

Nieuwbouw 3 woningen te Hoek van Holland



Opdrachtgever Kleine Schoolstraat V.O.F. Hoek van Holland

Architect RoosRos Architecten
Laurens Janszn. Costerstraat 2
3261 LH Oud-Beijerland

Project nummer 22-163
Rapport SB-01
Onderdeel Statische berekening
Status Definitief

Datum 2-12-2022
Gewijzigd 7-5-2024

Opgesteld door [Redacted]
Projectconstructeur

Controleur [Redacted]
Adviseur

Bouwwerk gegevens

| | | | | | |
|-----------------------|----------|------------------------|------------------------|----------------------|-----------|
| Bouwwerkaand.: | Woningen | Betrouw.klasse: | RC 1 | Ref. per.: | 50 jaar |
| Plaats: | Stad | Windgebied: | Gebied II | Omg.: | onbebouwd |
| Hoogte (m): | 10,1 m | qp: | 0,85 kN/m ² | (excl. Psi-t) | |
| Breedte (m): | 5,2 m | | | | |
| Lengte (m): | 11,0 m | | | | |

Belastingen

| Onderdeel | Omschrijving | Permanent | Variabel | ψ0 | Opmerkingen |
|--------------|--------------|------------------------|------------------------|----|--------------|
| Kapplan | Sporenkap | 1,00 kN/m ² | | | 0,80/cos(35) |
| | PV-panelen | 0,15 kN/m ² | | | 0,12/cos(35) |
| code: | Variabel | | 0,70 kN/m ² | | |
| | Totaal | 1,15 kN/m ² | 0,70 kN/m ² | | |

| Onderdeel | Omschrijving | Permanent | Variabel | ψ0 | Opmerkingen |
|-----------------|-------------------------|------------------------|------------------------|-----|-------------|
| 2e + 1e verd.vl | Afwerkvloer d=70mm | 1,40 kN/m ² | | | |
| | Breedplaatvloer d = 250 | 6,25 kN/m ² | | | |
| | Lichte scheidingswanden | | 0,80 kN/m ² | | |
| code: | Variabel | | 1,75 kN/m ² | 0,4 | |
| | Totaal | 7,65 kN/m ² | 2,55 kN/m ² | | |

| Onderdeel | Omschrijving | Permanent | Variabel | ψ0 | Opmerkingen |
|--------------|--------------------------------|------------------------|------------------------|-----|-------------|
| BG-vloer | Afwerkvloer d=70mm | 1,40 kN/m ² | | | |
| | Geis. Kanaalplaatvloer d=200mm | 3,10 kN/m ² | | | |
| | Lichte scheidingswanden | | 0,80 kN/m ² | | |
| code: | Variabel | | 1,75 kN/m ² | 0,4 | |
| | Totaal | 4,50 kN/m ² | 2,55 kN/m ² | | |

| Onderdeel | Omschrijving | Permanent | Variabel | ψ0 | Opmerkingen |
|--------------|----------------|------------------------|----------|----|-------------|
| wanden | kzs-wand d=120 | 2,40 kN/m ² | | | |
| | Metselwerk | 2,00 kN/m ² | | | |
| code: | Variabel | | | | |
| | Totaal | 4,40 kN/m ² | | | |

Dakbalklaag berging

Bijlage A

| | Belasting | | b of h | | fac | | PB | | VB | | PB | | VB |
|-----|------------|---|--------|---|-----|---|-----------------------|--|-----------------------|---|------------------------|--|------------------------|
| Q 1 | Houten dak | = | 1,00 | x | 1,0 | x | 1,0 kN/m ² | | 1,0 kN/m ² | = | 1,00 kN/m ² | | 1,00 kN/m ² |

