.44 | **-3.22** |
| 34 | | 7 | 0.0 | **-285.77** | **-2.31** | -0.00 | -0.00 | -0.00 | 4.22 |
| | | 5 | | -140.34 | -1.10 | **9.07** | **15.79** | 96.14 | 2.01 |
| | | 6 | | -140.34 | -1.10 | **-5.81** | **-10.11** | -61.56 | 2.01 |
| | | 12 | 1825.0 | -282.14 | -2.31 | 3.38 | 15.79 | **109.23** | 0.00 |
| | | 13 | | -282.14 | -2.31 | -2.16 | -10.11 | **-69.95** | 0.00 |
| | | | 0.0 | -285.77 | -2.31 | -5.81 | -10.11 | -61.56 | **4.22** |
| 35 | | 7 | | **-282.14** | **-2.31** | -0.00 | -0.00 | -0.00 | 0.00 |
| | | 5 | | -137.62 | -1.10 | **3.38** | **15.79** | 109.23 | 0.00 |
| | | | 2025.0 | -134.60 | -1.10 | **-3.57** | 15.79 | 106.73 | -2.23 |
| | | 6 | 0.0 | -137.62 | -1.10 | -2.16 | **-10.11** | -69.95 | 0.00 |
| | | 12 | 578.6 | -280.99 | -2.31 | 0.01 | 15.79 | **110.17** | -1.33 |
| | | 13 | | -280.99 | -2.31 | -0.00 | -10.11 | **-70.55** | -1.33 |
| | | | 0.0 | -282.14 | -2.31 | -2.16 | -10.11 | -69.95 | **0.00** |
| | | 12 | 2025.0 | -278.12 | -2.31 | -3.57 | 15.79 | 106.73 | **-4.67** |
| 36 | | 7 | 0.0 | **-266.07** | -3.38 | -0.00 | -0.00 | -0.00 | 5.99 |
| | | 12 | 296.2 | -265.48 | **-3.38** | 10.05 | 60.62 | 81.65 | 4.98 |
| | | 5 | 0.0 | -124.44 | -1.61 | **10.20** | **60.62** | 78.64 | 2.86 |
| | | 6 | | -124.44 | -1.61 | **-6.53** | **-38.82** | -50.36 | 2.86 |
| | | 12 | 2665.4 | -260.77 | -3.38 | -0.05 | 60.62 | **95.51** | -3.02 |
| | | 13 | | -260.77 | -3.38 | 0.03 | -38.82 | **-61.16** | -3.02 |
| | | | 0.0 | -266.07 | -3.38 | -6.53 | -38.82 | -50.36 | **5.99** |
| | | 12 | 3850.0 | -258.42 | -3.38 | -2.45 | 60.62 | 93.56 | **-7.03** |
| 37 | | 7 | 0.0 | **-247.48** | -1.19 | 0.00 | -0.00 | -0.00 | 4.39 |
| | | 13 | | -247.48 | **-1.19** | 0.76 | -0.00 | **-19.96** | **4.39** |
| | | 6 | 3690.0 | -103.50 | -0.56 | **13.77** | 0.00 | 0.00 | 0.00 |
| | | 5 | | -103.50 | -0.56 | **-21.50** | 0.00 | -0.00 | 0.00 |
| | | 12 | 0.0 | -247.48 | -1.19 | -1.18 | 0.00 | **31.16** | 4.39 |
| 38 | | 7 | | **-360.27** | 0.00 | -0.00 | 0.00 | -0.00 | 0.00 |
| | | 13 | | -360.27 | **0.00** | -32.75 | 0.00 | -0.00 | 0.00 |



the scale towards document
546

| staaf | doorsn. | combi | dx [mm] | N [kN] | Vy [kN] | Vz [kN] | Mx [kNm] | My [kNm] | Mz [kNm] |
|---|---|---|---|---|---|---|---|---|---|
| | | 5 | | -192.97 | 0.00 | **51.15** | 0.00 | -0.00 | 0.00 |
| | | 6 | | -192.97 | 0.00 | **-32.75** | 0.00 | -0.00 | 0.00 |
| | | 12 | 3238.0 | -353.84 | 0.00 | 36.76 | -0.00 | **136.68** | 0.01 |
| | | 13 | | -353.84 | 0.00 | -23.54 | 0.00 | **-87.53** | **0.01** |
| 39 | | 7 | 0.0 | **-339.74** | 0.01 | -0.00 | 0.00 | -0.00 | -0.01 |
| | | 3 | | -266.38 | **0.02** | -0.00 | 0.00 | -0.00 | **-0.02** |
| | | 5 | | -177.59 | 0.01 | **24.89** | **-34.93** | 95.71 | -0.01 |
| | | 6 | | -177.59 | 0.01 | **-15.94** | **22.37** | -61.29 | -0.01 |
| | | 12 | 2887.0 | -334.00 | 0.01 | 17.76 | -34.93 | **157.28** | 0.03 |
| | | 13 | | -334.00 | 0.01 | -11.38 | 22.37 | **-100.72** | 0.03 |
| | | 3 | | -259.92 | 0.02 | -0.00 | 0.00 | -0.00 | **0.04** |
| 40 | | 7 | 0.0 | **-318.67** | 0.06 | -0.00 | 0.00 | -0.00 | -0.09 |
| | | 3 | | -242.73 | **0.06** | -0.00 | 0.00 | -0.00 | **-0.09** |
| | | 5 | | -161.82 | 0.04 | **15.82** | **-17.66** | 131.23 | -0.06 |
| | | 6 | | -161.82 | 0.04 | **-10.13** | **11.31** | -84.03 | -0.06 |
| | | 12 | 3850.0 | -311.01 | 0.06 | 3.21 | -17.66 | **167.87** | 0.13 |
| | | 13 | | -311.01 | 0.06 | -2.05 | 11.31 | **-107.49** | **0.13** |
| 41 | | 7 | 0.0 | **-295.38** | 0.09 | 0.00 | -0.00 | -0.00 | -0.16 |
| | | 12 | | -295.38 | **0.09** | 3.24 | 7.29 | 162.90 | **-0.16** |
| | | 5 | | -144.45 | 0.06 | **3.24** | **7.29** | 162.90 | -0.11 |
| | | | 1825.0 | -141.73 | 0.06 | **-2.46** | 7.29 | 165.35 | -0.00 |
| | | 6 | 0.0 | -144.45 | 0.06 | -2.07 | **-4.67** | -104.32 | -0.11 |
| | | 12 | 1520.8 | -292.36 | 0.09 | -0.72 | 7.29 | **165.82** | -0.03 |
| | | 13 | | -292.36 | 0.09 | 0.46 | -4.67 | **-106.19** | -0.03 |
| 42 | | 7 | 0.0 | **-291.75** | 0.09 | 0.00 | -0.00 | -0.00 | -0.00 |
| | | 12 | 867.9 | -290.03 | **0.09** | -7.09 | 7.29 | 161.05 | 0.07 |
| | | 6 | 2025.0 | -138.71 | 0.06 | **6.01** | -4.67 | -96.74 | 0.11 |
| | | 5 | | -138.71 | 0.06 | **-9.38** | 7.29 | 151.08 | 0.11 |
| | | | 0.0 | -141.73 | 0.06 | -2.46 | **7.29** | 165.35 | -0.00 |
| | | 6 | | -141.73 | 0.06 | 1.57 | **-4.67** | -105.88 | -0.00 |
| | | 12 | | -291.75 | 0.09 | -2.46 | 7.29 | **165.35** | **-0.00** |
| | | 13 | | -291.75 | 0.09 | 1.57 | -4.67 | **-105.88** | -0.00 |
| | | | 2025.0 | -287.73 | 0.09 | 6.01 | -4.67 | -96.74 | **0.17** |
| 43 | | 7 | 0.0 | **-271.90** | 0.17 | 0.00 | -0.00 | -0.00 | -0.26 |
| | | 12 | 2961.5 | -266.02 | **0.17** | -20.41 | 30.64 | 128.55 | 0.24 |
| | | 6 | 3850.0 | -121.24 | 0.10 | **13.93** | -19.62 | -70.19 | 0.22 |
| | | 5 | | -121.24 | 0.10 | **-21.76** | 30.64 | 109.62 | 0.22 |
| | | | 0.0 | -126.97 | 0.10 | -9.14 | **30.64** | 169.10 | -0.16 |
| | | 6 | | -126.97 | 0.10 | 5.85 | **-19.62** | -108.28 | -0.16 |
| | | 12 | | -271.90 | 0.17 | -9.14 | 30.64 | **169.10** | **-0.26** |
| | | 13 | | -271.90 | 0.17 | 5.85 | -19.62 | **-108.28** | -0.26 |
| | | | 3850.0 | -264.25 | 0.17 | 13.93 | -19.62 | -70.19 | **0.39** |
| 44 | | 7 | 0.0 | **-247.48** | 0.09 | 0.00 | -0.00 | -0.00 | -0.33 |
| | | 12 | | -247.48 | **0.09** | -33.45 | 0.00 | **148.23** | **-0.33** |
| | | 6 | 3690.0 | -103.50 | 0.05 | **32.42** | 0.00 | -0.00 | -0.00 |
| | | 5 | | -103.50 | 0.05 | **-50.63** | -0.00 | -0.00 | -0.00 |
| | | 13 | 0.0 | -247.48 | 0.09 | 21.42 | -0.00 | **-94.92** | -0.33 |



the scale towards document
Patch Reference numbers on UTT Serial No. 546

| staaf | doorsn. | combi | dx [mm] | N [kN] | Vy [kN] | Vz [kN] | Mx [kNm] | My [kNm] | Mz [kNm] |
|---|---|---|---|---|---|---|---|---|---|
| 45 | | 7 | | **-357.93** | 0.01 | -0.00 | 0.00 | -0.00 | 0.00 |
| | | 13 | | -357.93 | **0.01** | -38.60 | 0.00 | -0.00 | 0.00 |
| | | 5 | | -191.71 | 0.00 | **60.27** | 0.00 | -0.00 | 0.00 |
| | | 6 | | -191.71 | 0.00 | **-38.60** | 0.00 | -0.00 | 0.00 |
| | | 12 | 3238.0 | -351.50 | 0.01 | 45.88 | 0.00 | **166.21** | 0.03 |
| | | 13 | | -351.50 | 0.01 | -29.38 | -0.00 | **-106.43** | **0.03** |
| 46 | | 7 | 0.0 | **-337.36** | -0.02 | -0.00 | 0.00 | -0.00 | 0.03 |
| | | 12 | 577.4 | -336.22 | **-0.02** | 24.42 | 0.00 | 130.75 | 0.02 |
| | | 5 | 0.0 | -176.29 | -0.01 | **24.99** | **0.00** | 116.43 | 0.01 |
| | | 6 | | -176.29 | -0.01 | **-16.00** | **-0.00** | -74.56 | 0.01 |
| | | 12 | 2887.0 | -331.63 | -0.02 | 17.86 | 0.00 | **178.28** | **-0.03** |
| | | 13 | | -331.63 | -0.02 | -11.44 | -0.00 | **-114.16** | -0.03 |
| | | | 0.0 | -337.36 | -0.02 | -16.00 | -0.00 | -74.56 | **0.03** |
| 47 | | 7 | | **-316.37** | 0.01 | -0.00 | -0.00 | -0.00 | -0.02 |
| | | 13 | 888.5 | -314.61 | **0.01** | -9.71 | -0.00 | -104.33 | -0.01 |
| | | 5 | 0.0 | -160.58 | 0.00 | **16.52** | **0.00** | 148.66 | -0.01 |
| | | 6 | | -160.58 | 0.00 | **-10.58** | **-0.00** | -95.19 | -0.01 |
| | | 12 | 3850.0 | -308.72 | 0.01 | 3.90 | 0.00 | **187.95** | 0.01 |
| | | 13 | | -308.72 | 0.01 | -2.50 | -0.00 | **-120.36** | **0.01** |
| | | 12 | 0.0 | -316.37 | 0.01 | 16.52 | 0.00 | 148.66 | **-0.02** |
| 48 | | 7 | | **-293.47** | 0.00 | 0.00 | -0.00 | -0.00 | -0.00 |
| | | 12 | | -293.47 | **0.00** | 3.38 | -0.00 | 182.49 | -0.00 |
| | | 5 | | -143.43 | 0.00 | **3.38** | **-0.00** | 182.49 | 0.00 |
| | | | 1825.0 | -140.71 | 0.00 | **-2.31** | -0.00 | 185.20 | 0.00 |
| | | 6 | 0.0 | -143.43 | 0.00 | -2.17 | **0.00** | -116.86 | 0.00 |
| | | 12 | 1520.8 | -290.45 | 0.00 | -0.57 | -0.00 | **185.63** | 0.01 |
| | | 13 | | -290.45 | 0.00 | 0.37 | 0.00 | **-118.87** | 0.01 |
| | | | 1825.0 | -289.84 | 0.00 | 1.48 | 0.00 | -118.59 | **0.01** |
| | | 10 | 0.0 | -245.66 | 0.00 | 3.38 | -0.00 | 182.49 | **-0.00** |
| 49 | | 7 | | **-289.84** | 0.00 | 0.00 | -0.00 | -0.00 | 0.01 |
| | | 12 | 1012.5 | -287.83 | **0.00** | -7.48 | -0.00 | 179.99 | 0.01 |
| | | 6 | 2025.0 | -137.70 | 0.00 | **5.91** | 0.00 | -109.65 | 0.01 |
| | | 5 | | -137.70 | 0.00 | **-9.23** | -0.00 | 171.23 | 0.01 |
| | | 6 | 0.0 | -140.71 | 0.00 | 1.48 | **0.00** | -118.59 | 0.00 |
| | | 5 | | -140.71 | 0.00 | -2.31 | **-0.00** | 185.20 | 0.00 |
| | | 12 | | -289.84 | 0.00 | -2.31 | -0.00 | **185.20** | 0.01 |
| | | 13 | | -289.84 | 0.00 | 1.48 | 0.00 | **-118.59** | 0.01 |
| | | | 2025.0 | -285.82 | 0.00 | 5.91 | 0.00 | -109.65 | **0.01** |
| 50 | | 7 | 0.0 | **-270.49** | -0.05 | 0.00 | 0.00 | -0.00 | 0.09 |
| | | 13 | 2961.5 | -264.60 | **-0.05** | 13.39 | 0.00 | -95.61 | -0.05 |
| | | 6 | 3850.0 | -120.51 | -0.02 | **14.26** | 0.00 | -83.20 | -0.04 |
| | | 5 | | -120.51 | -0.02 | **-22.27** | -0.00 | 129.93 | -0.04 |
| | | 6 | 0.0 | -126.25 | -0.02 | 6.18 | **0.00** | -122.54 | 0.04 |
| | | 5 | | -126.25 | -0.02 | -9.65 | **-0.00** | 191.37 | 0.04 |
| | | 12 | | -270.49 | -0.05 | -9.65 | -0.00 | **191.37** | 0.09 |
| | | 13 | | -270.49 | -0.05 | 6.18 | 0.00 | **-122.54** | **0.09** |
| | | 12 | 3850.0 | -262.84 | -0.05 | -22.27 | -0.00 | 129.93 | **-0.09** |



the scale towards document
Patch Reference numbers on UTT
Serial No. 546

| staaf | doorsn. | combi | dx [mm] | N [kN] | Vy [kN] | Vz [kN] | Mx [kNm] | My [kNm] | Mz [kNm] |
|---|---|---|---|---|---|---|---|---|---|
| 51 | | 7 | 0.0 | **-247.48** | 0.02 | 0.00 | -0.00 | -0.00 | -0.06 |
| | | 12 | | -247.48 | **0.02** | -41.38 | -0.00 | **177.50** | **-0.06** |
| | | 6 | 3690.0 | -103.50 | 0.01 | **37.50** | 0.00 | -0.00 | -0.00 |
| | | 5 | | -103.50 | 0.01 | **-58.56** | 0.00 | -0.00 | -0.00 |
| | | 13 | 0.0 | -247.48 | 0.02 | 26.50 | 0.00 | **-113.66** | -0.06 |
| 52 | | 7 | | **-360.27** | 0.01 | -0.00 | 0.00 | -0.00 | 0.00 |
| | | 13 | | -360.27 | **0.01** | -32.75 | 0.00 | -0.00 | 0.00 |
| | | 5 | | -192.97 | 0.01 | **51.15** | 0.00 | -0.00 | 0.00 |
| | | 6 | | -192.97 | 0.01 | **-32.75** | 0.00 | -0.00 | 0.00 |
| | | 12 | 3238.0 | -353.84 | 0.01 | 36.76 | 0.00 | **136.68** | 0.05 |
| | | 13 | | -353.84 | 0.01 | -23.54 | -0.00 | **-87.53** | **0.05** |
| 53 | | 7 | 0.0 | **-339.74** | -0.05 | -0.00 | -0.00 | -0.00 | 0.07 |
| | | 12 | 577.4 | -338.59 | **-0.05** | 24.32 | 34.93 | 109.97 | 0.04 |
| | | 5 | 0.0 | -177.59 | -0.03 | **24.89** | **34.93** | 95.71 | 0.03 |
| | | 6 | | -177.59 | -0.03 | **-15.94** | **-22.37** | -61.29 | 0.03 |
| | | 12 | 2887.0 | -334.00 | -0.05 | 17.76 | 34.93 | **157.28** | **-0.08** |
| | | 13 | | -334.00 | -0.05 | -11.38 | -22.37 | **-100.72** | -0.08 |
| | | | 0.0 | -339.74 | -0.05 | -15.94 | -22.37 | -61.29 | **0.07** |
| 54 | | 7 | | **-318.67** | -0.04 | -0.00 | -0.00 | -0.00 | 0.05 |
| | | 3 | | -242.73 | **-0.05** | -0.00 | -0.00 | -0.00 | **0.07** |
| | | 5 | | -161.82 | -0.03 | **15.82** | **17.66** | 131.23 | 0.05 |
| | | 6 | | -161.82 | -0.03 | **-10.13** | **-11.31** | -84.03 | 0.05 |
| | | 12 | 3850.0 | -311.01 | -0.04 | 3.21 | 17.66 | **167.87** | -0.10 |
| | | 13 | | -311.01 | -0.04 | -2.05 | -11.31 | **-107.49** | -0.10 |
| | | 3 | | -234.12 | -0.05 | -0.00 | -0.00 | -0.00 | **-0.11** |
| 55 | | 7 | 0.0 | **-295.38** | -0.08 | 0.00 | 0.00 | -0.00 | 0.16 |
| | | 3 | | -216.67 | **-0.08** | 0.00 | 0.00 | -0.00 | **0.16** |
| | | 5 | | -144.45 | -0.05 | **3.24** | **-7.29** | 162.90 | 0.11 |
| | | | 1825.0 | -141.73 | -0.05 | **-2.46** | -7.29 | 165.35 | 0.01 |
| | | 6 | 0.0 | -144.45 | -0.05 | -2.07 | **4.67** | -104.32 | 0.11 |
| | | 12 | 1520.8 | -292.36 | -0.08 | -0.72 | -7.29 | **165.82** | 0.04 |
| | | 13 | | -292.36 | -0.08 | 0.46 | 4.67 | **-106.18** | 0.04 |
| 56 | | 7 | 0.0 | **-291.75** | -0.08 | 0.00 | 0.00 | -0.00 | 0.02 |
| | | 3 | | -212.59 | **-0.08** | 0.00 | 0.00 | -0.00 | 0.01 |
| | | 6 | 2025.0 | -138.71 | -0.05 | **6.01** | 4.67 | -96.74 | -0.10 |
| | | 5 | | -138.71 | -0.05 | **-9.38** | -7.29 | 151.08 | -0.10 |
| | | 6 | 0.0 | -141.73 | -0.05 | 1.57 | **4.67** | -105.88 | 0.01 |
| | | 5 | | -141.73 | -0.05 | -2.46 | **-7.29** | 165.35 | 0.01 |
| | | 12 | | -291.75 | -0.08 | -2.46 | -7.29 | **165.35** | 0.02 |
| | | 13 | | -291.75 | -0.08 | 1.57 | 4.67 | **-105.88** | **0.02** |
| | | 3 | 2025.0 | -208.06 | -0.08 | 0.00 | 0.00 | -0.00 | **-0.15** |
| 57 | | 7 | 0.0 | **-271.90** | -0.26 | 0.00 | 0.00 | -0.00 | 0.43 |
| | | 13 | 2369.2 | -267.19 | **-0.26** | 11.53 | 19.62 | -89.64 | -0.19 |
| | | 6 | 3850.0 | -121.24 | -0.14 | **13.93** | 19.62 | -70.19 | -0.31 |
| | | 5 | | -121.24 | -0.14 | **-21.76** | -30.64 | 109.62 | -0.31 |
| | | 6 | 0.0 | -126.97 | -0.14 | 5.85 | **19.62** | -108.28 | 0.24 |
| | | 5 | | -126.97 | -0.14 | -9.14 | **-30.64** | 169.10 | 0.24 |

| staaf | doorsn. | combi | dx [mm] | N [kN] | Vy [kN] | Vz [kN] | Mx [kNm] | My [kNm] | Mz [kNm] |
|---|---|---|---|---|---|---|---|---|---|
| | | 12 | | -271.90 | -0.26 | -9.14 | -30.64 | **169.10** | 0.43 |
| | | 13 | | -271.90 | -0.26 | 5.85 | 19.62 | **-108.28** | **0.43** |
| | | 12 | 3850.0 | -264.25 | -0.26 | -21.76 | -30.64 | 109.62 | **-0.58** |
| 58 | | 7 | 0.0 | **-247.48** | -0.06 | 0.00 | 0.00 | -0.00 | 0.22 |
| | | 13 | | -247.48 | **-0.06** | 21.42 | 0.00 | **-94.92** | **0.22** |
| | | 6 | 3690.0 | -103.50 | -0.03 | **32.42** | 0.00 | -0.00 | -0.00 |
| | | 5 | | -103.50 | -0.03 | **-50.63** | 0.00 | 0.00 | -0.00 |
| | | 12 | 0.0 | -247.48 | -0.06 | -33.45 | -0.00 | **148.23** | 0.22 |
| 59 | | 7 | | **-348.12** | 0.18 | -0.00 | -0.00 | -0.00 | -0.00 |
| | | 13 | | -348.12 | **0.18** | -9.87 | -0.00 | -0.00 | -0.00 |
| | | 5 | | -188.62 | 0.06 | **15.41** | -0.00 | 0.00 | -0.00 |
| | | 6 | | -188.62 | 0.06 | **-9.87** | -0.00 | -0.00 | -0.00 |
| | | 12 | 2649.3 | -342.85 | 0.18 | 0.15 | 0.00 | **17.02** | 0.47 |
| | | 13 | | -342.85 | 0.18 | -0.10 | -0.00 | **-10.90** | 0.47 |
| | | | 3238.0 | -341.68 | 0.18 | 0.28 | -0.00 | -10.81 | **0.57** |
| 60 | | 7 | 0.0 | **-327.13** | 1.16 | 0.00 | -0.00 | -0.00 | -1.40 |
| | | 12 | | -327.13 | **1.16** | -1.96 | 69.23 | **82.74** | **-1.40** |
| | | 6 | 2887.0 | -168.33 | 0.50 | **5.82** | -44.33 | -42.76 | 0.86 |
| | | 5 | | -168.33 | 0.50 | **-9.09** | 69.23 | 66.78 | 0.86 |
| | | | 0.0 | -172.63 | 0.50 | -1.96 | **69.23** | 82.74 | -0.57 |
| | | 6 | | -172.63 | 0.50 | 1.26 | **-44.33** | -52.98 | -0.57 |
| | | 13 | | -327.13 | 1.16 | 1.26 | -44.33 | **-52.98** | -1.40 |
| | | | 2887.0 | -321.39 | 1.16 | 5.82 | -44.33 | -42.76 | **1.95** |
| 61 | | 7 | 0.0 | **-306.71** | 1.51 | 0.00 | -0.00 | -0.00 | -2.59 |
| | | 12 | 2369.2 | -302.00 | **1.51** | -7.56 | 36.37 | 103.34 | 1.00 |
| | | 6 | 3850.0 | -151.10 | 0.71 | **7.24** | -23.29 | -56.63 | 1.53 |
| | | 5 | | -151.10 | 0.71 | **-11.31** | 36.37 | 88.44 | 1.53 |
| | | | 0.0 | -156.84 | 0.71 | 1.33 | **36.37** | 107.65 | -1.20 |
| | | 6 | | -156.84 | 0.71 | -0.85 | **-23.29** | -68.93 | -1.20 |
| | | 12 | 888.5 | -304.94 | 1.51 | -0.02 | 36.37 | **108.43** | -1.24 |
| | | 13 | | -304.94 | 1.51 | 0.01 | -23.29 | **-69.44** | -1.24 |
| | | | 3850.0 | -299.05 | 1.51 | 7.24 | -23.29 | -56.63 | **3.24** |
| | | 12 | 0.0 | -306.71 | 1.51 | 1.33 | 36.37 | 107.65 | **-2.59** |
| 62 | | 7 | | **-285.73** | **2.32** | 0.00 | 0.00 | -0.00 | -4.23 |
| | | 5 | | -140.32 | 1.11 | **9.07** | **-15.79** | 96.14 | -2.02 |
| | | 6 | | -140.32 | 1.11 | **-5.81** | **10.11** | -61.56 | -2.02 |
| | | 12 | 1825.0 | -282.10 | 2.32 | 3.38 | -15.79 | **109.23** | 0.01 |
| | | 13 | | -282.10 | 2.32 | -2.16 | 10.11 | **-69.95** | **0.01** |
| | | 12 | 0.0 | -285.73 | 2.32 | 9.07 | -15.79 | 96.14 | **-4.23** |
| 63 | | 7 | | **-282.10** | **2.32** | 0.00 | 0.00 | -0.00 | 0.01 |
| | | 5 | | -137.60 | 1.11 | **3.38** | **-15.79** | 109.23 | 0.01 |
| | | | 2025.0 | -134.58 | 1.11 | **-3.57** | -15.79 | 106.73 | 2.25 |
| | | 6 | 0.0 | -137.60 | 1.11 | -2.16 | **10.11** | -69.95 | 0.01 |
| | | 12 | 578.6 | -280.95 | 2.32 | 0.01 | -15.79 | **110.17** | 1.36 |
| | | 13 | | -280.95 | 2.32 | -0.00 | 10.11 | **-70.55** | 1.36 |
| | | | 2025.0 | -278.08 | 2.32 | 2.29 | 10.11 | -68.34 | **4.71** |
| 64 | | 7 | 0.0 | **-266.06** | **3.29** | 0.00 | 0.00 | -0.00 | -5.81 |



the scale towards document
Patch Reference numbers on UTT Serial No. 546

| staaf | doorsn. | combi | dx [mm] | N [kN] | Vy [kN] | Vz [kN] | Mx [kNm] | My [kNm] | Mz [kNm] |
|---|---|---|---|---|---|---|---|---|---|
| | | 5 | | -124.44 | 1.57 | **10.20** | **-60.62** | 78.64 | -2.77 |
| | | 6 | | -124.44 | 1.57 | **-6.53** | **38.82** | -50.36 | -2.77 |
| | | 12 | 2665.4 | -260.76 | 3.29 | -0.05 | -60.62 | **95.51** | 2.95 |
| | | 13 | | -260.76 | 3.29 | 0.03 | 38.82 | **-61.16** | 2.95 |
| | | | 3850.0 | -258.40 | 3.29 | 1.57 | 38.82 | -59.91 | **6.84** |
| | | 12 | 0.0 | -266.06 | 3.29 | 10.20 | -60.62 | 78.64 | **-5.81** |
| 65 | | 7 | | **-247.48** | 1.22 | 0.00 | 0.00 | -0.00 | -4.52 |
| | | 12 | | -247.48 | **1.22** | -1.18 | -0.00 | **31.16** | **-4.52** |
| | | 6 | 3690.0 | -103.50 | 0.58 | **13.77** | -0.00 | -0.00 | -0.00 |
| | | 5 | | -103.50 | 0.58 | **-21.50** | -0.00 | -0.00 | -0.00 |
| | | 13 | 0.0 | -247.48 | 1.22 | 0.76 | 0.00 | **-19.96** | -4.52 |

## Reacties (alles), UGT. comb (alles), lokale extremen.

Groep van knopen:1/54

Groep van UGT combi:1/13

| Steunpunt | knoop | combi | Rx [kN] | Ry [kN] | Rz [kN] | Mx [kNm] | My [kNm] | Mz [kNm] |
|---|---|---|---|---|---|---|---|---|
| 1 | 1 | 13 | **0.16** | 9.87 | 348.15 | 0.00 | 0.00 | 0.00 |
| | | 5 | **0.06** | **-15.41** | 188.64 | 0.00 | 0.00 | 0.00 |
| | | 6 | 0.06 | **9.87** | 188.64 | 0.00 | 0.00 | 0.00 |
| | | 7 | 0.16 | 0.00 | **348.15** | 0.00 | 0.00 | 0.00 |
| | | 1 | 0.06 | 0.00 | **188.64** | 0.00 | 0.00 | 0.00 |
| 2 | 2 | 6 | **-0.00** | **32.75** | 192.97 | 0.00 | 0.00 | 0.00 |
| | | 12 | **-0.00** | -51.15 | 360.27 | 0.00 | 0.00 | 0.00 |
| | | 5 | -0.00 | **-51.15** | 192.97 | 0.00 | 0.00 | 0.00 |
| | | 7 | -0.00 | 0.00 | **360.27** | 0.00 | 0.00 | 0.00 |
| | | 1 | -0.00 | 0.00 | **192.97** | 0.00 | 0.00 | 0.00 |
| 3 | 3 | 6 | **-0.00** | **38.60** | 191.71 | 0.00 | 0.00 | 0.00 |
| | | 12 | **-0.01** | -60.27 | 357.93 | 0.00 | 0.00 | 0.00 |
| | | 5 | -0.00 | **-60.27** | 191.71 | 0.00 | 0.00 | 0.00 |
| | | 7 | -0.01 | 0.00 | **357.93** | 0.00 | 0.00 | 0.00 |
| | | 1 | -0.00 | 0.00 | **191.71** | 0.00 | 0.00 | 0.00 |
| 4 | 4 | 6 | **-0.01** | **32.75** | 192.97 | 0.00 | 0.00 | 0.00 |
| | | 12 | **-0.01** | -51.15 | 360.27 | 0.00 | 0.00 | 0.00 |
| | | 5 | -0.01 | **-51.15** | 192.97 | 0.00 | 0.00 | 0.00 |
| | | 7 | -0.01 | 0.00 | **360.27** | 0.00 | 0.00 | 0.00 |
| | | 1 | -0.01 | 0.00 | **192.97** | 0.00 | 0.00 | 0.00 |
| 5 | 5 | 6 | **-0.06** | **9.87** | 188.62 | 0.00 | 0.00 | 0.00 |
| | | 12 | **-0.18** | -15.41 | 348.12 | 0.00 | 0.00 | 0.00 |
| | | 5 | -0.06 | **-15.41** | 188.62 | 0.00 | 0.00 | 0.00 |
| | | 7 | -0.18 | 0.00 | **348.12** | 0.00 | 0.00 | 0.00 |
| | | 1 | -0.06 | 0.00 | **188.62** | 0.00 | 0.00 | 0.00 |
| 6 | 6 | 13 | **0.14** | 10.42 | 6.48 | 0.00 | 0.00 | 0.00 |
| | | 5 | **0.06** | **-16.27** | 4.64 | 0.00 | 0.00 | 0.00 |

| Steunpunt | knoop | combi | Rx [kN] | Ry [kN] | Rz [kN] | Mx [kNm] | My [kNm] | Mz [kNm] |
|---|---|---|---|---|---|---|---|---|
| | | 6 | 0.06 | **10.42** | **4.64** | 0.00 | 0.00 | 0.00 |
| | | 3 | 0.08 | 0.00 | **6.96** | 0.00 | 0.00 | 0.00 |
| 7 | 12 | 6 | 0.00 | **10.42** | **4.64** | 0.00 | 0.00 | 0.00 |
| | | 5 | 0.00 | **-16.27** | 4.64 | 0.00 | 0.00 | 0.00 |
| | | 3 | 0.00 | 0.00 | **6.96** | 0.00 | 0.00 | 0.00 |
| 8 | 13 | 6 | **-0.05** | **29.02** | **5.42** | 0.00 | 0.00 | 0.00 |
| | | 12 | **-0.13** | -45.32 | 7.80 | 0.00 | 0.00 | 0.00 |
| | | 5 | -0.05 | **-45.32** | 5.42 | 0.00 | 0.00 | 0.00 |
| | | 3 | -0.08 | 0.00 | **8.13** | 0.00 | 0.00 | 0.00 |
| 9 | 19 | 6 | 0.00 | **29.02** | **5.42** | 0.00 | 0.00 | 0.00 |
| | | 5 | 0.00 | **-45.32** | 5.42 | 0.00 | 0.00 | 0.00 |
| | | 3 | 0.00 | 0.00 | **8.13** | 0.00 | 0.00 | 0.00 |
| 10 | 20 | 13 | **0.01** | 38.22 | 8.86 | 0.00 | 0.00 | 0.00 |
| | | 5 | **0.01** | **-59.68** | 5.97 | 0.00 | 0.00 | 0.00 |
| | | 6 | 0.01 | **38.22** | 5.97 | 0.00 | 0.00 | 0.00 |
| | | 3 | 0.01 | 0.00 | **8.95** | 0.00 | 0.00 | 0.00 |
| | | 1 | 0.01 | 0.00 | **5.97** | 0.00 | 0.00 | 0.00 |
| 11 | 26 | 6 | 0.00 | **38.22** | **5.97** | 0.00 | 0.00 | 0.00 |
| | | 5 | 0.00 | **-59.68** | 5.97 | 0.00 | 0.00 | 0.00 |
| | | 3 | 0.00 | 0.00 | **8.95** | 0.00 | 0.00 | 0.00 |
| 12 | 32 | 13 | **0.26** | 34.15 | 9.92 | 0.00 | 0.00 | 0.00 |
| | | 5 | **0.12** | **-53.32** | 6.48 | 0.00 | 0.00 | 0.00 |
| | | 6 | 0.12 | **34.15** | 6.48 | 0.00 | 0.00 | 0.00 |
| | | 7 | 0.26 | 0.00 | **9.92** | 0.00 | 0.00 | 0.00 |
| | | 1 | 0.12 | 0.00 | **6.48** | 0.00 | 0.00 | 0.00 |
| 13 | 38 | 6 | 0.00 | **34.15** | **6.48** | 0.00 | 0.00 | 0.00 |
| | | 5 | 0.00 | **-53.32** | 6.48 | 0.00 | 0.00 | 0.00 |
| | | 12 | 0.00 | -53.32 | **9.91** | 0.00 | 0.00 | 0.00 |
| 14 | 39 | 6 | **-0.15** | **13.98** | 6.88 | 0.00 | 0.00 | 0.00 |
| | | 12 | **-0.32** | -21.84 | **10.72** | 0.00 | 0.00 | 0.00 |
| | | 5 | -0.15 | **-21.84** | 6.88 | 0.00 | 0.00 | 0.00 |
| | | 1 | -0.15 | 0.00 | **6.88** | 0.00 | 0.00 | 0.00 |
| 15 | 45 | 6 | 0.00 | **13.98** | 6.87 | 0.00 | 0.00 | 0.00 |
| | | 5 | 0.00 | **-21.84** | 6.87 | 0.00 | 0.00 | 0.00 |
| | | 12 | 0.00 | -21.84 | **10.72** | 0.00 | 0.00 | 0.00 |
| | | 1 | 0.00 | 0.00 | **6.87** | 0.00 | 0.00 | 0.00 |
| 16 | 46 | 6 | **-0.56** | **13.77** | 0.00 | 0.00 | 0.00 | 0.00 |
| | | 12 | **-1.19** | -21.50 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | 5 | -0.56 | **-21.50** | 0.00 | 0.00 | 0.00 | 0.00 |
| 17 | 47 | 13 | **0.09** | 32.42 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | 5 | **0.05** | **-50.63** | 0.00 | 0.00 | 0.00 | 0.00 |
| | | 6 | 0.05 | **32.42** | 0.00 | 0.00 | 0.00 | 0.00 |
| 18 | 48 | 13 | **0.02** | 37.50 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | 5 | **0.01** | **-58.56** | 0.00 | 0.00 | 0.00 | 0.00 |
| | | 6 | 0.01 | **37.50** | 0.00 | 0.00 | 0.00 | 0.00 |
| 19 | 49 | | **-0.03** | **32.42** | 0.00 | 0.00 | 0.00 | 0.00 |
| | | 12 | **-0.06** | -50.63 | 0.00 | 0.00 | 0.00 | 0.00 |





| Steunpunt | knoop | combi | Rx [kN] | Ry [kN] | Rz [kN] | Mx [kNm] | My [kNm] | Mz [kNm] |
|---|---|---|---|---|---|---|---|---|
| | | 5 | -0.03 | **-50.63** | 0.00 | 0.00 | 0.00 | 0.00 |
| 20 | 50 | 13 | **1.22** | 13.77 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | 5 | **0.58** | **-21.50** | 0.00 | 0.00 | 0.00 | 0.00 |
| | | 6 | 0.58 | **13.77** | 0.00 | 0.00 | 0.00 | 0.00 |

## Vervormingen van staven. Globale extremen

Lineair statisch - extreme van alle combinaties

Groep van staven:1/65

Groep van GebruiksGT combi:1/6

| staaf | doorsn. | combi | dx [mm] | ux [mm] | uy [mm] | uz [mm] | fix [mrad] | fiy [mrad] | fiz [mrad] |
|---|---|---|---|---|---|---|---|---|---|
| 5 | 4 | 5 | 3600.0 | **0.00** | -0.20 | -19.14 | -5.70 | -5.07 | 0.01 |
| 58 | | 2 | 3690.0 | **-1.12** | -0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 65 | | 5 | 1419.2 | -0.99 | **0.04** | -13.86 | -5.69 | -5.89 | 0.00 |
| 26 | | 6 | 1800.0 | -0.00 | **-1.00** | 19.84 | -4.52 | -2.77 | -0.00 |
| 48 | | 4 | 912.5 | -0.46 | -0.00 | **50.08** | 0.00 | 0.13 | -0.00 |
| | | 3 | | -0.46 | -0.00 | **-78.21** | -0.00 | -0.20 | -0.00 |
| 27 | | | 3600.0 | -0.00 | -0.69 | -42.97 | **9.74** | -0.00 | 0.00 |
| 3 | | | | 0.00 | -0.15 | -37.82 | **-10.13** | -0.00 | -0.00 |
| 45 | | 5 | 0.0 | -0.00 | -0.00 | -0.00 | -0.00 | **12.43** | -0.00 |
| 51 | | | 3690.0 | -1.11 | 0.00 | -0.00 | -0.00 | **-12.59** | -0.00 |
| 30 | | 6 | 3600.0 | -0.00 | -0.00 | 0.00 | -3.55 | 4.07 | **0.40** |
| 25 | | | 0.0 | 0.00 | -0.00 | 0.00 | -3.55 | -4.07 | **-0.40** |

the scale towards document
Image Engineering Scan Reference Chart TE263 Serial No. 546

# BIJLAGE 7 ESA Prima Win output gevels in oostgevel

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## Basisgegevens
## Structuurtype : Raamwerk XYZ

| | |
|---|---|
| Aantal knopen: | 28 |
| Aantal staven: | 27 |
| Aantal 1D macro's: | 7 |
| Aantal randlijnen: | 0 |

| | |
|---|---|
| Aantal 2D macro's: | 0 |
| Aantal profielen: | 1 |
| Aantal belastingsgev.: | 8 |
| Aantal materialen: | 1 |

## Materiaal

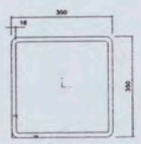
| | | |
|---|---|---|
| Naam | | |
| S235 | | |
| | Treksterkte | 360.000 MPa |
| | Vloeigrens | 235.000 MPa |
| | E-modulus | 210000.00 MPa |
| | Poisson coëff. | 0.30 |
| | Specifiek gewicht | 0.000 kg/mm^3 |
| | Uitzettingscoëff. | 1.2e-005 mm/mm.K |

## Materialenlijst
## Groep staven:
## 1/27

| nr. | Naam | Kwaliteit | Eenh. gewicht kg/mm | Lengte mm | Massa kg |
|---|---|---|---|---|---|
| 1 | SHS350/350/16.0 | S235 | 0.17 | 100325.00 | 16617.33 |

Totaal gewicht van constructie: 16617.33 kg
Verfoppervlakte: 140454997.61 mm^2

## Profielen




**SHS350/350/16.0**

Doorsnedenr. 1 - SHS350/350/16.0
Materiaal : 7 - S235

| | | | |
|---|---|---|---|
| A : | 2.110000e+004 mm^2 | | |

| | | | |
|---|---|---|---|
| A : | 2.110000e+004 mm^2 | | |
| Ay/A : | 0.500 | Az/A : | 0.500 |
| Iy : | 3.894000e+008 mm^4 | Iz : | 3.894000e+008 mm^4 |
| Iyz : | 2.710505e-007 mm^4 | It : | 6.099000e+008 mm^4 |
| Iw : | 7.002917e+012 mm^6 | | |
| Wely : | 2.225000e+006 mm^3 | Welz : | 2.225000e+006 mm^3 |
| Wply : | 2.604152e+006 mm^3 | Wplz : | 2.604152e+006 mm^3 |
| cy : | 175.00 mm | cz : | 175.00 mm |
| iy : | 135.85 mm | iz : | 135.85 mm |
| dy : | 0.00 mm | dz : | 0.00 mm |
| Omtrek : | | 1400.00 mm | |

Controletype: Kokerprofiel

| | | | |
|---|---|---|---|
| Hoogte | 350.00 mm | Breedte | 350.00 mm |
| Lijfdikte | 16.00 mm | | |

## Belastinggevallen

| BG | Naam | Omschrijving |
|---|---|---|
| 1 | EG constructie | Eigengewicht. Richting -Z |
| 2 | EG glas | Permanent - Lasten |
| 3 | EG dak | Permanent - Lasten |
| 4 | vb dak | Permanent - Lasten |
| 5 | EG loopbrug | Permanent - Lasten |
| 6 | vb loopbrug | Permanent - Lasten |
| 7 | wind in | Variabel - wind |
| 8 | wind uit | Variabel - wind |

## Groep van variabele lasten

| Naam | Omschrijving |
|---|---|
| wind | NEN - momentaan factor = 1.00 |

## Combinaties

| Combi | Norm | BG | coëff |
|---|---|---|---|
| 1. | NEN - UGT | 1 EG constructie | 1.00 |
| | | 2 EG glas | 1.00 |
| | | 3 EG dak | 1.00 |
| | | 4 vb dak | 1.00 |
| | | 5 EG loopbrug | 1.00 |
| | | 6 vb loopbrug | 1.00 |
| | | 7 wind in | 1.00 |
| 2. | NEN - GGT | 1 EG constructie | 1.00 |
| | | 2 EG glas | 1.00 |
| | | 3 EG dak | 1.00 |
| | | 4 vb dak | 1.00 |
| | | 5 EG loopbrug | 1.00 |
| | | 6 vb loopbrug | 1.00 |
| | | 7 wind in | 1.00 |
| 3.zuiging | | 1 EG constructie | 1.00 |
| | | 2 EG glas | 1.00 |
| | | 3 EG dak | 1.00 |
| | | 4 vb dak | 1.00 |
| | | 5 EG loopbrug | 1.00 |
| | | 6 vb loopbrug | 1.00 |
| | | 8 wind uit | 1.00 |
| 4.zuiging | NEN - UGT | 1 EG constructie | 1.00 |
| | | 2 EG glas | 1.00 |
| | | 3 EG dak | 1.00 |
| | | 4 vb dak | 1.00 |
| | | 5 EG loopbrug | 1.00 |
| | | 6 vb loopbrug | 1.00 |
| | | 8 wind uit | 1.00 |

Regels voor het genereren van uiterste combinaties:

1 : 1.35*BG1 / 1.35*BG2 / 1.35*BG3 / 1.35*BG4 / 1.35*BG5 / 1.35*BG6

2 : 0.90*BG1 / 0.90*BG2 / 0.90*BG3 / 0.90*BG4 / 0.90*BG5 / 0.90*BG6

3 : 1.20*BG1 / 1.20*BG2 / 1.20*BG3 / 1.20*BG4 / 1.20*BG5 / 1.20*BG6 / 1.50*BG7

4 : 0.90*BG1 / 0.90*BG2 / 0.90*BG3 / 0.90*BG4 / 0.90*BG5 / 0.90*BG6 / 1.50*BG7

5 : 1.35*BG1 / 1.35*BG2 / 1.35*BG3 / 1.35*BG4 / 1.35*BG5 / 1.35*BG6

6 : 0.90*BG1 / 0.90*BG2 / 0.90*BG3 / 0.90*BG4 / 0.90*BG5 / 0.90*BG6

7 : 1.20*BG1 / 1.20*BG2 / 1.20*BG3 / 1.20*BG4 / 1.20*BG5 / 1.20*BG6 / 1.50*BG8

8 : 0.90*BG1 / 0.90*BG2 / 0.90*BG3 / 0.90*BG4 / 0.90*BG5 / 0.90*BG6 / 1.50*BG8

Regels voor het genereren van gebruiks combinaties:

1 : 1.00*BG1 / 1.00*BG2 / 1.00*BG3 / 1.00*BG4 / 1.00*BG5 / 1.00*BG6

2 : 1.00*BG1 / 1.00*BG2 / 1.00*BG3 / 1.00*BG4 / 1.00*BG5 / 1.00*BG6 / 1.00*BG7

3 : 1.00*BG1 / 1.00*BG2 / 1.00*BG3 / 1.00*BG4 / 1.00*BG5 / 1.00*BG6

4 : 1.00*BG1 / 1.00*BG2 / 1.00*BG3 / 1.00*BG4 / 1.00*BG5 / 1.00*BG6 / 1.00*BG8

Lijst van extreme UGT combinaties

1/ 2 : +0.90*BG1+0.90*BG2+0.90*BG3+0.90*BG4+0.90*BG5+0.90*BG6

2/ 1 : +1.35*BG1+1.35*BG2+1.35*BG3+1.35*BG4+1.35*BG5+1.35*BG6

3/ 3 : +1.20*BG1+1.20*BG2+1.20*BG3+1.20*BG4+1.20*BG5+1.20*BG6+1.50*BG7

4/ 7 : +1.20*BG1+1.20*BG2+1.20*BG3+1.20*BG4+1.20*BG5+1.20*BG6+1.50*BG8

Lijst van extreme GGT combinaties

1/ 1 : +1.00*BG1+1.00*BG2+1.00*BG3+1.00*BG4+1.00*BG5+1.00*BG6

2/ 2 : +1.00*BG1+1.00*BG2+1.00*BG3+1.00*BG4+1.00*BG5+1.00*BG6+1.00*BG7

3/ 4 : +1.00*BG1+1.00*BG2+1.00*BG3+1.00*BG4+1.00*BG5+1.00*BG6+1.00*BG8

## Verslag berekening.

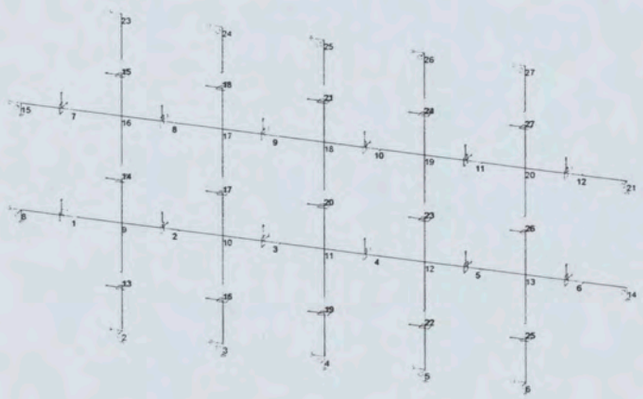
## Lineaire berekening

| | |
|---|---|
| Aantal 2D elementen | 0 |
| Aantal 1D elementen | 27 |
| Aantal netknopen | 28 |
| Aantal vergelijkingen | 168 |
| Belastinggevallen | BG 1 EG constructie |
| | BG 2 EG glas |
| | BG 3 EG dak |
| | BG 4 vb dak |
| | BG 5 EG loopbrug |
| | BG 6 vb loopbrug |
| | BG 7 wind in |
| | BG 8 wind uit |
| Start berekening | 19.12.2005 09:49 |
| Einde berekening | 19.12.2005 09:49 |

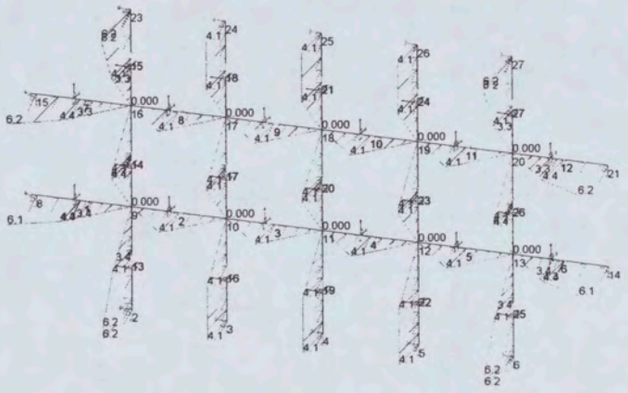
## Som van lasten en reacties.

| | | X | Y | Z |
|---|---|---|---|---|
| belastinggeval 1 | last | 0.0 | 0.0 | -166.2 |
| | knoopreacties | 0.0 | 0.0 | 166.2 |
| | lijnreactions | 0.0 | 0.0 | 0.0 |
| | contact 1D | 0.0 | 0.0 | 0.0 |
| | contact 2D | 0.0 | 0.0 | 0.0 |
| belastinggeval 2 | last | 0.0 | 0.0 | -82.1 |
| | knoopreacties | 0.0 | 0.0 | 82.1 |
| | lijnreactions | 0.0 | 0.0 | 0.0 |
| | contact 1D | 0.0 | 0.0 | 0.0 |

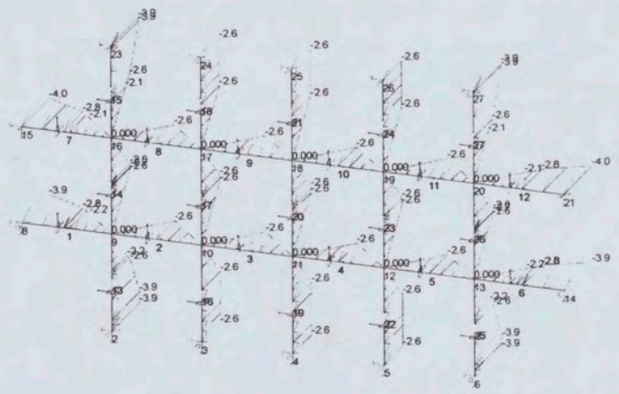
| | | X | Y | Z |
|---|---|---|---|---|
| | contact 2D | 0.0 | 0.0 | 0.0 |
| belastinggeval 3 | last | 0.0 | 0.0 | -860.0 |
| | knoopreacties | 0.0 | 0.0 | 860.0 |
| | lijnreactions | 0.0 | 0.0 | 0.0 |
| | contact 1D | 0.0 | 0.0 | 0.0 |
| | contact 2D | 0.0 | 0.0 | 0.0 |
| belastinggeval 4 | last | 0.0 | 0.0 | -492.0 |
| | knoopreacties | 0.0 | 0.0 | 492.0 |
| | lijnreactions | 0.0 | 0.0 | 0.0 |
| | contact 1D | 0.0 | 0.0 | 0.0 |
| | contact 2D | 0.0 | 0.0 | 0.0 |
| belastinggeval 5 | last | 0.0 | 0.0 | -220.3 |
| | knoopreacties | 0.0 | 0.0 | 220.3 |
| | lijnreactions | 0.0 | 0.0 | 0.0 |
| | contact 1D | 0.0 | 0.0 | 0.0 |
| | contact 2D | 0.0 | 0.0 | 0.0 |
| belastinggeval 6 | last | 0.0 | 0.0 | -162.0 |
| | knoopreacties | 0.0 | 0.0 | 162.0 |
| | lijnreactions | 0.0 | 0.0 | 0.0 |
| | contact 1D | 0.0 | 0.0 | 0.0 |
| | contact 2D | 0.0 | 0.0 | 0.0 |
| belastinggeval 7 | last | 0.0 | 281.3 | 0.0 |
| | knoopreacties | 0.0 | -281.3 | 0.0 |
| | lijnreactions | 0.0 | 0.0 | 0.0 |
| | contact 1D | 0.0 | 0.0 | 0.0 |
| | contact 2D | 0.0 | 0.0 | 0.0 |
| belastinggeval 8 | last | 0.0 | -180.1 | 0.0 |
| | knoopreacties | 0.0 | 180.1 | 0.0 |
| | lijnreactions | 0.0 | 0.0 | 0.0 |
| | contact 1D | 0.0 | 0.0 | 0.0 |
| | contact 2D | 0.0 | 0.0 | 0.0 |



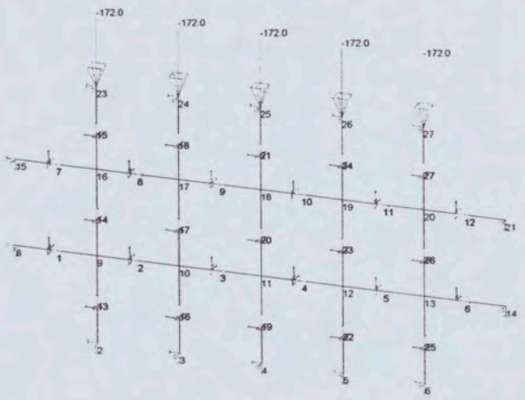
Geometrie knoop- en staafnummers



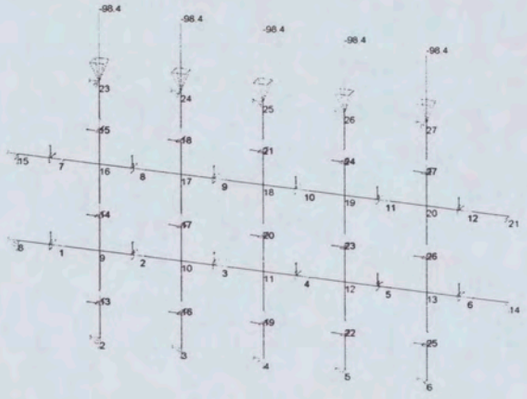
windbelasting Druk



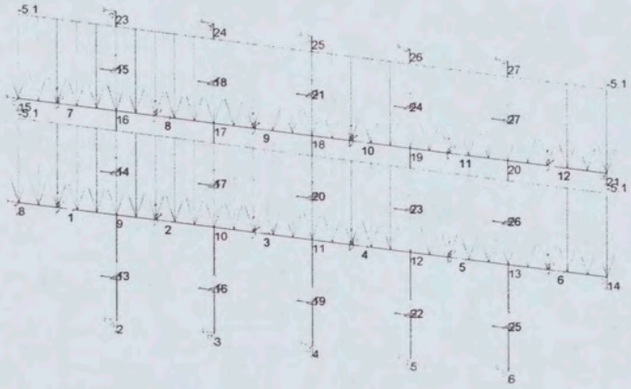
windbelasting zuiging



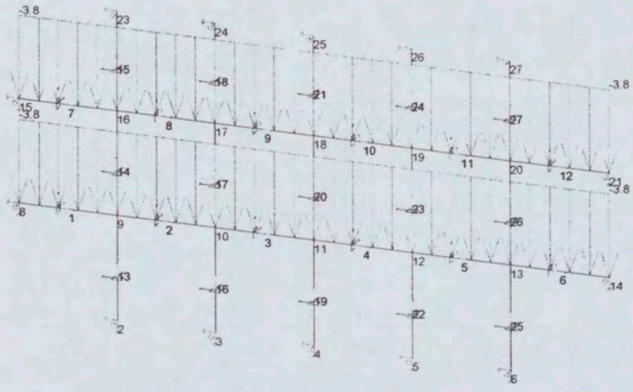
belasting EG dak



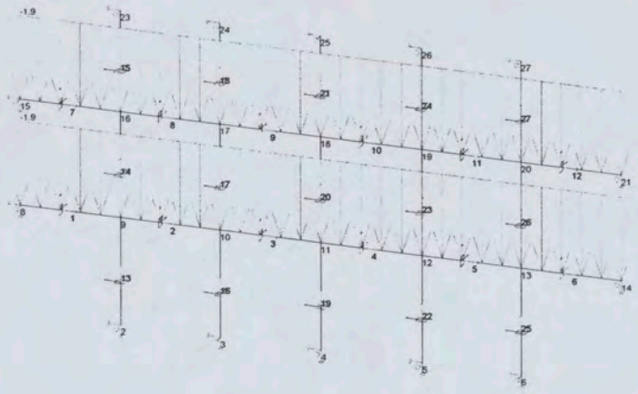

belasting vb dak




belasting EG loopbruggen




belasting vb loopbrug



EG glas

## Interne krachten in staven. Extremen per staaf

Lineair statisch - extreme van alle combinaties

Groep van staven:1/27

Groep van UGT combi:1/4

| staaf | doorsn. | combi | dx [mm] | N [kN] | Vy [kN] | Vz [kN] | Mx [kNm] | My [kNm] | Mz [kNm] |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 1 | 2 | 0.0 | **-0.08** | 0.00 | **25.17** | 0.00 | -0.00 | 0.00 |
| | | 4 | | -0.07 | **13.81** | 22.37 | 0.00 | -0.00 | -0.00 |
| | | 3 | | -0.07 | **-21.56** | 22.37 | 0.00 | -0.00 | -0.00 |
| | | 2 | 3600.0 | -0.08 | 0.00 | **-35.12** | 0.00 | **-17.91** | 0.00 |
| | | | 1600.0 | -0.08 | 0.00 | -1.63 | 0.00 | **18.84** | 0.00 |
| | | 4 | 3600.0 | -0.07 | 1.33 | -31.22 | 0.00 | -15.92 | **20.84** |
| | | 3 | | -0.07 | -2.08 | -31.22 | 0.00 | -15.92 | **-32.55** |
| 2 | | 2 | 0.0 | **0.59** | 0.00 | **30.17** | 0.00 | **-18.22** | 0.00 |
| | | 3 | 3600.0 | 0.52 | **9.06** | -26.78 | 8.91 | -16.13 | -19.17 |
| | | 4 | | 0.52 | **-5.80** | -26.78 | -5.71 | -16.13 | 12.27 |
| | | 2 | | 0.59 | 0.00 | **-30.13** | 0.00 | -18.15 | 0.00 |
| | | 3 | 0.0 | 0.52 | -2.02 | 26.82 | **8.91** | -16.20 | -31.83 |
| | | 4 | | 0.52 | 1.29 | 26.82 | **-5.71** | -16.20 | 20.38 |
| | | 2 | 1800.0 | 0.59 | 0.00 | 0.02 | 0.00 | **8.95** | 0.00 |
| | | 4 | 1200.0 | 0.52 | -0.28 | 8.95 | -5.71 | 5.26 | **21.31** |
| | | 3 | | 0.52 | 0.44 | 8.95 | 8.91 | 5.26 | **-33.27** |
| 3 | | 2 | 0.0 | **0.47** | 0.00 | **30.12** | 0.00 | -18.04 | 0.00 |
| | | 3 | 3600.0 | 0.42 | **7.55** | -26.82 | 2.95 | -16.11 | -11.67 |
| | | 4 | | 0.42 | **-4.83** | -26.82 | -1.89 | -16.11 | 7.47 |
| | | 2 | | 0.47 | 0.00 | **-30.17** | 0.00 | **-18.13** | 0.00 |
| | | 3 | 0.0 | 0.42 | -3.53 | 26.78 | **2.95** | -16.03 | -18.90 |
| | | 4 | | 0.42 | 2.26 | 26.78 | **-1.89** | -16.03 | 12.10 |
| | | 2 | 1800.0 | 0.47 | 0.00 | -0.02 | 0.00 | **9.05** | 0.00 |
| | | 4 | 1600.0 | 0.42 | -0.54 | 2.96 | -1.89 | 7.75 | **14.22** |
| | | 3 | | 0.42 | 0.84 | 2.96 | 2.95 | 7.75 | **-22.21** |

| staaf | doorsn. | combi | dx [mm] | N [kN] | Vy [kN] | Vz [kN] | Mx [kNm] | My [kNm] | Mz [kNm] |
|---|---|---|---|---|---|---|---|---|---|
| 4 | | 2 | 0.0 | **0.49** | 0.00 | **30.18** | 0.00 | **-18.13** | 0.00 |
| | | 4 | | 0.44 | **4.83** | 26.82 | **1.89** | -16.12 | 7.47 |
| | | 3 | | 0.44 | **-7.55** | 26.82 | **-2.95** | -16.12 | -11.67 |
| | | 2 | 3600.0 | 0.49 | 0.00 | **-30.12** | 0.00 | -18.03 | 0.00 |
| | | | 1800.0 | 0.49 | 0.00 | 0.03 | 0.00 | **9.05** | 0.00 |
| | | 4 | 2000.0 | 0.44 | 0.54 | -2.95 | 1.89 | 7.75 | **14.22** |
| | | 3 | | 0.44 | -0.84 | -2.95 | -2.95 | 7.75 | **-22.21** |
| 5 | | 2 | 0.0 | **0.63** | 0.00 | **30.13** | 0.00 | -18.16 | 0.00 |
| | | 4 | | 0.56 | **5.80** | 26.78 | **5.71** | -16.14 | 12.27 |
| | | 3 | | 0.56 | **-9.06** | 26.78 | **-8.91** | -16.14 | -19.17 |
| | | 2 | 3600.0 | 0.63 | 0.00 | **-30.16** | 0.00 | **-18.21** | 0.00 |
| | | | 1800.0 | 0.63 | 0.00 | -0.01 | 0.00 | **8.95** | 0.00 |
| | | 4 | 2400.0 | 0.56 | 0.28 | -8.95 | 5.71 | 5.26 | **21.31** |
| | | 3 | | 0.56 | -0.44 | -8.95 | -8.91 | 5.26 | **-33.27** |
| 6 | | | 3600.0 | -0.00 | **21.56** | -22.37 | 0.00 | -0.00 | 0.00 |
| | | 4 | | -0.00 | **-13.81** | -22.37 | 0.00 | -0.00 | -0.00 |
| | | 2 | 0.0 | -0.00 | 0.00 | **35.13** | 0.00 | **-17.92** | 0.00 |
| | | | 3600.0 | -0.00 | 0.00 | **-25.17** | 0.00 | -0.00 | 0.00 |
| | | | 2000.0 | -0.00 | 0.00 | 1.63 | 0.00 | **18.83** | 0.00 |
| | | 4 | 0.0 | -0.00 | -1.33 | 31.22 | 0.00 | -15.93 | **20.84** |
| | | 3 | | -0.00 | 2.08 | 31.22 | 0.00 | -15.93 | **-32.55** |
| 7 | | 2 | | **0.07** | 0.00 | **26.63** | 0.00 | -0.00 | 0.00 |
| | | 4 | | 0.06 | **13.54** | 23.67 | 0.00 | -0.00 | -0.00 |
| | | 3 | | 0.06 | **-21.14** | 23.67 | 0.00 | -0.00 | 0.00 |
| | | 2 | 3600.0 | 0.07 | 0.00 | **-33.67** | 0.00 | **-12.68** | 0.00 |
| | | | 1600.0 | 0.07 | 0.00 | -0.17 | 0.00 | **21.16** | 0.00 |
| | | 4 | 3600.0 | 0.06 | 0.95 | -29.93 | 0.00 | -11.27 | **19.53** |
| | | 3 | | 0.06 | -1.48 | -29.93 | 0.00 | -11.27 | **-30.50** |
| 8 | | 2 | 0.0 | **-0.11** | 0.00 | **29.32** | 0.00 | -15.97 | 0.00 |
| | | 3 | 3600.0 | -0.10 | **9.16** | -27.53 | -9.76 | -16.84 | -18.19 |
| | | 4 | | -0.10 | **-5.86** | -27.53 | 6.25 | -16.84 | 11.65 |
| | | 2 | | -0.11 | 0.00 | **-30.97** | 0.00 | **-18.95** | 0.00 |
| | | 4 | 0.0 | -0.10 | 1.23 | 26.06 | **6.25** | -14.19 | 19.99 |
| | | 3 | | -0.10 | -1.92 | 26.06 | **-9.76** | -14.19 | -31.22 |
| | | 2 | 1800.0 | -0.11 | 0.00 | -0.83 | 0.00 | **9.68** | 0.00 |
| | | 4 | 1200.0 | -0.10 | -0.35 | 8.20 | 6.25 | 6.36 | **20.84** |
| | | 3 | | -0.10 | 0.54 | 8.20 | -9.76 | 6.36 | **-32.54** |
| 9 | | 2 | 0.0 | **-0.08** | 0.00 | **30.25** | 0.00 | **-18.37** | 0.00 |
| | | 3 | 3600.0 | -0.07 | **7.58** | -26.70 | -3.21 | -15.99 | -11.13 |
| | | 4 | | -0.07 | **-4.85** | -26.70 | 2.06 | -15.99 | 7.13 |
| | | 2 | | -0.08 | 0.00 | **-30.04** | 0.00 | -17.99 | 0.00 |
| | | 4 | 0.0 | -0.07 | 2.24 | 26.89 | **2.06** | -16.33 | 11.83 |
| | | 3 | | -0.07 | -3.50 | 26.89 | **-3.21** | -16.33 | -18.47 |

| staaf | doorsn. | combi | dx [mm] | N [kN] | Vy [kN] | Vz [kN] | Mx [kNm] | My [kNm] | Mz [kNm] |
|---|---|---|---|---|---|---|---|---|---|
| | | 2 | 1800.0 | -0.08 | 0.00 | 0.11 | 0.00 | **8.95** | 0.00 |
| | | 4 | 1600.0 | -0.07 | -0.56 | 3.07 | 2.06 | 7.64 | **13.92** |
| | | 3 | | -0.07 | 0.88 | 3.07 | -3.21 | 7.64 | **-21.74** |
| 10 | | 2 | 0.0 | **-0.09** | 0.00 | **30.05** | 0.00 | -18.00 | 0.00 |
| | | 4 | | -0.08 | **4.85** | 26.71 | **-2.06** | -16.00 | 7.13 |
| | | 3 | | -0.08 | **-7.58** | 26.71 | **3.21** | -16.00 | -11.13 |
| | | 2 | 3600.0 | -0.09 | 0.00 | **-30.25** | 0.00 | **-18.36** | 0.00 |
| | | | 1800.0 | -0.09 | 0.00 | -0.10 | 0.00 | **8.95** | 0.00 |
| | | 4 | 2000.0 | -0.08 | 0.56 | -3.07 | -2.06 | 7.64 | **13.92** |
| | | 3 | | -0.08 | -0.88 | -3.07 | 3.21 | 7.64 | **-21.74** |
| 11 | | 2 | 0.0 | **-0.15** | 0.00 | **30.98** | 0.00 | **-18.96** | 0.00 |
| | | 4 | | -0.14 | **5.87** | 27.54 | **-6.25** | -16.85 | 11.65 |
| | | 3 | | -0.14 | **-9.16** | 27.54 | **9.76** | -16.85 | -18.19 |
| | | 2 | 3600.0 | -0.15 | 0.00 | **-29.31** | 0.00 | -15.95 | 0.00 |
| | | | 1800.0 | -0.15 | 0.00 | 0.84 | 0.00 | **9.68** | 0.00 |
| | | 4 | 2400.0 | -0.14 | 0.35 | -8.19 | -6.25 | 6.37 | **20.84** |
| | | 3 | | -0.14 | -0.54 | -8.19 | 9.76 | 6.37 | **-32.54** |
| 12 | | | 3600.0 | 0.00 | **21.14** | -23.66 | 0.00 | -0.00 | -0.00 |
| | | 4 | | 0.00 | **-13.54** | -23.66 | 0.00 | -0.00 | -0.00 |
| | | 2 | 0.0 | 0.00 | 0.00 | **33.67** | 0.00 | **-12.69** | 0.00 |
| | | | 3600.0 | 0.00 | 0.00 | **-26.62** | 0.00 | -0.00 | 0.00 |
| | | | 2000.0 | 0.00 | 0.00 | 0.18 | 0.00 | **21.16** | 0.00 |
| | | 4 | 0.0 | 0.00 | -0.95 | 29.93 | 0.00 | -11.28 | **19.53** |
| | | 3 | | 0.00 | 1.48 | 29.93 | 0.00 | -11.28 | **-30.50** |
| 13 | | 2 | | **-518.87** | 0.00 | **0.07** | 0.00 | 0.00 | 0.00 |
| | | 4 | | -461.22 | **18.13** | 0.06 | -0.00 | 0.00 | -0.00 |
| | | 3 | | -461.22 | **-28.32** | 0.06 | 0.00 | 0.00 | 0.00 |
| | | 2 | 3885.0 | -510.18 | 0.00 | 0.07 | 0.00 | **0.25** | 0.00 |
| | | 4 | | -453.49 | 3.85 | 0.06 | -0.00 | 0.23 | **34.89** |
| | | 3 | | -453.49 | -6.01 | 0.06 | 0.00 | 0.23 | **-54.49** |
| 14 | | 2 | 0.0 | **-444.89** | 0.00 | **-0.60** | 0.00 | **0.56** | 0.00 |
| | | 3 | 3850.0 | -387.81 | **6.57** | -0.53 | 0.72 | -1.55 | -62.44 |
| | | | 0.0 | -395.46 | **-6.07** | -0.53 | **0.72** | 0.50 | -63.40 |
| | | 4 | | -395.46 | 3.89 | -0.53 | **-0.46** | 0.50 | 40.60 |
| | | 2 | 3850.0 | -436.28 | 0.00 | -0.60 | 0.00 | **-1.74** | 0.00 |
| | | 4 | 1925.0 | -391.63 | -0.16 | -0.53 | -0.46 | -0.53 | **45.48** |
| | | 3 | | -391.63 | 0.25 | -0.53 | 0.72 | -0.53 | **-71.03** |
| 15 | | 2 | 0.0 | **-373.29** | 0.00 | **-0.42** | 0.00 | **1.54** | 0.00 |
| | | 3 | 3690.0 | -324.48 | **27.33** | -0.37 | 0.00 | -0.00 | 0.00 |
| | | 4 | | -324.48 | **-17.50** | -0.37 | 0.00 | -0.00 | -0.00 |
| | | | 0.0 | -331.81 | -4.49 | -0.37 | 0.00 | 1.37 | **33.73** |
| | | 3 | | -331.81 | 7.02 | -0.37 | 0.00 | 1.37 | **-52.68** |
| 16 | | 2 | | **-512.07** | 0.00 | **-0.00** | 0.00 | -0.00 | 0.00 |



the scale towards document
Patch Reference numbers on UTT
Image Engineering Scan Reference Chart TE263 Serial No. 546

| staaf | doorsn. | combi | dx [mm] | N [kN] | Vy [kN] | Vz [kN] | Mx [kNm] | My [kNm] | Mz [kNm] |
|---|---|---|---|---|---|---|---|---|---|
| | | 4 | | -455.17 | **23.45** | -0.00 | 0.00 | -0.00 | -0.00 |
| | | 3 | | -455.17 | **-36.62** | -0.00 | 0.00 | -0.00 | 0.00 |
| | | 2 | 3885.0 | -503.38 | 0.00 | -0.00 | 0.00 | **-0.01** | 0.00 |
| | | 4 | | -447.45 | 11.68 | -0.00 | 0.00 | -0.01 | **63.48** |
| | | 3 | | -447.45 | -18.24 | -0.00 | 0.00 | -0.01 | **-99.13** |
| 17 | | 2 | 0.0 | **-443.13** | 0.00 | **0.11** | 0.00 | **-0.12** | 0.00 |
| | | 3 | 3850.0 | -386.24 | **6.96** | 0.10 | 0.27 | 0.27 | -90.65 |
| | | | 0.0 | -393.89 | **-5.65** | 0.10 | **0.27** | -0.11 | -93.17 |
| | | 4 | | -393.89 | 3.62 | 0.10 | **-0.17** | -0.11 | 59.66 |
| | | 2 | 3850.0 | -434.52 | 0.00 | 0.11 | 0.00 | **0.31** | 0.00 |
| | | 4 | 1925.0 | -390.07 | -0.42 | 0.10 | -0.17 | 0.08 | **64.03** |
| | | 3 | | -390.07 | 0.65 | 0.10 | 0.27 | 0.08 | **-99.99** |
| 18 | | 2 | 0.0 | **-373.29** | 0.00 | **0.07** | 0.00 | **-0.27** | 0.00 |
| | | 3 | 3690.0 | -324.48 | **36.80** | 0.06 | 0.00 | -0.00 | -0.00 |
| | | 4 | | -324.48 | **-23.56** | 0.06 | 0.00 | -0.00 | 0.00 |
| | | | 0.0 | -331.81 | -12.57 | 0.06 | 0.00 | -0.24 | **62.24** |
| | | 3 | | -331.81 | 19.62 | 0.06 | 0.00 | -0.24 | **-97.20** |
| 19 | | 2 | | **-511.02** | 0.00 | **0.00** | 0.00 | -0.00 | 0.00 |
| | | 4 | | -454.24 | **25.03** | 0.00 | 0.00 | -0.00 | -0.00 |
| | | 3 | | -454.24 | **-39.08** | 0.00 | -0.00 | -0.00 | 0.00 |
| | | 2 | 3885.0 | -502.34 | 0.00 | 0.00 | 0.00 | **0.01** | 0.00 |
| | | 4 | | -446.52 | 13.26 | 0.00 | 0.00 | 0.01 | **69.61** |
| | | 3 | | -446.52 | -20.71 | 0.00 | -0.00 | 0.01 | **-108.70** |
| 20 | | 2 | 0.0 | **-441.99** | 0.00 | **-0.01** | 0.00 | **0.02** | 0.00 |
| | | 3 | 3850.0 | -385.23 | **7.00** | -0.01 | -0.00 | -0.02 | -100.13 |
| | | | 0.0 | -392.88 | **-5.61** | -0.01 | **-0.00** | 0.02 | -102.81 |
| | | 4 | | -392.88 | 3.59 | -0.01 | **0.00** | 0.02 | 65.83 |
| | | 2 | 3850.0 | -433.38 | 0.00 | -0.01 | 0.00 | **-0.02** | 0.00 |
| | | 4 | 1925.0 | -389.05 | -0.45 | -0.01 | 0.00 | 0.00 | **70.15** |
| | | 3 | | -389.05 | 0.70 | -0.01 | -0.00 | 0.00 | **-109.55** |
| 21 | | 2 | 0.0 | **-373.29** | 0.00 | **0.00** | 0.00 | **-0.01** | 0.00 |
| | | 3 | 3690.0 | -324.48 | **39.33** | 0.00 | 0.00 | 0.00 | -0.00 |
| | | 4 | | -324.48 | **-25.19** | 0.00 | 0.00 | 0.00 | 0.00 |
| | | | 0.0 | -331.81 | -14.19 | 0.00 | 0.00 | -0.01 | **68.23** |
| | | 3 | | -331.81 | 22.16 | 0.00 | 0.00 | -0.01 | **-106.56** |
| 22 | | 2 | | **-512.07** | 0.00 | **0.01** | 0.00 | 0.00 | 0.00 |
| | | 4 | | -455.17 | **23.45** | 0.01 | 0.00 | 0.00 | -0.00 |
| | | 3 | | -455.17 | **-36.62** | 0.01 | -0.00 | 0.00 | 0.00 |
| | | 2 | 3885.0 | -503.38 | 0.00 | 0.01 | 0.00 | **0.04** | 0.00 |
| | | 4 | | -447.45 | 11.68 | 0.01 | 0.00 | 0.03 | **63.48** |
| | | 3 | | -447.45 | -18.24 | 0.01 | -0.00 | 0.03 | **-99.13** |
| 23 | | 2 | 0.0 | **-443.13** | 0.00 | **-0.13** | 0.00 | **0.17** | 0.00 |
| | | 3 | 3850.0 | -386.24 | **6.96** | -0.12 | -0.27 | -0.31 | -90.65 |

| staaf | doorsn. | combi | dx [mm] | N [kN] | Vy [kN] | Vz [kN] | Mx [kNm] | My [kNm] | Mz [kNm] |
|---|---|---|---|---|---|---|---|---|---|
| | | | 0.0 | -393.89 | **-5.65** | -0.12 | **-0.27** | 0.15 | -93.17 |
| | | 4 | | -393.89 | 3.62 | -0.12 | **0.17** | 0.15 | 59.66 |
| | | 2 | 3850.0 | -434.52 | 0.00 | -0.13 | 0.00 | **-0.35** | 0.00 |
| | | 4 | 1925.0 | -390.07 | -0.42 | -0.12 | 0.17 | -0.08 | **64.03** |
| | | 3 | | -390.07 | 0.65 | -0.12 | -0.27 | -0.08 | **-99.99** |
| 24 | | 2 | 0.0 | **-373.29** | 0.00 | **-0.07** | 0.00 | **0.25** | 0.00 |
| | | 3 | 3690.0 | -324.48 | **36.80** | -0.06 | 0.00 | -0.00 | -0.00 |
| | | 4 | | -324.48 | **-23.56** | -0.06 | 0.00 | -0.00 | 0.00 |
| | | | 0.0 | -331.81 | -12.57 | -0.06 | 0.00 | 0.23 | **62.24** |
| | | 3 | | -331.81 | 19.62 | -0.06 | 0.00 | 0.23 | **-97.20** |
| 25 | | 2 | | **-518.86** | 0.00 | **-0.06** | 0.00 | -0.00 | 0.00 |
| | | 4 | | -461.21 | **18.13** | -0.05 | 0.00 | -0.00 | -0.00 |
| | | 3 | | -461.21 | **-28.32** | -0.05 | -0.00 | -0.00 | 0.00 |
| | | 2 | 3885.0 | -510.17 | 0.00 | -0.06 | 0.00 | **-0.22** | 0.00 |
| | | 4 | | -453.49 | 3.85 | -0.05 | 0.00 | -0.20 | **34.89** |
| | | 3 | | -453.49 | -6.01 | -0.05 | -0.00 | -0.20 | **-54.49** |
| 26 | | 2 | 0.0 | **-444.88** | 0.00 | **0.58** | 0.00 | **-0.52** | 0.00 |
| | | 3 | 3850.0 | -387.80 | **6.57** | 0.51 | -0.72 | 1.51 | -62.44 |
| | | | 0.0 | -395.45 | **-6.07** | 0.51 | **-0.72** | -0.46 | -63.40 |
| | | 4 | | -395.45 | 3.89 | 0.51 | **0.46** | -0.46 | 40.60 |
| | | 2 | 3850.0 | -436.28 | 0.00 | 0.58 | 0.00 | **1.70** | 0.00 |
| | | 4 | 1925.0 | -391.63 | -0.16 | 0.51 | 0.46 | 0.53 | **45.48** |
| | | 3 | | -391.63 | 0.25 | 0.51 | -0.72 | 0.53 | **-71.03** |
| 27 | | 2 | 0.0 | **-373.29** | 0.00 | **0.42** | 0.00 | **-1.56** | 0.00 |
| | | 3 | 3690.0 | -324.48 | **27.33** | 0.38 | 0.00 | -0.00 | -0.00 |
| | | 4 | | -324.48 | **-17.50** | 0.38 | 0.00 | -0.00 | 0.00 |
| | | | 0.0 | -331.81 | -4.49 | 0.38 | 0.00 | -1.39 | **33.73** |
| | | 3 | | -331.81 | 7.02 | 0.38 | 0.00 | -1.39 | **-52.68** |