Fundering

Bijlage B

| | Belasting | | b of h | | fac | | PB | | VB | | PB | | VB |
|-----|-----------------|---|--------|---|-----|---|-----------------------|--|-----------------------|---|--------------------------|--|------------------------|
| q 1 | Verd vloer | = | 2,50 | x | 1,0 | x | 7,7 kN/m ² | | 2,6 kN/m ² | = | 19,13 kN/m ¹ | | 6,38 kN/m ¹ |
| | Verd vloer | = | 2,50 | x | 1,0 | x | 7,7 kN/m ² | | 2,6 kN/m ² | = | 19,13 kN/m ¹ | | 6,38 kN/m ¹ |
| | Beg gr vloer | = | 2,50 | x | 1,0 | x | 4,5 kN/m ² | | 2,6 kN/m ² | = | 11,25 kN/m ¹ | | 6,38 kN/m ¹ |
| | Kalkzandst. 120 | = | 5,80 | x | 1,0 | x | 2,4 kN/m ² | | | = | 13,92 kN/m ¹ | | |
| | Metselwerk | = | 5,80 | x | 1,0 | x | 2,0 kN/m ² | | | = | 11,60 kN/m ¹ | | |
| | | | | | | | | | | = | 75,02 kN/m ¹ | | |
| q 2 | Verd vloer | = | 2,50 | x | 1,0 | x | 7,7 kN/m ² | | 2,6 kN/m ² | = | 19,13 kN/m ¹ | | 6,38 kN/m ¹ |
| | Verd vloer | = | 2,50 | x | 1,0 | x | 7,7 kN/m ² | | 2,6 kN/m ² | = | 19,13 kN/m ¹ | | 6,38 kN/m ¹ |
| | Beg gr vloer | = | 2,50 | x | 1,0 | x | 4,5 kN/m ² | | 2,6 kN/m ² | = | 11,25 kN/m ¹ | | 6,38 kN/m ¹ |
| | Kalkzandst. 120 | = | 9,70 | x | 1,0 | x | 2,4 kN/m ² | | | = | 23,28 kN/m ¹ | | |
| | Metselwerk | = | 9,70 | x | 1,0 | x | 2,0 kN/m ² | | | = | 19,40 kN/m ¹ | | |
| | | | | | | | | | | = | 92,18 kN/m ¹ | | |
| q 3 | Verd vloer | = | 5,00 | x | 1,0 | x | 7,7 kN/m ² | | 2,6 kN/m ² | = | 38,25 kN/m ¹ | | 12,8 kN/m ¹ |
| | Verd vloer | = | 5,00 | x | 1,0 | x | 7,7 kN/m ² | | 2,6 kN/m ² | = | 38,25 kN/m ¹ | | 12,8 kN/m ¹ |
| | Beg gr vloer | = | 5,00 | x | 1,0 | x | 4,5 kN/m ² | | 2,6 kN/m ² | = | 22,50 kN/m ¹ | | 12,8 kN/m ¹ |
| | Kalkzandst. 120 | = | 5,80 | x | 2,0 | x | 2,4 kN/m ² | | | = | 27,84 kN/m ¹ | | |
| | | | | | | | | | | = | 126,84 kN/m ¹ | | |
| q 4 | Verd vloer | = | 5,00 | x | 1,0 | x | 7,7 kN/m ² | | 2,6 kN/m ² | = | 38,25 kN/m ¹ | | 12,8 kN/m ¹ |
| | Verd vloer | = | 5,00 | x | 1,0 | x | 7,7 kN/m ² | | 2,6 kN/m ² | = | 38,25 kN/m ¹ | | 12,8 kN/m ¹ |
| | Beg gr vloer | = | 5,00 | x | 1,0 | x | 4,5 kN/m ² | | 2,6 kN/m ² | = | 22,50 kN/m ¹ | | 12,8 kN/m ¹ |
| | Kalkzandst. 120 | = | 9,70 | x | 2,0 | x | 2,4 kN/m ² | | | = | 46,56 kN/m ¹ | | |
| | | | | | | | | | | = | 145,56 kN/m ¹ | | |
| q 5 | Dak plat | = | 1,25 | x | 1,0 | x | 7,7 kN/m ² | | 1,0 kN/m ² | = | 9,56 kN/m ¹ | | 1,25 kN/m ¹ |
| | Verd vloer | = | 1,25 | x | 1,0 | x | 7,7 kN/m ² | | 2,6 kN/m ² | = | 9,56 kN/m ¹ | | 3,19 kN/m ¹ |
| | Beg gr vloer | = | 1,25 | x | 1,0 | x | 4,5 kN/m ² | | 2,6 kN/m ² | = | 5,63 kN/m ¹ | | 3,19 kN/m ¹ |
| | Kalkzandst. 120 | = | 6,50 | x | 1,0 | x | 2,4 kN/m ² | | | = | 15,60 kN/m ¹ | | |
| | Metselwerk | = | 6,50 | x | 1,0 | x | 2,0 kN/m ² | | | = | 13,00 kN/m ¹ | | |
| | | | | | | | | | | = | 53,35 kN/m ¹ | | |