## Reacties in steunpunten - waardes in knopen. Lokale extremen

Lineair statisch - extreme van alle combinaties

Groep van knopen:1/28

Groep van UGT combi:1/4

| Steunpunt | knoop | combi | Rx [kN] | Ry [kN] | Rz [kN] | Mx [kNm] | My [kNm] | Mz [kNm] |
|---|---|---|---|---|---|---|---|---|
| 1 | 2 | 1 | **-0.04** | 0.00 | **345.91** | 0.00 | 0.00 | 0.00 |
| | | 2 | **-0.07** | 0.00 | **518.87** | 0.00 | 0.00 | 0.00 |
| | | 4 | -0.06 | **18.13** | 461.22 | 0.00 | 0.00 | 0.00 |
| | | 3 | -0.06 | **-28.32** | 461.22 | 0.00 | 0.00 | 0.00 |
| 2 | 3 | 2 | **0.00** | 0.00 | **512.07** | 0.00 | 0.00 | 0.00 |
| | | 1 | **0.00** | 0.00 | **341.38** | 0.00 | 0.00 | 0.00 |
| | | 4 | 0.00 | **23.45** | 455.17 | 0.00 | 0.00 | 0.00 |

| Steunpunt | knoop | combi | Rx [kN] | Ry [kN] | Rz [kN] | Mx [kNm] | My [kNm] | Mz [kNm] |
|---|---|---|---|---|---|---|---|---|
| | | 3 | 0.00 | **-36.62** | 455.17 | 0.00 | 0.00 | 0.00 |
| 3 | 4 | 1 | **-0.00** | 0.00 | **340.68** | 0.00 | 0.00 | 0.00 |
| | | 2 | **-0.00** | 0.00 | **511.02** | 0.00 | 0.00 | 0.00 |
| | | 4 | -0.00 | **25.03** | 454.24 | 0.00 | 0.00 | 0.00 |
| | | 3 | -0.00 | **-39.08** | 454.24 | 0.00 | 0.00 | 0.00 |
| 4 | 5 | 1 | **-0.01** | 0.00 | **341.38** | 0.00 | 0.00 | 0.00 |
| | | 2 | **-0.01** | 0.00 | **512.07** | 0.00 | 0.00 | 0.00 |
| | | 4 | -0.01 | **23.45** | 455.17 | 0.00 | 0.00 | 0.00 |
| | | 3 | -0.01 | **-36.62** | 455.17 | 0.00 | 0.00 | 0.00 |
| 5 | 6 | 2 | **0.06** | 0.00 | **518.86** | 0.00 | 0.00 | 0.00 |
| | | 1 | **0.04** | 0.00 | **345.91** | 0.00 | 0.00 | 0.00 |
| | | 4 | 0.05 | **18.13** | 461.21 | 0.00 | 0.00 | 0.00 |
| | | 3 | 0.05 | **-28.32** | 461.21 | 0.00 | 0.00 | 0.00 |
| 6 | 8 | 2 | **0.08** | 0.00 | **25.17** | 0.00 | 0.00 | 0.00 |
| | | 1 | **0.05** | 0.00 | **16.78** | 0.00 | 0.00 | 0.00 |
| | | 4 | 0.07 | **13.81** | 22.37 | 0.00 | 0.00 | 0.00 |
| | | 3 | 0.07 | **-21.56** | 22.37 | 0.00 | 0.00 | 0.00 |
| 7 | 14 | 4 | 0.00 | **13.81** | 22.37 | 0.00 | 0.00 | 0.00 |
| | | 3 | 0.00 | **-21.56** | 22.37 | 0.00 | 0.00 | 0.00 |
| | | 2 | 0.00 | 0.00 | **25.17** | 0.00 | 0.00 | 0.00 |
| | | 1 | 0.00 | 0.00 | **16.78** | 0.00 | 0.00 | 0.00 |
| 8 | 15 | | **-0.04** | 0.00 | **17.75** | 0.00 | 0.00 | 0.00 |
| | | 2 | **-0.07** | 0.00 | **26.63** | 0.00 | 0.00 | 0.00 |
| | | 4 | -0.06 | **13.54** | 23.67 | 0.00 | 0.00 | 0.00 |
| | | 3 | -0.06 | **-21.14** | 23.67 | 0.00 | 0.00 | 0.00 |
| 9 | 21 | 4 | 0.00 | **13.54** | 23.66 | 0.00 | 0.00 | 0.00 |
| | | 3 | 0.00 | **-21.14** | 23.66 | 0.00 | 0.00 | 0.00 |
| | | 2 | 0.00 | 0.00 | **26.62** | 0.00 | 0.00 | 0.00 |
| | | 1 | 0.00 | 0.00 | **17.75** | 0.00 | 0.00 | 0.00 |
| 10 | 23 | | **-0.28** | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | 2 | **-0.42** | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | 4 | -0.37 | **17.50** | 0.00 | 0.00 | 0.00 | 0.00 |
| | | 3 | -0.37 | **-27.33** | 0.00 | 0.00 | 0.00 | 0.00 |
| 11 | 24 | 2 | **0.07** | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | 1 | **0.05** | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | 4 | 0.06 | **23.56** | 0.00 | 0.00 | 0.00 | 0.00 |
| | | 3 | 0.06 | **-36.80** | 0.00 | 0.00 | 0.00 | 0.00 |
| 12 | 25 | 2 | **0.00** | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | 1 | **0.00** | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | 4 | 0.00 | **25.19** | 0.00 | 0.00 | 0.00 | 0.00 |
| | | 3 | 0.00 | **-39.33** | 0.00 | 0.00 | 0.00 | 0.00 |
| 13 | 26 | 1 | **-0.05** | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | 2 | **-0.07** | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

| Steunpunt | knoop | combi | Rx [kN] | Ry [kN] | Rz [kN] | Mx [kNm] | My [kNm] | Mz [kNm] |
|---|---|---|---|---|---|---|---|---|
| | | 4 | -0.06 | **23.56** | 0.00 | 0.00 | 0.00 | 0.00 |
| | | 3 | -0.06 | **-36.80** | 0.00 | 0.00 | 0.00 | 0.00 |
| 14 | 27 | 2 | **0.42** | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | 1 | **0.28** | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | 4 | 0.38 | **17.50** | 0.00 | 0.00 | 0.00 | 0.00 |
| | | 3 | 0.38 | **-27.33** | 0.00 | 0.00 | 0.00 | 0.00 |

## Vervormingen van staven. Globale extremen

Lineair statisch - extreme van alle combinaties

Groep van staven:1/27

Groep van GebruiksGT combi:1/3

| staaf | doorsn. | combi | dx [mm] | ux [mm] | uy [mm] | uz [mm] | fix [mrad] | fiy [mrad] | fiz [mrad] |
|---|---|---|---|---|---|---|---|---|---|
| 5 | 1 | 1 | 3600.0 | **0.00** | 0.00 | -0.33 | 0.00 | 0.00 | 0.00 |
| 15 | | | 3690.0 | **-0.85** | 0.00 | -0.00 | 0.00 | -0.01 | 0.00 |
| 20 | | 2 | 1925.0 | -0.47 | **12.59** | -0.00 | -0.00 | -0.00 | -0.09 |
| | | 3 | | -0.47 | **-8.06** | -0.00 | 0.00 | -0.00 | 0.06 |
| 27 | | 1 | 1640.0 | -0.72 | 0.00 | **0.01** | 0.00 | 0.00 | 0.00 |
| 11 | | | 1800.0 | -0.00 | 0.00 | **-0.71** | 0.00 | 0.00 | 0.00 |
| 9 | | 2 | 3600.0 | -0.00 | 10.79 | -0.61 | **1.75** | -0.00 | -0.00 |
| 3 | | | | 0.00 | 11.12 | -0.33 | **-1.59** | -0.00 | -0.00 |
| 7 | | 1 | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | **0.40** | 0.00 |
| 12 | | | 3600.0 | -0.00 | 0.00 | 0.00 | 0.00 | **-0.40** | 0.00 |
| 19 | | 2 | 0.0 | -0.00 | 0.00 | -0.00 | -0.00 | 0.00 | **3.52** |
| 21 | | | 3690.0 | -0.84 | 0.00 | 0.00 | -0.00 | 0.00 | **-3.52** |

# BIJLAGE 8 ESA Prima Win output noord gevel

## Inhoudsopgave

Basisgegevens , gebruikte materialen

Materialenlijst

Doorsnede-eig. , standaard , gebruikte profielen

Belastinggevallen

Combinaties

Verslag berekening.

Geometire met knoop- en staafnummers

EG glas

windbelasting zuiging

windbelasting druk

Interne krachten in staven (alles), UGT. comb (alles), extremen.

Reacties (alles), UGT. comb (alles), lokale extremen.

Vervorming in staven (alles), GGT. combi (alles), globale extremen.

## Basisgegevens
## Structuurtype : Raamwerk XYZ

| | |
|---|---|
| Aantal knopen: | 26 |
| Aantal staven: | 24 |
| Aantal 1D macro's: | 10 |
| Aantal randlijnen: | 0 |
| Aantal 2D macro's: | 0 |
| Aantal profielen: | 5 |
| Aantal belastingsgev.: | 4 |
| Aantal materialen: | 1 |

## Materiaal

| Naam | | |
|---|---|---|
| S235 | | |
| | Treksterkte | 360.000 MPa |
| | Vloeigrens | 235.000 MPa |

Naam

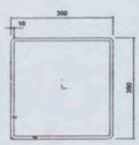
| | |
|---|---|
| E-modulus | 210000.00 MPa |
| Poisson coëff. | 0.30 |
| Specifiek gewicht | 0.000 kg/mm^3 |
| Uitzettingscoëff. | 1.2e-005 mm/mm.K |

## Materialenlijst
## Groep staven:
## 1/24

| nr. | Naam | Kwaliteit | Eenh. gewicht kg/mm | Lengte mm | Massa kg |
|---|---|---|---|---|---|
| 5 | SHS350/350/10.0 | S235 | 0.11 | 85362.01 | 9046.24 |

Totaal gewicht van constructie: 9046.24 kg
Verfoppervlakte: 119506807.30 mm^2

## Profielen




**SHS350/350/10.0**

Doorsnedenr. 5 - SHS350/350/10.0
Materiaal : 7 - S235

| | | | |
|---|---|---|---|
| A : | 1.350000e+004 mm^2 | | |
| Ay/A : | 0.500 | Az/A : | 0.500 |
| Iy : | 2.588000e+008 mm^4 | Iz : | 2.588000e+008 mm^4 |
| Iyz : | -3.035766e-006 mm^4 | It : | 3.989000e+008 mm^4 |
| Iw : | 4.376823e+012 mm^6 | | |
| Wely : | 1.479000e+006 mm^3 | Welz : | 1.479000e+006 mm^3 |
| Wply : | 1.704864e+006 mm^3 | Wplz : | 1.704864e+006 mm^3 |
| cy : | 175.00 mm | cz : | 175.00 mm |
| iy : | 138.46 mm | iz : | 138.46 mm |
| dy : | 0.00 mm | dz : | 0.00 mm |
| Omtrek : | | 1400.00 mm | |

Controletype: Kokerprofiel

| | | | |
|---|---|---|---|
| Hoogte | 350.00 mm | Breedte | 350.00 mm |
| Lijfdikte | 10.00 mm | | |

## Belastinggevallen

| B G | Naam | Omschrijving |
|---|---|---|
| 1 | Wind in | Variabel - Wind<br>Korte termijn |
| 2 | EG glas | Permanent - Lasten |
| 3 | wind uit | Variabel - Wind |
| 4 | EG constructie | Eigengewicht. Richting -Z |

## Combinaties

| Combi | Norm | BG | coëff |
|---|---|---|---|
| 1. | Lineair- UGT | 1 Wind in | 1.50 |
| | | 2 EG glas | 1.20 |
| | | 4 EG constructie | 1.20 |
| 2. | Lineair- GGT | 1 Wind in | 1.00 |
| | | 2 EG glas | 1.00 |
| | | 4 EG constructie | 1.00 |
| 3.wind uit | Lineair- UGT | 2 EG glas | 1.20 |
| | | 3 wind uit | 1.50 |
| | | 4 EG constructie | 1.20 |
| 4.wind uit | Lineair- GGT | 2 EG glas | 1.00 |
| | | 3 wind uit | 1.00 |
| | | 4 EG constructie | 1.00 |

Regels voor het genereren van uiterste combinaties:
1 : 1.50*BG1 / 1.20*BG2 / 1.20*BG4
2 : 1.20*BG2 / 1.50*BG3 / 1.20*BG4

Regels voor het genereren van gebruiks combinaties:
1 : 1.00*BG1 / 1.00*BG2 / 1.00*BG4
2 : 1.00*BG2 / 1.00*BG3 / 1.00*BG4

Lijst van alle UGT combinaties
1/ 1 : +1.50*BG1+1.20*BG2+1.20*BG4
2/ 3 : +1.20*BG2+1.50*BG3+1.20*BG4

Lijst van alle GGT combinaties
1/ 2 : +1.00*BG1+1.00*BG2+1.00*BG4
2/ 4 : +1.00*BG2+1.00*BG3+1.00*BG4

## Verslag berekening.

## Lineaire berekening

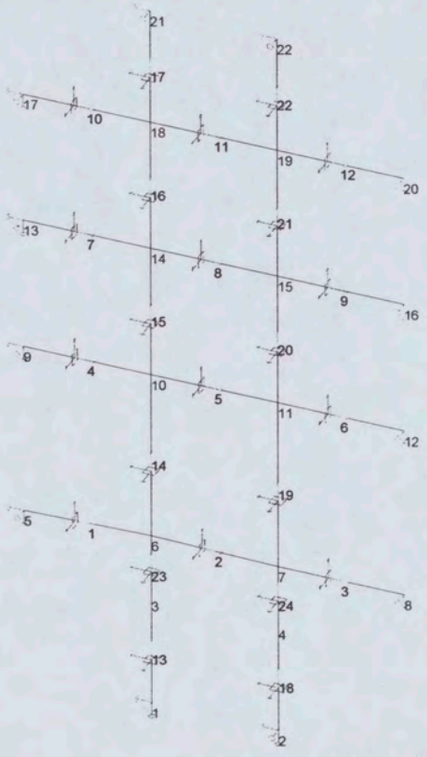
| | |
|---|---|
| Aantal 2D elementen | 0 |
| Aantal 1D elementen | 24 |
| Aantal netknopen | 22 |
| Aantal vergelijkingen | 132 |
| Belastinggevallen | BG 1 Wind in |
| | BG 2 EG glas |
| | BG 3 wind uit |
| | BG 4 EG constructie |
| Start berekening | 19.12.2005 10:21 |
| Einde berekening | 19.12.2005 10:21 |

## Som van lasten en reacties.

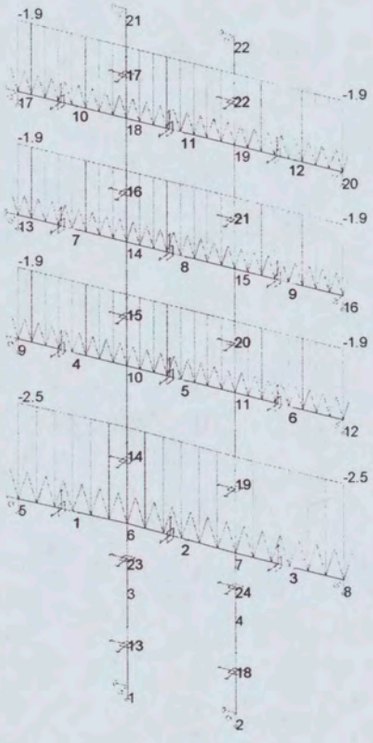
| | | X | Y | Z |
|---|---|---|---|---|
| belastinggeval 1 | last | 0.0 | 198.2 | 0.0 |
| | knoopreacties | 0.0 | -198.2 | 0.0 |
| | lijnreactions | 0.0 | 0.0 | 0.0 |
| | contact 1D | 0.0 | 0.0 | 0.0 |
| | contact 2D | 0.0 | 0.0 | 0.0 |
| belastinggeval 2 | last | 0.0 | 0.0 | -86.9 |
| | knoopreacties | 0.0 | 0.0 | 86.9 |
| | lijnreactions | 0.0 | 0.0 | 0.0 |
| | contact 1D | 0.0 | 0.0 | 0.0 |
| | contact 2D | 0.0 | 0.0 | 0.0 |
| belastinggeval 3 | last | 0.0 | -126.9 | 0.0 |
| | knoopreacties | 0.0 | 126.9 | 0.0 |
| | lijnreactions | 0.0 | 0.0 | 0.0 |
| | contact 1D | 0.0 | 0.0 | 0.0 |
| | contact 2D | 0.0 | 0.0 | 0.0 |
| belastinggeval 4 | last | 0.0 | 0.0 | -90.5 |
| | knoopreacties | 0.0 | 0.0 | 90.5 |
| | lijnreactions | 0.0 | 0.0 | 0.0 |
| | contact 1D | 0.0 | 0.0 | 0.0 |
| | contact 2D | 0.0 | 0.0 | 0.0 |



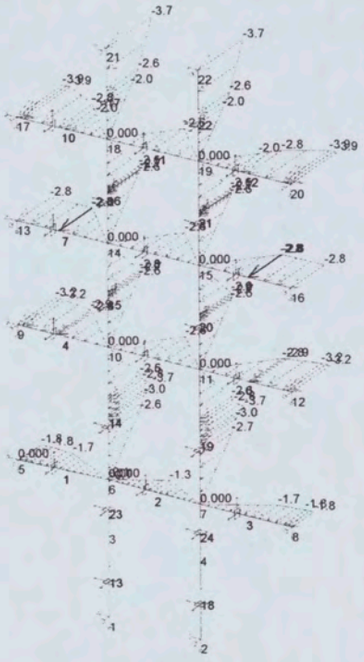




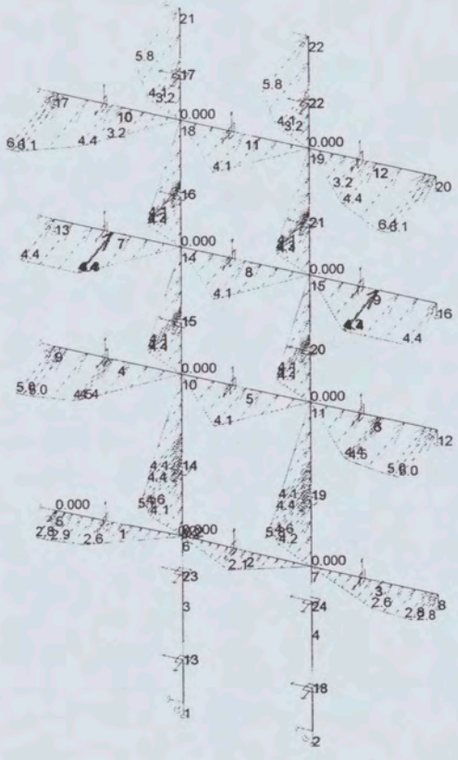

Geometire met knoop- en staafnummers




EG glas



windbelasting zuiging



windbelasting druk

## Interne krachten in staven. Extremen per staaf

Lineair statisch - extreme van alle combinaties

Groep van staven:1/24

Groep van UGT combi:1/2

| staaf | doorsn. | combi | dx [mm] | N [kN] | Vy [kN] | Vz [kN] | Mx [kNm] | My [kNm] | Mz [kNm] |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 5 | 1 | 3601.0 | **0.18** | **-9.03** | 12.72 | -0.00 | **59.44** | -4.84 |
| | | 2 | 0.0 | **-0.18** | **6.35** | **-14.65** | 0.00 | -0.00 | 0.00 |
| | | 1 | | -0.18 | 6.35 | **22.88** | 0.00 | -0.00 | 0.00 |
| | | 2 | 3601.0 | 0.18 | -9.03 | -8.14 | 0.00 | **-38.06** | **-4.84** |
| | | | 1440.4 | -0.04 | 0.20 | -10.90 | 0.00 | -18.41 | **4.71** |
| 2 | | 1 | 0.0 | **0.22** | **7.67** | **2.97** | **-1.03** | 66.06 | -4.70 |
| | | 2 | 3601.0 | **-0.14** | -7.70 | 1.81 | 0.66 | -42.31 | **-4.75** |
| | | 1 | | -0.14 | **-7.70** | **-2.83** | -1.03 | 66.08 | -4.75 |
| | | 2 | 0.0 | 0.22 | 7.67 | -1.90 | **0.66** | -42.30 | -4.70 |
| | | 1 | 1800.5 | 0.04 | -0.02 | -0.06 | -1.03 | **69.51** | 2.20 |
| | | 2 | | 0.04 | -0.02 | 0.04 | 0.66 | **-44.51** | **2.20** |
| 3 | | 1 | 0.0 | -0.00 | **9.05** | -12.99 | 0.00 | **59.54** | **-4.88** |
| | | 2 | 3600.0 | -0.00 | **-6.33** | **14.65** | 0.00 | -0.00 | 0.00 |
| | | 1 | | -0.00 | -6.33 | **-22.88** | -0.00 | 0.00 | -0.00 |
| | | 2 | 0.0 | -0.00 | 9.05 | 8.32 | -0.00 | **-38.13** | -4.88 |
| | | | 2160.0 | -0.00 | -0.18 | 10.87 | -0.00 | -18.32 | **4.69** |
| 4 | | 1 | 0.0 | **0.03** | 5.50 | **40.13** | 0.00 | -0.00 | 0.00 |
| | | 2 | | 0.03 | **5.50** | **-25.70** | 0.00 | 0.00 | 0.00 |
| | | 1 | 3600.0 | 0.03 | **-7.07** | 21.69 | -0.00 | **102.68** | -2.83 |
| | | 2 | | 0.03 | -7.07 | -13.89 | 0.00 | **-65.75** | **-2.83** |
| | | | 1440.0 | 0.03 | 0.47 | -18.97 | 0.00 | -32.07 | **4.30** |
| 5 | | 1 | 0.0 | **0.27** | **6.29** | **5.50** | **0.03** | 94.76 | -3.59 |
| | | | 3600.0 | 0.27 | **-6.28** | **-5.58** | 0.03 | 94.62 | -3.57 |
| | | 2 | 0.0 | 0.27 | 6.29 | -3.52 | **-0.02** | -60.68 | **-3.59** |
| | | 1 | 1800.0 | 0.27 | 0.00 | -0.04 | 0.03 | **101.34** | 2.08 |
| | | 2 | | 0.27 | 0.00 | 0.03 | -0.02 | **-64.89** | **2.08** |
| 6 | | 1 | 0.0 | -0.00 | **7.08** | -21.63 | 0.00 | **102.45** | **-2.86** |
| | | 2 | 3600.0 | -0.00 | **-5.49** | **25.66** | 0.00 | -0.00 | 0.00 |
| | | 1 | | -0.00 | -5.49 | **-40.07** | 0.00 | 0.00 | 0.00 |
| | | 2 | 0.0 | -0.00 | 7.08 | 13.85 | -0.00 | **-65.60** | -2.86 |
| | | | 2160.0 | -0.00 | -0.46 | 18.92 | -0.00 | -32.01 | **4.29** |
| 7 | | | 0.0 | **-0.01** | **5.66** | **-24.16** | -0.00 | -0.00 | 0.00 |
| | | 1 | 3600.0 | -0.01 | **-6.91** | 20.36 | 0.00 | **97.21** | -2.27 |
| | | | 0.0 | -0.01 | 5.66 | **37.72** | -0.00 | 0.00 | 0.00 |
| | | 2 | 3600.0 | -0.01 | -6.91 | -13.04 | -0.00 | **-62.25** | **-2.27** |
| | | | 1440.0 | -0.01 | 0.63 | -18.09 | -0.00 | -30.41 | **4.52** |
| 8 | | 1 | 0.0 | **0.10** | **6.28** | **5.54** | **0.01** | 90.07 | -3.53 |
| | | | 3600.0 | 0.10 | **-6.29** | **-5.54** | 0.01 | 90.07 | -3.54 |
| | | 2 | 0.0 | 0.10 | 6.28 | -3.55 | **-0.00** | -57.67 | -3.53 |
| | | 1 | 1800.0 | 0.10 | -0.00 | 0.00 | 0.01 | **96.72** | 2.12 |

| staaf | doorsn. | combi | dx [mm] | N [kN] | Vy [kN] | Vz [kN] | Mx [kNm] | My [kNm] | Mz [kNm] |
|---|---|---|---|---|---|---|---|---|---|
| | | 2 | | 0.10 | -0.00 | -0.00 | -0.00 | **-61.93** | **2.12** |
| | | | 3600.0 | 0.10 | -6.29 | 3.55 | -0.00 | -57.68 | **-3.54** |
| 9 | | 1 | 0.0 | -0.00 | **6.92** | -20.36 | -0.00 | **97.19** | **-2.27** |
| | | 2 | 3600.0 | -0.00 | **-5.65** | **24.15** | -0.00 | -0.00 | 0.00 |
| | | 1 | | -0.00 | -5.65 | **-37.72** | -0.00 | 0.00 | 0.00 |
| | | 2 | 0.0 | -0.00 | 6.92 | 13.03 | 0.00 | **-62.24** | -2.27 |
| | | | 2160.0 | -0.00 | -0.63 | 18.08 | 0.00 | -30.41 | **4.52** |
| 10 | | 1 | 0.0 | **0.00** | 5.70 | **27.11** | -0.00 | -0.00 | 0.00 |
| | | 2 | | 0.00 | **5.70** | **-17.36** | 0.00 | -0.00 | 0.00 |
| | | 1 | 3600.0 | 0.00 | **-6.87** | 7.19 | 0.00 | **51.30** | -2.09 |
| | | 2 | | 0.00 | -6.87 | -4.60 | -0.00 | **-32.85** | **-2.09** |
| | | | 1800.0 | 0.00 | -0.58 | -8.16 | -0.00 | -22.44 | **4.61** |
| 11 | | | 0.0 | **-0.23** | 6.28 | -3.55 | **0.00** | -38.24 | -3.42 |
| | | 1 | | -0.23 | **6.28** | **5.54** | **-0.00** | 59.71 | -3.42 |
| | | | 3600.0 | -0.23 | **-6.29** | **-5.54** | -0.00 | 59.72 | -3.43 |
| | | | 1800.0 | -0.23 | -0.00 | 0.00 | -0.00 | **66.37** | 2.23 |
| | | 2 | | -0.23 | -0.00 | -0.00 | 0.00 | **-42.50** | **2.23** |
| | | | 3600.0 | -0.23 | -6.29 | 3.55 | 0.00 | -38.24 | **-3.43** |
| 12 | | 1 | 0.0 | 0.00 | **6.87** | -7.19 | -0.00 | **51.31** | **-2.10** |
| | | 2 | 3600.0 | 0.00 | **-5.70** | **17.36** | 0.00 | 0.00 | 0.00 |
| | | 1 | | 0.00 | -5.70 | **-27.11** | 0.00 | 0.00 | 0.00 |
| | | 2 | 0.0 | 0.00 | 6.87 | 4.60 | 0.00 | **-32.86** | -2.10 |
| | | | 1800.0 | 0.00 | 0.58 | 8.16 | 0.00 | -22.44 | **4.61** |
| 13 | | 1 | 0.0 | **-83.22** | 0.03 | **1.46** | -0.00 | -0.00 | -0.00 |
| | | 2 | | -83.22 | **0.03** | **-0.94** | 0.00 | 0.00 | -0.00 |
| | | 1 | 3238.0 | -79.11 | 0.03 | 1.46 | 0.00 | **4.74** | 0.09 |
| | | 2 | | -79.11 | 0.03 | -0.94 | -0.00 | **-3.03** | **0.09** |
| 14 | | 1 | 0.0 | **-60.07** | -0.05 | **11.20** | **-6.65** | 9.35 | 0.00 |
| | | | 1051.1 | -58.73 | **-0.05** | 9.27 | -6.65 | 20.45 | -0.05 |
| | | | 4905.0 | -53.83 | -0.05 | **-9.21** | -6.65 | 14.06 | **-0.23** |
| | | 2 | 0.0 | -60.07 | -0.05 | -7.18 | **4.26** | -5.99 | **0.00** |
| | | 1 | 2452.5 | -56.95 | -0.05 | 0.93 | -6.65 | **28.30** | -0.11 |
| | | 2 | | -56.95 | -0.05 | -0.60 | 4.26 | **-18.12** | -0.11 |
| 15 | | 1 | 0.0 | **-40.47** | -0.28 | **6.98** | **1.27** | 14.10 | 0.53 |
| | | | 700.0 | -39.58 | **-0.28** | 6.14 | 1.27 | 18.79 | 0.33 |
| | | | 3850.0 | -35.57 | -0.28 | **-5.67** | 1.27 | 16.62 | **-0.57** |
| | | 2 | 0.0 | -40.47 | -0.28 | -4.47 | **-0.81** | -9.03 | **0.53** |
| | | 1 | 2100.0 | -37.80 | -0.28 | -0.43 | 1.27 | **23.48** | -0.07 |
| | | 2 | | -37.80 | -0.28 | 0.28 | -0.81 | **-15.04** | -0.07 |
| 16 | | 1 | 0.0 | **-22.37** | -0.39 | **9.15** | **8.41** | 16.62 | 0.70 |
| | | | 350.0 | -21.93 | **-0.39** | 8.94 | 8.41 | 19.80 | 0.56 |
| | | 2 | 0.0 | -22.37 | -0.39 | **-5.86** | **-5.39** | -10.64 | **0.70** |
| | | 1 | 2450.0 | -19.26 | -0.39 | -0.15 | 8.41 | **30.83** | -0.26 |
| | | 2 | | -19.26 | -0.39 | 0.09 | -5.39 | **-19.74** | -0.26 |
| | | 1 | 3850.0 | -17.48 | -0.39 | -3.50 | 8.41 | 27.50 | **-0.80** |
| 17 | | | 0.0 | **-4.33** | -0.16 | -1.85 | -0.00 | **27.50** | 0.53 |
| | | 2 | | -4.33 | **-0.16** | 1.19 | 0.00 | **-17.61** | **0.53** |

| staaf | doorsn. | combi | dx [mm] | N [kN] | Vy [kN] | Vz [kN] | Mx [kNm] | My [kNm] | Mz [kNm] |
|---|---|---|---|---|---|---|---|---|---|
| | | | 3405.0 | 0.00 | -0.16 | **12.35** | 0.00 | -0.00 | 0.00 |
| | | 1 | | 0.00 | -0.16 | **-19.29** | -0.00 | 0.00 | 0.00 |
| 18 | | | 0.0 | **-83.28** | **-0.02** | **1.59** | 0.00 | -0.00 | -0.00 |
| | | 2 | | -83.28 | -0.02 | **-1.02** | -0.00 | 0.00 | -0.00 |
| | | 1 | 3238.0 | -79.16 | -0.02 | 1.59 | -0.00 | **5.15** | **-0.06** |
| | | 2 | | -79.16 | -0.02 | -1.02 | 0.00 | **-3.30** | -0.06 |
| 19 | | 1 | 0.0 | **-60.19** | 0.03 | **11.75** | **6.54** | 7.40 | 0.05 |
| | | 2 | 1069.3 | -58.83 | **0.03** | -6.29 | -4.19 | -12.34 | 0.07 |
| | | 1 | 4990.0 | -53.84 | 0.03 | **-9.08** | 6.54 | 14.19 | 0.17 |
| | | 2 | 0.0 | -60.19 | 0.03 | -7.52 | **-4.19** | -4.74 | 0.05 |
| | | 1 | 2495.0 | -57.01 | 0.03 | 1.44 | 6.54 | **28.03** | 0.11 |
| | | 2 | | -57.01 | 0.03 | -0.92 | -4.19 | **-17.95** | 0.11 |
| | | | 4990.0 | -53.84 | 0.03 | 5.81 | -4.19 | -9.09 | **0.17** |
| 20 | | 1 | 0.0 | **-40.48** | 0.29 | **6.97** | **-1.29** | 14.15 | **-0.54** |
| | | | 2800.0 | -36.92 | **0.29** | -3.79 | -1.29 | 21.95 | 0.27 |
| | | | 3850.0 | -35.59 | 0.29 | **-5.68** | -1.29 | 16.65 | 0.58 |
| | | 2 | 0.0 | -40.48 | 0.29 | -4.46 | **0.83** | -9.06 | -0.54 |
| | | 1 | 2100.0 | -37.81 | 0.29 | -0.44 | -1.29 | **23.53** | 0.07 |
| | | 2 | | -37.81 | 0.29 | 0.28 | 0.83 | **-15.07** | 0.07 |
| | | | 3850.0 | -35.59 | 0.29 | 3.63 | 0.83 | -10.66 | **0.58** |
| 21 | | 1 | 0.0 | **-22.38** | 0.39 | **9.14** | **-8.41** | 16.64 | **-0.69** |
| | | 2 | 350.0 | -21.94 | **0.39** | -5.72 | 5.39 | -12.69 | -0.56 |
| | | | 0.0 | -22.38 | 0.39 | **-5.85** | **5.39** | -10.66 | -0.69 |
| | | 1 | 2450.0 | -19.27 | 0.39 | -0.15 | -8.41 | **30.84** | 0.25 |
| | | 2 | | -19.27 | 0.39 | 0.10 | 5.39 | **-19.75** | 0.25 |
| | | | 3850.0 | -17.49 | 0.39 | 2.24 | 5.39 | -17.61 | **0.80** |
| 22 | | 1 | 0.0 | **-4.33** | **0.16** | -1.85 | 0.00 | **27.50** | **-0.54** |
| | | 2 | 3405.0 | -0.00 | 0.16 | **12.35** | -0.00 | -0.00 | -0.00 |
| | | 1 | | -0.00 | 0.16 | **-19.29** | 0.00 | 0.00 | -0.00 |
| | | 2 | 0.0 | -4.33 | 0.16 | 1.19 | -0.00 | **-17.61** | -0.54 |
| 23 | | 1 | | **-79.11** | 0.03 | **1.46** | 0.00 | 4.74 | 0.09 |
| | | 2 | | -79.11 | **0.03** | **-0.94** | -0.00 | -3.03 | 0.09 |
| | | 1 | 1832.0 | -76.78 | 0.03 | 1.45 | 0.00 | **7.42** | 0.14 |
| | | 2 | | -76.78 | 0.03 | -0.93 | -0.00 | **-4.75** | **0.14** |
| 24 | | 1 | 0.0 | **-79.16** | **-0.02** | **1.59** | -0.00 | 5.15 | -0.06 |
| | | 2 | | -79.16 | -0.02 | **-1.02** | 0.00 | -3.30 | -0.06 |
| | | 1 | 1747.0 | -76.94 | -0.02 | 1.59 | -0.00 | **7.93** | **-0.09** |
| | | 2 | | -76.94 | -0.02 | -1.02 | 0.00 | **-5.08** | -0.09 |

## Reacties in steunpunten - waardes in knopen. Lokale extremen

Lineair statisch - extreme van alle combinaties

Groep van knopen:1/26

Groep van UGT combi:1/2

| Steunpunt | knoop | combi | Rx [kN] | Ry [kN] | Rz [kN] | Mx [kNm] | My [kNm] | Mz [kNm] |
|---|---|---|---|---|---|---|---|---|

| Steunpunt | knoop | combi | Rx [kN] | Ry [kN] | Rz [kN] | Mx [kNm] | My [kNm] | Mz [kNm] |
|---|---|---|---|---|---|---|---|---|
| 1 | 1 | 1 | **-0.03** | **-1.46** | **83.22** | 0.00 | 0.00 | 0.00 |
| | | 2 | **-0.03** | **0.94** | 83.22 | 0.00 | 0.00 | 0.00 |
| 2 | 2 | 1 | **0.02** | **-1.59** | **83.28** | 0.00 | 0.00 | 0.00 |
| | | 2 | **0.02** | **1.02** | 83.28 | 0.00 | 0.00 | 0.00 |
| 3 | 5 | | **0.03** | **14.65** | 6.35 | 0.00 | 0.00 | 0.00 |
| | | 1 | **0.03** | **-22.88** | **6.35** | 0.00 | 0.00 | 0.00 |
| 4 | 8 | 2 | 0.00 | **14.65** | 6.33 | 0.00 | 0.00 | 0.00 |
| | | 1 | 0.00 | **-22.88** | **6.33** | 0.00 | 0.00 | 0.00 |
| 5 | 9 | 2 | **-0.03** | **25.70** | **5.50** | 0.00 | 0.00 | 0.00 |
| | | 1 | **-0.03** | **-40.13** | **5.50** | 0.00 | 0.00 | 0.00 |
| 6 | 12 | 2 | 0.00 | **25.66** | **5.49** | 0.00 | 0.00 | 0.00 |
| | | 1 | 0.00 | **-40.07** | **5.49** | 0.00 | 0.00 | 0.00 |
| 7 | 13 | 2 | **0.01** | **24.16** | **5.66** | 0.00 | 0.00 | 0.00 |
| | | 1 | **0.01** | **-37.72** | **5.66** | 0.00 | 0.00 | 0.00 |
| 8 | 16 | 2 | 0.00 | **24.15** | 5.65 | 0.00 | 0.00 | 0.00 |
| | | 1 | 0.00 | **-37.72** | **5.65** | 0.00 | 0.00 | 0.00 |
| 9 | 17 | 2 | **-0.00** | **17.36** | **5.70** | 0.00 | 0.00 | 0.00 |
| | | 1 | **-0.00** | **-27.11** | **5.70** | 0.00 | 0.00 | 0.00 |
| 10 | 20 | 2 | 0.00 | **17.36** | **5.70** | 0.00 | 0.00 | 0.00 |
| | | 1 | 0.00 | **-27.11** | **5.70** | 0.00 | 0.00 | 0.00 |
| 11 | 21 | 2 | **-0.16** | **12.35** | 0.00 | 0.00 | 0.00 | 0.00 |
| | | 1 | **-0.16** | **-19.29** | 0.00 | 0.00 | 0.00 | 0.00 |
| 12 | 22 | 2 | **0.16** | **12.35** | 0.00 | 0.00 | 0.00 | 0.00 |
| | | 1 | **0.16** | **-19.29** | 0.00 | 0.00 | 0.00 | 0.00 |

## Vervormingen van staven. Globale extremen

Lineair statisch - extreme van alle combinaties

Groep van staven:1/24

Groep van GebruiksGT combi:1/2

| staaf | doorsn. | combi | dx [mm] | ux [mm] | uy [mm] | uz [mm] | fix [mrad] | fiy [mrad] | fiz [mrad] |
|---|---|---|---|---|---|---|---|---|---|
| 2 | 5 | 1 | 2160.6 | **0.01** | -0.15 | -10.26 | -1.61 | -0.35 | 0.01 |
| 17 | | | 3405.0 | **-0.27** | -0.00 | -0.00 | 1.41 | -2.74 | 0.00 |
| 22 | | | 1362.0 | -0.27 | **0.01** | -5.36 | -1.41 | -2.38 | 0.00 |
| 11 | | 2 | 1800.0 | -0.00 | **-0.31** | 6.16 | -1.25 | -0.00 | 0.00 |
| 5 | | | | 0.00 | -0.24 | **10.15** | 0.19 | 0.00 | 0.00 |
| | | 1 | | 0.00 | -0.24 | **-15.86** | -0.30 | -0.00 | 0.00 |
| 14 | | | 4905.0 | -0.20 | -0.00 | -13.86 | **2.18** | 0.30 | -0.01 |
| 19 | | | 4990.0 | -0.20 | -0.00 | -13.86 | **-2.18** | 0.30 | 0.01 |
| 4 | | | 0.0 | 0.00 | -0.00 | -0.00 | -0.30 | **4.71** | -0.14 |
| 6 | | | 3600.0 | 0.00 | -0.00 | -0.00 | -0.30 | **-4.70** | 0.13 |
| 12 | | 2 | | -0.00 | -0.00 | 0.00 | -1.25 | 1.80 | **0.16** |
| 10 | | | 0.0 | 0.00 | -0.00 | 0.00 | -1.25 | -1.80 | **-0.16** |

C1 B1 A1 C2 B2 A2 B5 A5 20 18 17 16 11
10 09 03 02 01 C7 B7 A7 C8 B8 A8 C9 B9
the scale towards document
Patch Reference numbers on UTT
546

# BIJLAGE 9 ESA Prima Win output gevel in as 125 met hoofdentree

## Inhoudsopgave

Basisgegevens , gebruikte materialen

Materialenlijst

Doorsnede-eig. , standaard , gebruikte profielen

Belastinggevallen

Groep van variabele lasten

Niet-lineaire combinatie

Lokale niet-lineariteit

Verslag berekening.

Geometrie

EG dak

VB dak

EG glas

Wind druk

Wind zuiging

Interne krachten in staven (alles), non. c. 1/2, extremen.

Reacties (alles), non. c. 1/2, lokale extremen.

Vervorming in staven (alles), non. c. 3, globale extremen.

## Basisgegevens
## Structuurtype : Raamwerk XYZ

| | |
|---|---|
| Aantal knopen: | 86 |
| Aantal staven: | 111 |
| Aantal 1D macro's: | 67 |
| Aantal randlijnen: | 0 |
| Aantal 2D macro's: | 0 |
| Aantal profielen: | 18 |
| Aantal belastingsgev.: | 6 |
| Aantal materialen: | 1 |

## Materiaal

Naam
S235

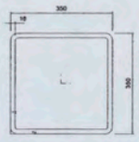
| | |
|---|---|
| Treksterkte | 360.000 MPa |
| Vloeigrens | 235.000 MPa |
| E-modulus | 210000.00 MPa |
| Poisson coëff. | 0.30 |
| Specifiek gewicht | 0.000 kg/mm^3 |
| Uitzettingscoëff. | 1.2e-005 mm/mm.K |

## Materialenlijst
## Groep staven:
## 1/111

| nr. | Naam | Kwaliteit | Eenh. gewicht kg/mm | Lengte mm | Massa kg |
|---|---|---|---|---|---|
| 4 | SHS350/350/16.0 | S235 | 0.17 | 171900.00 | 28472.66 |
| 7 | HEA240 | S235 | 0.06 | 14700.00 | 886.23 |
| 8 | HEA220 | S235 | 0.05 | 14700.00 | 741.99 |
| 9 | FLB200/12 | S235 | 0.02 | 42206.40 | 795.17 |
| 10 | HEA100 | S235 | 0.02 | 19952.00 | 332.04 |
| 11 | HEA280 | S235 | 0.08 | 10400.00 | 794.36 |
| 12 | HS100/100/8 | S235 | 0.01 | 25623.45 | 311.77 |
| 14 | HEM800 | S235 | 0.32 | 10400.00 | 3300.71 |

Totaal gewicht van constructie: 35634.92 kg
Verfoppervlakte: 366171455.13 mm^2

## Profielen



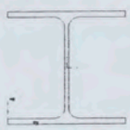

**SHS350/350/16.0**

Doorsnedenr. 4 - SHS350/350/16.0
Materiaal : 7 - S235

| | | | |
|---|---|---|---|
| A : | 2.110000e+004 mm^2 | | |
| Ay/A : | 0.500 | Az/A : | 0.500 |
| Iy : | 3.894000e+008 mm^4 | Iz : | 3.894000e+008 mm^4 |
| Iyz : | 2.710505e-007 mm^4 | It : | 6.099000e+008 mm^4 |
| Iw : | 7.002917e+012 mm^6 | | |
| Wely : | 2.225000e+006 mm^3 | Welz : | 2.225000e+006 mm^3 |
| Wply : | 2.604152e+006 mm^3 | Wplz : | 2.604152e+006 mm^3 |
| cy : | 175.00 mm | cz : | 175.00 mm |
| iy : | 135.85 mm | iz : | 135.85 mm |
| dy : | 0.00 mm | dz : | 0.00 mm |
| Omtrek : | | 1400.00 mm | |

Controletype: Kokerprofiel

| | | | |
|---|---|---|---|
| Hoogte | 350.00 mm | Breedte | 350.00 mm |
| Lijfdikte | 16.00 mm | | |



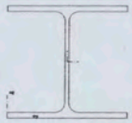
**HEA240**

Doorsnedenr. 7 - HEA240
Materiaal : 7 - S235

| | | | |
|---|---|---|---|
| A : | 7.680000e+003 mm^2 | | |
| Ay/A : | 0.653 | Az/A : | 0.202 |
| Iy : | 7.760000e+007 mm^4 | Iz : | 2.770000e+007 mm^4 |
| Iyz : | 0.000000e+000 mm^4 | It : | 4.160000e+005 mm^4 |
| Iw : | 3.294577e+011 mm^6 | | |
| Wely : | 6.750000e+005 mm^3 | Welz : | 2.310000e+005 mm^3 |
| Wply : | 7.440000e+005 mm^3 | Wplz : | 3.520000e+005 mm^3 |
| cy : | 120.00 mm | cz : | 115.00 mm |
| iy : | 100.52 mm | iz : | 60.06 mm |
| dy : | 0.00 mm | dz : | 0.00 mm |
| Omtrek : | | 1405.00 mm | |

Controletype: I-profiel

| | | | |
|---|---|---|---|
| Hoogte | 230.00 mm | Breedte | 240.00 mm |
| Flensdikte | 12.00 mm | Lijfdikte | 7.50 mm |
| Straal | 21.00 mm | | |



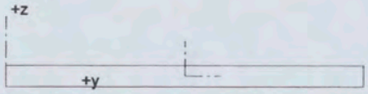
**HEA220**

Doorsnedenr. 8 - HEA220
Materiaal : 7 - S235

| | | | |
|---|---|---|---|
| A : | 6.430000e+003 mm^2 | | |
| Ay/A : | 0.651 | Az/A : | 0.203 |
| Iy : | 5.410000e+007 mm^4 | Iz : | 1.960000e+007 mm^4 |
| Iyz : | 0.000000e+000 mm^4 | It : | 2.850000e+005 mm^4 |
| Iw : | 1.938379e+011 mm^6 | | |
| Wely : | 5.150000e+005 mm^3 | Welz : | 1.780000e+005 mm^3 |
| Wply : | 5.680000e+005 mm^3 | Wplz : | 2.720000e+005 mm^3 |
| cy : | 110.00 mm | cz : | 105.00 mm |
| iy : | 91.73 mm | iz : | 55.21 mm |
| dy : | 0.00 mm | dz : | 0.00 mm |
| Omtrek : | | 1286.00 mm | |

Controletype: I-profiel

| | | | |
|---|---|---|---|
| Hoogte | 210.00 mm | Breedte | 220.00 mm |
| Flensdikte | 11.00 mm | Lijfdikte | 7.00 mm |
| Straal | 18.00 mm | | |



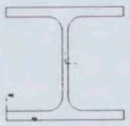

**FLB200/12**

Doorsnedenr. 9 - FLB200/12
Materiaal : 7 - S235

| | | | |
|---|---|---|---|
| A : | 2.400000e+003 mm^2 | | |
| Ay/A : | 0.838 | Az/A : | 0.833 |
| Iy : | 2.880000e+004 mm^4 | Iz : | 8.000000e+006 mm^4 |
| Iyz : | 0.000000e+000 mm^4 | It : | 1.152000e+005 mm^4 |
| Iw : | 0.000000e+000 mm^6 | | |

| | | | |
|---|---|---|---|
| A : | 2.400000e+003 mm^2 | | |
| Wely : | 4.800000e+003 mm^3 | Welz : | 8.000001e+004 mm^3 |
| Wply : | 7.200000e+003 mm^3 | Wplz : | 1.200000e+005 mm^3 |
| cy : | 100.00 mm | cz : | 6.00 mm |
| iy : | 3.46 mm | iz : | 57.74 mm |
| dy : | 0.00 mm | dz : | 0.00 mm |
| Omtrek : | | 424.00 mm | |

Controletype: A-typische doorsnede



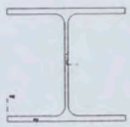
HEA100

Doorsnedenr. 10 - HEA100
Materiaal : 7 - S235

| | | | |
|---|---|---|---|
| A : | 2.120000e+003 mm^2 | | |
| Ay/A : | 0.657 | Az/A : | 0.196 |
| Iy : | 3.490000e+006 mm^4 | Iz : | 1.340000e+006 mm^4 |
| Iyz : | 0.000000e+000 mm^4 | It : | 5.240000e+004 mm^4 |
| Iw : | 2.588970e+009 mm^6 | | |
| Wely : | 7.280000e+004 mm^3 | Welz : | 2.680000e+004 mm^3 |
| Wply : | 8.400000e+004 mm^3 | Wplz : | 4.120000e+004 mm^3 |
| cy : | 50.00 mm | cz : | 48.00 mm |
| iy : | 40.57 mm | iz : | 25.14 mm |
| dy : | 0.00 mm | dz : | -0.00 mm |
| Omtrek : | | 582.00 mm | |

Controletype: I-profiel

| | | | |
|---|---|---|---|
| Hoogte | 96.00 mm | Breedte | 100.00 mm |
| Flensdikte | 8.00 mm | Lijfdikte | 5.00 mm |
| Straal | 12.00 mm | | |



HEA280

Doorsnedenr. 11 - HEA280

Materiaal : 7 - S235

| | | | |
|---|---|---|---|
| A : | 9.730000e+003 mm^2 | | |
| Ay/A : | 0.654 | Az/A : | 0.201 |
| Iy : | 1.370000e+008 mm^4 | Iz : | 4.760000e+007 mm^4 |
| Iyz : | 1.355253e-008 mm^4 | It : | 6.210000e+005 mm^4 |
| Iw : | 7.876902e+011 mm^6 | | |
| Wely : | 1.010000e+006 mm^3 | Welz : | 3.400000e+005 mm^3 |
| Wply : | 1.112000e+006 mm^3 | Wplz : | 5.180000e+005 mm^3 |
| cy : | 140.00 mm | cz : | 135.00 mm |
| iy : | 118.66 mm | iz : | 69.94 mm |
| dy : | 0.00 mm | dz : | 0.00 mm |
| Omtrek : | | 1644.00 mm | |

Controletype: I-profiel

| | | | |
|---|---|---|---|
| Hoogte | 270.00 mm | Breedte | 280.00 mm |
| Flensdikte | 13.00 mm | Lijfdikte | 8.00 mm |
| Straal | 24.00 mm | | |



**HS100/100/8**

Doorsnedenr. 12 - HS100/100/8
Materiaal : 7 - S235

| | | | |
|---|---|---|---|
| A : | 1.550000e+003 mm^2 | | |
| Ay/A : | 0.419 | Az/A : | 0.417 |
| Iy : | 2.300000e+006 mm^4 | Iz : | 5.990000e+005 mm^4 |
| Iy0 : | 1.450000e+006 mm^4 | Iz0 : | 1.440000e+006 mm^4 |
| alpha : | 44.831 deg | | |
| Iyz : | -8.496422e+005 mm^4 | It : | 3.410000e+004 mm^4 |
| Iw : | 0.000000e+000 mm^6 | | |
| Wely : | 3.248379e+004 mm^3 | Welz : | 1.547783e+004 mm^3 |
| Wply : | 5.117440e+004 mm^3 | Wplz : | 2.638780e+004 mm^3 |
| cy : | 27.37 mm | cz : | 27.37 mm |
| iy : | 38.52 mm | iz : | 19.66 mm |
| dy : | -33.94 mm | dz : | -0.00 mm |
| Omtrek : | | 400.00 mm | |

Controletype: Hoekprofiel

| | | | |
|---|---|---|---|
| Hoogte | 100.00 mm | Breedte | 100.00 mm |
| Flensdikte | 8.00 mm | Straal | 6.00 mm |




**HEM800**

Doorsnedenr. 14 - HEM800
Materiaal : 7 - S235

| | | | |
|---|---|---|---|
| A : | 4.043000e+004 mm^2 | | |
| Ay/A : | 0.519 | Az/A : | 0.390 |
| Iy : | 4.430000e+009 mm^4 | Iz : | 1.860000e+008 mm^4 |
| Iyz : | -1.084202e-007 mm^4 | It : | 1.646000e+007 mm^4 |
| Iw : | 2.833079e+013 mm^6 | | |
| Wely : | 1.087000e+007 mm^3 | Welz : | 1.230000e+006 mm^3 |
| Wply : | 1.250000e+007 mm^3 | Wplz : | 1.932000e+006 mm^3 |
| cy : | 151.50 mm | cz : | 407.00 mm |
| iy : | 331.02 mm | iz : | 67.83 mm |
| dy : | -0.00 mm | dz : | 0.00 mm |
| Omtrek : | | | 2798.00 mm |

Controletype: I-profiel

| | | | |
|---|---|---|---|
| Hoogte | 814.00 mm | Breedte | 303.00 mm |
| Flensdikte | 40.00 mm | Lijfdikte | 21.00 mm |
| Straal | 30.00 mm | | |

## Belastinggevallen

| B | Naam | Omschrijving |
|---|---|---|
| G | | |

| B G | Naam | Omschrijving |
|---|---|---|
| 1 | EG glas | Permanent - Lasten |
| 2 | EG Dak | Permanent - Lasten |
| 3 | wind2 zuiging | Variabel - wind<br>Lange termijn |
| 4 | wind1 druk | Variabel - wind |
| 5 | EG constructie | Eigengewicht. Richting -Z |
| 6 | vb dak | Permanent - Lasten |

## Groep van variabele lasten

| Naam | Omschrijving |
|---|---|
| wind | NEN - momentaan factor = 1.00 |

## Niet-lineaire combinatie

| Combi | Groep van voorvervormingen | | dx mm/m | dy mm/m | Groep van voorkrommingen | BG | coëff |
|---|---|---|---|---|---|---|---|
| C 1 | | 0 | 0.00 | 0.00 | | 0 1 EG glas | 1.20 |
| | | 0 | 0.00 | 0.00 | | 0 2 EG Dak | 1.20 |
| | | 0 | 0.00 | 0.00 | | 0 3 wind2 zuiging | 1.50 |
| | | 0 | 0.00 | 0.00 | | 0 5 EG constructie | 1.20 |
| | | 0 | 0.00 | 0.00 | | 0 6 vb dak | 1.20 |
| C 2 | | 0 | 0.00 | 0.00 | | 0 1 EG glas | 1.20 |
| | | 0 | 0.00 | 0.00 | | 0 2 EG Dak | 1.20 |
| | | 0 | 0.00 | 0.00 | | 0 4 wind1 druk | 1.50 |
| | | 0 | 0.00 | 0.00 | | 0 5 EG constructie | 1.20 |
| | | 0 | 0.00 | 0.00 | | 0 6 vb dak | 1.20 |
| C 3 | | 0 | 0.00 | 0.00 | | 0 1 EG glas | 1.00 |
| | | 0 | 0.00 | 0.00 | | 0 2 EG Dak | 1.00 |
| | | 0 | 0.00 | 0.00 | | 0 4 wind1 druk | 1.00 |
| | | 0 | 0.00 | 0.00 | | 0 5 EG constructie | 1.00 |
| | | 0 | 0.00 | 0.00 | | 0 6 vb dak | 1.00 |

## Lokale niet-lineariteit

| staaf | Type |
|---|---|
| 69 | Alleen trek |
| 70 | Alleen trek |
| 74 | Alleen trek |
| 75 | Alleen trek |

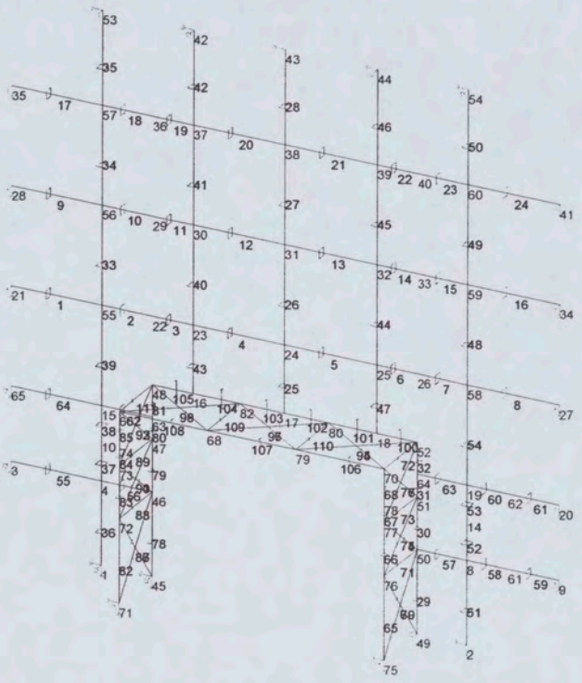
| staaf | Type |
|---|---|
| 76 | Alleen trek |
| 77 | Alleen trek |
| 86 | Alleen trek |
| 87 | Alleen trek |
| 90 | Alleen trek |
| 91 | Alleen trek |
| 92 | Alleen trek |
| 93 | Alleen trek |
| 94 | Alleen trek |
| 95 | Alleen trek |
| 96 | Alleen trek |
| 97 | Alleen trek |
| 98 | Alleen trek |
| 99 | Alleen trek |

## Verslag berekening.

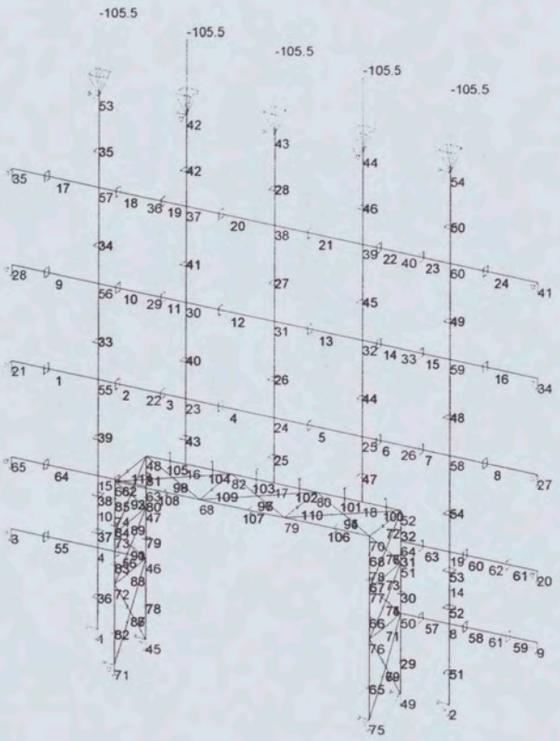
## Niet-lineaire berekening

| | |
|---|---|
| Aantal 2D elementen | 0 |
| Aantal 1D elementen | 111 |
| Aantal netknopen | 86 |
| Aantal vergelijkingen | 516 |
| Maximum iteraties | 50 |
| Type van niet-lineariteit | lokale niet-lineariteiten |

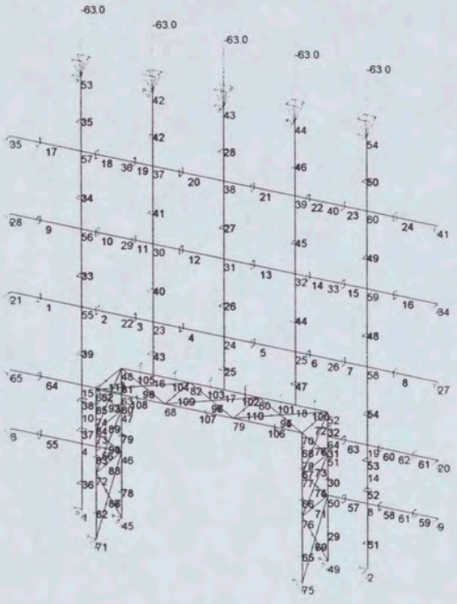
| Aantal combinaties | Start | Eind | Aantal iteraties |
|---|---|---|---|
| NC 1 | 19.12.2005 10:41 | 19.12.2005 10:41 | 2 |
| NC 2 | 19.12.2005 10:41 | 19.12.2005 10:41 | 3 |
| NC 3 | 19.12.2005 10:41 | 19.12.2005 10:41 | 3 |



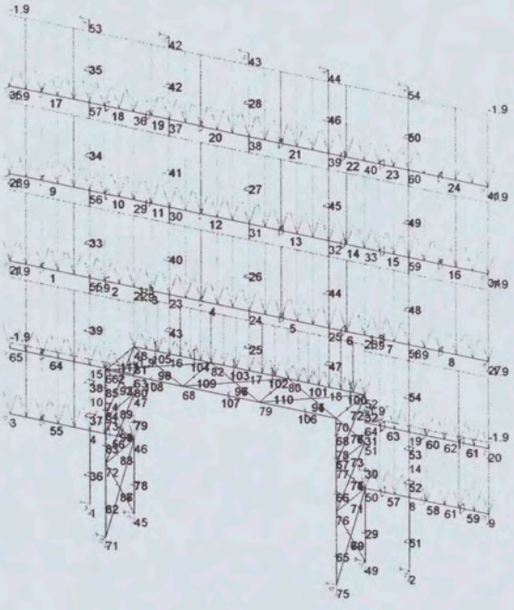
Geometrie



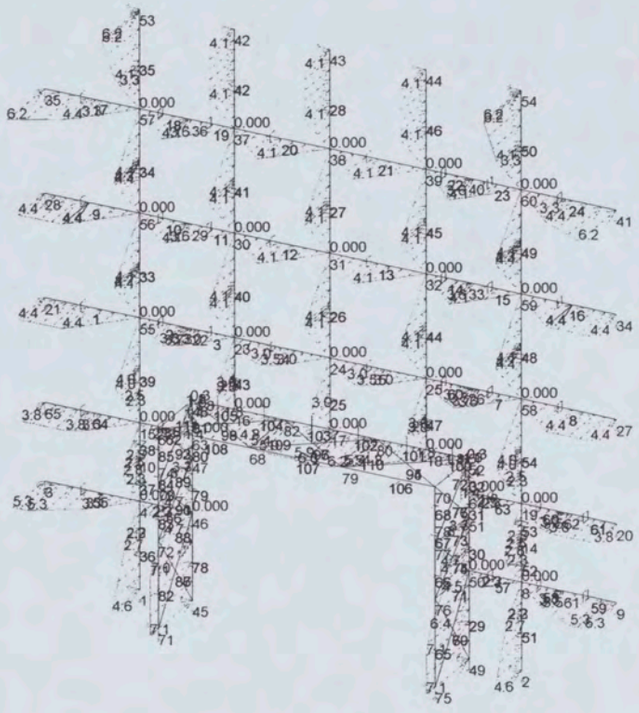

EG dak



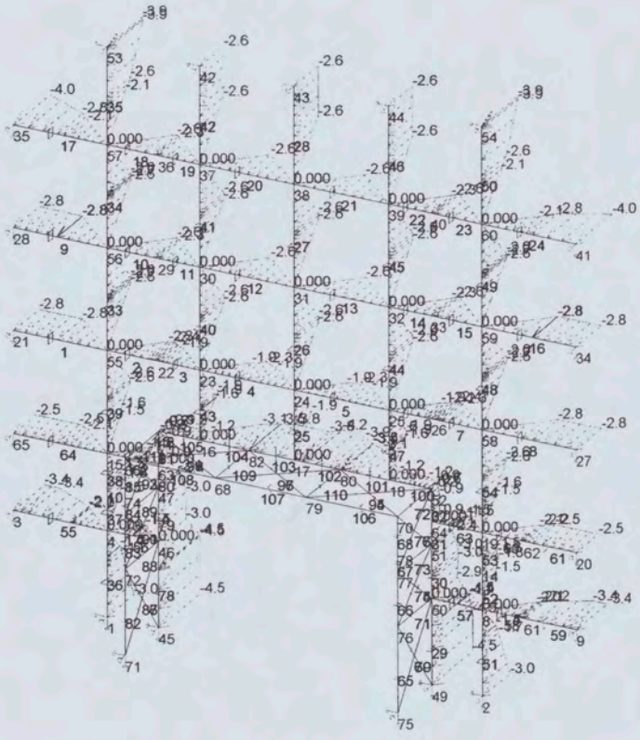

VB dak




EG glas



Wind druk



Wind zuiging

## Interne krachten in staven. Extremen per staaf

Niet-lineaire berekening, lokale niet-lineariteiten

Groep van staven:1/111

Groep van niet-lineaire combinaties:1/2

| staaf | doorsn. | non. c. | dx [mm] | N [kN] | Vy [kN] | Vz [kN] | Mx [kNm] | My [kNm] | Mz [kNm] |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 4 | 1 | 0.0 | -0.00 | **0.93** | **-17.98** | 0.00 | 0.00 | 0.00 |
| | | 2 | 3600.0 | -0.00 | **-14.74** | 11.23 | 0.00 | **64.33** | **-25.79** |
| | | | 0.0 | -0.00 | 0.41 | **28.59** | -0.00 | 0.00 | 0.00 |
| | | 1 | 3600.0 | -0.00 | -14.22 | -6.86 | -0.00 | **-40.01** | -23.92 |
| | | | 257.1 | -0.00 | -0.15 | -16.89 | -0.00 | -4.48 | **0.10** |
| 2 | | | 0.0 | **28.74** | 48.88 | -0.80 | **-18.21** | -31.27 | -82.04 |
| | | 2 | | 25.67 | **60.25** | 2.71 | **25.96** | 48.92 | **-102.56** |
| | | 1 | 2000.0 | 28.74 | 40.47 | **3.38** | -18.21 | -29.97 | 7.31 |
| | | 2 | | 25.67 | 51.83 | **-3.81** | 25.96 | 49.82 | **9.52** |
| | | | 1142.9 | 25.67 | 55.44 | 0.48 | 25.96 | **51.16** | -36.45 |
| | | 1 | 857.1 | 28.74 | 45.28 | 0.00 | -18.21 | **-31.72** | -41.69 |
| 3 | | | 0.0 | **28.74** | 40.47 | 3.38 | **-18.21** | **-29.97** | 7.31 |
| | | 2 | | 25.67 | **51.83** | -3.81 | **25.96** | **49.82** | 9.52 |
| | | 1 | 1600.0 | 28.74 | 33.73 | **6.13** | -18.21 | -21.65 | 66.67 |
| | | 2 | | 25.67 | 45.10 | **-8.12** | 25.96 | 39.15 | **87.07** |
| 4 | | 1 | 0.0 | **43.79** | **52.93** | -2.55 | **-5.26** | -26.97 | **-70.98** |
| | | | 3600.0 | 43.79 | 37.78 | **4.28** | -5.26 | -23.85 | **92.31** |
| | | 2 | | 42.69 | 33.60 | **-7.04** | 8.27 | 40.45 | 86.25 |
| | | | 0.0 | 42.69 | 48.75 | 3.63 | **8.27** | 46.59 | -61.98 |
| | | | 1542.9 | 42.69 | 42.26 | -0.39 | 8.27 | **50.10** | 8.22 |
| | | 1 | | 43.79 | 46.44 | 0.03 | -5.26 | **-29.57** | 5.68 |
| 5 | | | 0.0 | **43.79** | -37.79 | **-4.28** | **5.27** | -23.85 | **92.31** |
| | | | 3600.0 | 43.79 | **-52.93** | 2.55 | 5.27 | -26.97 | **-70.98** |
| | | 2 | 0.0 | 42.69 | -33.61 | **7.05** | **-8.28** | 40.45 | 86.26 |
| | | | 2057.1 | 42.69 | -42.26 | 0.40 | -8.28 | **50.12** | 8.22 |
| | | 1 | | 43.79 | -46.44 | -0.03 | 5.27 | **-29.57** | 5.68 |
| 6 | | | 0.0 | **28.74** | -33.73 | **-6.12** | **18.20** | -21.66 | 66.67 |
| | | 2 | 1600.0 | 25.67 | **-51.83** | 3.79 | -25.93 | **49.80** | 9.52 |
| | | | 0.0 | 25.67 | -45.09 | **8.09** | **-25.93** | 39.18 | **87.06** |
| | | 1 | 1600.0 | 28.74 | -40.46 | -3.36 | 18.20 | **-29.96** | 7.31 |
| 7 | | | 0.0 | **28.74** | -40.46 | **-3.36** | **18.20** | -29.96 | 7.31 |
| | | 2 | 2000.0 | 25.67 | **-60.24** | -2.74 | -25.93 | 48.85 | **-102.55** |
| | | | 0.0 | 25.67 | -51.83 | **3.79** | **-25.93** | 49.80 | **9.52** |
| | | | 857.1 | 25.67 | -55.43 | -0.50 | -25.93 | **51.13** | -36.45 |
| | | 1 | 1142.9 | 28.74 | -45.27 | 0.02 | 18.20 | **-31.69** | -41.68 |
| 8 | | 2 | 0.0 | -0.00 | **14.74** | -11.22 | -0.00 | **64.30** | **-25.79** |
| | | 1 | 3600.0 | -0.00 | **-0.93** | **17.97** | 0.00 | 0.00 | 0.00 |
| | | 2 | | -0.00 | -0.41 | **-28.58** | -0.00 | 0.00 | 0.00 |
| | | 1 | 0.0 | -0.00 | 14.22 | 6.85 | 0.00 | **-39.98** | -23.92 |
| | | | 3342.9 | -0.00 | 0.15 | 16.89 | 0.00 | -4.48 | **0.10** |
| 9 | | | 0.0 | 0.00 | **5.77** | **-20.87** | 0.00 | 0.00 | 0.00 |

| staaf | doorsn. | non. c. | dx [mm] | N [kN] | Vy [kN] | Vz [kN] | Mx [kNm] | My [kNm] | Mz [kNm] |
|---|---|---|---|---|---|---|---|---|---|
| | | 2 | 3600.0 | 0.00 | **-9.97** | 15.89 | -0.00 | **81.10** | **-8.63** |
| | | | 0.0 | 0.00 | 5.18 | **33.25** | 0.00 | 0.00 | 0.00 |
| | | 1 | 3600.0 | 0.00 | -9.38 | -9.75 | 0.00 | **-50.43** | -6.50 |
| | | | 1285.7 | 0.00 | 0.36 | -15.45 | 0.00 | -23.35 | **3.94** |
| 10 | | | 0.0 | **-2.57** | 55.60 | **-7.68** | **0.19** | -29.01 | -96.77 |
| | | 2 | | -2.18 | **66.29** | **11.77** | **-1.03** | 47.75 | **-115.58** |
| | | | 2000.0 | -2.18 | 57.88 | 5.07 | -1.03 | **66.74** | **8.59** |
| | | 1 | | -2.57 | 47.18 | -3.39 | 0.19 | **-41.45** | 6.02 |
| 11 | | | 0.0 | **-2.57** | 47.18 | **-3.39** | **0.19** | -41.45 | 6.02 |
| | | 2 | | -2.18 | **57.88** | **5.07** | **-1.03** | 66.74 | 8.59 |
| | | | 1600.0 | -2.18 | 51.14 | 0.69 | -1.03 | **70.17** | **95.81** |
| | | 1 | | -2.57 | 40.45 | -0.58 | 0.19 | **-43.88** | 76.12 |
| 12 | | | 0.0 | **-1.59** | **52.31** | **-4.32** | -0.07 | -33.34 | **-71.26** |
| | | 2 | | -1.39 | 49.23 | **6.94** | **-0.29** | 54.02 | -64.54 |
| | | | 2057.1 | -1.39 | 40.57 | -0.07 | -0.29 | **63.36** | 27.82 |
| | | 1 | | -1.59 | 43.65 | 0.17 | -0.07 | **-39.06** | 27.44 |
| | | | 3600.0 | -1.59 | 37.16 | 2.78 | -0.07 | -36.12 | **89.78** |
| 13 | | | 0.0 | **-1.59** | -37.16 | -2.77 | 0.06 | -36.12 | **89.78** |
| | | | 3600.0 | -1.59 | **-52.31** | **4.32** | 0.06 | -33.33 | **-71.27** |
| | | 2 | | -1.39 | -49.23 | **-6.95** | 0.29 | 54.01 | -64.55 |
| | | | 0.0 | -1.39 | -34.08 | 4.13 | **0.29** | 59.07 | 85.41 |
| | | | 1542.9 | -1.39 | -40.58 | 0.06 | 0.29 | **63.36** | 27.82 |
| | | 1 | | -1.59 | -43.65 | -0.17 | 0.06 | **-39.06** | 27.44 |
| 14 | | | 0.0 | **-2.57** | -40.45 | 0.58 | **-0.19** | **-43.87** | 76.12 |
| | | 2 | 1600.0 | -2.18 | **-57.87** | **-5.06** | 1.03 | 66.73 | 8.59 |
| | | 1 | | -2.57 | -47.18 | **3.38** | -0.19 | -41.44 | 6.02 |
| | | 2 | 0.0 | -2.18 | -51.14 | -0.68 | **1.03** | **70.16** | **95.79** |
| 15 | | 1 | | **-2.57** | -47.18 | 3.38 | **-0.19** | **-41.44** | 6.02 |
| | | 2 | 2000.0 | -2.18 | **-66.28** | **-11.76** | 1.03 | 47.76 | **-115.56** |
| | | 1 | | -2.57 | -55.60 | **7.68** | -0.19 | -29.00 | -96.76 |
| | | 2 | 0.0 | -2.18 | -57.87 | -5.06 | **1.03** | **66.73** | **8.59** |
| 16 | | | | 0.00 | **9.97** | -15.89 | 0.00 | **81.11** | **-8.63** |
| | | 1 | 3600.0 | 0.00 | **-5.77** | **20.87** | 0.00 | 0.00 | 0.00 |
| | | 2 | | 0.00 | -5.18 | **-33.25** | 0.00 | 0.00 | 0.00 |
| | | 1 | 0.0 | 0.00 | 9.38 | 9.75 | -0.00 | **-50.43** | -6.50 |
| | | | 2314.3 | 0.00 | -0.36 | 15.45 | -0.00 | -23.35 | **3.94** |
| 17 | | | 0.0 | 0.00 | **5.41** | **-13.93** | -0.00 | -0.00 | 0.00 |
| | | 2 | 3600.0 | 0.00 | **-10.46** | 2.10 | -0.00 | **32.76** | **-10.38** |
| | | | 0.0 | 0.00 | 4.69 | **21.78** | 0.00 | 0.00 | 0.00 |
| | | 1 | 3600.0 | 0.00 | -9.74 | -1.33 | 0.00 | **-20.92** | -7.79 |
| | | | 1285.7 | 0.00 | 0.00 | -7.10 | 0.00 | -13.33 | **3.48** |
| 18 | | 2 | 0.0 | **-18.66** | **58.35** | 1.81 | **-25.90** | 50.20 | **-101.44** |
| | | 1 | 2000.0 | -15.59 | 40.29 | **3.08** | 16.05 | -30.89 | 4.48 |
| | | 2 | | -18.66 | 49.93 | **-4.89** | -25.90 | 49.26 | **6.84** |
| | | 1 | 0.0 | -15.59 | 48.71 | -1.22 | **16.05** | -31.37 | -84.52 |
| | | 2 | 1000.0 | -18.66 | 54.14 | 0.10 | -25.90 | **51.43** | -45.19 |
| | | 1 | | -15.59 | 44.50 | -0.12 | 16.05 | **-32.22** | -37.92 |