| | | | | | | | | | | | |
|-----|-----------------|---|------|---|-----|---|-----------------------|-----------------------|-----------------------|--------------------------------|---|
| q 6 | Dak plat | = | 3,75 | x | 1,0 | x | 7,7 kN/m ² | 1,0 kN/m ² | = | 28,69 kN/m ¹ | 3,75 kN/m ¹ |
| | Verd vloer | = | 3,75 | x | 1,0 | x | 7,7 kN/m ² | 2,6 kN/m ² | = | 28,69 kN/m ¹ | 9,56 kN/m ¹ |
| | Beg gr vloer | = | 3,75 | x | 1,0 | x | 4,5 kN/m ² | 2,6 kN/m ² | = | 16,88 kN/m ¹ | 9,56 kN/m ¹ |
| | Kalkzandst. 120 | = | 6,50 | x | 1,0 | x | 2,4 kN/m ² | | = | 15,60 kN/m ¹ | |
| | Kalkzandst. 120 | = | 6,50 | x | 1,0 | x | 2,4 kN/m ² | | = | 15,60 kN/m ¹ | |
| | | | | | | | | | | <u>105,45 kN/m¹</u> | |
| q 7 | Kapplan | = | 5,50 | x | 1,0 | x | 1,2 kN/m ² | 0,7 kN/m ² | = | 6,33 kN/m ¹ | 3,85 kN/m ¹ |
| | Kalkzandst. 120 | = | 5,80 | x | 0,8 | x | 2,4 kN/m ² | | = | 11,14 kN/m ¹ | |
| | Metselwerk | = | 5,80 | x | 0,8 | x | 2,0 kN/m ² | | = | 9,28 kN/m ¹ | |
| | | | | | | | | | | <u>26,74 kN/m¹</u> | |
| q 8 | Kalkzandst. 120 | = | 6,50 | x | 0,8 | x | 2,4 kN/m ² | | = | 12,48 kN/m ¹ | |
| | Metselwerk | = | 6,50 | x | 0,8 | x | 2,0 kN/m ² | | = | 10,40 kN/m ¹ | |
| | | | | | | | | | | <u>22,88 kN/m¹</u> | |
| F 1 | Kapplan | = | 5,50 | x | 1,3 | x | 1,0 | x | 1,2 kN/m ² | 0,7 kN/m ² | = 7,91 kN/m ¹ 4,81 kN/m ¹ |
| F 2 | Kapplan | = | 5,50 | x | 3,8 | x | 1,0 | x | 1,2 kN/m ² | 0,7 kN/m ² | = 23,72 kN/m ¹ 14,44 kN/m ¹ |

Project : 22-163 Nieuwbouw 3 woningen Hoek van Holland
 Onderdeel : Dakbalklaag bergingen
 Datum : 25/05/2023
 Eenheden : kN/m/rad
 Bestand : U:\TE ARCHIVEREN
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 bergingen.cnw

Toegepaste normen volgens Eurocode met Nederlandse NB

| | | | |
|-------------|----------------------|-----------------|-------------|
| Belastingen | NEN-EN 1990:2002 | C2:2010,A1:2019 | NB:2019(nl) |
| | NEN-EN 1991-1-1:2002 | C1/C11:2019 | NB:2019(nl) |
| Hout | NEN-EN 1995-1-1:2005 | A1:2011,C1:2006 | NB:2013(nl) |
| | NEN-EN 14080:2013 | | |

Balklaag berekening. (H)

Algemene gegevens

| | | | | |
|------------------------|--------|----------|--|------|
| B x H | [mm] : | 71 x 171 | Sterkteklasse : | C24 |
| Overspanning | [mm] : | 2200 | Klimaatklasse : | I |
| Opleglengte | [mm] : | 100 | Referentie periode [j] : | 50 |
| H.o.h. afstand | [mm] : | 600 | Min. eigenfreq. [Hz] : | 3 |
| Beschot sterkteklasse: | | C18 | | |
| Dikte beschot | [mm] : | 18 | $E_{0,mean} \times I$ [Nm ² /m] : | 4374 |

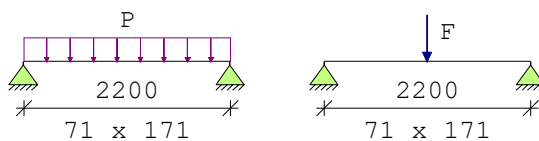
Permanente belastingen

 G_{rep}

| | | |
|-----------------------------|---|-------|
| EG balklaag | : | 0.30 |
| Extra belasting | : | 0.70+ |
| Totaal [kN/m ²] | : | 1.00 |

Veranderlijke belastingen

| | | | | |
|---|---|-------------|--------|------|
| $q_k + P_{wanden}$ [kN/m ²] | : | 1.00 = | 1.00 + | 0.00 |
| Ψ_0 [-] | : | 0.00 | | |
| Ψ_2 [-] | : | 0.00 | | |
| Q_k [kN] | : | 2.00 | | |
| Q_k oppervlak [m ²] | : | 0.05 x 0.05 | | |
| Reductiefactor | : | 0.76 | | |



Belastingfactoren (NEN-EN 1990)

| | | | | |
|----------------|-----------------|------|--------------|------|
| Formule 6.10a: | γ_G : | 1.22 | γ_Q : | 1.35 |
| Formule 6.10b: | $\xi\gamma_G$: | 1.08 | γ_Q : | 1.35 |

Partiële factor (Tabel 2.3 NEN-EN 1995-1-1)

$\gamma_M[-]$: 1.30

| Meegenomen combinaties in de berekening : | | $k_{mod} [-]$ | b_{ef} [mm] | $k_{C,90,q}$ | $k_{C,90,F}$ |
|---|---------------------|---------------|---------------|--------------|--------------|
| * Permanent | (G_{rep}) | 0.60 | 71 | | |
| * Perm. + q-last (6.10a) | ($G_{rep} + q_k$) | 0.60 | 71 | 1.00 | |
| * Perm. + q-last (6.10b) | ($G_{rep} + q_k$) | 0.80 | 71 | 1.00 | |
| * Perm. + puntlast (6.10a) | ($G_{rep} + Q_k$) | 0.60 | 71 | 1.00 | 1.00 |
| * Perm. + puntlast (6.10b) | ($G_{rep} + Q_k$) | 0.80 | 71 | 1.00 | 1.00 |

Technosoft Construct release

7 mei 2024

Project : 22-163 Nieuwbouw 3 woningen Hoek van Holland
 Onderdeel : Dakbalklaag bergingen
 Datum : 25/05/2023
 Eenheden : kN/m/rad

| Resultaten (maatgevende combinaties) | | | eis | u.c. |
|--------------------------------------|---|---------------------------------------|-----|------|
| Perm + plast(6.10b) frm(6.11) | $\sigma_{m,y,d}$ | $= 4.37 < 14.77$ [N/mm ²] | | 0.30 |
| Perm + plast(6.10b) frm(6.13) | $\tau_{v,d}$ | $= 0.38 < 2.46$ [N/mm ²] | | 0.16 |
| Perm + plast(6.10b) frm(6.3) | $\sigma_{c,90,q,d} / (k_{c,90,q} * f_{c,90,d}) +$ $\sigma_{c,90,F,d} / (k_{c,90,F} * f_{c,90,d}) < 1.00$ $= 0.10 / 1.54 + 0.37 / 1.54 = 0.31$ | | | |
| Geconc. belasting | u_{bij} | $= 1.38 < 8.80$ [mm] | | 0.16 |
| Geconc. belasting | $u_{net,fin}$ | $= 1.94 < 8.80$ [mm] | | 0.22 |

Technosoft Balkroosters release 6.77

7 mei 2024

Project.....: 22-163 - Nieuwbouw 3 woningen Hoek van Holland

Onderdeel.....: Fundering

Dimensies.....: kN/m/rad

Datum.....: 24/11/2022

Bestand.....: U:\TE ARCHIVEREN

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buispalen 07-05-2024.grw

Torsiefac.....: 15 %

Betrouwbaarheidsklasse : 1 Referentieperiode : 50

Ouderdom bij belasten : 28 Relatieve vochtigheid : 50%

Doorbuigingen(beton) zijn dmv gecorrigeerde stijfheden berekend.