| staaf | doorsn. | non. c. | dx [mm] | N [kN] | Vy [kN] | Vz [kN] | Mx [kNm] | My [kNm] | Mz [kNm] |
|---|---|---|---|---|---|---|---|---|---|
| 19 | | 2 | 0.0 | **-18.66** | **49.93** | -4.89 | **-25.90** | **49.26** | 6.84 |
| | | 1 | 1600.0 | -15.59 | 33.56 | **5.88** | 16.05 | -22.98 | 63.56 |
| | | 2 | | -18.66 | 43.20 | **-9.27** | -25.90 | 36.77 | **81.34** |
| | | 1 | 0.0 | -15.59 | 40.29 | 3.08 | **16.05** | **-30.89** | 4.48 |
| 20 | | 2 | | **-47.95** | 44.68 | 3.08 | **-9.55** | 45.48 | -54.05 |
| | | 1 | | -42.60 | **47.77** | -2.03 | **5.91** | -28.20 | **-61.01** |
| | | | 3600.0 | -42.60 | 32.63 | **5.07** | 5.91 | -22.72 | **83.71** |
| | | 2 | | -47.95 | 29.53 | **-8.00** | -9.55 | 36.64 | 79.53 |
| | | | 1285.7 | -47.95 | 39.27 | 0.26 | -9.55 | **48.24** | -0.08 |
| | | 1 | | -42.60 | 42.36 | -0.22 | 5.91 | **-30.03** | -3.07 |
| 21 | | 2 | 0.0 | **-47.95** | -29.53 | **7.99** | **9.55** | 36.64 | 79.53 |
| | | 1 | 3600.0 | -42.60 | **-47.78** | 2.03 | -5.91 | -28.19 | **-61.02** |
| | | | 0.0 | -42.60 | -32.63 | **-5.07** | **-5.91** | -22.72 | **83.71** |
| | | 2 | 2314.3 | -47.95 | -39.27 | -0.26 | 9.55 | **48.24** | -0.09 |
| | | 1 | | -42.60 | -42.37 | 0.22 | -5.91 | **-30.03** | -3.07 |
| 22 | | 2 | 0.0 | **-18.66** | -43.19 | **9.27** | **25.89** | 36.76 | **81.33** |
| | | | 1600.0 | -18.66 | **-49.92** | 4.89 | 25.89 | **49.26** | 6.84 |
| | | 1 | 0.0 | -15.59 | -33.56 | **-5.88** | **-16.05** | -22.97 | 63.55 |
| | | | 1600.0 | -15.59 | -40.29 | -3.08 | -16.05 | **-30.88** | 4.47 |
| 23 | | 2 | 0.0 | **-18.66** | -49.92 | **4.89** | **25.89** | 49.26 | **6.84** |
| | | | 2000.0 | -18.66 | **-58.34** | -1.81 | 25.89 | 50.20 | **-101.42** |
| | | 1 | 0.0 | -15.59 | -40.29 | **-3.08** | **-16.05** | -30.88 | 4.47 |
| | | 2 | 1000.0 | -18.66 | -54.13 | -0.10 | 25.89 | **51.43** | -45.19 |
| | | 1 | | -15.59 | -44.50 | 0.12 | -16.05 | **-32.22** | -37.92 |
| 24 | | 2 | 0.0 | 0.00 | **10.46** | -2.10 | 0.00 | **32.76** | **-10.39** |
| | | 1 | 3600.0 | 0.00 | **-5.41** | **13.93** | -0.00 | 0.00 | 0.00 |
| | | 2 | | 0.00 | -4.69 | **-21.78** | 0.00 | 0.00 | 0.00 |
| | | 1 | 0.0 | 0.00 | 9.74 | 1.33 | -0.00 | **-20.93** | -7.79 |
| | | | 2314.3 | 0.00 | -0.00 | 7.10 | -0.00 | -13.33 | **3.48** |
| 25 | | 2 | 0.0 | **-35.59** | **0.00** | **40.52** | 0.00 | -0.00 | -0.00 |
| | | 1 | | -14.88 | 0.00 | **-25.75** | -0.00 | 0.00 | -0.00 |
| | | 2 | 2625.0 | -30.37 | 0.00 | 34.63 | 0.00 | **98.64** | **0.00** |
| | | 1 | | -9.66 | 0.00 | -21.98 | -0.00 | **-62.64** | 0.00 |
| 26 | | 2 | 0.0 | **-97.58** | **0.00** | **20.54** | **0.00** | 82.09 | **-0.00** |
| | | 1 | | -85.23 | 0.00 | **-13.41** | 0.00 | -52.11 | -0.00 |
| | | 2 | 3850.0 | -89.93 | 0.00 | 7.92 | 0.00 | **136.88** | **0.00** |
| | | 1 | | -77.58 | 0.00 | -5.33 | 0.00 | **-88.17** | 0.00 |
| 27 | | 2 | 0.0 | **-158.09** | **0.00** | -0.35 | **-0.00** | **137.45** | **-0.00** |
| | | 1 | 3850.0 | -144.25 | 0.00 | **8.30** | 0.00 | -71.64 | 0.00 |
| | | 2 | | -150.44 | 0.00 | **-12.96** | -0.00 | 111.83 | **0.00** |
| | | 1 | 0.0 | -151.90 | 0.00 | 0.22 | **0.00** | **-88.04** | -0.00 |
| 28 | | | | **-209.50** | **0.00** | 18.44 | 0.00 | **-83.46** | **-0.00** |
| | | 2 | | -209.50 | **-0.00** | -28.95 | -0.00 | **130.94** | **0.00** |
| | | 1 | 3675.0 | -202.20 | 0.00 | **29.37** | 0.00 | 0.00 | -0.00 |
| | | 2 | | -202.20 | -0.00 | **-46.04** | 0.00 | 0.00 | -0.00 |
| 29 | 7 | | 0.0 | **-655.25** | **0.30** | **13.46** | **0.00** | -0.00 | **-0.00** |
| | | | 3238.0 | -652.91 | 0.30 | **-17.98** | 0.00 | **-10.46** | **0.98** |

| staaf | doorsn. | non. c. | dx [mm] | N [kN] | Vy [kN] | Vz [kN] | Mx [kNm] | My [kNm] | Mz [kNm] |
|---|---|---|---|---|---|---|---|---|---|
| | | 1 | 0.0 | -191.06 | 0.07 | -9.79 | **-0.00** | -0.00 | 0.00 |
| | | 2 | 1349.2 | -654.28 | 0.30 | -0.84 | 0.00 | **8.51** | 0.41 |
| 30 | | | 0.0 | **-455.57** | 0.63 | **9.18** | **0.00** | **-10.46** | 0.98 |
| | | 1 | | -262.35 | **1.04** | **-4.77** | **-0.00** | **2.92** | 0.24 |
| | | | 2040.0 | -260.87 | 1.04 | 3.74 | -0.00 | 2.21 | **2.36** |
| 31 | | 2 | 0.0 | **-348.26** | 0.63 | **23.71** | **0.00** | -5.81 | 2.25 |
| | | 1 | | -316.36 | **1.04** | **-16.18** | 0.00 | 2.21 | 2.35 |
| | | 2 | 847.0 | -347.65 | 0.63 | 20.71 | 0.00 | **12.82** | 2.78 |
| | | 1 | | -315.74 | 1.04 | -14.26 | 0.00 | **-10.57** | **3.23** |
| 32 | | 2 | 0.0 | **-365.12** | 8.14 | -9.20 | **0.00** | **12.82** | 2.78 |
| | | 1 | | -313.35 | **9.36** | 7.82 | 0.00 | **-10.57** | 3.23 |
| | | | 1225.0 | -312.46 | 9.36 | **9.38** | 0.00 | 0.00 | **14.70** |
| | | 2 | | -364.24 | 8.14 | **-11.63** | 0.00 | 0.00 | 12.76 |
| 33 | 4 | | 0.0 | **-369.88** | **-30.32** | **15.37** | **-15.91** | 36.88 | **61.96** |
| | | 1 | | -348.23 | -26.18 | **-10.34** | **10.98** | -21.37 | 54.18 |
| | | 2 | 3850.0 | -362.22 | -30.32 | 2.72 | -15.91 | **71.70** | **-54.78** |
| | | 1 | | -340.58 | -26.18 | -2.25 | 10.98 | **-45.61** | -46.61 |
| 34 | | 2 | 0.0 | **-285.96** | **-28.14** | **6.84** | **17.44** | 70.66 | **52.17** |
| | | | 3850.0 | -278.31 | -28.14 | **-5.81** | 17.44 | 72.65 | **-56.19** |
| | | 1 | 0.0 | -275.60 | -23.61 | -4.32 | **-10.44** | -45.41 | 43.65 |
| | | 2 | 2053.3 | -281.88 | -28.14 | -0.29 | 17.44 | **79.78** | -5.62 |
| | | 1 | | -271.52 | -23.61 | 0.24 | -10.44 | **-51.13** | -4.83 |
| 35 | | | 0.0 | **-209.50** | -8.02 | 3.66 | -0.00 | **-30.41** | 29.48 |
| | | 2 | | -209.50 | **-9.49** | -5.52 | 0.00 | **46.75** | **34.87** |
| | | 1 | 3675.0 | -202.20 | -8.02 | **16.57** | 0.00 | 0.00 | 0.00 |
| | | 2 | | -202.20 | -9.49 | **-25.68** | 0.00 | 0.00 | 0.00 |
| 36 | | | 0.0 | **-540.04** | **-12.49** | **4.11** | 0.00 | -0.00 | 0.00 |
| | | | 3238.0 | -533.60 | -12.49 | **-9.23** | 0.00 | **-13.92** | **-40.44** |
| | | 1 | | -457.47 | -6.73 | 3.73 | 0.00 | **1.86** | -21.78 |
| 37 | | 2 | 0.0 | **-495.79** | **-12.17** | -5.36 | **-14.80** | -13.92 | **9.43** |
| | | 1 | 1662.0 | -435.79 | -5.77 | **9.80** | 5.48 | **15.23** | -7.57 |
| | | 2 | | -492.49 | -12.17 | **-9.62** | -14.80 | **-25.35** | **-10.79** |
| | | 1 | 0.0 | -439.09 | -5.77 | 7.07 | **5.48** | 1.86 | 2.01 |
| 38 | | 2 | | **-492.49** | **-12.17** | -9.62 | **-14.80** | -25.35 | -10.79 |
| | | 1 | 1225.0 | -433.36 | -5.77 | **11.42** | 5.48 | **28.55** | -14.64 |
| | | 2 | | -490.05 | -12.17 | **-12.15** | -14.80 | **-39.19** | **-25.69** |
| | | 1 | 0.0 | -435.79 | -5.77 | 9.80 | **5.48** | 15.23 | -7.57 |
| 39 | | 2 | | **-452.52** | **-4.65** | **19.11** | **-31.33** | **-39.19** | **3.09** |
| | | 1 | | -418.98 | **2.56** | **-12.14** | **19.72** | **28.55** | -13.79 |
| | | 2 | 3850.0 | -444.86 | -4.65 | 6.85 | -31.33 | 10.92 | **-14.82** |
| 40 | | 1 | 0.0 | **-250.88** | -38.64 | **-12.09** | **5.32** | -46.58 | 75.71 |
| | | 2 | | -224.37 | **-42.23** | **19.20** | **-7.44** | 71.38 | **82.89** |
| | | | 3850.0 | -216.72 | -42.23 | 6.58 | -7.44 | **121.02** | **-79.70** |
| | | 1 | | -243.23 | -38.64 | -4.01 | 5.32 | **-77.56** | -73.07 |
| 41 | | | 0.0 | **-231.37** | -39.62 | -0.27 | **-5.22** | -77.82 | 74.32 |
| | | 2 | | -218.64 | **-43.02** | 0.33 | **8.72** | 121.77 | **80.65** |
| | | 1 | 3850.0 | -223.72 | -39.62 | **7.81** | -5.22 | -63.31 | -78.22 |





| staaf | doorsn. | non. c. | dx [mm] | N [kN] | Vy [kN] | Vz [kN] | Mx [kNm] | My [kNm] | Mz [kNm] |
|---|---|---|---|---|---|---|---|---|---|
| | | 2 | | -210.99 | -43.02 | **-12.29** | 8.72 | 98.75 | **-84.97** |
| | | | 513.3 | -217.62 | -43.02 | -0.12 | 8.72 | **121.86** | 58.57 |
| | | 1 | | -230.35 | -39.62 | 0.02 | -5.22 | **-77.91** | 53.98 |
| 42 | | | 0.0 | **-209.50** | -12.61 | 15.71 | -0.00 | **-73.46** | 46.34 |
| | | 2 | | -209.50 | **-13.72** | -24.64 | 0.00 | **115.09** | **50.43** |
| | | 1 | 3675.0 | -202.20 | -12.61 | **26.65** | 0.00 | 0.00 | 0.00 |
| | | 2 | | -202.20 | -13.72 | **-41.72** | 0.00 | 0.00 | 0.00 |
| 43 | | 1 | 0.0 | **-275.30** | -23.60 | **-24.59** | 0.00 | 0.00 | 0.00 |
| | | 2 | | -233.24 | **-25.21** | **36.91** | -0.00 | -0.00 | 0.00 |
| | | | 2625.0 | -228.02 | -25.21 | 30.96 | -0.00 | **89.07** | **-66.17** |
| | | 1 | | -270.08 | -23.60 | -20.77 | 0.00 | **-59.53** | -61.94 |
| 44 | | | 0.0 | **-250.89** | 38.64 | **-12.09** | **-5.31** | -46.56 | -75.71 |
| | | 2 | | -224.39 | **42.23** | **19.21** | **7.43** | 71.35 | **-82.88** |
| | | | 3850.0 | -216.74 | 42.23 | 6.59 | 7.43 | **121.02** | **79.70** |
| | | 1 | | -243.24 | 38.64 | -4.01 | -5.31 | **-77.56** | 73.07 |
| 45 | | | 0.0 | **-231.38** | 39.62 | -0.27 | **5.22** | -77.82 | -74.32 |
| | | 2 | | -218.65 | **43.02** | 0.33 | **-8.72** | 121.77 | **-80.65** |
| | | 1 | 3850.0 | -223.72 | 39.62 | **7.81** | 5.22 | -63.32 | 78.22 |
| | | 2 | | -211.00 | 43.02 | **-12.29** | -8.72 | 98.75 | **84.96** |
| | | | 513.3 | -217.63 | 43.02 | -0.12 | -8.72 | **121.86** | -58.57 |
| | | 1 | | -230.36 | 39.62 | 0.02 | 5.22 | **-77.91** | -53.98 |
| 46 | | | 0.0 | **-209.50** | 12.61 | 15.71 | 0.00 | **-73.46** | -46.34 |
| | | 2 | | -209.50 | **13.72** | -24.64 | -0.00 | **115.09** | **-50.42** |
| | | 1 | 3675.0 | -202.20 | 12.61 | **26.65** | 0.00 | 0.00 | -0.00 |
| | | 2 | | -202.20 | 13.72 | **-41.73** | 0.00 | 0.00 | -0.00 |
| 47 | | 1 | 0.0 | **-275.31** | 23.60 | **-24.57** | -0.00 | 0.00 | -0.00 |
| | | 2 | | -233.27 | **25.21** | **36.89** | 0.00 | -0.00 | -0.00 |
| | | | 2625.0 | -228.05 | 25.21 | 30.93 | 0.00 | **89.00** | **66.17** |
| | | 1 | | -270.09 | 23.60 | -20.76 | -0.00 | **-59.49** | 61.94 |
| 48 | | 2 | 0.0 | **-369.86** | **30.32** | **15.36** | **15.91** | 36.92 | **-61.95** |
| | | 1 | | -348.23 | 26.18 | **-10.34** | **-10.98** | -21.40 | -54.18 |
| | | 2 | 3850.0 | -362.21 | 30.32 | 2.71 | 15.91 | **71.71** | **54.77** |
| | | 1 | | -340.57 | 26.18 | -2.24 | -10.98 | **-45.61** | 46.61 |
| 49 | | 2 | 0.0 | **-285.95** | **28.14** | **6.84** | **-17.44** | 70.67 | **-52.16** |
| | | | 3850.0 | -278.30 | 28.14 | **-5.81** | -17.44 | 72.65 | **56.18** |
| | | 1 | 0.0 | -275.60 | 23.61 | -4.32 | **10.44** | -45.42 | -43.65 |
| | | 2 | 2053.3 | -281.87 | 28.14 | -0.29 | -17.44 | **79.78** | 5.62 |
| | | 1 | | -271.52 | 23.61 | 0.24 | 10.44 | **-51.13** | 4.83 |
| 50 | | | 0.0 | **-209.50** | 8.02 | 3.66 | 0.00 | **-30.41** | -29.48 |
| | | 2 | | -209.50 | **9.49** | -5.52 | -0.00 | **46.75** | **-34.86** |
| | | 1 | 3675.0 | -202.20 | 8.02 | **16.57** | 0.00 | -0.00 | -0.00 |
| | | 2 | | -202.20 | 9.49 | **-25.68** | 0.00 | 0.00 | -0.00 |
| 51 | | | 0.0 | **-539.97** | **12.49** | **4.08** | 0.00 | -0.00 | -0.00 |
| | | | 3238.0 | -533.54 | 12.49 | **-9.26** | 0.00 | **-14.03** | **40.43** |
| | | 1 | | -457.45 | 6.73 | 3.76 | 0.00 | **1.95** | 21.78 |
| 52 | | 2 | 0.0 | **-495.75** | **12.16** | -5.34 | **14.82** | -14.03 | **-9.42** |
| | | 1 | 1662.0 | -435.78 | 5.76 | **9.79** | -5.49 | **15.29** | 7.57 |



the scale towards document
Patch Reference numbers on UTT Scan Reference Chart TE263 Serial No. 546

| staaf | doorsn. | non. c. | dx [mm] | N [kN] | Vy [kN] | Vz [kN] | Mx [kNm] | My [kNm] | Mz [kNm] |
|---|---|---|---|---|---|---|---|---|---|
| | | 2 | | -492.45 | 12.16 | **-9.60** | 14.82 | **-25.43** | **10.79** |
| | | 1 | 0.0 | -439.08 | 5.76 | 7.05 | **-5.49** | 1.95 | -2.01 |
| 53 | | 2 | | **-492.45** | **12.16** | -9.60 | **14.82** | -25.43 | 10.79 |
| | | 1 | 1225.0 | -433.34 | 5.76 | **11.40** | -5.49 | **28.59** | 14.64 |
| | | 2 | | -490.01 | 12.16 | **-12.13** | 14.82 | **-39.24** | **25.69** |
| | | 1 | 0.0 | -435.78 | 5.76 | 9.79 | **-5.49** | 15.29 | 7.57 |
| 54 | | 2 | | **-452.49** | **4.65** | **19.14** | **31.36** | **-39.24** | **-3.08** |
| | | 1 | | -418.98 | **-2.56** | **-12.16** | **-19.75** | **28.59** | 13.79 |
| | | 2 | 3850.0 | -444.84 | 4.65 | 6.88 | 31.36 | 10.98 | **14.81** |
| 55 | | 1 | 0.0 | -0.00 | **9.47** | **-7.24** | 0.00 | -0.00 | 0.00 |
| | | 2 | 3600.0 | -0.00 | **-7.97** | -4.94 | 0.00 | 6.25 | **-1.41** |
| | | | 0.0 | -0.00 | 7.18 | **13.44** | 0.00 | 0.00 | 0.00 |
| | | | 1800.0 | -0.00 | -0.39 | 0.51 | 0.00 | **11.83** | 6.11 |
| | | 1 | 1542.9 | -0.00 | 2.98 | 0.07 | -0.00 | **-5.27** | 9.60 |
| | | | 2314.3 | -0.00 | -0.27 | 2.72 | -0.00 | -4.14 | **10.64** |
| 56 | | | 0.0 | **-0.96** | 12.70 | 1.19 | -0.00 | **-4.57** | -16.98 |
| | | 2 | | -0.32 | **29.85** | -8.82 | 0.00 | **21.05** | **-51.28** |
| | | 1 | 2000.0 | -0.96 | 4.28 | **3.38** | -0.00 | 0.00 | -0.00 |
| | | 2 | | -0.32 | 21.43 | **-12.24** | 0.00 | -0.00 | -0.00 |
| 57 | | 1 | 0.0 | **-0.96** | -4.28 | **-3.41** | 0.00 | 0.00 | -0.00 |
| | | 2 | 2000.0 | -0.32 | **-29.83** | 8.85 | -0.00 | **21.13** | **-51.24** |
| | | | 0.0 | -0.32 | -21.41 | **12.27** | -0.00 | -0.00 | -0.00 |
| | | 1 | 2000.0 | -0.96 | -12.69 | -1.22 | 0.00 | **-4.63** | -16.97 |
| 58 | | 2 | 0.0 | -0.00 | **7.96** | **4.93** | 0.00 | 6.31 | **-1.39** |
| | | 1 | 1600.0 | -0.00 | **-1.05** | -1.72 | -0.00 | **-4.87** | 10.52 |
| | | | 0.0 | -0.00 | 5.68 | **-4.52** | -0.00 | 0.86 | 6.82 |
| | | 2 | 1600.0 | -0.00 | 1.23 | 0.56 | 0.00 | **11.86** | 5.96 |
| | | 1 | 1333.3 | -0.00 | 0.07 | -2.57 | -0.00 | -4.30 | **10.65** |
| 59 | | 2 | 0.0 | -0.00 | **1.23** | 0.56 | -0.00 | **11.86** | 5.96 |
| | | 1 | 2000.0 | 0.00 | **-9.47** | **7.25** | 0.00 | 0.00 | 0.00 |
| | | 2 | | -0.00 | -7.19 | **-13.45** | 0.00 | 0.00 | -0.00 |
| | | 1 | 571.4 | 0.00 | -3.46 | 0.40 | 0.00 | **-5.27** | 9.23 |
| | | | 0.0 | 0.00 | -1.05 | -1.72 | 0.00 | -4.87 | **10.52** |
| 60 | | 2 | | 0.00 | **11.63** | -4.83 | 0.00 | **39.79** | **-14.60** |
| | | 1 | 1600.0 | -0.00 | 1.61 | **6.49** | -0.00 | -20.25 | **5.19** |
| | | 2 | | 0.00 | 4.90 | **-9.19** | 0.00 | 29.73 | -1.38 |
| | | 1 | 0.0 | -0.00 | 8.35 | 3.70 | -0.00 | **-27.67** | -2.78 |
| 61 | | 2 | | 0.00 | **4.90** | -9.19 | -0.00 | **29.73** | **-1.38** |
| | | 1 | 2000.0 | 0.00 | **-6.80** | **13.81** | 0.00 | -0.00 | 0.00 |
| | | 2 | | 0.00 | -3.52 | **-20.62** | 0.00 | 0.00 | 0.00 |
| | | 1 | 0.0 | 0.00 | 1.61 | 6.49 | 0.00 | **-20.25** | 5.19 |
| | | | 285.7 | 0.00 | 0.41 | 7.49 | 0.00 | -18.26 | **5.48** |
| 62 | | | 0.0 | **-8.32** | 6.03 | 19.85 | 0.00 | **-41.92** | -3.64 |
| | | 2 | | -7.51 | **25.91** | -26.42 | -0.00 | **56.32** | **-43.40** |
| | | 1 | 2000.0 | -8.32 | **-2.39** | **22.08** | 0.00 | 0.00 | -0.00 |
| | | 2 | | -7.51 | 17.49 | **-29.90** | -0.00 | -0.00 | -0.00 |
| | | 1 | 1428.6 | -8.32 | 0.01 | 21.72 | 0.00 | -12.55 | **0.68** |

| staaf | doorsn. | non. c. | dx [mm] | N [kN] | Vy [kN] | Vz [kN] | Mx [kNm] | My [kNm] | Mz [kNm] |
|---|---|---|---|---|---|---|---|---|---|
| 63 | | | 0.0 | **-8.32** | **2.40** | **-22.08** | -0.00 | 0.00 | -0.00 |
| | | 2 | 2000.0 | -7.51 | **-25.89** | 26.43 | 0.00 | **56.33** | **-43.37** |
| | | | 0.0 | -7.51 | -17.48 | **29.91** | 0.00 | -0.00 | -0.00 |
| | | 1 | 2000.0 | -8.32 | -6.02 | -19.86 | -0.00 | **-41.94** | -3.62 |
| | | | 571.4 | -8.32 | -0.01 | -21.72 | -0.00 | -12.55 | **0.68** |
| 64 | | | 0.0 | -0.00 | **6.80** | **-13.81** | 0.00 | 0.00 | 0.00 |
| | | 2 | 3600.0 | -0.00 | **-11.63** | 4.83 | 0.00 | **39.79** | **-14.61** |
| | | | 0.0 | -0.00 | 3.52 | **20.62** | -0.00 | 0.00 | 0.00 |
| | | 1 | 3600.0 | -0.00 | -8.35 | -3.70 | -0.00 | **-27.67** | -2.78 |
| | | | 1542.9 | -0.00 | 0.31 | -8.12 | -0.00 | -16.92 | **5.48** |
| 65 | 8 | 2 | 3238.0 | **177.20** | 0.32 | 0.00 | -0.00 | 0.01 | 1.04 |
| | | 1 | 0.0 | **-276.98** | **0.33** | **0.01** | **0.00** | 0.00 | 0.00 |
| | | 2 | | 175.24 | 0.32 | 0.00 | **-0.00** | 0.00 | **-0.00** |
| | | 1 | 3238.0 | -275.02 | 0.33 | 0.01 | 0.00 | **0.02** | **1.06** |
| 66 | | 2 | 2040.0 | **74.66** | 0.32 | 0.03 | -0.00 | **0.07** | 1.69 |
| | | 1 | 0.0 | **-136.93** | **0.33** | **-0.91** | **0.00** | 0.02 | 1.06 |
| | | 2 | | 73.42 | 0.32 | **0.03** | **-0.00** | 0.01 | 1.04 |
| | | 1 | 2040.0 | -135.69 | 0.33 | -0.91 | 0.00 | **-1.83** | **1.73** |
| 67 | | | 0.0 | **-64.29** | **0.33** | **0.88** | -0.00 | **-1.83** | 1.72 |
| | | 2 | | -7.82 | 0.32 | **-0.03** | **-0.00** | **0.07** | 1.69 |
| | | 1 | 847.0 | -63.78 | 0.33 | 0.88 | -0.00 | -1.08 | **2.00** |
| 68 | | | 0.0 | **-63.78** | **0.33** | **0.88** | -0.00 | **-1.08** | 2.00 |
| | | 2 | | -7.31 | 0.32 | **-0.03** | **-0.00** | **0.04** | 1.96 |
| | | 1 | 1225.0 | -63.03 | 0.33 | 0.88 | -0.00 | -0.00 | **2.40** |
| 69 | 9 | 2 | 4087.1 | **275.13** | -0.28 | 0.00 | 0.00 | 0.00 | **-0.00** |
| | | 1 | 0.0 | **-0.37** | **0.28** | -0.00 | **-0.00** | 0.00 | -0.00 |
| | | | 4087.1 | 0.37 | **-0.28** | -0.00 | -0.00 | -0.00 | -0.00 |
| | | 2 | 0.0 | 274.39 | 0.28 | 0.00 | **0.00** | -0.00 | -0.00 |
| | | 1 | 2043.6 | -0.00 | 0.00 | -0.00 | -0.00 | -0.00 | **0.29** |
| 70 | | | 0.0 | **173.32** | **0.28** | -0.00 | **0.00** | 0.00 | -0.00 |
| | | 2 | 4087.1 | **-0.37** | -0.28 | 0.00 | -0.00 | 0.00 | -0.00 |
| | | 1 | | 172.58 | **-0.28** | -0.00 | 0.00 | -0.00 | **-0.00** |
| | | 2 | 0.0 | 0.37 | 0.28 | 0.00 | **-0.00** | -0.00 | -0.00 |
| | | | 2043.6 | -0.00 | -0.00 | 0.00 | -0.00 | -0.00 | **0.29** |
| 71 | 10 | | 0.0 | **-128.22** | -0.00 | 0.25 | **-0.00** | -0.00 | 0.00 |
| | | 1 | | -104.62 | 0.00 | **0.25** | -0.00 | -0.00 | -0.00 |
| | | | 2494.0 | -104.62 | 0.00 | **-0.25** | -0.00 | -0.00 | 0.00 |
| | | 2 | 1247.0 | -128.22 | -0.00 | 0.00 | -0.00 | **0.16** | 0.00 |
| | | | 2494.0 | -128.22 | -0.00 | -0.25 | -0.00 | **-0.00** | -0.00 |
| 72 | | | 0.0 | **-66.82** | -0.00 | 0.25 | 0.00 | -0.00 | 0.00 |
| | | 1 | | -66.47 | 0.00 | **0.25** | **0.00** | -0.00 | -0.00 |
| | | | 2494.0 | -66.47 | 0.00 | **-0.25** | 0.00 | -0.00 | 0.00 |
| | | 2 | 1247.0 | -66.82 | -0.00 | 0.00 | 0.00 | **0.16** | -0.00 |
| | | | 2494.0 | -66.82 | -0.00 | -0.25 | 0.00 | **-0.00** | -0.00 |
| 73 | | | 0.0 | **-100.40** | -0.00 | 0.25 | -0.00 | -0.00 | 0.00 |
| | | 1 | | -87.89 | 0.00 | **0.25** | **-0.00** | -0.00 | -0.00 |
| | | | 2494.0 | -87.89 | 0.00 | **-0.25** | -0.00 | -0.00 | 0.00 |



the scale towards document
Patch Reference numbers on UIT Scan Reference Chart TE263 Serial No. 546

| staaf | doorsn. | non. c. | dx [mm] | N [kN] | Vy [kN] | Vz [kN] | Mx [kNm] | My [kNm] | Mz [kNm] |
|---|---|---|---|---|---|---|---|---|---|
| | | 2 | 1247.0 | -100.40 | -0.00 | 0.00 | -0.00 | **0.16** | 0.00 |
| | | | 2494.0 | -100.40 | -0.00 | -0.25 | -0.00 | **-0.00** | -0.00 |
| 74 | 9 | | 3222.1 | **165.84** | -0.28 | 0.00 | 0.00 | 0.00 | **-0.00** |
| | | 1 | 0.0 | **-0.23** | **0.28** | -0.00 | 0.00 | 0.00 | -0.00 |
| | | | 3222.1 | 0.23 | **-0.28** | -0.00 | 0.00 | -0.00 | -0.00 |
| | | 2 | 0.0 | 165.38 | 0.28 | 0.00 | **0.00** | -0.00 | -0.00 |
| | | 1 | 1611.0 | -0.00 | 0.00 | -0.00 | 0.00 | -0.00 | **0.23** |
| 75 | | | 3222.1 | **111.46** | **-0.28** | -0.00 | -0.00 | -0.00 | **-0.00** |
| | | 2 | 0.0 | **-0.23** | 0.28 | 0.00 | **-0.00** | -0.00 | -0.00 |
| | | 1 | | 111.00 | **0.28** | -0.00 | -0.00 | 0.00 | -0.00 |
| | | 2 | 1611.0 | -0.00 | 0.00 | 0.00 | -0.00 | 0.00 | **0.23** |
| 76 | | 1 | 0.0 | **88.60** | **0.28** | -0.00 | -0.00 | 0.00 | -0.00 |
| | | 2 | 3242.4 | **-0.23** | -0.28 | 0.00 | -0.00 | 0.00 | -0.00 |
| | | 1 | | 88.13 | **-0.28** | -0.00 | -0.00 | -0.00 | **-0.00** |
| | | 2 | 0.0 | 0.23 | 0.28 | 0.00 | **-0.00** | -0.00 | -0.00 |
| | | | 1621.2 | -0.00 | -0.00 | 0.00 | -0.00 | -0.00 | **0.23** |
| 77 | | | 3242.4 | **130.84** | -0.28 | 0.00 | 0.00 | 0.00 | **-0.00** |
| | | 1 | 0.0 | **-0.23** | **0.28** | -0.00 | 0.00 | 0.00 | -0.00 |
| | | | 3242.4 | 0.23 | **-0.28** | -0.00 | 0.00 | -0.00 | -0.00 |
| | | 2 | 0.0 | 130.37 | 0.28 | 0.00 | **0.00** | -0.00 | -0.00 |
| | | 1 | 1621.2 | -0.00 | 0.00 | -0.00 | 0.00 | -0.00 | **0.23** |
| 78 | 7 | 2 | 0.0 | **-655.94** | **-0.30** | **13.66** | **-0.00** | -0.00 | **0.00** |
| | | | 3238.0 | -653.60 | -0.30 | **-18.80** | -0.00 | **-10.70** | **-0.98** |
| | | 1 | 0.0 | -191.21 | -0.07 | -9.92 | **0.00** | -0.00 | -0.00 |
| | | 2 | 1349.2 | -654.97 | -0.30 | -0.64 | -0.00 | **8.78** | -0.41 |
| 79 | | | 0.0 | **-455.28** | -0.63 | **9.42** | **-0.00** | **-10.70** | -0.98 |
| | | 1 | | -262.38 | **-1.04** | **-4.91** | **0.00** | **3.06** | -0.24 |
| | | | 2040.0 | -260.91 | -1.04 | 3.67 | 0.00 | 2.20 | **-2.36** |
| 80 | | 2 | 0.0 | **-348.13** | -0.63 | **23.69** | **-0.00** | -5.78 | -2.25 |
| | | 1 | | -316.34 | **-1.04** | **-16.17** | -0.00 | 2.20 | -2.35 |
| | | 2 | 847.0 | -347.52 | -0.63 | 20.69 | -0.00 | **12.84** | -2.78 |
| | | 1 | | -315.73 | -1.04 | -14.25 | -0.00 | **-10.58** | **-3.23** |
| 81 | | 2 | 0.0 | **-365.01** | -8.14 | -9.21 | **-0.00** | **12.84** | -2.78 |
| | | 1 | | -313.34 | **-9.36** | 7.82 | -0.00 | **-10.58** | -3.23 |
| | | | 1225.0 | -312.45 | -9.36 | **9.38** | -0.00 | 0.00 | **-14.70** |
| | | 2 | | -364.12 | -8.14 | **-11.64** | -0.00 | 0.00 | -12.75 |
| 82 | 8 | | 3238.0 | **176.95** | -0.32 | 0.02 | 0.00 | **0.05** | -1.04 |
| | | 1 | 0.0 | **-277.45** | **-0.33** | 0.00 | **-0.00** | 0.00 | -0.00 |
| | | 2 | | 174.99 | -0.32 | **0.02** | **0.00** | 0.00 | **0.00** |
| | | 1 | 3238.0 | -275.49 | -0.33 | 0.00 | -0.00 | 0.01 | **-1.06** |
| 83 | | 2 | 2040.0 | **74.57** | -0.32 | 0.00 | 0.00 | **0.06** | -1.69 |
| | | 1 | 0.0 | **-136.76** | **-0.33** | **-0.90** | **-0.00** | 0.01 | -1.06 |
| | | 2 | | 73.34 | -0.32 | **0.00** | **0.00** | 0.05 | -1.04 |
| | | 1 | 2040.0 | -135.52 | -0.33 | -0.90 | -0.00 | **-1.84** | **-1.72** |
| 84 | | | 0.0 | **-64.24** | **-0.33** | **0.89** | 0.00 | **-1.84** | -1.72 |
| | | 2 | | -7.82 | -0.32 | **-0.03** | **0.00** | **0.06** | -1.69 |
| | | 1 | 847.0 | -63.72 | -0.33 | 0.89 | 0.00 | -1.09 | **-2.00** |

| staaf | doorsn. | non. c. | dx [mm] | N [kN] | Vy [kN] | Vz [kN] | Mx [kNm] | My [kNm] | Mz [kNm] |
|---|---|---|---|---|---|---|---|---|---|
| 85 | | | 0.0 | **-63.72** | **-0.33** | **0.89** | 0.00 | **-1.09** | -2.00 |
| | | 2 | | -7.31 | -0.32 | **-0.03** | **0.00** | **0.03** | -1.96 |
| | | 1 | 1225.0 | -62.98 | -0.33 | 0.89 | 0.00 | -0.00 | **-2.40** |
| 86 | 9 | 2 | 4087.1 | **276.39** | -0.28 | -0.00 | -0.00 | -0.00 | **-0.00** |
| | | 1 | 0.0 | **-0.37** | **0.28** | 0.00 | **0.00** | -0.00 | -0.00 |
| | | | 4087.1 | 0.37 | **-0.28** | 0.00 | 0.00 | 0.00 | -0.00 |
| | | 2 | 0.0 | 275.66 | 0.28 | -0.00 | **-0.00** | 0.00 | -0.00 |
| | | 1 | 2043.6 | -0.00 | 0.00 | 0.00 | 0.00 | 0.00 | **0.29** |
| 87 | | | 0.0 | **174.12** | **0.28** | 0.00 | **-0.00** | -0.00 | -0.00 |
| | | 2 | 4087.1 | **-0.37** | -0.28 | -0.00 | 0.00 | -0.00 | -0.00 |
| | | 1 | | 173.39 | **-0.28** | 0.00 | -0.00 | 0.00 | **-0.00** |
| | | 2 | 0.0 | 0.37 | 0.28 | -0.00 | **0.00** | 0.00 | -0.00 |
| | | | 2043.6 | -0.00 | -0.00 | -0.00 | 0.00 | 0.00 | **0.29** |
| 88 | 10 | | 0.0 | **-127.97** | 0.00 | 0.25 | **0.00** | -0.00 | -0.00 |
| | | 1 | | -105.12 | -0.00 | **0.25** | 0.00 | -0.00 | 0.00 |
| | | | 2494.0 | -105.12 | -0.00 | **-0.25** | 0.00 | -0.00 | -0.00 |
| | | 2 | 1247.0 | -127.97 | 0.00 | 0.00 | 0.00 | **0.16** | -0.00 |
| | | | 2494.0 | -127.97 | 0.00 | -0.25 | 0.00 | **-0.00** | 0.00 |
| 89 | | | 0.0 | **-100.32** | 0.00 | 0.25 | 0.00 | -0.00 | -0.00 |
| | | 1 | | -87.74 | -0.00 | **0.25** | **0.00** | -0.00 | 0.00 |
| | | | 2494.0 | -87.74 | -0.00 | **-0.25** | 0.00 | -0.00 | -0.00 |
| | | 2 | 1247.0 | -100.32 | 0.00 | 0.00 | 0.00 | **0.16** | -0.00 |
| | | | 2494.0 | -100.32 | 0.00 | -0.25 | 0.00 | **-0.00** | 0.00 |
| 90 | 9 | | 3222.1 | **165.58** | -0.28 | -0.00 | -0.00 | -0.00 | **-0.00** |
| | | 1 | 0.0 | **-0.23** | **0.28** | 0.00 | -0.00 | -0.00 | -0.00 |
| | | | 3222.1 | 0.23 | **-0.28** | 0.00 | -0.00 | 0.00 | -0.00 |
| | | 2 | 0.0 | 165.12 | 0.28 | -0.00 | **-0.00** | 0.00 | -0.00 |
| | | 1 | 1611.0 | -0.00 | 0.00 | 0.00 | -0.00 | 0.00 | **0.23** |
| 91 | | | 3222.1 | **111.28** | **-0.28** | 0.00 | 0.00 | 0.00 | **-0.00** |
| | | 2 | 0.0 | **-0.23** | 0.28 | -0.00 | **0.00** | 0.00 | -0.00 |
| | | 1 | | 110.82 | **0.28** | 0.00 | 0.00 | -0.00 | -0.00 |
| | | 2 | 1611.0 | -0.00 | 0.00 | -0.00 | 0.00 | -0.00 | **0.23** |
| 92 | | 1 | 0.0 | **88.52** | **0.28** | 0.00 | 0.00 | -0.00 | -0.00 |
| | | 2 | 3242.4 | **-0.23** | -0.28 | -0.00 | 0.00 | -0.00 | -0.00 |
| | | 1 | | 88.05 | **-0.28** | 0.00 | 0.00 | 0.00 | **-0.00** |
| | | 2 | 0.0 | 0.23 | 0.28 | -0.00 | **0.00** | 0.00 | -0.00 |
| | | | 1621.2 | -0.00 | -0.00 | -0.00 | 0.00 | 0.00 | **0.23** |
| 93 | | | 3242.4 | **130.70** | -0.28 | -0.00 | -0.00 | -0.00 | **-0.00** |
| | | 1 | 0.0 | **-0.23** | **0.28** | 0.00 | -0.00 | -0.00 | -0.00 |
| | | | 3242.4 | 0.23 | **-0.28** | 0.00 | -0.00 | 0.00 | -0.00 |
| | | 2 | 0.0 | 130.23 | 0.28 | -0.00 | **-0.00** | 0.00 | -0.00 |
| | | 1 | 1621.2 | -0.00 | 0.00 | 0.00 | -0.00 | 0.00 | **0.23** |
| 94 | 12 | | 0.0 | **73.02** | 0.00 | **0.31** | **0.00** | **-0.00** | -0.00 |
| | | 2 | | **-0.00** | -0.00 | 0.31 | 0.00 | -0.00 | -0.00 |
| | | 1 | 4270.0 | 73.02 | 0.00 | **-0.31** | 0.00 | -0.00 | 0.00 |
| | | 2 | 2135.0 | -0.00 | -0.00 | 0.00 | 0.00 | **0.33** | -0.00 |
| 95 | | | 0.0 | **112.91** | -0.00 | 0.31 | -0.00 | **-0.00** | 0.00 |



the scale towards document
Patch Reference numbers on UTT Serial No. 546

| staaf | doorsn. | non. c. | dx [mm] | N [kN] | Vy [kN] | Vz [kN] | Mx [kNm] | My [kNm] | Mz [kNm] |
|---|---|---|---|---|---|---|---|---|---|
| | | 1 | | **-0.00** | 0.00 | **0.31** | **-0.00** | -0.00 | -0.00 |
| | | | 4270.0 | -0.00 | 0.00 | **-0.31** | -0.00 | -0.00 | -0.00 |
| | | | 2135.0 | -0.00 | 0.00 | 0.00 | -0.00 | **0.33** | -0.00 |
| 96 | | | 0.0 | **-0.00** | 0.00 | **0.31** | **0.00** | -0.00 | -0.00 |
| | | | 4270.8 | -0.00 | 0.00 | **-0.31** | 0.00 | **-0.00** | -0.00 |
| | | | 2135.4 | -0.00 | 0.00 | 0.00 | 0.00 | **0.33** | -0.00 |
| 97 | | | 0.0 | **-0.00** | -0.00 | **0.31** | **-0.00** | -0.00 | 0.00 |
| | | | 4270.8 | -0.00 | -0.00 | **-0.31** | -0.00 | **-0.00** | 0.00 |
| | | | 2135.4 | -0.00 | -0.00 | 0.00 | -0.00 | **0.33** | 0.00 |
| 98 | | 2 | 0.0 | **112.90** | 0.00 | 0.31 | 0.00 | **-0.00** | -0.00 |
| | | 1 | | **-0.00** | -0.00 | **0.31** | **0.00** | -0.00 | 0.00 |
| | | | 4270.8 | -0.00 | -0.00 | **-0.31** | 0.00 | -0.00 | 0.00 |
| | | | 2135.4 | -0.00 | -0.00 | 0.00 | 0.00 | **0.33** | 0.00 |
| 99 | | | 0.0 | **73.02** | -0.00 | **0.31** | **-0.00** | **-0.00** | 0.00 |
| | | 2 | | **-0.00** | 0.00 | 0.31 | -0.00 | -0.00 | 0.00 |
| | | 1 | 4270.8 | 73.02 | -0.00 | **-0.31** | -0.00 | -0.00 | -0.00 |
| | | 2 | 2135.4 | -0.00 | 0.00 | 0.00 | -0.00 | **0.33** | 0.00 |
| 100 | 14 | 1 | 0.0 | **-68.63** | **-13.88** | **311.54** | **0.00** | **-14.70** | -0.00 |
| | | 2 | | -8.14 | **21.13** | 279.85 | 0.00 | -12.76 | -0.01 |
| | | 1 | 1600.0 | -68.63 | -11.21 | 302.95 | 0.00 | **476.88** | **-20.16** |
| | | 2 | | -8.14 | 16.96 | 271.26 | 0.00 | 428.13 | **30.60** |
| 101 | | | 0.0 | **17.06** | -19.92 | **37.99** | 0.00 | 428.13 | **30.60** |
| | | 1 | | **-45.04** | 13.36 | 27.64 | **0.00** | 476.88 | **-20.16** |
| | | | 1866.0 | -45.04 | **20.28** | 17.62 | 0.00 | **519.10** | 10.16 |
| | | 2 | | 17.06 | **-30.72** | 27.97 | 0.00 | 489.66 | -14.99 |
| 102 | | | 0.0 | **108.72** | **36.09** | **27.10** | **0.00** | 489.66 | -14.99 |
| | | 1 | | **-45.04** | **-23.01** | 16.75 | **-0.00** | 519.10 | 10.16 |
| | | | 1734.0 | -45.04 | -12.63 | 7.44 | -0.00 | **540.07** | **-20.91** |
| | | 2 | | 108.72 | 19.88 | 17.79 | 0.00 | 528.58 | **33.80** |
| 103 | | | 0.0 | **108.72** | -20.64 | -17.80 | **0.00** | 528.58 | **33.80** |
| | | 1 | | **-45.04** | 13.12 | -7.44 | **-0.00** | **540.07** | **-20.91** |
| | | | 1733.0 | -45.04 | **22.89** | -16.75 | -0.00 | 519.11 | 10.35 |
| | | 2 | | 108.72 | **-35.90** | **-27.10** | 0.00 | 489.67 | -15.30 |
| 104 | | | 0.0 | **17.07** | **30.82** | -27.98 | -0.00 | 489.67 | -15.30 |
| | | 1 | | **-45.04** | **-20.34** | -17.62 | **-0.00** | **519.12** | 10.35 |
| | | 2 | 1867.0 | 17.07 | 20.01 | **-38.00** | -0.00 | 428.09 | **30.50** |
| | | 1 | | -45.04 | -13.42 | -27.64 | -0.00 | 476.87 | **-20.10** |
| 105 | | | 0.0 | **-68.63** | 11.17 | -302.94 | **-0.00** | **476.87** | **-20.10** |
| | | | 1600.0 | -68.63 | **13.84** | **-311.53** | -0.00 | **-14.70** | -0.00 |
| | | 2 | | -8.14 | **-21.07** | -279.82 | -0.00 | -12.76 | -0.01 |
| | | | 0.0 | -8.14 | -16.90 | -271.23 | -0.00 | 428.09 | **30.50** |
| 106 | 11 | | | **-91.97** | **0.84** | 5.64 | -0.00 | -2.35 | 0.01 |
| | | 1 | | -0.33 | **-0.62** | **5.64** | **-0.00** | **-2.40** | 0.00 |
| | | 2 | 3466.0 | -91.97 | 0.84 | 2.46 | -0.00 | **11.69** | **2.92** |
| | | 1 | | -0.33 | -0.62 | 2.46 | -0.00 | 11.64 | **-2.15** |
| 107 | | | 0.0 | **58.95** | **0.02** | **1.59** | **-0.00** | 11.64 | **-2.15** |
| | | 2 | | **-91.97** | **-0.03** | 1.59 | **0.00** | 11.69 | **2.92** |

| staaf | doorsn. | non. c. | dx [mm] | N [kN] | Vy [kN] | Vz [kN] | Mx [kNm] | My [kNm] | Mz [kNm] |
|---|---|---|---|---|---|---|---|---|---|
| | | | 3467.0 | -91.97 | -0.03 | **-1.59** | 0.00 | 11.69 | 2.83 |
| | | | 1733.5 | -91.97 | -0.03 | 0.00 | 0.00 | **13.06** | 2.88 |
| 108 | | | 0.0 | **-91.97** | **-0.81** | -2.46 | 0.00 | **11.69** | **2.83** |
| | | 1 | | -0.33 | **0.60** | -2.46 | **0.00** | 11.64 | **-2.09** |
| | | 2 | 3467.0 | -91.97 | -0.81 | **-5.64** | 0.00 | -2.35 | 0.01 |
| | | 1 | | -0.33 | 0.60 | -5.64 | 0.00 | **-2.40** | 0.00 |
| 109 | 10 | 2 | 0.0 | **0.79** | 0.00 | 0.25 | -0.00 | -0.00 | -0.00 |
| | | 1 | | **-43.23** | -0.00 | **0.25** | **-0.00** | **-0.00** | 0.00 |
| | | | 2494.0 | -43.23 | -0.00 | **-0.25** | -0.00 | -0.00 | -0.00 |
| | | | 1247.0 | -43.23 | -0.00 | 0.00 | -0.00 | **0.16** | 0.00 |
| 110 | | 2 | 0.0 | **0.87** | -0.00 | 0.25 | 0.00 | -0.00 | 0.00 |
| | | 1 | | **-43.29** | 0.00 | **0.25** | **0.00** | **-0.00** | -0.00 |
| | | | 2494.0 | -43.29 | 0.00 | **-0.25** | 0.00 | -0.00 | 0.00 |
| | | | 1247.0 | -43.29 | 0.00 | 0.00 | 0.00 | **0.16** | -0.00 |
| 111 | | 2 | 0.0 | **-66.77** | 0.00 | 0.25 | -0.00 | -0.00 | -0.00 |
| | | 1 | | -66.42 | -0.00 | **0.25** | **-0.00** | -0.00 | 0.00 |
| | | | 2494.0 | -66.42 | -0.00 | **-0.25** | -0.00 | -0.00 | -0.00 |
| | | 2 | 1247.0 | -66.77 | 0.00 | 0.00 | -0.00 | **0.16** | 0.00 |
| | | | 2494.0 | -66.77 | 0.00 | -0.25 | -0.00 | **-0.00** | 0.00 |

## Reacties in steunpunten - waardes in knopen. Lokale extremen

Niet-lineaire berekening, lokale niet-lineariteiten

Groep van knopen:1/86

Groep van niet-lineaire combinaties:1/2

| Steunpunt | knoop | non. c. | Rx [kN] | Ry [kN] | Rz [kN] | Mx [kNm] | My [kNm] | Mz [kNm] |
|---|---|---|---|---|---|---|---|---|
| 1 | 1 | 2 | **12.49** | **-4.11** | **540.04** | 0.00 | 0.00 | 0.00 |
| | | 1 | **6.73** | **4.81** | **463.91** | 0.00 | 0.00 | 0.00 |
| 2 | 2 | | **-6.73** | **4.78** | **463.89** | 0.00 | 0.00 | 0.00 |
| | | 2 | **-12.49** | **-4.08** | **539.97** | 0.00 | 0.00 | 0.00 |
| 3 | 3 | 1 | 0.00 | **7.24** | **9.47** | 0.00 | 0.00 | 0.00 |
| | | 2 | 0.00 | **-13.44** | **7.18** | 0.00 | 0.00 | 0.00 |
| 4 | 9 | 1 | 0.00 | **7.25** | **9.47** | 0.00 | 0.00 | 0.00 |
| | | 2 | 0.00 | **-13.45** | **7.19** | 0.00 | 0.00 | 0.00 |
| 5 | 20 | 1 | 0.00 | **13.81** | **6.80** | 0.00 | 0.00 | 0.00 |
| | | 2 | 0.00 | **-20.62** | **3.52** | 0.00 | 0.00 | 0.00 |
| 6 | 21 | 1 | 0.00 | **17.98** | **0.93** | 0.00 | 0.00 | 0.00 |
| | | 2 | 0.00 | **-28.59** | **0.41** | 0.00 | 0.00 | 0.00 |
| 7 | 27 | 1 | 0.00 | **17.97** | **0.93** | 0.00 | 0.00 | 0.00 |
| | | 2 | 0.00 | **-28.58** | **0.41** | 0.00 | 0.00 | 0.00 |
| 8 | 28 | 1 | 0.00 | **20.87** | **5.77** | 0.00 | 0.00 | 0.00 |
| | | 2 | 0.00 | **-33.25** | **5.18** | 0.00 | 0.00 | 0.00 |
| 9 | 34 | 1 | 0.00 | **20.87** | **5.77** | 0.00 | 0.00 | 0.00 |
| | | 2 | 0.00 | **-33.25** | **5.18** | 0.00 | 0.00 | 0.00 |
| 10 | 35 | 1 | 0.00 | **13.93** | **5.41** | 0.00 | 0.00 | 0.00 |



the scale towards document
Patch Reference numbers on UTT
Image Engineering Scan Reference Chart TE263 Serial No. 546

| Steunpunt | knoop | non. c. | Rx [kN] | Ry [kN] | Rz [kN] | Mx [kNm] | My [kNm] | Mz [kNm] |
|---|---|---|---|---|---|---|---|---|
| | | 2 | 0.00 | **-21.78** | **4.69** | 0.00 | 0.00 | 0.00 |
| 11 | 41 | 1 | 0.00 | **13.93** | **5.41** | 0.00 | 0.00 | 0.00 |
| | | 2 | 0.00 | **-21.78** | **4.69** | 0.00 | 0.00 | 0.00 |
| 12 | 42 | 1 | **-12.61** | **26.65** | 0.00 | 0.00 | 0.00 | 0.00 |
| | | 2 | **-13.72** | **-41.72** | 0.00 | 0.00 | 0.00 | 0.00 |
| 13 | 43 | 1 | **0.00** | **29.37** | 0.00 | 0.00 | 0.00 | 0.00 |
| | | 2 | **-0.00** | **-46.04** | 0.00 | 0.00 | 0.00 | 0.00 |
| 14 | 44 | | **13.72** | **-41.73** | 0.00 | 0.00 | 0.00 | 0.00 |
| | | 1 | **12.61** | **26.65** | 0.00 | 0.00 | 0.00 | 0.00 |
| 15 | 45 | 2 | **0.30** | **-13.66** | **656.41** | 0.00 | 0.00 | 0.00 |
| | | 1 | **0.07** | **115.94** | **54.02** | 0.00 | 0.00 | 0.00 |
| 16 | 49 | | **-0.07** | **115.32** | **54.51** | 0.00 | 0.00 | 0.00 |
| | | 2 | **-0.30** | **-13.46** | **655.72** | 0.00 | 0.00 | 0.00 |
| 17 | 53 | 1 | **-8.02** | **16.57** | 0.00 | 0.00 | 0.00 | 0.00 |
| | | 2 | **-9.49** | **-25.68** | 0.00 | 0.00 | 0.00 | 0.00 |
| 18 | 54 | | **9.49** | **-25.68** | 0.00 | 0.00 | 0.00 | 0.00 |
| | | 1 | **8.02** | **16.57** | 0.00 | 0.00 | 0.00 | 0.00 |
| 19 | 65 | | 0.00 | **13.81** | **6.80** | 0.00 | 0.00 | 0.00 |
| | | 2 | 0.00 | **-20.62** | **3.52** | 0.00 | 0.00 | 0.00 |
| 20 | 71 | 1 | **0.33** | **-0.00** | **277.91** | 0.00 | 0.00 | 0.00 |
| | | 2 | **0.32** | **-168.45** | **-393.21** | 0.00 | 0.00 | 0.00 |
| 21 | 75 | | **-0.32** | **-167.66** | **-392.46** | 0.00 | 0.00 | 0.00 |
| | | 1 | **-0.33** | **-0.01** | **277.45** | 0.00 | 0.00 | 0.00 |

## Vervormingen van staven. Globale extremen

Niet-lineaire berekening, lokale niet-lineariteiten

Groep van staven:1/111

Groep van niet-lineaire combinaties:3

| staaf | doorsn. | non. c. | dx [mm] | ux [mm] | uy [mm] | uz [mm] | fix [mrad] | fiy [mrad] | fiz [mrad] |
|---|---|---|---|---|---|---|---|---|---|
| 110 | 10 | 3 | 2494.0 | **11.53** | -0.02 | -7.21 | -0.80 | 1.42 | -0.03 |
| 28 | 4 | | 3675.0 | **-8.27** | -0.00 | -0.00 | -0.00 | **-6.40** | 0.00 |
| 94 | 12 | | 0.0 | 6.68 | **9.39** | -3.31 | -1.48 | 0.46 | -0.43 |
| 102 | 14 | | 1734.0 | -0.00 | **-12.05** | -7.94 | 1.13 | 0.00 | 0.00 |
| 74 | 9 | | 3222.1 | 4.11 | -5.20 | **1.53** | -0.70 | -0.02 | -0.74 |
| 26 | 4 | | 3593.3 | -8.01 | -0.00 | **-29.75** | -0.00 | 0.09 | 0.00 |
| 20 | | | 3600.0 | 0.00 | -8.13 | -20.88 | **4.26** | -0.00 | 0.00 |
| 48 | | | 3850.0 | -1.17 | 0.00 | -16.41 | **-3.66** | -0.12 | 0.34 |
| 9 | | | 0.0 | 0.00 | 0.00 | -0.00 | 0.12 | **5.03** | -0.36 |
| 32 | 7 | | 1225.0 | -1.79 | -0.02 | -9.34 | -1.08 | 1.13 | **1.88** |
| 81 | | | | -1.79 | 0.02 | -9.35 | 1.07 | 1.13 | **-1.88** |



the scale towards document
546

the scale towards document

# BIJLAGE 10 ESA Prima Win output zuid gevel

## Inhoudsopgave

Basisgegevens , gebruikte materialen

Materialenlijst

Doorsnede-eig. , standaard , gebruikte profielen

Groep van variabele lasten

Belastinggevallen

Combinaties

Niet-lineaire combinatie

Verslag berekening.

Geometrie

EG glas

EG dak

VB dak

Wind druk

Wind zuiging

EG trappenhuis

VB trappenhuis

Interne krachten in staven (alles), UGT. comb (alles), extremen.

Reacties (alles), UGT. comb (alles), lokale extremen.

Vervorming in staven (alles), GGT. combi (alles), globale extremen.

## Basisgegevens
## Structuurtype : Algemeen XYZ

| | |
|---|---|
| Aantal knopen: | 72 |
| Aantal staven: | 81 |
| Aantal 1D macro's: | 26 |
| Aantal randlijnen: | 0 |

| | |
|---|---|
| Aantal 2D macro's: | 0 |
| Aantal profielen: | 5 |
| Aantal belastingsgev.: | 12 |
| Aantal materialen: | 1 |

## Materiaal

Naam

S235

| | |
|---|---|
| Treksterkte | 360.000 MPa |
| Vloeigrens | 235.000 MPa |
| E-modulus | 210000.00 MPa |
| Poisson coëff. | 0.30 |
| Specifiek gewicht | 0.000 kg/mm^3 |
| Uitzettingscoëff. | 1.2e-005 mm/mm.K |

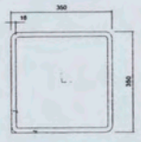
## Materialenlijst
## Groep staven:
## 1/81

| nr. | Naam | Kwaliteit | Eenh. gewicht kg/mm | Lengte mm | Massa kg |
|---|---|---|---|---|---|
| 2 | SHS350/350/16.0 | S235 | 0.17 | 214750.00 | 35570.12 |
| 5 | HEA180 | S235 | 0.04 | 28800.00 | 1024.14 |

Totaal gewicht van constructie: 36594.26 kg

Verfoppervlakte: 330889995.92 mm^2

## Profielen



**SHS350/350/16.0**

Doorsnedenr. 2 - SHS350/350/16.0

Materiaal : 7 - S235

A : 2.110000e+004 mm^2

| | | | |
|---|---|---|---|
| A : | 2.110000e+004 mm^2 | | |
| Ay/A : | 0.500 | Az/A : | 0.500 |
| Iy : | 3.894000e+008 mm^4 | Iz : | 3.894000e+008 mm^4 |
| Iyz : | 2.710505e-007 mm^4 | It : | 6.099000e+008 mm^4 |
| Iw : | 7.002917e+012 mm^6 | | |
| Wely : | 2.225000e+006 mm^3 | Welz : | 2.225000e+006 mm^3 |
| Wply : | 2.604152e+006 mm^3 | Wplz : | 2.604152e+006 mm^3 |
| cy : | 175.00 mm | cz : | 175.00 mm |
| iy : | 135.85 mm | iz : | 135.85 mm |
| dy : | 0.00 mm | dz : | 0.00 mm |
| Omtrek : | | | 1400.00 mm |

Controletype: Kokerprofiel

| | | | |
|---|---|---|---|
| Hoogte | 350.00 mm | Breedte | 350.00 mm |
| Lijfdikte | 16.00 mm | | |



HEA180

Doorsnedenr. 5 - HEA180

Materiaal : 7 - S235

| | | | |
|---|---|---|---|
| A : | 4.530000e+003 mm^2 | | |
| Ay/A : | 0.653 | Az/A : | 0.201 |
| Iy : | 2.510000e+007 mm^4 | Iz : | 9.250000e+006 mm^4 |
| Iyz : | 0.000000e+000 mm^4 | It : | 1.480000e+005 mm^4 |
| Iw : | 6.038901e+010 mm^6 | | |
| Wely : | 2.940000e+005 mm^3 | Welz : | 1.030000e+005 mm^3 |
| Wply : | 3.240000e+005 mm^3 | Wplz : | 1.560000e+005 mm^3 |
| cy : | 90.00 mm | cz : | 85.50 mm |
| iy : | 74.44 mm | iz : | 45.19 mm |
| dy : | -0.00 mm | dz : | -0.00 mm |
| Omtrek : | | | 1050.00 mm |

Controletype: I-profiel

| | | | |
|---|---|---|---|
| Hoogte | 171.00 mm | Breedte | 180.00 mm |
| Flensdikte | 9.50 mm | Lijfdikte | 6.00 mm |
| Straal | 15.00 mm | | |

## Groep van variabele lasten

| Naam | Omschrijving |
|---|---|
| Wind | NEN - momentaan factor = 1.00 |
| vloeren | NEN - momentaan factor = 1.00 |

## Belastinggevallen

| BG | Naam | Omschrijving |
|---|---|---|
| 1 | Wind in | Variabel - Wind |
| | | Korte termijn |
| 2 | EG glas | Permanent - Lasten |
| 3 | Wind uit | Variabel - Wind |
| | | Korte termijn |
| 4 | eg trappenhuis | Permanent - Lasten |
| 5 | vb trappenhuis | Variabel - vloeren |
| | | Korte termijn |
| 6 | pb dak | Permanent - Lasten |
| 7 | vb dak | Variabel - vloeren |
| 8 | EG constructie | Eigengewicht. Richting -Z |
| 9 | eg trappenhuis momentaan vol | Permanent - Lasten |
| 10 | vb trappenhuis momentaan vol | Variabel - vloeren |
| | | Korte termijn |
| 11 | eg trappenhuis momentaan factor | Permanent - Lasten |
| 12 | vb trappenhuis momentaan factor | Variabel - vloeren |
| | | Korte termijn |

## Combinaties

| Combi | Norm | BG | coëff |
|---|---|---|---|
| 1.wind in | Lineair- UGT | 1 Wind in | 0.30 |
| | | 2 EG glas | 1.20 |
| | | 4 eg trappenhuis | 1.20 |
| | | 5 vb trappenhuis | 1.50 |
| | | 6 pb dak | 1.20 |
| | | 7 vb dak | 0.00 |
| | | 8 EG constructie | 1.20 |
| 2.wind uit | | 2 EG glas | 1.20 |
| | | 3 Wind uit | 0.30 |
| | | 4 eg trappenhuis | 1.20 |
| | | 5 vb trappenhuis | 1.50 |

| Combi | Norm | BG | coëff |
|---|---|---|---|
| | | 6 pb dak | 1.20 |
| | | 7 vb dak | 0.00 |
| | | 8 EG constructie | 1.20 |
| 3.wind in | | 1 Wind in | 1.50 |
| | | 2 EG glas | 1.20 |
| | | 4 eg trappenhuis | 1.20 |
| | | 5 vb trappenhuis | 0.75 |
| | | 6 pb dak | 1.20 |
| | | 7 vb dak | 0.00 |
| | | 8 EG constructie | 1.20 |
| 4.wind uit | | 2 EG glas | 1.20 |
| | | 3 Wind uit | 1.50 |
| | | 4 eg trappenhuis | 1.20 |
| | | 5 vb trappenhuis | 0.75 |
| | | 6 pb dak | 1.20 |
| | | 7 vb dak | 0.00 |
| | | 8 EG constructie | 1.20 |
| 5.wind in | Lineair- GGT | 1 Wind in | 0.20 |
| | | 2 EG glas | 1.00 |
| | | 4 eg trappenhuis | 1.00 |
| | | 5 vb trappenhuis | 1.00 |
| | | 6 pb dak | 1.00 |
| | | 7 vb dak | 0.00 |
| | | 8 EG constructie | 1.00 |
| 6.wind in | | 1 Wind in | 1.00 |
| | | 2 EG glas | 1.00 |
| | | 4 eg trappenhuis | 1.00 |
| | | 5 vb trappenhuis | 0.50 |
| | | 6 pb dak | 1.00 |
| | | 7 vb dak | 0.00 |
| | | 8 EG constructie | 1.00 |
| 7.wind uit | | 2 EG glas | 1.00 |
| | | 3 Wind uit | 0.20 |
| | | 4 eg trappenhuis | 1.00 |
| | | 5 vb trappenhuis | 1.00 |
| | | 6 pb dak | 1.00 |
| | | 7 vb dak | 0.00 |
| | | 8 EG constructie | 1.00 |
| 8.wind uit | | 2 EG glas | 1.00 |
| | | 3 Wind uit | 1.00 |
| | | 4 eg trappenhuis | 1.00 |
| | | 5 vb trappenhuis | 0.50 |
| | | 6 pb dak | 1.00 |
| | | 7 vb dak | 0.00 |
| | | 8 EG constructie | 1.00 |
| 9.wind in | | 1 Wind in | 0.00 |
| | | 2 EG glas | 1.00 |
| | | 4 eg trappenhuis | 1.00 |



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Patch Reference numbers on UTT Serial No. 546

| Combi | Norm | BG | coëff |
|---|---|---|---|
| | | 5 vb trappenhuis | 1.00 |
| | | 6 pb dak | 1.00 |
| | | 7 vb dak | 0.00 |
| | | 8 EG constructie | 1.00 |
| 10.wind uit | | 2 EG glas | 1.00 |
| | | 3 Wind uit | 0.00 |
| | | 4 eg trappenhuis | 1.00 |
| | | 5 vb trappenhuis | 1.00 |
| | | 6 pb dak | 1.00 |
| | | 7 vb dak | 0.00 |
| | | 8 EG constructie | 1.00 |
| 11.wind in | Lineair- UGT | 1 Wind in | 0.30 |
| | | 2 EG glas | 1.20 |
| | | 4 eg trappenhuis | 1.20 |
| | | 6 pb dak | 1.20 |
| | | 5 vb trappenhuis | 1.50 |
| | | 7 vb dak | 1.50 |
| | | 8 EG constructie | 1.20 |
| 12.wind in | | 1 Wind in | 0.30 |
| | | 2 EG glas | 1.20 |
| | | 4 eg trappenhuis | 1.20 |
| | | 5 vb trappenhuis | 1.50 |
| | | 7 vb dak | 1.50 |
| | | 8 EG constructie | 1.20 |
| 13.wind in momentaan | | 1 Wind in | 0.30 |
| | | 2 EG glas | 1.20 |
| | | 7 vb dak | 1.50 |
| | | 8 EG constructie | 1.20 |
| | | 9 eg trappenhuis momentaan vol | 1.20 |
| | | 10 vb trappenhuis momentaan vol | 1.50 |
| | | 11 eg trappenhuis momentaan factor | 1.20 |
| | | 12 vb trappenhuis momentaan factor | 0.30 |
| | | 6 pb dak | 1.20 |

Regels voor het genereren van uiterste combinaties:

1 : 0.30*BG1 / 1.20*BG2 / 1.20*BG4 / 1.50*BG5 / 1.20*BG6 / 0.00*BG7 / 1.20*BG8

2 : 1.20*BG2 / 0.30*BG3 / 1.20*BG4 / 1.50*BG5 / 1.20*BG6 / 0.00*BG7 / 1.20*BG8

3 : 1.50*BG1 / 1.20*BG2 / 1.20*BG4 / 0.75*BG5 / 1.20*BG6 / 0.00*BG7 / 1.20*BG8

4 : 1.20*BG2 / 1.50*BG3 / 1.20*BG4 / 0.75*BG5 / 1.20*BG6 / 0.00*BG7 / 1.20*BG8

5 : 0.30*BG1 / 1.20*BG2 / 1.20*BG4 / 1.20*BG6 / 1.50*BG5 / 1.50*BG7 / 1.20*BG8

6 : 0.30*BG1 / 1.20*BG2 / 1.20*BG4 / 1.50*BG5 / 1.50*BG7 / 1.20*BG8

7 : 0.30*BG1 / 1.20*BG2 / 1.50*BG7 / 1.20*BG8 / 1.20*BG9 / 1.50*BG10 / 1.20*BG11 / 0.30*BG12 / 1.20*BG6

Regels voor het genereren van gebruiks combinaties:

1 : 0.20*BG1 / 1.00*BG2 / 1.00*BG4 / 1.00*BG5 / 1.00*BG6 / 0.00*BG7 / 1.00*BG8

2 : 1.00*BG1 / 1.00*BG2 / 1.00*BG4 / 0.50*BG5 / 1.00*BG6 / 0.00*BG7 / 1.00*BG8



the scale towards document

3 : 1.00*BG2 / 0.20*BG3 / 1.00*BG4 / 1.00*BG5 / 1.00*BG6 / 0.00*BG7 / 1.00*BG8
4 : 1.00*BG2 / 1.00*BG3 / 1.00*BG4 / 0.50*BG5 / 1.00*BG6 / 0.00*BG7 / 1.00*BG8
5 : 0.00*BG1 / 1.00*BG2 / 1.00*BG4 / 1.00*BG5 / 1.00*BG6 / 0.00*BG7 / 1.00*BG8
6 : 1.00*BG2 / 0.00*BG3 / 1.00*BG4 / 1.00*BG5 / 1.00*BG6 / 0.00*BG7 / 1.00*BG8

Lijst van alle UGT combinaties
1/ 1 : +0.30*BG1+1.20*BG2+1.20*BG4+1.50*BG5+1.20*BG6+1.20*BG8
2/ 2 : +1.20*BG2+0.30*BG3+1.20*BG4+1.50*BG5+1.20*BG6+1.20*BG8
3/ 12 : +0.30*BG1+1.20*BG2+1.20*BG4+1.50*BG5+1.50*BG7+1.20*BG8
4/ 3 : +1.50*BG1+1.20*BG2+1.20*BG4+0.75*BG5+1.20*BG6+1.20*BG8
5/ 4 : +1.20*BG2+1.50*BG3+1.20*BG4+0.75*BG5+1.20*BG6+1.20*BG8
6/ 11 : +0.30*BG1+1.20*BG2+1.20*BG4+1.50*BG5+1.20*BG6+1.50*BG7+1.20*BG8
7/ 13 : +0.30*BG1+1.20*BG2+1.20*BG6+1.50*BG7+1.20*BG8+1.20*BG9+1.50*BG10
+1.20*BG11+0.30*BG12

Lijst van alle GGT combinaties
1/ 9 : +1.00*BG2+1.00*BG4+1.00*BG5+1.00*BG6+1.00*BG8
2/ 5 : +0.20*BG1+1.00*BG2+1.00*BG4+1.00*BG5+1.00*BG6+1.00*BG8
3/ 7 : +1.00*BG2+0.20*BG3+1.00*BG4+1.00*BG5+1.00*BG6+1.00*BG8
4/ 6 : +1.00*BG1+1.00*BG2+1.00*BG4+0.50*BG5+1.00*BG6+1.00*BG8
5/ 8 : +1.00*BG2+1.00*BG3+1.00*BG4+0.50*BG5+1.00*BG6+1.00*BG8

## Niet-lineaire combinatie

| Combi | Groep van voorvervormingen | | dx mm/m | dy mm/m | Groep van voorkrommingen | BG | coëff |
|---|---|---|---|---|---|---|---|
| C 1 | | 0 | 0.00 | 0.00 | | 0 1 Wind in | 0.30 |
| | | 0 | 0.00 | 0.00 | | 0 2 EG glas | 1.20 |
| | | 0 | 0.00 | 0.00 | | 0 4 eg trappenhuis | 1.20 |
| | | 0 | 0.00 | 0.00 | | 0 6 pb dak | 1.20 |
| | | 0 | 0.00 | 0.00 | | 0 8 EG constructie | 1.20 |
| | | 0 | 0.00 | 0.00 | | 0 5 vb trappenhuis | 1.50 |
| | | 0 | 0.00 | 0.00 | | 0 7 vb dak | 0.00 |

## Verslag berekening.

## Lineaire berekening

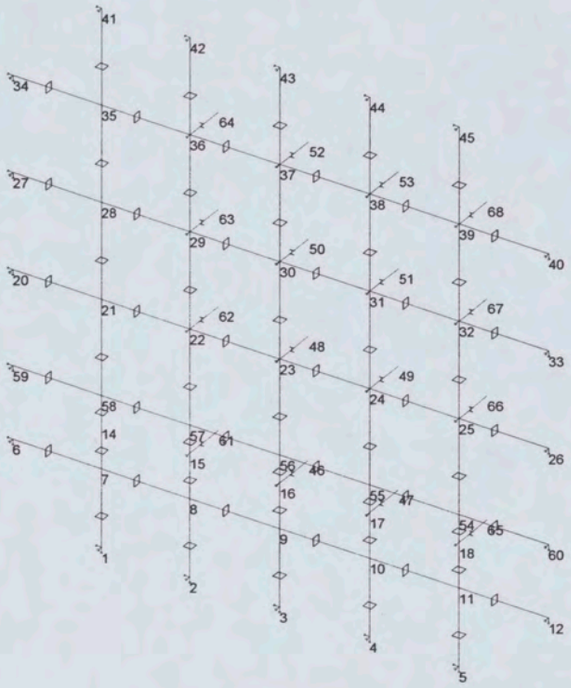
| | | |
|---|---|---|
| Aantal 2D elementen | | 0 |
| Aantal 1D elementen | | 81 |
| Aantal netknopen | | 72 |
| Aantal vergelijkingen | | 432 |
| Belastinggevallen | BG 1 Wind in | |
| | BG 2 EG glas | |

| | | |
|---|---|---|
| Aantal 2D elementen | | 0 |
| Aantal 1D elementen | | 81 |
| Aantal netknopen | | 72 |
| Aantal vergelijkingen | | 432 |
| | BG 3 Wind uit | |
| | BG 4 eg trappenhuis | |
| | BG 5 vb trappenhuis | |
| | BG 6 pb dak | |
| | BG 7 vb dak | |
| | BG 8 EG constructie | |
| | BG 9 eg trappenhuis momentaan vol | |
| | BG 10 vb trappenhuis momentaan vol | |
| | BG 11 eg trappenhuis momentaan factor | |
| | BG 12 vb trappenhuis momentaan factor | |
| Buigtheorie | Mindlin | |
| Start berekening | 06.12.2005 12:34 | |
| Einde berekening | 06.12.2005 12:34 | |

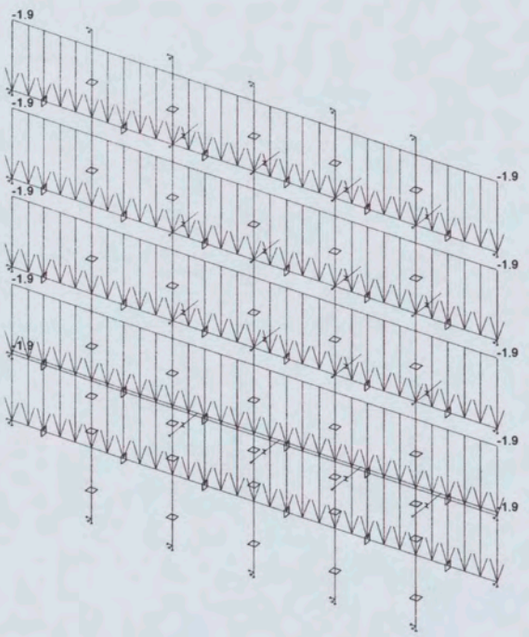
## Som van lasten en reacties.

| | | | X | Y | Z |
|---|---|---|---|---|---|
| belastinggeval | 1 | last | 0.0 | 558.0 | 0.0 |
| | | knoopreacties | 0.0 | -558.0 | 0.0 |
| | | lijnreactions | 0.0 | 0.0 | 0.0 |
| | | contact 1D | 0.0 | 0.0 | 0.0 |
| | | contact 2D | 0.0 | 0.0 | 0.0 |
| belastinggeval | 2 | last | 0.0 | 0.0 | -206.8 |
| | | knoopreacties | 0.0 | 0.0 | 206.8 |
| | | lijnreactions | 0.0 | 0.0 | 0.0 |
| | | contact 1D | 0.0 | 0.0 | 0.0 |
| | | contact 2D | 0.0 | 0.0 | 0.0 |
| belastinggeval | 3 | last | 0.0 | -355.1 | 0.0 |
| | | knoopreacties | 0.0 | 355.1 | 0.0 |
| | | lijnreactions | 0.0 | 0.0 | 0.0 |
| | | contact 1D | 0.0 | 0.0 | 0.0 |
| | | contact 2D | 0.0 | 0.0 | 0.0 |
| belastinggeval | 4 | last | 0.0 | 0.0 | -262.4 |
| | | knoopreacties | 0.0 | 0.0 | 262.4 |
| | | lijnreactions | 0.0 | 0.0 | 0.0 |
| | | contact 1D | 0.0 | 0.0 | 0.0 |
| | | contact 2D | 0.0 | 0.0 | 0.0 |
| belastinggeval | 5 | last | 0.0 | 0.0 | -316.8 |
| | | knoopreacties | 0.0 | 0.0 | 316.8 |
| | | lijnreactions | 0.0 | 0.0 | 0.0 |
| | | contact 1D | 0.0 | 0.0 | 0.0 |
| | | contact 2D | 0.0 | 0.0 | 0.0 |
| belastinggeval | 6 | last | 0.0 | 0.0 | -2319.4 |
| | | knoopreacties | 0.0 | 0.0 | 2319.4 |

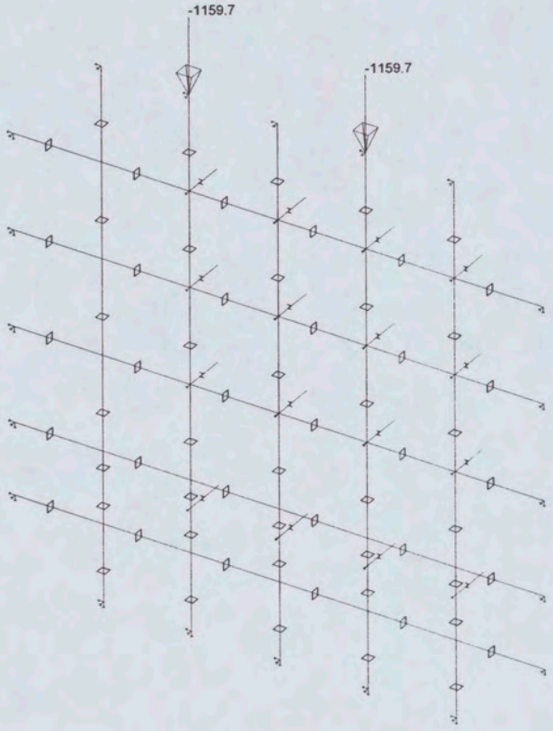
| | | X | Y | Z |
|---|---|---|---|---|
| | lijnreactions | 0.0 | 0.0 | 0.0 |
| | contact 1D | 0.0 | 0.0 | 0.0 |
| | contact 2D | 0.0 | 0.0 | 0.0 |
| belastinggeval 7 | last | 0.0 | 0.0 | -393.2 |
| | knoopreacties | 0.0 | 0.0 | 393.2 |
| | lijnreactions | 0.0 | 0.0 | 0.0 |
| | contact 1D | 0.0 | 0.0 | 0.0 |
| | contact 2D | 0.0 | 0.0 | 0.0 |
| belastinggeval 8 | last | 0.0 | 0.0 | -365.9 |
| | knoopreacties | 0.0 | 0.0 | 365.9 |
| | lijnreactions | 0.0 | 0.0 | 0.0 |
| | contact 1D | 0.0 | 0.0 | 0.0 |
| | contact 2D | 0.0 | 0.0 | 0.0 |
| belastinggeval 9 | last | 0.0 | 0.0 | -65.6 |
| | knoopreacties | 0.0 | 0.0 | 65.6 |
| | lijnreactions | 0.0 | 0.0 | 0.0 |
| | contact 1D | 0.0 | 0.0 | 0.0 |
| | contact 2D | 0.0 | 0.0 | 0.0 |
| belastinggeval 10 | last | 0.0 | 0.0 | -79.2 |
| | knoopreacties | 0.0 | 0.0 | 79.2 |
| | lijnreactions | 0.0 | 0.0 | 0.0 |
| | contact 1D | 0.0 | 0.0 | 0.0 |
| | contact 2D | 0.0 | 0.0 | 0.0 |
| belastinggeval 11 | last | 0.0 | 0.0 | -196.8 |
| | knoopreacties | 0.0 | 0.0 | 196.8 |
| | lijnreactions | 0.0 | 0.0 | 0.0 |
| | contact 1D | 0.0 | 0.0 | 0.0 |
| | contact 2D | 0.0 | 0.0 | 0.0 |
| belastinggeval 12 | last | 0.0 | 0.0 | -237.6 |
| | knoopreacties | 0.0 | 0.0 | 237.6 |
| | lijnreactions | 0.0 | 0.0 | 0.0 |
| | contact 1D | 0.0 | 0.0 | 0.0 |
| | contact 2D | 0.0 | 0.0 | 0.0 |