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

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

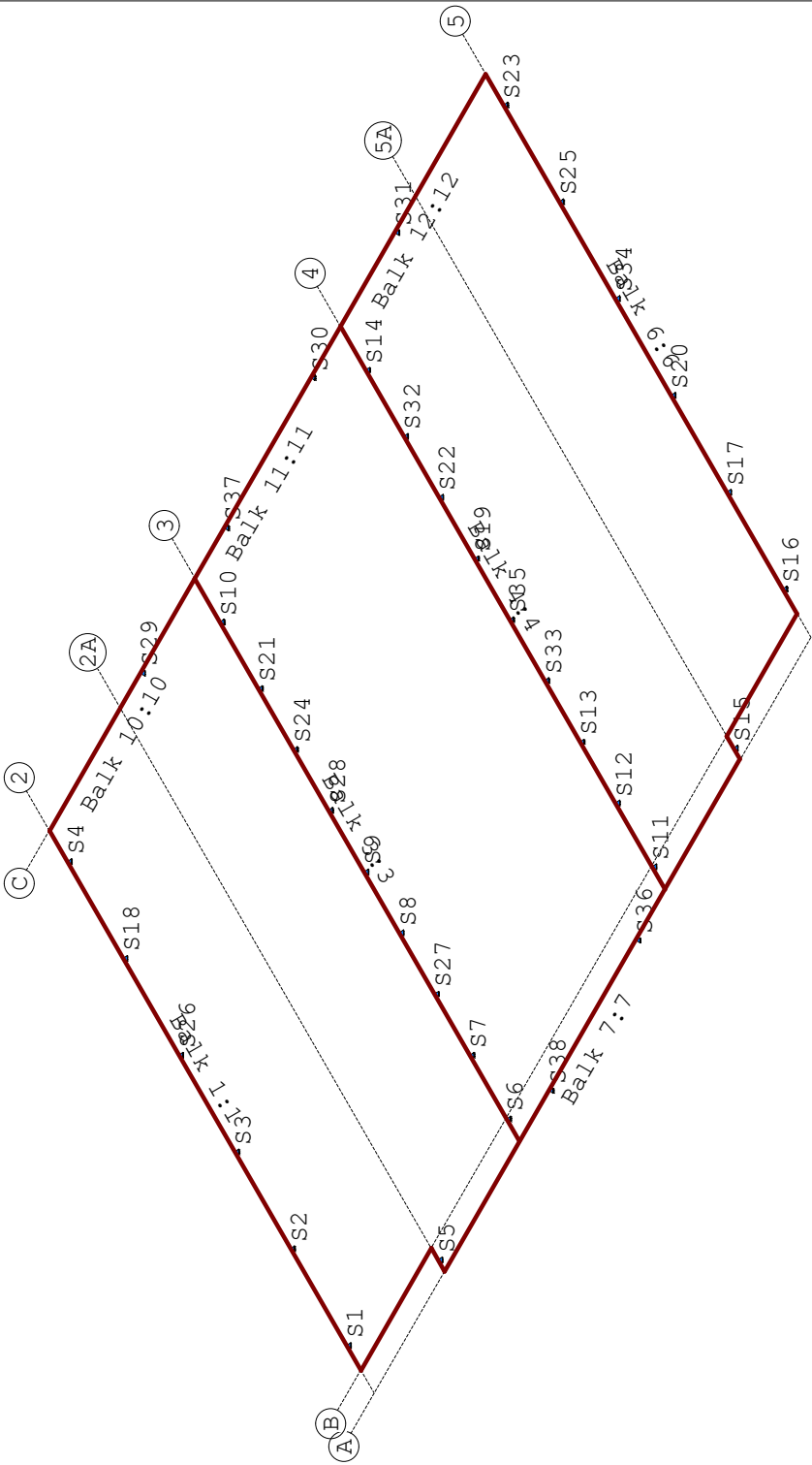
Deze e-mod. is berekend mbv de krachten uit de fysisch lineair berekening.

Toegepaste normen volgens Eurocode met Nederlandse NB

| | | | |
|-------------|--------------------------|-----------------|-------------|
| Belastingen | NEN-EN 1990:2002 | C2:2010,A1:2019 | NB:2019(nl) |
| | NEN-EN 1991-1-1:2002 | C1/C11:2019 | NB:2019(nl) |
| Beton | NEN-EN 1992-1-1:2011(nl) | C2/A1:2015(nl) | NB:2016(nl) |

Project.....: 22-163 - Nieuwbouw 3 woningen Hoek van Holland
Onderdeel.....: Fundering

GEOMETRIE



Project.....: 22-163 - Nieuwbouw 3 woningen Hoek van Holland

Onderdeel.....: Fundering

MATERIALEN

| Mt | Kwaliteit | E-modulus[N/mm2] | S.G. | Pois. | Uitz. coëff |
|----|-----------|------------------|------|-------|-------------|
| 1 | C20/25 | 7480 | 25.0 | 0.20 | 1.0000e-05 |

MATERIALEN vervolg

| Mt | Kwaliteit | Cement | Kruipfac. |
|----|-----------|--------|-----------|
| 1 | C20/25 | | 3.01 |

PROFIELEN [mm]

| Prof. | Omschrijving | Materiaal | Oppervlak | Torsietr. | Traagheid | Vormf. |
|-------|--------------|-----------|-----------|-----------|-----------|--------|
| 1 | B*H 400*500 | 1:C20/25 | 2.000e+05 | 5.577e+09 | 4.167e+09 | 0.00 |

PROFIELEN vervolg [mm]

| Prof. | Staaftype | Breedte | Hoogte | Zs | Rek.As | Type | b1 | h1 | b2 | h2 |
|-------|-----------|---------|--------|-----|--------|------|----|----|----|----|
| 1 | 0:Normaal | 400 | 500 | 250 | 0.00 | 0:RH | | | | |

PROFIELVORMEN [mm]

1 B*H 400*500

**STRAMIENLIJNEN**

| Nr. | Naam | X-begin | Y-begin | X-eind | Y-Eind |
|-----|------|---------|---------|--------|--------|
| 1 | 2 | 0.000 | 11.050 | 0.000 | 0.000 |
| 2 | 2A | 2.400 | 11.050 | 2.400 | 0.000 |
| 3 | 3 | 4.950 | 11.050 | 4.950 | 0.000 |
| 4 | 4 | 9.900 | 11.050 | 9.900 | 0.000 |
| 5 | 5A | 12.450 | 11.050 | 12.450 | 0.000 |
| 6 | 5 | 14.850 | 11.050 | 14.850 | 0.000 |
| 7 | A | 0.000 | 0.000 | 14.850 | 0.000 |
| 8 | B | 0.000 | 0.450 | 14.850 | 0.450 |
| 9 | C | 0.000 | 11.050 | 14.850 | 11.050 |