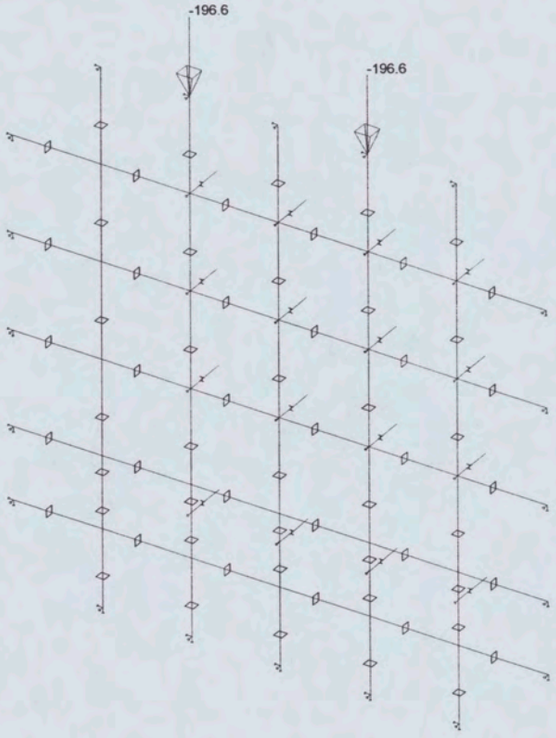

Geometrie



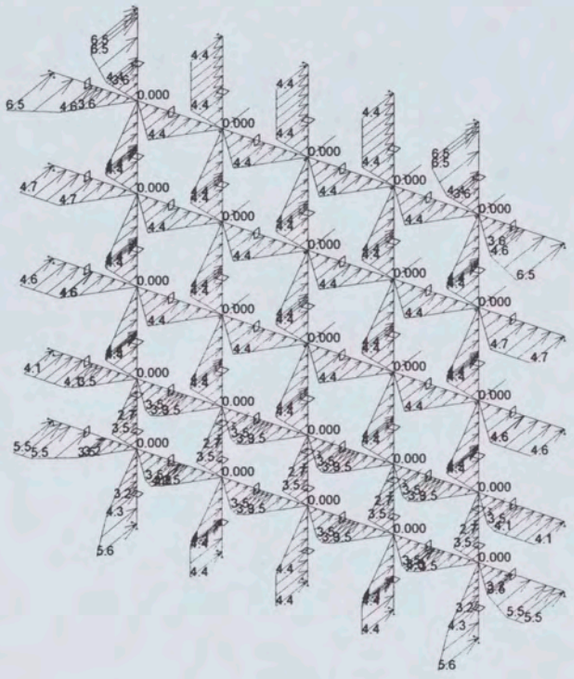

EG glas



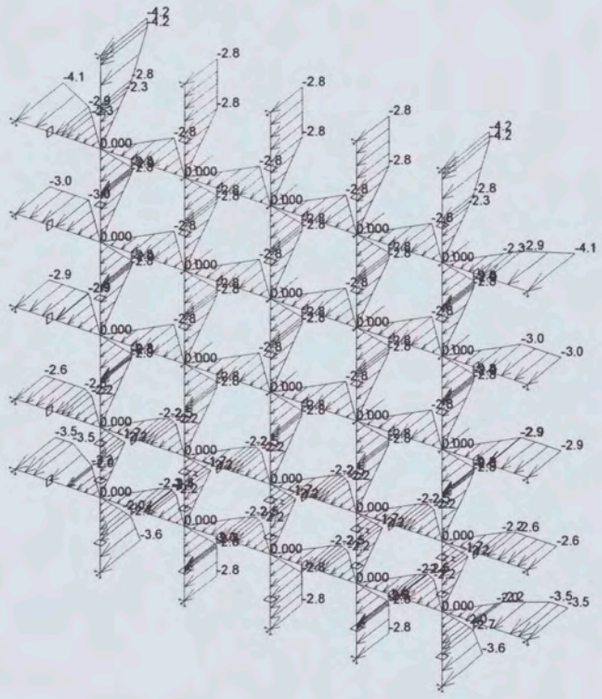

EG dak



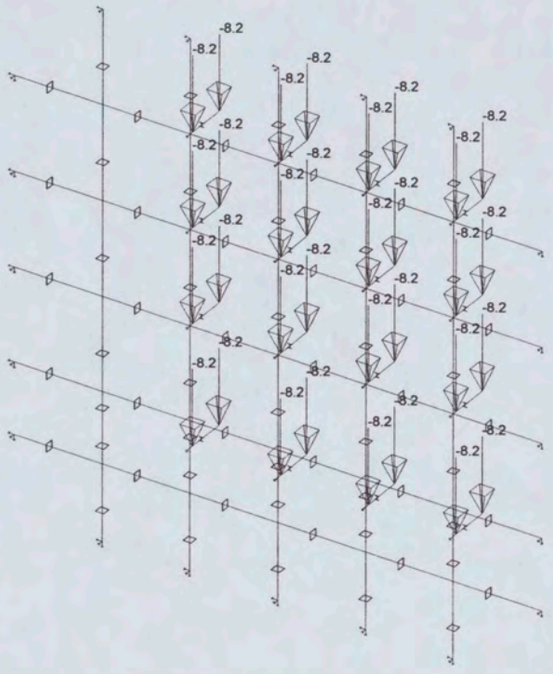

VB dak



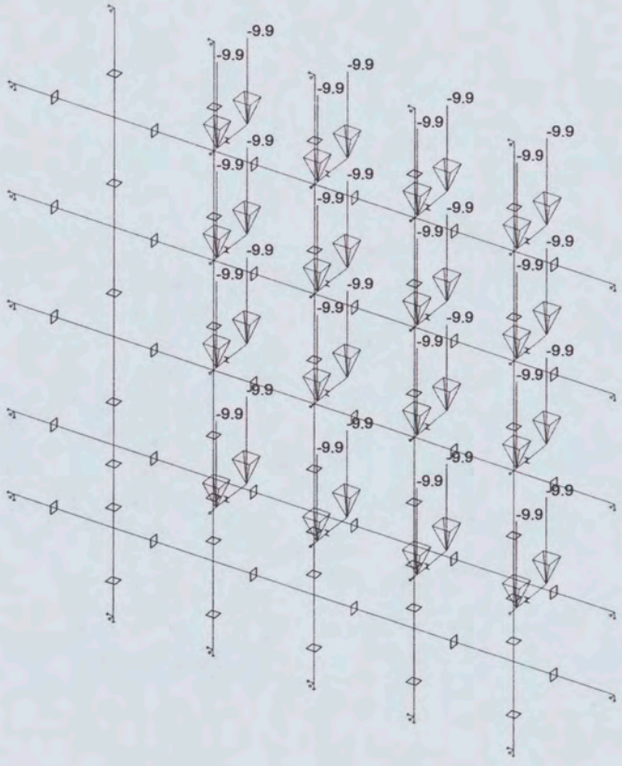
Wind druk



Wind zuiging




EG trappenhuis




VB trappenhuis

## Interne krachten in staven. Extremen per staaf

Lineair statisch - extreme van alle combinaties

Groep van staven:1/81

Groep van UGT combi:1/7

| staaf | doorsn. | combi | dx [mm] | N [kN] | Vy [kN] | Vz [kN] | Mx [kNm] | My [kNm] | Mz [kNm] |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 2 | 6 | 0.0 | **-2.68** | -4.03 | 5.71 | 0.00 | 0.00 | 0.00 |
| | | 5 | | -2.04 | **10.32** | 5.82 | -0.00 | 0.00 | -0.00 |
| | | 4 | | -2.04 | **-17.38** | 5.82 | -0.00 | 0.00 | 0.00 |
| | | 3 | | -1.58 | -4.03 | **6.10** | 0.00 | 0.00 | 0.00 |
| | | 6 | 3600.0 | -2.68 | -0.13 | **-9.65** | 0.00 | **-7.09** | -5.60 |
| | | 3 | 1542.9 | -1.58 | -1.62 | -0.49 | 0.00 | **4.33** | -4.29 |
| | | 5 | 2314.3 | -2.04 | -0.18 | -4.05 | -0.00 | 2.05 | **10.67** |
| | | 4 | 2571.4 | -2.04 | 0.20 | -5.15 | 0.00 | 0.86 | **-19.55** |
| 2 | | 7 | 0.0 | **6.78** | 1.75 | 20.37 | -0.77 | -26.11 | -4.88 |
| | | 4 | 3600.0 | 5.54 | **18.09** | 3.07 | -4.10 | 15.85 | **26.45** |
| | | 5 | | 5.54 | **-10.16** | 3.07 | 2.78 | 15.85 | -15.96 |
| | | 6 | 0.0 | 6.66 | 2.32 | **20.93** | -0.69 | **-27.11** | -6.55 |
| | | 3 | 3600.0 | 0.93 | 4.63 | **-4.08** | -0.69 | 2.07 | 5.95 |
| | | 5 | 0.0 | 5.54 | -2.81 | 18.43 | **2.78** | -22.86 | 7.38 |
| | | 4 | | 5.54 | 6.54 | 18.43 | **-4.10** | -22.86 | **-17.87** |
| | | 6 | 3600.0 | 6.66 | 4.63 | 5.57 | -0.69 | **20.59** | 5.95 |
| 3 | | | 0.0 | **8.48** | -2.13 | -3.98 | 0.17 | **16.72** | 4.98 |
| | | 5 | | 6.91 | **9.49** | -1.94 | **-3.20** | 12.96 | **-16.76** |
| | | 4 | | 6.91 | **-13.65** | -1.94 | **3.78** | 12.96 | **25.92** |
| | | 3 | | 2.11 | -2.13 | **5.58** | 0.17 | -0.60 | 4.98 |
| | | 6 | 3600.0 | 8.48 | 0.18 | **-19.35** | 0.17 | -25.27 | 1.46 |
| | | 7 | | 8.21 | -0.16 | -19.32 | 0.50 | **-25.29** | 0.37 |
| 4 | | 6 | 0.0 | **8.75** | -1.31 | 19.27 | 0.08 | -25.34 | 1.23 |
| | | 4 | 3600.0 | 7.13 | **5.14** | 1.89 | 0.32 | 12.72 | -6.44 |
| | | | 0.0 | 7.13 | **-6.39** | 17.25 | **0.32** | -21.72 | -4.19 |
| | | 7 | | 8.48 | -1.29 | **19.28** | 0.07 | **-25.34** | 0.07 |
| | | 3 | 3600.0 | 2.17 | 1.00 | **-5.65** | 0.08 | -0.93 | 0.66 |
| | | 5 | 0.0 | 7.13 | 4.03 | 17.25 | **-0.19** | -21.72 | 5.43 |
| | | 7 | 3600.0 | 8.48 | 1.01 | 3.91 | 0.07 | **16.39** | -0.43 |
| | | 5 | 1800.0 | 7.13 | 0.35 | 9.57 | -0.19 | 2.42 | **10.44** |
| | | 4 | | 7.13 | -0.63 | 9.57 | 0.32 | 2.42 | **-12.18** |
| 5 | | 6 | 0.0 | **8.51** | -0.67 | -3.95 | -0.15 | 17.83 | 0.79 |
| | | 4 | 3600.0 | 6.94 | **11.29** | -17.30 | -4.00 | -20.70 | **14.82** |
| | | 5 | | 6.94 | **-8.01** | -17.30 | 3.41 | -20.70 | **-10.03** |
| | | 3 | 0.0 | 2.14 | -0.67 | **5.69** | -0.15 | -0.69 | 0.79 |
| | | 7 | 3600.0 | 8.24 | 1.98 | **-19.35** | -0.52 | **-24.16** | 2.77 |
| | | 5 | 0.0 | 6.94 | -0.67 | -1.93 | **3.41** | 13.91 | 5.60 |
| | | 4 | | 6.94 | -0.26 | -1.93 | **-4.00** | 13.91 | -5.02 |
| | | 7 | | 8.24 | -0.33 | -3.99 | -0.52 | **17.85** | -0.21 |
| 6 | | 4 | 3600.0 | -0.00 | **7.80** | -6.29 | 0.00 | -0.00 | 0.00 |
| | | | 0.0 | -0.00 | **-11.70** | 9.07 | 0.00 | -5.01 | **16.45** |
| | | 7 | | -0.00 | -2.38 | **9.19** | 0.00 | **-5.43** | 3.43 |

| staaf | doorsn. | combi | dx [mm] | N [kN] | Vy [kN] | Vz [kN] | Mx [kNm] | My [kNm] | Mz [kNm] |
|---|---|---|---|---|---|---|---|---|---|
| | | 3 | 3600.0 | -0.00 | 1.47 | **-6.76** | 0.00 | -0.00 | 0.00 |
| | | | 2057.1 | -0.00 | -0.94 | -0.18 | -0.00 | **5.36** | -0.34 |
| | | 5 | 0.0 | -0.00 | 7.32 | 9.07 | -0.00 | -5.01 | **-10.03** |
| 7 | | 3 | | **-0.58** | -3.97 | **6.17** | 0.00 | 0.00 | -0.00 |
| | | 5 | | -0.40 | **12.08** | 4.85 | 0.00 | 0.00 | -0.00 |
| | | 4 | | -0.40 | **-19.24** | 4.85 | 0.00 | 0.00 | -0.00 |
| | | 6 | 3600.0 | -0.57 | -0.30 | **-11.08** | -0.00 | **-12.06** | -6.14 |
| | | 3 | 1542.9 | -0.58 | -1.83 | -0.46 | -0.00 | **4.41** | -4.47 |
| | | 5 | 3600.0 | -0.40 | 0.40 | -10.62 | -0.00 | -10.37 | **17.54** |
| | | 4 | | -0.40 | -0.88 | -10.62 | -0.00 | -10.37 | **-28.50** |
| 8 | | 7 | 0.0 | **5.97** | 2.78 | 48.63 | 1.36 | -72.99 | -6.41 |
| | | 4 | 3600.0 | 4.94 | **25.46** | 26.63 | 1.13 | 61.58 | **41.31** |
| | | 5 | | 4.94 | **-16.21** | 26.63 | 2.58 | 61.58 | -27.18 |
| | | 6 | 0.0 | 5.93 | 2.74 | **50.03** | 2.69 | **-75.52** | -6.51 |
| | | 2 | | 4.90 | -1.75 | 43.32 | **2.98** | -64.33 | 2.87 |
| | | 6 | 3600.0 | 5.93 | 5.09 | 34.56 | 2.69 | **76.75** | 7.59 |
| | | 4 | 0.0 | 4.94 | 13.70 | 42.10 | 1.13 | -62.15 | **-29.20** |
| 9 | | 6 | | **6.55** | -3.41 | -31.85 | 0.62 | **67.48** | 7.13 |
| | | 5 | | 5.39 | **13.64** | -24.90 | 0.39 | 54.75 | **-27.46** |
| | | 4 | | 5.39 | **-20.14** | -24.90 | 0.48 | 54.75 | **40.92** |
| | | 3 | | 1.52 | -3.41 | **0.64** | **0.62** | 8.77 | 7.13 |
| | | 6 | 3600.0 | 6.55 | -1.06 | **-47.32** | 0.62 | -75.02 | -0.92 |
| | | 7 | 0.0 | 6.46 | -3.72 | -31.77 | **-0.01** | 67.12 | 7.71 |
| | | | 3600.0 | 6.46 | -1.37 | -47.24 | -0.01 | **-75.08** | -1.46 |
| 10 | | 6 | 0.0 | **6.57** | -1.35 | 47.02 | 0.01 | -75.08 | -0.87 |
| | | 4 | 3600.0 | 5.41 | **5.05** | 24.68 | 0.06 | 53.93 | -12.87 |
| | | | 0.0 | 5.41 | **-6.71** | 40.15 | **0.06** | -62.77 | -9.90 |
| | | 7 | | 6.48 | -1.35 | **47.02** | 0.02 | **-75.09** | -1.18 |
| | | 3 | 3600.0 | 1.54 | 1.00 | **-0.88** | 0.01 | 7.74 | -1.50 |
| | | 5 | 0.0 | 5.41 | 4.25 | 40.15 | **-0.04** | -62.77 | 7.79 |
| | | 7 | 3600.0 | 6.48 | 1.00 | 31.55 | 0.02 | **66.35** | -1.82 |
| | | 5 | 2057.1 | 5.41 | -0.48 | 31.31 | -0.04 | 10.73 | **13.20** |
| | | 4 | | 5.41 | 0.73 | 31.31 | 0.06 | 10.73 | **-18.45** |
| 11 | | 6 | 0.0 | **6.41** | 0.20 | -30.28 | -0.40 | 69.50 | -1.48 |
| | | 4 | 3600.0 | 5.28 | **16.35** | -39.11 | -0.21 | -56.43 | **24.51** |
| | | 5 | | 5.28 | **-11.37** | -39.11 | -0.34 | -56.43 | **-17.53** |
| | | 3 | 0.0 | 1.52 | 0.20 | **1.49** | -0.40 | 8.07 | -1.48 |
| | | 7 | 3600.0 | 6.32 | 2.88 | **-45.86** | 0.16 | **-67.71** | 4.09 |
| | | | 0.0 | 6.32 | 0.53 | -30.39 | **0.16** | **69.53** | -2.04 |
| | | 2 | | 5.37 | -1.50 | -23.55 | **-0.43** | 56.48 | 3.14 |
| 12 | | 5 | | -0.00 | **9.29** | 9.29 | -0.00 | -5.60 | **-17.33** |
| | | 4 | | -0.00 | **-13.88** | 9.29 | -0.00 | -5.60 | **24.64** |
| | | 7 | | -0.00 | -2.53 | **9.73** | -0.00 | **-7.19** | 4.04 |
| | | 3 | 3600.0 | -0.00 | 1.24 | **-8.02** | 0.00 | 0.00 | -0.00 |
| | | | 1800.0 | -0.00 | -1.26 | -0.29 | -0.00 | **7.48** | 0.02 |
| 13 | | 6 | 0.0 | **-2.97** | -3.78 | 3.50 | 0.00 | -0.00 | 0.00 |
| | | 5 | | -2.40 | **12.53** | 4.16 | 0.00 | -0.00 | 0.00 |



the scale towards document
Patch Reference numbers on UIT7 Image Engineering Scan Reference Chart TE263 Serial No. 546

| staaf | doorsn. | combi | dx [mm] | N [kN] | Vy [kN] | Vz [kN] | Mx [kNm] | My [kNm] | Mz [kNm] |
|---|---|---|---|---|---|---|---|---|---|
| | | 4 | | -2.40 | **-19.47** | 4.16 | 0.00 | -0.00 | 0.00 |
| | | 3 | | -0.97 | -3.78 | **6.13** | 0.00 | -0.00 | 0.00 |
| | | 6 | 3600.0 | -2.97 | -0.10 | **-11.97** | -0.00 | **-15.24** | -5.43 |
| | | 3 | 1542.9 | -0.97 | -1.63 | -0.50 | -0.00 | **4.35** | -4.17 |
| | | 5 | 3600.0 | -2.40 | 0.81 | -11.31 | -0.00 | -12.86 | **19.05** |
| | | 4 | | -2.40 | -1.04 | -11.31 | 0.00 | -12.86 | **-29.12** |
| 14 | | 7 | 0.0 | **7.55** | 2.30 | 67.52 | 0.92 | -104.98 | -5.59 |
| | | 4 | 3600.0 | 6.25 | **25.55** | 42.26 | 1.68 | 91.38 | **41.65** |
| | | 5 | | 6.25 | **-16.37** | 42.26 | 1.93 | 91.38 | -26.30 |
| | | 6 | 0.0 | 7.54 | 2.68 | **69.13** | 2.57 | **-107.88** | -5.40 |
| | | 2 | | 6.23 | -1.86 | 59.23 | **2.62** | -91.31 | 4.27 |
| | | 6 | 3600.0 | 7.54 | 5.03 | 53.65 | 2.57 | **113.12** | 8.49 |
| | | 4 | 0.0 | 6.25 | 13.80 | 57.74 | 1.68 | -88.62 | **-29.18** |
| 15 | | 6 | | **7.58** | -4.12 | -50.98 | 1.07 | **102.17** | 8.30 |
| | | 5 | | 6.23 | **12.77** | -40.69 | 0.93 | 83.35 | **-26.19** |
| | | 4 | | 6.23 | **-20.22** | -40.69 | 0.56 | 83.35 | **41.27** |
| | | 6 | 3600.0 | 7.58 | -1.76 | **-66.45** | 1.07 | -109.22 | -2.28 |
| | | 2 | 0.0 | 6.33 | 2.48 | -40.76 | **1.15** | 83.69 | -5.19 |
| | | 7 | 3600.0 | 7.51 | -0.66 | -66.37 | 0.47 | **-109.31** | -0.28 |
| 16 | | 6 | 0.0 | **8.03** | -1.34 | 66.54 | -0.02 | -110.06 | -2.51 |
| | | 4 | 3600.0 | 6.61 | **5.03** | 40.79 | -0.02 | 83.05 | -13.38 |
| | | | 0.0 | 6.61 | **-6.73** | 56.26 | **-0.02** | -91.64 | -10.32 |
| | | 7 | | 7.97 | -1.34 | **66.55** | -0.02 | **-110.08** | -0.94 |
| | | | 3600.0 | 7.97 | 1.01 | 51.07 | -0.02 | **101.63** | -1.55 |
| | | 5 | 2057.1 | 6.61 | -0.44 | 47.42 | -0.01 | 15.00 | **11.47** |
| | | 4 | | 6.61 | 0.71 | 47.42 | -0.02 | 15.00 | **-18.92** |
| 17 | | 6 | 0.0 | **9.42** | 1.08 | -47.92 | -0.97 | 103.37 | -2.85 |
| | | 4 | 3600.0 | 7.76 | **16.49** | -53.65 | -0.58 | -80.86 | **24.89** |
| | | 5 | | 7.76 | **-10.31** | -53.65 | -0.78 | -80.86 | **-15.44** |
| | | 7 | | 9.35 | 2.25 | **-63.50** | -0.50 | **-97.36** | 3.01 |
| | | 2 | 0.0 | 7.86 | -0.43 | -38.08 | **-1.01** | 84.42 | 1.45 |
| | | 7 | | 9.35 | -0.10 | -48.03 | -0.50 | **103.40** | -0.87 |
| 18 | | 5 | | -0.00 | **8.70** | 9.82 | -0.00 | -7.49 | **-15.16** |
| | | 4 | | -0.00 | **-13.97** | 9.82 | -0.00 | -7.49 | **24.89** |
| | | 7 | | -0.00 | -2.41 | **10.44** | -0.00 | **-9.73** | 3.59 |
| | | 3 | 3600.0 | -0.00 | 0.75 | **-8.37** | 0.00 | 0.00 | 0.00 |
| | | | 1542.9 | -0.00 | -2.07 | 0.47 | -0.00 | **8.12** | 1.41 |
| 19 | | 6 | 0.0 | **4.80** | -4.07 | -0.62 | 0.00 | -0.00 | 0.00 |
| | | 5 | | 3.72 | **13.29** | 0.79 | 0.00 | -0.00 | 0.00 |
| | | 4 | | 3.72 | **-20.73** | 0.79 | 0.00 | -0.00 | 0.00 |
| | | 3 | | 2.56 | -4.07 | **5.34** | 0.00 | -0.00 | 0.00 |
| | | 6 | 3600.0 | 4.80 | 0.07 | **-16.09** | -0.00 | **-30.08** | -5.08 |
| | | 3 | 1285.7 | 2.56 | -1.84 | -0.18 | -0.00 | **3.32** | -3.74 |
| | | 5 | 3600.0 | 3.72 | 0.11 | -14.68 | 0.00 | -24.99 | **17.35** |
| | | 4 | | 3.72 | -0.02 | -14.68 | -0.00 | -24.99 | **-26.70** |
| 20 | | 7 | 0.0 | **-15.46** | 2.89 | 84.47 | 4.16 | -129.52 | -5.45 |
| | | 4 | 3600.0 | -12.74 | **24.61** | 56.11 | 4.18 | 121.24 | **40.72** |

| staaf | doorsn. | combi | dx [mm] | N [kN] | Vy [kN] | Vz [kN] | Mx [kNm] | My [kNm] | Mz [kNm] |
|---|---|---|---|---|---|---|---|---|---|
| | | 5 | | -12.74 | **-14.64** | 56.11 | 1.21 | 121.24 | -22.02 |
| | | 6 | 0.0 | -15.32 | 3.33 | **85.92** | 3.73 | **-132.13** | -5.19 |
| | | 4 | | -12.74 | 12.86 | 71.58 | **4.18** | -108.59 | **-26.72** |
| | | 6 | 3600.0 | -15.32 | 5.69 | 70.44 | 3.73 | **149.32** | 11.05 |
| 21 | | | 0.0 | **-17.53** | -6.01 | -73.44 | -0.01 | **142.29** | 11.72 |
| | | 5 | | -14.37 | **10.46** | -59.19 | **1.30** | 116.37 | **-21.50** |
| | | 4 | | -14.37 | **-20.48** | -59.19 | **-1.45** | 116.37 | **41.14** |
| | | 6 | 3600.0 | -17.53 | -3.66 | **-88.91** | -0.01 | -149.95 | -5.70 |
| | | 7 | | -17.18 | -2.58 | -88.81 | 0.37 | **-150.03** | -3.74 |
| 22 | | 6 | 0.0 | **-18.10** | -1.28 | 88.65 | -0.03 | -150.43 | -5.04 |
| | | 4 | 3600.0 | -14.84 | **5.30** | 59.03 | -0.26 | 115.41 | -13.39 |
| | | | 0.0 | -14.84 | **-6.46** | 74.50 | **-0.26** | -124.95 | -11.32 |
| | | 7 | | -17.75 | -1.29 | **88.66** | -0.03 | **-150.46** | -3.16 |
| | | 5 | | -14.84 | 4.12 | 74.50 | **0.19** | -124.95 | 3.49 |
| | | 7 | 3600.0 | -17.75 | 1.06 | 73.19 | -0.03 | **140.86** | -3.57 |
| | | 5 | 1800.0 | -14.84 | 0.38 | 66.77 | 0.19 | 2.19 | **8.67** |
| | | 4 | | -14.84 | -0.58 | 66.77 | -0.26 | 2.19 | **-19.41** |
| 23 | | 6 | 0.0 | **-18.60** | 3.04 | -64.68 | 0.37 | 139.71 | -6.11 |
| | | 4 | 3600.0 | -15.26 | **16.81** | -67.49 | 2.17 | -100.70 | **25.75** |
| | | 5 | | -15.26 | **-7.98** | -67.49 | -1.48 | -100.70 | -11.16 |
| | | 7 | | -18.24 | 4.21 | **-80.30** | 0.06 | **-121.46** | 6.75 |
| | | 4 | 0.0 | -15.26 | 5.05 | -52.02 | **2.17** | 114.43 | **-13.60** |
| | | 5 | | -15.26 | -0.50 | -52.02 | **-1.48** | 114.43 | 4.11 |
| | | 7 | | -18.24 | 1.86 | -64.82 | 0.06 | **139.76** | -4.18 |
| 24 | | 5 | | 0.00 | **8.00** | 13.00 | -0.00 | -18.94 | **-11.86** |
| | | 4 | | 0.00 | **-14.53** | 13.00 | -0.00 | -18.94 | **25.70** |
| | | 7 | | 0.00 | -3.22 | **14.26** | -0.00 | **-23.50** | 6.26 |
| | | 3 | 3600.0 | 0.00 | 0.30 | **-7.80** | 0.00 | 0.00 | 0.00 |
| | | | 1800.0 | 0.00 | -2.66 | -0.07 | -0.00 | **7.08** | 2.29 |
| 25 | | 6 | 0.0 | **-360.73** | -2.04 | **-1.86** | 0.00 | 0.00 | -0.00 |
| | | 5 | | -316.82 | **8.74** | -1.50 | 0.00 | -0.00 | 0.00 |
| | | 4 | | -316.82 | **-12.69** | -1.50 | 0.00 | -0.00 | -0.00 |
| | | 6 | 3100.0 | -354.57 | 1.06 | -1.86 | 0.00 | **-5.78** | -0.13 |
| | | 5 | 2066.7 | -312.71 | 0.10 | -1.50 | -0.00 | -3.10 | **8.14** |
| | | 4 | 1808.3 | -313.23 | -0.21 | -1.50 | 0.00 | -2.71 | **-10.71** |
| 26 | | 6 | 0.0 | **-323.98** | -1.39 | **-11.21** | -0.95 | **14.24** | 0.56 |
| | | 4 | 1800.0 | -279.11 | **3.83** | -9.09 | 0.17 | -4.84 | -3.68 |
| | | 5 | | -279.11 | **-3.87** | -9.09 | -1.43 | -4.84 | 1.67 |
| | | 4 | 0.0 | -282.69 | -1.60 | -9.09 | **0.17** | 11.52 | -4.27 |
| | | 5 | | -282.69 | -0.41 | -9.09 | **-1.43** | 11.52 | **4.62** |
| | | 6 | 1800.0 | -320.41 | -0.30 | -11.21 | -0.95 | **-5.94** | -1.24 |
| | | 4 | 900.0 | -280.90 | -0.13 | -9.09 | 0.17 | 3.34 | **-5.27** |
| 27 | | 6 | 0.0 | **-320.41** | -0.30 | **-11.21** | -0.95 | -5.94 | -1.24 |
| | | 4 | 1100.0 | -276.92 | **6.03** | -9.09 | 0.17 | -14.83 | **2.15** |
| | | 5 | | -276.92 | **-5.26** | -9.09 | -1.43 | -14.83 | -3.61 |
| | | 4 | 0.0 | -279.11 | 3.83 | -9.09 | **0.17** | -4.84 | **-3.68** |
| | | 5 | | -279.11 | -3.87 | -9.09 | **-1.43** | -4.84 | 1.67 |



the scale towards document
Patch Reference numbers on UTT Serial No. 546
Image Engineer .org Scan Reference Chart TE263

| staaf | doorsn. | combi | dx [mm] | N [kN] | Vy [kN] | Vz [kN] | Mx [kNm] | My [kNm] | Mz [kNm] |
|---|---|---|---|---|---|---|---|---|---|
| | | 6 | 1100.0 | -318.22 | 0.14 | -11.21 | -0.95 | **-18.28** | -1.24 |
| 28 | | | 0.0 | **-274.73** | -0.21 | **-13.15** | 0.44 | **22.30** | -1.73 |
| | | 4 | 3800.0 | -230.98 | **8.11** | -10.71 | 0.78 | -22.56 | **6.66** |
| | | | 0.0 | -238.53 | **-4.97** | -10.71 | **0.78** | 18.15 | 0.69 |
| | | 5 | | -238.53 | 4.22 | -10.71 | **-0.11** | 18.15 | -2.94 |
| | | 6 | 3800.0 | -267.17 | 2.41 | -13.15 | 0.44 | **-27.68** | 2.45 |
| | | 4 | 1773.3 | -235.01 | 0.73 | -10.71 | 0.78 | -0.85 | **-4.75** |
| 29 | | 6 | 0.0 | **-206.06** | -0.63 | **-19.65** | 0.08 | **35.78** | -0.24 |
| | | 4 | 3850.0 | -170.60 | **6.95** | -16.05 | 0.08 | -32.58 | **6.44** |
| | | | 0.0 | -178.26 | **-6.47** | -16.05 | **0.08** | 29.21 | 5.53 |
| | | 7 | | -202.75 | -1.13 | -19.04 | **-0.00** | 34.63 | 0.49 |
| | | 6 | 3850.0 | -198.41 | 2.05 | -19.65 | 0.08 | **-39.88** | 2.51 |
| | | 5 | 0.0 | -178.26 | 5.01 | -16.05 | 0.03 | 29.21 | **-5.32** |
| 30 | | 6 | | **-117.31** | -0.72 | **-30.16** | 0.11 | **52.76** | -0.06 |
| | | 5 | | -101.56 | **6.16** | -24.70 | 0.13 | 43.18 | -4.40 |
| | | 4 | | -101.56 | **-7.88** | -24.70 | 0.02 | 43.18 | 4.77 |
| | | 2 | | -103.20 | 2.08 | -25.37 | **0.14** | 44.41 | -1.90 |
| | | 6 | 3850.0 | -109.66 | 1.96 | -30.16 | 0.11 | **-63.38** | 2.32 |
| | | 5 | 2310.0 | -96.97 | 0.36 | -24.70 | 0.13 | -13.88 | **5.14** |
| | | 4 | 2053.3 | -97.48 | -0.32 | -24.70 | 0.02 | -7.54 | **-6.19** |
| 31 | | 3 | 0.0 | **-7.65** | -1.31 | -2.45 | -0.00 | 9.44 | -1.41 |
| | | 4 | 3850.0 | 0.00 | **15.96** | -8.23 | -0.00 | -0.00 | 0.00 |
| | | 5 | | 0.00 | **-9.94** | -8.23 | 0.00 | -0.00 | 0.00 |
| | | 6 | 0.0 | -7.65 | -1.31 | **-10.04** | -0.00 | **38.67** | -1.41 |
| | | 5 | 2053.3 | -3.57 | 0.04 | -8.23 | 0.00 | 14.79 | **8.36** |
| | | 4 | | -3.57 | 0.28 | -8.23 | -0.00 | 14.79 | **-13.76** |
| 32 | | 6 | 0.0 | **-1571.44** | 0.46 | **-0.35** | 0.00 | 0.00 | -0.00 |
| | | 5 | | -1295.76 | **11.16** | -0.26 | 0.00 | 0.00 | 0.00 |
| | | 4 | | -1295.76 | **-11.66** | -0.26 | 0.00 | 0.00 | -0.00 |
| | | 6 | 3100.0 | -1565.28 | 3.34 | -0.35 | 0.00 | **-1.08** | 7.00 |
| | | 5 | | -1289.60 | 2.02 | -0.26 | 0.00 | -0.80 | **16.88** |
| | | 4 | 1808.3 | -1292.17 | -0.32 | -0.26 | 0.00 | -0.46 | **-10.48** |
| 33 | | 6 | 0.0 | **-1574.83** | 10.09 | **-2.16** | -0.96 | **2.79** | 6.14 |
| | | 4 | 1800.0 | -1291.03 | **39.88** | -1.62 | -0.53 | -0.82 | **49.30** |
| | | 5 | | -1291.03 | **-21.08** | -1.62 | -0.81 | -0.82 | -11.08 |
| | | 2 | 0.0 | -1348.69 | -0.32 | -2.01 | **-1.02** | 2.60 | 13.95 |
| | | 6 | 1800.0 | -1571.25 | 11.18 | -2.16 | -0.96 | **-1.10** | 25.01 |
| | | 4 | 0.0 | -1294.61 | 34.44 | -1.62 | -0.53 | 2.10 | **-16.17** |
| 34 | | 6 | | **-1521.10** | 5.09 | **-2.16** | -0.96 | -1.10 | -23.83 |
| | | 5 | | -1255.74 | **39.62** | -1.62 | -0.81 | -0.82 | **-45.44** |
| | | 4 | | -1255.74 | **-36.27** | -1.62 | -0.53 | -0.82 | **14.94** |
| | | 2 | | -1294.96 | 20.27 | -2.01 | **-1.02** | -1.02 | -35.90 |
| | | 6 | 1100.0 | -1518.91 | 5.53 | -2.16 | -0.96 | **-3.47** | -17.90 |
| 35 | | | 0.0 | **-1552.56** | 10.08 | **-2.08** | -0.02 | **3.69** | -17.81 |
| | | 4 | 3800.0 | -1270.70 | **19.37** | -1.54 | 0.36 | -3.12 | **27.55** |
| | | 5 | | -1270.70 | **-0.51** | -1.54 | -0.35 | -3.12 | 9.20 |
| | | 4 | 0.0 | -1278.26 | 6.31 | -1.54 | **0.36** | 2.73 | **-21.23** |