BALKEN

| Nr. | Naam | Begin | Eind | Profiel |
|-----|------|-------|------|---------------|
| 1 | 1 | 2;B | 2;C | 1:B*H 400*500 |
| 2 | 2 | 2A;A | 2A;B | 1:B*H 400*500 |
| 3 | 3 | 3;A | 3;C | 1:B*H 400*500 |
| 4 | 4 | 4;A | 4;C | 1:B*H 400*500 |
| 5 | 5 | 5A;A | 5A;B | 1:B*H 400*500 |
| 6 | 6 | 5;B | 5;C | 1:B*H 400*500 |
| 7 | 7 | 2A;A | 5A;A | 1:B*H 400*500 |
| 8 | 8 | 2;B | 2A;B | 1:B*H 400*500 |
| 9 | 9 | 5A;B | 5;B | 1:B*H 400*500 |
| 10 | 10 | 2;C | 3;C | 1:B*H 400*500 |
| 11 | 11 | 3;C | 4;C | 1:B*H 400*500 |

Project.....: 22-163 - Nieuwbouw 3 woningen Hoek van Holland

Onderdeel....: Fundering

BALKEN

| Nr. | Naam | Begin | Eind | Profiel |
|-----|------|-------|------|---------------|
| 12 | 12 | 4;C | 5;C | 1:B*H 400*500 |

BALKEN vervolg

| Nr. | Naam | Aansl.begin | Aansl.eind | Excentr. | Pasm.begin | Pasm.eind | Opm. |
|-----|------|-------------|------------|----------|------------|-----------|------|
| 1 | 1 | WDM | WDM | 0.000 | 0.000 | 0.000 | |
| 2 | 2 | WDM | WDM | 0.000 | 0.000 | 0.000 | |
| 3 | 3 | WDM | WDM | 0.000 | 0.000 | 0.000 | |
| 4 | 4 | WDM | WDM | 0.000 | 0.000 | 0.000 | |
| 5 | 5 | WDM | WDM | 0.000 | 0.000 | 0.000 | |
| 6 | 6 | WDM | WDM | 0.000 | 0.000 | 0.000 | |
| 7 | 7 | WDM | WDM | 0.000 | 0.000 | 0.000 | |
| 8 | 8 | WDM | WDM | 0.000 | 0.000 | 0.000 | |
| 9 | 9 | WDM | WDM | 0.000 | 0.000 | 0.000 | |
| 10 | 10 | WDM | WDM | 0.000 | 0.000 | 0.000 | |
| 11 | 11 | WDM | WDM | 0.000 | 0.000 | 0.000 | |
| 12 | 12 | WDM | WDM | 0.000 | 0.000 | 0.000 | |


Opmerkingen:

De torsie traagheid van alle balken is tot 15% gereduceerd

BALKEN vervolg

| Nr. | Naam | Toevallige inklemming % | | |
|-----|-------------|-------------------------|--------|------|
| | | begin | tussen | eind |
| | Alle balken | 15 | 15 | 15 |

STEUNPUNTTYPE

Nr. : 1  Assenstelsel: Globaal
Afmeting : Rond 323 Rotatie X:Vrij
Min.afst.: 0.500 Verplaatsing Z:Veerwaarde Ondergr. Bovengr.
Type:Normaal 80000.000 -230.000
Rotatie Y:Vrij

STEUNPUNTEN

| Nr. | Naam | Steunpunttype | Balk | Positie | Excentr. | Hoek Opm: |
|-----|------|---------------|----------|---------|----------|-----------|
| 1 | | 1:Rond 323 | Balk 1:1 | 0.500 | 0.000 | 0.000 |
| 2 | | 1:Rond 323 | Balk 1:1 | 2.400 | 0.000 | 0.000 |
| 3 | | 1:Rond 323 | Balk 1:1 | 4.300 | 0.000 | 0.000 |
| 4 | | 1:Rond 323 | Balk 1:1 | 10.000 | 0.000 | 0.000 |
| 5 | | 1:Rond 323 | Balk 2:2 | 0.225 | 0.000 | 0.000 |
| 6 | | 1:Rond 323 | Balk 3:3 | 0.450 | 0.000 | 0.000 |
| 7 | | 1:Rond 323 | Balk 3:3 | 1.700 | 0.000 | 0.000 |
| 8 | | 1:Rond 323 | Balk 3:3 | 4.100 | 0.000 | 0.000 |
| 9 | | 1:Rond 323 | Balk 3:3 | 5.300 | 0.000 | 0.000 |
| 10 | | 1:Rond 323 | Balk 3:3 | 10.200 | 0.000 | 0.000 |
| 11 | | 1:Rond 323 | Balk 4:4 | 0.450 | 0.000 | 0.000 |
| 12 | | 1:Rond 323 | Balk 4:4 | 1.700 | 0.000 | 0.000 |