| staaf | doorsn. | combi | dx [mm] | N [kN] | Vy [kN] | Vz [kN] | Mx [kNm] | My [kNm] | Mz [kNm] |
|---|---|---|---|---|---|---|---|---|---|
| | | 5 | | -1278.26 | 7.80 | -1.54 | **-0.35** | 2.73 | -4.66 |
| | | 6 | 3800.0 | -1545.01 | 12.69 | -2.08 | -0.02 | **-4.23** | 25.46 |
| 36 | | | 0.0 | **-1561.27** | 10.22 | **-2.71** | -0.49 | **5.03** | -21.30 |
| | | 5 | | -1286.94 | **13.66** | -2.00 | **-0.63** | 3.71 | -22.97 |
| | | 7 | | -1540.75 | 3.65 | -2.09 | **0.02** | 3.87 | -9.38 |
| | | 6 | 3850.0 | -1553.62 | 12.90 | -2.71 | -0.49 | **-5.39** | **23.20** |
| | | 2 | 0.0 | -1313.46 | 12.94 | -2.55 | -0.61 | 4.74 | **-24.67** |
| 37 | | 7 | | **-1609.66** | 9.90 | -2.05 | -0.58 | 4.26 | -15.39 |
| | | 4 | 3850.0 | -1319.29 | **17.01** | -1.97 | -0.41 | -3.53 | 26.24 |
| | | 6 | 0.0 | -1608.11 | 12.72 | **-2.74** | -0.67 | **5.56** | -24.13 |
| | | 2 | | -1340.18 | 14.75 | -2.65 | **-0.69** | 5.30 | **-25.48** |
| | | 6 | 3850.0 | -1600.45 | 15.39 | -2.74 | -0.67 | **-5.00** | **29.98** |
| 38 | | 7 | 0.0 | **-1694.19** | 2.93 | -0.33 | 0.00 | 1.26 | -17.15 |
| | | 4 | 3850.0 | -1391.64 | **12.31** | -0.35 | 0.00 | -0.00 | 0.00 |
| | | | 0.0 | -1399.29 | **-6.97** | -0.35 | -0.00 | 1.34 | -2.48 |
| | | 3 | | -302.55 | 2.40 | **-0.65** | 0.00 | **2.49** | -15.12 |
| | | 5 | 3080.0 | -1393.17 | 0.46 | -0.35 | 0.00 | 0.27 | **0.88** |
| | | 2 | 0.0 | -1399.29 | 5.70 | -0.55 | 0.00 | 2.13 | **-18.22** |
| 39 | | 6 | | **-748.04** | 1.74 | 0.07 | 0.00 | 0.00 | -0.00 |
| | | 5 | | -613.72 | **11.68** | 0.06 | 0.00 | 0.00 | 0.00 |
| | | 4 | | -613.72 | **-10.34** | 0.06 | 0.00 | 0.00 | -0.00 |
| | | 7 | | -676.44 | -0.38 | **0.08** | 0.00 | 0.00 | -0.00 |
| | | | 3100.0 | -670.28 | 2.50 | 0.08 | -0.00 | **0.23** | 4.41 |
| | | 5 | | -607.55 | 2.53 | 0.06 | 0.00 | 0.19 | **18.47** |
| | | 4 | 1550.0 | -610.64 | -0.33 | 0.06 | -0.00 | 0.09 | **-8.19** |
| 40 | | 6 | 0.0 | **-703.26** | 6.10 | **-0.20** | -0.24 | **0.29** | 11.04 |
| | | 4 | 1800.0 | -569.43 | **13.75** | -0.16 | -1.75 | -0.05 | 17.71 |
| | | 5 | | -569.43 | **-2.81** | -0.16 | 1.26 | -0.05 | 14.42 |
| | | | 0.0 | -573.00 | 0.65 | -0.16 | **1.26** | 0.23 | 15.46 |
| | | 4 | | -573.00 | 8.32 | -0.16 | **-1.75** | 0.23 | **-0.74** |
| | | 6 | 1800.0 | -699.68 | 7.19 | -0.20 | -0.24 | **-0.07** | **22.72** |
| 41 | | | 0.0 | **-649.53** | 7.61 | **-0.20** | -0.24 | -0.07 | -26.12 |
| | | 2 | | -578.94 | **9.13** | -0.17 | 0.36 | -0.06 | **-26.78** |
| | | 5 | | -534.13 | 8.96 | -0.16 | **1.26** | -0.05 | -19.94 |
| | | 4 | | -534.13 | 1.36 | -0.16 | **-1.75** | -0.05 | -16.64 |
| | | 6 | 1100.0 | -647.35 | 8.05 | -0.20 | -0.24 | **-0.29** | -17.43 |
| 42 | | | 0.0 | **-585.85** | 9.88 | 0.01 | -0.49 | -0.05 | **-17.07** |
| | | 4 | 3800.0 | -470.96 | **16.68** | 0.02 | -0.66 | 0.02 | 24.23 |
| | | 7 | 0.0 | -538.08 | 4.71 | **0.03** | -0.21 | -0.07 | -9.35 |
| | | 3 | | -290.71 | 9.88 | **-0.04** | -0.49 | **0.07** | -17.07 |
| | | 4 | | -478.52 | 3.62 | 0.02 | **-0.66** | -0.05 | -14.34 |
| | | 3 | 3800.0 | -283.16 | 12.49 | -0.04 | -0.49 | **-0.08** | 25.43 |
| | | 6 | | -578.29 | 12.49 | 0.01 | -0.49 | 0.01 | **25.43** |
| 43 | | | 0.0 | **-433.80** | 11.37 | -0.00 | -0.44 | 0.06 | -22.80 |
| | | 4 | 3850.0 | -347.49 | **15.34** | 0.00 | -0.14 | 0.05 | 23.59 |
| | | 7 | 0.0 | -409.88 | 5.50 | **0.01** | **0.08** | 0.03 | -12.19 |
| | | 3 | | -203.59 | 11.37 | **-0.05** | -0.44 | **0.10** | -22.80 |



the scale towards document
Patch Reference numbers on LITT
Image Engineering Scan Reference Chart TE263 Serial No. 546

| staaf | doorsn. | combi | dx [mm] | N [kN] | Vy [kN] | Vz [kN] | Mx [kNm] | My [kNm] | Mz [kNm] |
|---|---|---|---|---|---|---|---|---|---|
| | | 2 | | -385.02 | 13.67 | -0.01 | **-0.50** | 0.07 | **-25.21** |
| | | 3 | 3850.0 | -195.94 | 14.04 | -0.05 | -0.44 | **-0.10** | 26.12 |
| | | 6 | | -426.15 | 14.04 | -0.00 | -0.44 | 0.04 | **26.12** |
| 44 | | | 0.0 | **-243.01** | 10.54 | **-0.46** | -0.67 | **0.89** | -21.63 |
| | | 5 | | -199.77 | **13.85** | -0.38 | **-0.82** | 0.72 | -19.76 |
| | | 6 | 3850.0 | -235.36 | 13.22 | -0.46 | -0.67 | **-0.90** | 24.11 |
| | | 2 | | -207.09 | 11.55 | -0.39 | -0.81 | -0.76 | **24.20** |
| | | | 0.0 | -214.74 | 13.25 | -0.39 | -0.81 | 0.75 | **-23.54** |
| 45 | | 3 | | **-7.65** | 4.90 | 0.01 | 0.00 | -0.03 | -24.71 |
| | | 4 | 3850.0 | 0.00 | **16.55** | 0.09 | 0.00 | 0.00 | 0.00 |
| | | 5 | | 0.00 | **-3.24** | 0.09 | -0.00 | 0.00 | 0.00 |
| | | 7 | 0.0 | -7.65 | 5.02 | **0.12** | 0.00 | **-0.45** | **-25.21** |
| | | 5 | 3080.0 | -1.53 | -0.04 | 0.09 | -0.00 | -0.07 | **1.27** |
| 46 | | 6 | 0.0 | **-1592.52** | 1.65 | 0.28 | -0.00 | -0.00 | -0.00 |
| | | 5 | | -1310.60 | **12.05** | 0.23 | -0.00 | -0.00 | -0.00 |
| | | 4 | | -1310.60 | **-10.88** | 0.23 | -0.00 | -0.00 | -0.00 |
| | | 7 | | -1520.74 | -0.48 | **0.28** | -0.00 | -0.00 | 0.00 |
| | | | 3100.0 | -1514.58 | 2.40 | 0.28 | 0.00 | **0.86** | 4.09 |
| | | 5 | | -1304.44 | 2.91 | 0.23 | -0.00 | 0.71 | **19.63** |
| | | 4 | 1808.3 | -1307.00 | 0.45 | 0.23 | 0.00 | 0.41 | **-9.08** |
| 47 | | 6 | 0.0 | **-1594.21** | 6.19 | 0.51 | 0.13 | -0.59 | 10.91 |
| | | 4 | 1800.0 | -1304.68 | **14.32** | 0.42 | 1.42 | 0.27 | 17.91 |
| | | 5 | | -1304.68 | **-3.20** | 0.42 | -1.11 | 0.27 | 14.28 |
| | | 7 | 0.0 | -1522.48 | 3.74 | **0.51** | 0.22 | **-0.59** | 4.68 |
| | | 4 | | -1308.26 | 8.89 | 0.42 | **1.42** | -0.49 | **-1.57** |
| | | 5 | | -1308.26 | 0.26 | 0.42 | **-1.11** | -0.49 | 16.03 |
| | | 7 | 1800.0 | -1518.90 | 4.83 | 0.51 | 0.22 | **0.33** | 12.11 |
| | | 6 | | -1590.64 | 7.28 | 0.51 | 0.13 | 0.33 | **22.74** |
| 48 | | | 0.0 | **-1540.49** | 7.32 | 0.51 | 0.13 | 0.33 | -26.09 |
| | | 5 | | -1269.38 | **9.63** | 0.42 | **-1.11** | 0.27 | -20.08 |
| | | 7 | | -1492.51 | 3.25 | **0.51** | 0.22 | 0.33 | -13.56 |
| | | 4 | | -1269.38 | 0.20 | 0.42 | **1.42** | 0.27 | -16.45 |
| | | 7 | 1100.0 | -1490.33 | 3.69 | 0.51 | 0.22 | **0.89** | -9.66 |
| | | 2 | 0.0 | -1314.35 | 9.21 | 0.42 | -0.37 | 0.27 | **-26.82** |
| 49 | | 6 | | **-1568.83** | 9.91 | 0.80 | 0.45 | -1.51 | **-17.17** |
| | | 4 | 3800.0 | -1282.15 | **16.74** | 0.65 | 0.44 | 1.23 | 24.20 |
| | | 7 | 0.0 | -1520.92 | 4.72 | **0.80** | 0.16 | **-1.52** | -9.39 |
| | | 1 | | -1334.62 | 9.91 | 0.65 | **0.45** | -1.23 | -17.17 |
| | | 7 | 3800.0 | -1513.37 | 7.33 | 0.80 | 0.16 | **1.52** | 13.50 |
| | | 6 | | -1561.28 | 12.52 | 0.80 | 0.45 | 1.51 | **25.45** |
| 50 | | | 0.0 | **-1572.96** | 11.44 | 0.96 | 0.47 | -1.65 | -22.98 |
| | | 4 | 3850.0 | -1287.52 | **15.37** | 0.78 | 0.12 | 1.66 | 23.51 |
| | | 7 | 0.0 | -1548.92 | 5.53 | **0.96** | **-0.06** | **-1.66** | -12.31 |
| | | 2 | | -1325.14 | 13.75 | 0.78 | **0.55** | -1.33 | **-25.37** |
| | | 7 | 3850.0 | -1541.27 | 8.21 | 0.96 | -0.06 | **2.04** | 14.12 |
| | | 6 | | -1565.30 | 14.12 | 0.96 | 0.47 | 2.03 | **26.21** |
| 51 | | | 0.0 | **-1614.14** | 10.56 | **-0.43** | 0.70 | **0.29** | -21.68 |



the scale towards document
Image Engineering Scan Reference Chart TE263 Serial No. 546
Patch Reference numbers on UTT

| staaf | doorsn. | combi | dx | N | Vy | Vz | Mx | My | Mz |
|---|---|---|---|---|---|---|---|---|---|
| | | | [mm] | [kN] | [kN] | [kN] | [kNm] | [kNm] | [kNm] |
| | | 5 | | -1331.19 | **14.00** | -0.37 | 0.76 | 0.26 | -19.74 |
| | | 2 | | -1346.21 | 13.33 | -0.38 | **0.81** | 0.28 | **-23.57** |
| | | 6 | 3850.0 | -1606.49 | 13.23 | -0.43 | 0.70 | **-1.38** | 24.12 |
| | | 2 | | -1338.55 | 11.62 | -0.38 | 0.81 | -1.19 | **24.46** |
| 52 | | 7 | 0.0 | **-1694.19** | 5.15 | **0.07** | -0.00 | **-0.25** | **-25.69** |
| | | 4 | 3850.0 | -1391.64 | **17.04** | 0.05 | -0.00 | -0.00 | -0.00 |
| | | 5 | | -1391.64 | **-3.55** | 0.05 | 0.00 | -0.00 | -0.00 |
| | | 3 | 0.0 | -302.55 | 5.00 | **-0.03** | -0.00 | **0.10** | -25.11 |
| | | 5 | 3080.0 | -1393.17 | -0.34 | 0.05 | 0.00 | -0.04 | **1.50** |
| 53 | | 6 | 0.0 | **-532.57** | 0.66 | **1.97** | 0.00 | -0.00 | -0.00 |
| | | 5 | | -437.74 | **11.67** | 1.60 | -0.00 | -0.00 | 0.00 |
| | | 4 | | -437.74 | **-11.92** | 1.60 | 0.00 | -0.00 | -0.00 |
| | | 6 | 3100.0 | -526.41 | 3.76 | 1.97 | -0.00 | **6.12** | 8.24 |
| | | 5 | | -431.58 | 1.80 | 1.60 | -0.00 | 4.96 | **16.47** |
| | | 4 | 1808.3 | -434.14 | 0.56 | 1.60 | 0.00 | 2.89 | **-9.33** |
| 54 | | 6 | 0.0 | **-498.11** | 7.83 | **10.49** | 1.10 | **-13.22** | 8.09 |
| | | 4 | 1800.0 | -401.63 | **32.00** | 8.54 | 1.63 | 4.63 | **41.31** |
| | | 5 | | -401.63 | **-17.00** | 8.54 | -0.00 | 4.63 | -6.71 |
| | | 4 | 0.0 | -405.21 | 26.57 | 8.54 | **1.63** | -10.74 | **-9.99** |
| | | 5 | | -405.21 | -13.54 | 8.54 | **-0.00** | -10.74 | 19.87 |
| | | 6 | 1800.0 | -494.53 | 8.92 | 10.49 | 1.10 | **5.66** | 22.87 |
| 55 | | | 0.0 | **-444.38** | 7.62 | **10.49** | 1.10 | 5.66 | -25.96 |
| | | 5 | | -366.33 | **32.08** | 8.54 | **-0.00** | 4.63 | **-41.07** |
| | | 4 | | -366.33 | **-24.19** | 8.54 | **1.63** | 4.63 | **6.95** |
| | | 6 | 1100.0 | -442.20 | 8.06 | 10.49 | 1.10 | **17.20** | -17.26 |
| 56 | | | 0.0 | **-402.97** | 10.31 | **12.90** | 0.10 | **-21.93** | -17.76 |
| | | 4 | 3800.0 | -321.21 | **18.27** | 10.55 | -0.09 | 22.16 | **26.62** |
| | | 5 | 0.0 | -328.76 | 9.12 | 10.55 | **0.22** | -17.93 | -7.57 |
| | | 4 | | -328.76 | 5.19 | 10.55 | **-0.09** | -17.93 | **-17.95** |
| | | 6 | 3800.0 | -395.42 | 12.92 | 12.90 | 0.10 | **27.08** | 26.38 |
| 57 | | | 0.0 | **-290.31** | 10.91 | **19.31** | 0.34 | **-34.98** | -22.86 |
| | | 4 | 3850.0 | -229.86 | **14.09** | 15.83 | 0.04 | 32.27 | 20.46 |
| | | 5 | 0.0 | -237.51 | 14.01 | 15.83 | **0.42** | -28.67 | -23.44 |
| | | 7 | | -267.99 | 3.90 | 18.87 | **-0.09** | -34.16 | -10.20 |
| | | 6 | 3850.0 | -282.66 | 13.59 | 19.31 | 0.34 | **39.35** | **24.31** |
| | | 2 | 0.0 | -265.81 | 13.58 | 16.22 | 0.42 | -29.41 | **-25.96** |
| 58 | | 7 | | **-160.01** | 10.67 | 28.22 | 0.49 | -49.14 | -16.19 |
| | | 4 | 3850.0 | -123.44 | **17.97** | 23.59 | 0.05 | 49.70 | 28.86 |
| | | 6 | 0.0 | -159.29 | 13.62 | **28.73** | 0.56 | **-50.09** | -25.50 |
| | | 5 | | -131.09 | 14.14 | 23.59 | **0.70** | -41.10 | -21.07 |
| | | 6 | 3850.0 | -151.64 | 16.31 | 28.73 | 0.56 | **60.53** | **32.12** |
| | | 2 | 0.0 | -145.20 | 15.54 | 24.08 | 0.69 | -42.01 | **-26.82** |
| 59 | | 3 | | **-7.65** | 2.58 | 2.32 | -0.00 | -8.95 | -16.35 |
| | | 4 | 3850.0 | 0.00 | **15.80** | 8.33 | -0.00 | 0.00 | 0.00 |
| | | | 0.0 | -7.65 | **-7.50** | 8.33 | -0.00 | -32.06 | -3.32 |
| | | 6 | | -7.65 | 2.58 | **10.13** | -0.00 | **-39.02** | -16.35 |
| | | 5 | 3080.0 | -1.53 | 0.12 | 8.33 | 0.00 | -6.41 | **1.70** |



the scale towards document
Patch Reference numbers on UTT
Image Engineering Scan Reference Chart TE263 Serial No. 546

| staaf | doorsn. | combi | dx [mm] | N [kN] | Vy [kN] | Vz [kN] | Mx [kNm] | My [kNm] | Mz [kNm] |
|---|---|---|---|---|---|---|---|---|---|
| | | 2 | 0.0 | -7.65 | 6.12 | 8.48 | -0.00 | -32.65 | **-19.47** |
| 60 | 5 | 1 | | -0.00 | 0.00 | **50.15** | 0.00 | **-48.84** | -0.00 |
| 61 | | | | 0.00 | -0.00 | **50.15** | 0.00 | **-48.84** | -0.00 |
| 62 | | | | 0.00 | -0.00 | **50.15** | -0.00 | **-48.84** | -0.00 |
| 63 | | | | 0.00 | -0.00 | **50.15** | -0.00 | **-48.84** | 0.00 |
| 64 | | | | 0.00 | -0.00 | **50.15** | 0.00 | **-48.84** | -0.00 |
| 65 | | | | 0.00 | -0.00 | **50.15** | 0.00 | **-48.84** | 0.00 |
| 66 | | | | 0.00 | 0.00 | **50.15** | -0.00 | **-48.84** | -0.00 |
| 67 | | 7 | | 0.00 | -0.00 | **50.15** | -0.00 | **-48.84** | 0.00 |
| 68 | 2 | | | **1.08** | -3.36 | 5.53 | 0.00 | 0.00 | 0.00 |
| | | 5 | | 0.87 | **11.03** | 5.68 | 0.00 | 0.00 | -0.00 |
| | | 4 | | 0.87 | **-17.05** | 5.68 | 0.00 | 0.00 | 0.00 |
| | | 3 | | 0.03 | -3.28 | **6.21** | 0.00 | -0.00 | 0.00 |
| | | 6 | 3600.0 | 1.04 | 0.07 | **-9.90** | 0.00 | **-7.98** | -4.51 |
| | | 3 | 1542.9 | 0.03 | -1.40 | -0.38 | 0.00 | **4.50** | -3.61 |
| | | 5 | 3600.0 | 0.87 | 0.40 | -9.69 | 0.00 | -7.22 | **16.53** |
| | | 4 | | 0.87 | -0.34 | -9.69 | 0.00 | -7.22 | **-24.96** |
| 69 | | 7 | 0.0 | **3.00** | 1.40 | 32.58 | 0.33 | -46.72 | -4.15 |
| | | 4 | 3600.0 | 2.50 | **22.20** | 13.34 | 1.45 | 35.47 | **34.80** |
| | | 5 | | 2.50 | **-16.43** | 13.34 | -0.66 | 35.47 | **-28.08** |
| | | 6 | 0.0 | 2.98 | 0.41 | **33.59** | 0.49 | **-48.55** | -3.11 |
| | | 3 | 3600.0 | 0.63 | 2.72 | **-0.88** | 0.49 | 8.14 | 2.53 |
| | | 4 | 0.0 | 2.50 | 10.66 | 28.70 | **1.45** | -40.21 | -24.35 |
| | | 5 | | 2.50 | -9.09 | 28.70 | **-0.66** | -40.21 | 17.85 |
| | | 6 | 3600.0 | 2.98 | 2.72 | 18.23 | 0.49 | **44.74** | 2.53 |
| 70 | | | 0.0 | **2.91** | -1.83 | -15.42 | 0.39 | **37.58** | 3.47 |
| | | 5 | | 2.42 | **13.99** | -11.37 | **1.12** | 30.14 | **-27.63** |
| | | 4 | | 2.42 | **-18.18** | -11.37 | **-0.66** | 30.14 | **35.69** |
| | | 3 | | 0.69 | -1.83 | **3.56** | 0.39 | 3.22 | 3.47 |
| | | 6 | 3600.0 | 2.91 | 0.48 | **-30.78** | 0.39 | -45.58 | 1.05 |
| | | 7 | | 2.90 | -0.59 | -30.73 | 0.11 | **-45.63** | -0.63 |
| 71 | | 6 | 0.0 | **2.70** | -1.35 | 30.72 | 0.04 | -45.82 | 0.80 |
| | | 4 | 3600.0 | 2.25 | **4.85** | 11.33 | 0.15 | 29.82 | -11.21 |
| | | | 0.0 | 2.25 | **-6.69** | 26.69 | **0.15** | -38.63 | -7.89 |
| | | 7 | | 2.68 | -1.35 | **30.72** | 0.03 | **-45.83** | -0.53 |
| | | 3 | 3600.0 | 0.67 | 0.96 | **-3.66** | 0.04 | 2.68 | 0.10 |
| | | 5 | 0.0 | 2.25 | 4.25 | 26.69 | **-0.08** | -38.63 | 8.20 |
| | | 7 | 3600.0 | 2.68 | 0.96 | 15.36 | 0.03 | **37.12** | -1.22 |
| | | 5 | 2057.1 | 2.25 | -0.35 | 17.91 | -0.08 | 7.26 | **13.63** |
| | | 4 | | 2.25 | 0.53 | 17.91 | 0.15 | 7.26 | **-16.47** |
| 72 | | 6 | 0.0 | **2.41** | -1.19 | -15.17 | -0.51 | 39.52 | 0.42 |
| | | 4 | 3600.0 | 2.02 | **15.11** | -26.54 | 0.10 | -36.12 | **21.43** |
| | | 5 | | 2.02 | **-12.16** | -26.54 | -0.77 | -36.12 | **-18.98** |
| | | 3 | 0.0 | 0.65 | -1.19 | **3.89** | -0.51 | 2.99 | 0.42 |
| | | 7 | 3600.0 | 2.39 | 2.24 | **-30.60** | -0.23 | **-42.96** | 2.64 |
| | | 4 | 0.0 | 2.02 | 3.57 | -11.18 | **0.10** | 31.78 | -12.19 |
| | | 5 | | 2.02 | -4.82 | -11.18 | **-0.77** | 31.78 | 11.58 |



the scale towards document
Patch Reference numbers on LITT
Image Engineering Scan Reference Chart TE263 Serial No. 546

| staaf | doorsn. | combi | dx [mm] | N [kN] | Vy [kN] | Vz [kN] | Mx [kNm] | My [kNm] | Mz [kNm] |
|---|---|---|---|---|---|---|---|---|---|
| | | 7 | | 2.39 | -0.06 | -15.23 | -0.23 | **39.53** | -1.29 |
| 73 | | 5 | | -0.00 | **9.41** | 8.84 | 0.00 | -4.17 | **-18.75** |
| | | 4 | | -0.00 | **-12.07** | 8.84 | 0.00 | -4.17 | **19.72** |
| | | 7 | | -0.00 | -1.86 | **9.06** | -0.00 | **-4.96** | 1.94 |
| | | 3 | 3600.0 | -0.00 | 2.21 | **-7.44** | 0.00 | -0.00 | 0.00 |
| | | | 1800.0 | -0.00 | 0.03 | 0.25 | 0.00 | **6.47** | -2.02 |
| 74 | 5 | 1 | 0.0 | -0.00 | -0.00 | **50.15** | 0.00 | **-48.84** | 0.00 |
| 75 | | | | 0.00 | -0.00 | **50.15** | 0.00 | **-48.84** | 0.00 |
| 76 | | | | 0.00 | 0.00 | **50.15** | 0.00 | **-48.84** | 0.00 |
| 77 | | | | 0.00 | 0.00 | **50.15** | -0.00 | **-48.84** | -0.00 |
| 78 | | | | 0.00 | 0.00 | **50.15** | 0.00 | **-48.84** | -0.00 |
| 79 | | | | 0.00 | -0.00 | **50.15** | -0.00 | **-48.84** | 0.00 |
| 80 | | | | 0.00 | 0.00 | **50.15** | 0.00 | **-48.84** | 0.00 |
| 81 | | | | 0.00 | -0.00 | **50.15** | 0.00 | **-48.84** | 0.00 |

## Reacties in steunpunten - waardes in knopen. Lokale extremen

Lineair statisch - extreme van alle combinaties

Groep van knopen:1/72

Groep van UGT combi:1/7

| Steunpunt | knoop | combi | Rx [kN] | Ry [kN] | Rz [kN] | Mx [kNm] | My [kNm] | Mz [kNm] |
|---|---|---|---|---|---|---|---|---|
| 1 | 1 | 6 | **1.86** | -2.04 | **360.73** | 0.00 | 0.00 | 0.00 |
| | | 3 | **0.48** | -2.04 | **181.44** | 0.00 | 0.00 | 0.00 |
| | | 5 | 1.50 | **8.74** | 316.82 | 0.00 | 0.00 | 0.00 |
| | | 4 | 1.50 | **-12.69** | 316.82 | 0.00 | 0.00 | 0.00 |
| 2 | 2 | 6 | **0.35** | 0.46 | **1571.44** | 0.00 | 0.00 | 0.00 |
| | | 4 | **0.26** | **-11.66** | 1295.76 | 0.00 | 0.00 | 0.00 |
| | | 5 | 0.26 | **11.16** | 1295.76 | 0.00 | 0.00 | 0.00 |
| | | 3 | 0.26 | 0.46 | **523.49** | 0.00 | 0.00 | 0.00 |
| 3 | 3 | | **-0.00** | 1.74 | **395.79** | 0.00 | 0.00 | 0.00 |
| | | 7 | **-0.08** | -0.38 | 676.44 | 0.00 | 0.00 | 0.00 |
| | | 5 | -0.06 | **11.68** | 613.72 | 0.00 | 0.00 | 0.00 |
| | | 4 | -0.06 | **-10.34** | 613.72 | 0.00 | 0.00 | 0.00 |
| | | 6 | -0.07 | 1.74 | **748.04** | 0.00 | 0.00 | 0.00 |
| 4 | 4 | 3 | **-0.05** | 1.65 | **544.57** | 0.00 | 0.00 | 0.00 |
| | | 7 | **-0.28** | -0.48 | 1520.74 | 0.00 | 0.00 | 0.00 |
| | | 5 | -0.23 | **12.05** | 1310.60 | 0.00 | 0.00 | 0.00 |
| | | 4 | -0.23 | **-10.88** | 1310.60 | 0.00 | 0.00 | 0.00 |
| | | 6 | -0.28 | 1.65 | **1592.52** | 0.00 | 0.00 | 0.00 |
| 5 | 5 | 3 | **-0.44** | 0.66 | **353.55** | 0.00 | 0.00 | 0.00 |
| | | 6 | **-1.97** | 0.66 | **532.57** | 0.00 | 0.00 | 0.00 |
| | | 5 | -1.60 | **11.67** | 437.74 | 0.00 | 0.00 | 0.00 |
| | | 4 | -1.60 | **-11.92** | 437.74 | 0.00 | 0.00 | 0.00 |
| 6 | 6 | 6 | **2.68** | -4.03 | **5.71** | 0.00 | 0.00 | 0.00 |
| | | 3 | **1.58** | -4.03 | **6.10** | 0.00 | 0.00 | 0.00 |





| Steunpunt | knoop | combi | Rx [kN] | Ry [kN] | Rz [kN] | Mx [kNm] | My [kNm] | Mz [kNm] |
|---|---|---|---|---|---|---|---|---|
| | | 5 | 2.04 | **10.32** | 5.82 | 0.00 | 0.00 | 0.00 |
| | | 4 | 2.04 | **-17.38** | 5.82 | 0.00 | 0.00 | 0.00 |
| 7 | 12 | 5 | 0.00 | **5.09** | 6.29 | 0.00 | 0.00 | 0.00 |
| | | 4 | 0.00 | **-7.80** | 6.29 | 0.00 | 0.00 | 0.00 |
| | | 3 | 0.00 | -1.47 | **6.76** | 0.00 | 0.00 | 0.00 |
| | | 7 | 0.00 | -1.52 | **6.17** | 0.00 | 0.00 | 0.00 |
| 8 | 15 | 5 | 0.00 | **60.70** | 0.00 | 0.00 | 0.00 | 0.00 |
| | | 4 | 0.00 | **-76.14** | 0.00 | 0.00 | 0.00 | 0.00 |
| 9 | 16 | 5 | 0.00 | **11.77** | 0.00 | 0.00 | 0.00 | 0.00 |
| | | 4 | 0.00 | **-12.39** | 0.00 | 0.00 | 0.00 | 0.00 |
| 10 | 17 | 5 | 0.00 | **12.83** | 0.00 | 0.00 | 0.00 | 0.00 |
| | | 4 | 0.00 | **-14.12** | 0.00 | 0.00 | 0.00 | 0.00 |
| 11 | 18 | 5 | 0.00 | **49.08** | 0.00 | 0.00 | 0.00 | 0.00 |
| | | 4 | 0.00 | **-56.19** | 0.00 | 0.00 | 0.00 | 0.00 |
| 12 | 20 | 3 | **0.58** | -3.97 | **6.17** | 0.00 | 0.00 | 0.00 |
| | | 5 | **0.40** | **12.08** | 4.85 | 0.00 | 0.00 | 0.00 |
| | | 4 | 0.40 | **-19.24** | 4.85 | 0.00 | 0.00 | 0.00 |
| | | 6 | 0.57 | -3.97 | **4.39** | 0.00 | 0.00 | 0.00 |
| 13 | 22 | 5 | 0.00 | **44.02** | 0.00 | 0.00 | 0.00 | 0.00 |
| | | 4 | 0.00 | **-64.94** | 0.00 | 0.00 | 0.00 | 0.00 |
| 14 | 23 | 5 | 0.00 | **9.90** | 0.00 | 0.00 | 0.00 | 0.00 |
| | | 4 | 0.00 | **-13.05** | 0.00 | 0.00 | 0.00 | 0.00 |
| 15 | 24 | 5 | 0.00 | **11.23** | 0.00 | 0.00 | 0.00 | 0.00 |
| | | 4 | 0.00 | **-15.22** | 0.00 | 0.00 | 0.00 | 0.00 |
| 16 | 25 | 5 | 0.00 | **33.89** | 0.00 | 0.00 | 0.00 | 0.00 |
| | | 4 | 0.00 | **-47.84** | 0.00 | 0.00 | 0.00 | 0.00 |
| 17 | 26 | 5 | 0.00 | **2.39** | 6.18 | 0.00 | 0.00 | 0.00 |
| | | 4 | 0.00 | **-4.48** | 6.18 | 0.00 | 0.00 | 0.00 |
| | | 3 | 0.00 | -1.24 | **8.02** | 0.00 | 0.00 | 0.00 |
| | | 7 | 0.00 | -1.14 | **5.74** | 0.00 | 0.00 | 0.00 |
| 18 | 27 | 6 | **2.97** | -3.78 | **3.50** | 0.00 | 0.00 | 0.00 |
| | | 3 | **0.97** | -3.78 | **6.13** | 0.00 | 0.00 | 0.00 |
| | | 5 | 2.40 | **12.53** | 4.16 | 0.00 | 0.00 | 0.00 |
| | | 4 | 2.40 | **-19.47** | 4.16 | 0.00 | 0.00 | 0.00 |
| 19 | 29 | 5 | 0.00 | **37.77** | 0.00 | 0.00 | 0.00 | 0.00 |
| | | 4 | 0.00 | **-55.60** | 0.00 | 0.00 | 0.00 | 0.00 |
| 20 | 30 | 5 | 0.00 | **7.92** | 0.00 | 0.00 | 0.00 | 0.00 |
| | | 4 | 0.00 | **-13.32** | 0.00 | 0.00 | 0.00 | 0.00 |
| 21 | 31 | 5 | 0.00 | **9.35** | 0.00 | 0.00 | 0.00 | 0.00 |
| | | 4 | 0.00 | **-15.52** | 0.00 | 0.00 | 0.00 | 0.00 |
| 22 | 32 | 5 | 0.00 | **27.68** | 0.00 | 0.00 | 0.00 | 0.00 |
| | | 4 | 0.00 | **-40.00** | 0.00 | 0.00 | 0.00 | 0.00 |
| 23 | 33 | 5 | 0.00 | **3.03** | 5.65 | 0.00 | 0.00 | 0.00 |
| | | 4 | 0.00 | **-4.46** | 5.65 | 0.00 | 0.00 | 0.00 |
| | | 3 | 0.00 | -0.75 | **8.37** | 0.00 | 0.00 | 0.00 |
| | | 7 | 0.00 | -1.28 | **5.03** | 0.00 | 0.00 | 0.00 |
| 24 | 34 | 3 | **-2.56** | -4.07 | **5.34** | 0.00 | 0.00 | 0.00 |



the scale towards document
Patch Reference numbers on UTT
Image Engineering Scan Reference Chart TE263 Serial No. 546

| Steunpunt | knoop | combi | Rx [kN] | Ry [kN] | Rz [kN] | Mx [kNm] | My [kNm] | Mz [kNm] |
|---|---|---|---|---|---|---|---|---|
| | | 6 | **-4.80** | -4.07 | **-0.62** | 0.00 | 0.00 | 0.00 |
| | | 5 | -3.72 | **13.29** | 0.79 | 0.00 | 0.00 | 0.00 |
| | | 4 | -3.72 | **-20.73** | 0.79 | 0.00 | 0.00 | 0.00 |
| 25 | 36 | 5 | 0.00 | **29.38** | 0.00 | 0.00 | 0.00 | 0.00 |
| | | 4 | 0.00 | **-69.07** | 0.00 | 0.00 | 0.00 | 0.00 |
| 26 | 37 | 5 | 0.00 | **4.84** | 0.00 | 0.00 | 0.00 | 0.00 |
| | | 4 | 0.00 | **-14.15** | 0.00 | 0.00 | 0.00 | 0.00 |
| 27 | 38 | 5 | 0.00 | **6.10** | 0.00 | 0.00 | 0.00 | 0.00 |
| | | 4 | 0.00 | **-16.04** | 0.00 | 0.00 | 0.00 | 0.00 |
| 28 | 39 | 5 | 0.00 | **20.61** | 0.00 | 0.00 | 0.00 | 0.00 |
| | | 4 | 0.00 | **-56.81** | 0.00 | 0.00 | 0.00 | 0.00 |
| 29 | 40 | 5 | 0.00 | **5.18** | 2.48 | 0.00 | 0.00 | 0.00 |
| | | 4 | 0.00 | **-6.18** | 2.48 | 0.00 | 0.00 | 0.00 |
| | | 3 | 0.00 | -0.30 | **7.80** | 0.00 | 0.00 | 0.00 |
| | | 7 | 0.00 | -0.93 | **1.21** | 0.00 | 0.00 | 0.00 |
| 30 | 41 | 3 | **-2.45** | -3.35 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | 6 | **-10.04** | -3.35 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | 5 | -8.23 | **9.94** | 0.00 | 0.00 | 0.00 | 0.00 |
| | | 4 | -8.23 | **-15.96** | 0.00 | 0.00 | 0.00 | 0.00 |
| 31 | 42 | 7 | **-0.33** | -6.79 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | 3 | **-0.65** | -6.26 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | 5 | -0.35 | **2.74** | 0.00 | 0.00 | 0.00 | 0.00 |
| | | 4 | -0.35 | **-12.31** | 0.00 | 0.00 | 0.00 | 0.00 |
| 32 | 43 | 7 | **0.12** | -8.88 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | 3 | **0.01** | -8.75 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | 5 | 0.09 | **3.24** | 0.00 | 0.00 | 0.00 | 0.00 |
| | | 4 | 0.09 | **-16.55** | 0.00 | 0.00 | 0.00 | 0.00 |
| 33 | 44 | 7 | **0.07** | -9.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | 3 | **-0.03** | -8.86 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | 5 | 0.05 | **3.55** | 0.00 | 0.00 | 0.00 | 0.00 |
| | | 4 | 0.05 | **-17.04** | 0.00 | 0.00 | 0.00 | 0.00 |
| 34 | 45 | 6 | **10.13** | -7.24 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | 3 | **2.32** | -7.24 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | 5 | 8.33 | **4.60** | 0.00 | 0.00 | 0.00 | 0.00 |
| | | 4 | 8.33 | **-15.80** | 0.00 | 0.00 | 0.00 | 0.00 |
| 35 | 59 | 3 | **-0.03** | -3.28 | **6.21** | 0.00 | 0.00 | 0.00 |
| | | 7 | **-1.08** | -3.36 | 5.53 | 0.00 | 0.00 | 0.00 |
| | | 5 | -0.87 | **11.03** | 5.68 | 0.00 | 0.00 | 0.00 |
| | | 4 | -0.87 | **-17.05** | 5.68 | 0.00 | 0.00 | 0.00 |
| | | 6 | -1.04 | -3.28 | **5.47** | 0.00 | 0.00 | 0.00 |
| 36 | 60 | 5 | 0.00 | **1.23** | 6.52 | 0.00 | 0.00 | 0.00 |
| | | 4 | 0.00 | **-4.64** | 6.52 | 0.00 | 0.00 | 0.00 |
| | | 3 | 0.00 | -2.21 | **7.44** | 0.00 | 0.00 | 0.00 |
| | | 7 | 0.00 | -1.48 | **6.30** | 0.00 | 0.00 | 0.00 |

## Vervormingen van staven. Globale extremen

Lineair statisch - extreme van alle combinaties

Groep van staven:1/81

Groep van GebruiksGT combi:1/5

| staaf | doorsn. | combi | dx | ux | uy | uz | fix | fiy | fiz |
|---|---|---|---|---|---|---|---|---|---|
| | | | [mm] | [mm] | [mm] | [mm] | [mrad] | [mrad] | [mrad] |
| 67 | 5 | 4 | 0.0 | **1.09** | 0.03 | -4.26 | 0.00 | 0.06 | -0.22 |
| 52 | 2 | 1 | 3850.0 | **-5.37** | 0.00 | 0.00 | -0.05 | 0.01 | -0.20 |
| 22 | | 4 | 2057.1 | -0.02 | **1.28** | -3.13 | -0.07 | 1.08 | -0.00 |
| 4 | | 5 | | 0.01 | **-1.05** | -0.62 | 0.09 | 0.15 | 0.00 |
| 59 | | 1 | 1540.0 | -1.03 | 0.16 | **0.34** | -0.04 | -0.02 | 0.01 |
| 67 | 5 | 3 | 1800.0 | 0.15 | -0.03 | **-12.09** | 0.00 | 5.90 | -0.03 |
| 44 | 2 | 4 | 3850.0 | -1.37 | 0.97 | 0.02 | **0.28** | -0.00 | 0.08 |
| 81 | 5 | 1 | 0.0 | 0.00 | 0.04 | -1.03 | **-0.42** | 0.21 | -0.04 |
| 61 | | 2 | 1800.0 | -0.03 | 0.00 | -9.07 | -0.00 | **5.95** | 0.01 |
| 23 | 2 | 1 | 2057.1 | -0.03 | 0.11 | -2.59 | -0.22 | **-1.21** | -0.08 |
| 13 | | 4 | 0.0 | -0.00 | 0.00 | 0.00 | -0.01 | 0.18 | **0.50** |
| 52 | | | 3850.0 | -5.27 | 0.00 | 0.00 | -0.22 | 0.01 | **-0.51** |