Project.....: 22-163 - Nieuwbouw 3 woningen Hoek van Holland
Onderdeel.....: Fundering

STEUNPUNTEN

| Nr. | Naam | Steunpunttype | Balk | Positie | Excentr. | Hoek Opm: |
|-----|------|---------------|------------|---------|----------|-----------|
| 13 | | 1:Rond 323 | Balk 4:4 | 2.900 | 0.000 | 0.000 |
| 14 | | 1:Rond 323 | Balk 4:4 | 10.200 | 0.000 | 0.000 |
| 15 | | 1:Rond 323 | Balk 5:5 | 0.2250 | 0.000 | 0.000 |
| 16 | | 1:Rond 323 | Balk 6:6 | 0.500 | 0.000 | 0.000 |
| 17 | | 1:Rond 323 | Balk 6:6 | 2.400 | 0.000 | 0.000 |
| 18 | | 1:Rond 323 | Balk 1:1 | 8.100 | 0.000 | 0.000 |
| 19 | | 1:Rond 323 | Balk 4:4 | 6.500 | 0.000 | 0.000 |
| 20 | | 1:Rond 323 | Balk 6:6 | 4.300 | 0.000 | 0.000 |
| 21 | | 1:Rond 323 | Balk 3:3 | 8.900 | 0.000 | 0.000 |
| 22 | | 1:Rond 323 | Balk 4:4 | 7.700 | 0.000 | 0.000 |
| 23 | | 1:Rond 323 | Balk 6:6 | 10.000 | 0.000 | 0.000 |
| 24 | | 1:Rond 323 | Balk 3:3 | 7.700 | 0.000 | 0.000 |
| 25 | | 1:Rond 323 | Balk 6:6 | 8.100 | 0.000 | 0.000 |
| 26 | | 1:Rond 323 | Balk 1:1 | 6.200 | 0.000 | 0.000 |
| 27 | | 1:Rond 323 | Balk 3:3 | 2.900 | 0.000 | 0.000 |
| 28 | | 1:Rond 323 | Balk 3:3 | 6.500 | 0.000 | 0.000 |
| 29 | | 1:Rond 323 | Balk 10:10 | 3.100 | 0.000 | 0.000 |
| 30 | | 1:Rond 323 | Balk 11:11 | 3.950 | 0.000 | 0.000 |
| 31 | | 1:Rond 323 | Balk 12:12 | 1.850 | 0.000 | 0.000 |
| 32 | | 1:Rond 323 | Balk 4:4 | 8.900 | 0.000 | 0.000 |
| 33 | | 1:Rond 323 | Balk 4:4 | 4.100 | 0.000 | 0.000 |
| 34 | | 1:Rond 323 | Balk 6:6 | 6.200 | 0.000 | 0.000 |
| 35 | | 1:Rond 323 | Balk 4:4 | 5.300 | 0.000 | 0.000 |
| 36 | | 1:Rond 323 | Balk 7:7 | 6.500 | 0.000 | 0.000 |
| 37 | | 1:Rond 323 | Balk 11:11 | 1.000 | 0.000 | 0.000 |
| 38 | | 1:Rond 323 | Balk 7:7 | 3.550 | 0.000 | 0.000 |

BELASTINGGEVALLEN

| B.G. | Omschrijving | Belast/onbelast | ψ_0 | ψ_1 | ψ_2 | e.g. |
|------|------------------|--------------------|----------|----------|----------|-------|
| 1 | Permanent | 2:Permanent EN1991 | | | | -1.00 |
| 2 | Veranderlijk dak | 0:Alles tegelijk | 0.00 | 0.00 | 0.00 | 0.00 |
| 3 | Veranderlijk 2e | 0:Alles tegelijk | 0.40 | 0.50 | 0.30 | 0.00 |
| 4 | Veranderlijk 1e | 0:Alles tegelijk | 0.40 | 0.50 | 0.30 | 0.00 |
| 5 | Veranderlijk bg | 0:Alles tegelijk | 0.40 | 0.50 | 0.30 | 0.00 |

BELASTINGGEVALLEN

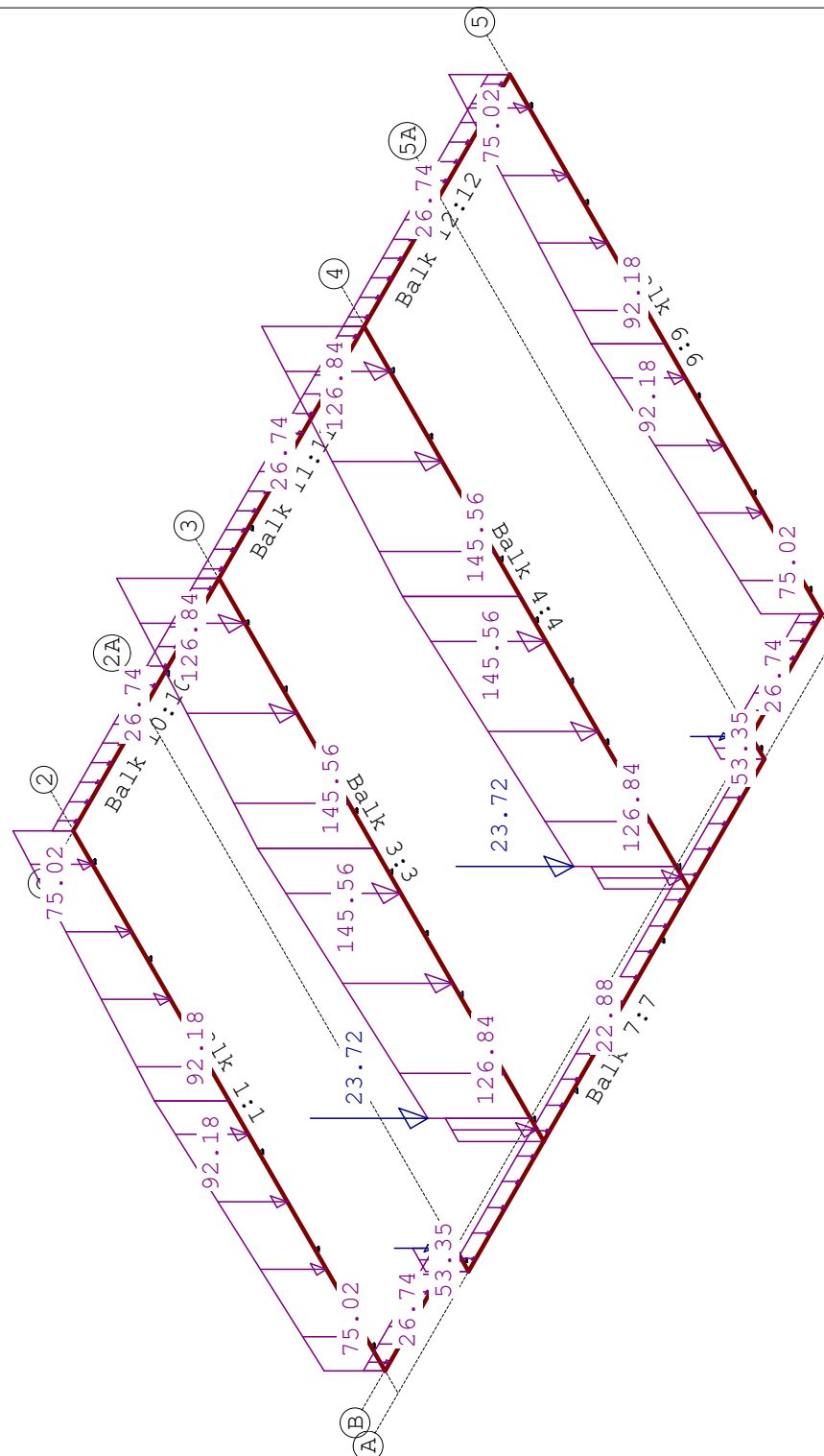
| B.G. | Omschrijving | Type |
|------|------------------|-----------------------------|
| 1 | Permanent | 1 Permanente belasting |
| 2 | Veranderlijk dak | 2 Ver. bel. pers. ed. (q_k) |
| 3 | Veranderlijk 2e | 2 Ver. bel. pers. ed. (q_k) |
| 4 | Veranderlijk 1e | 2 Ver. bel. pers. ed. (q_k) |
| 5 | Veranderlijk bg | 2 Ver. bel. pers. ed. (q_k) |

Project.....: 22-163 - Nieuwbouw 3 woningen Hoek van Holland

Onderdeel....: Fundering

VELDBELASTINGEN

B.G:1 Permanent



Project.....: 22-163 - Nieuwbouw 3 woningen Hoek van Holland

Onderdeel.....: Fundering

VELDBELASTINGEN

B.G:1 Permanent

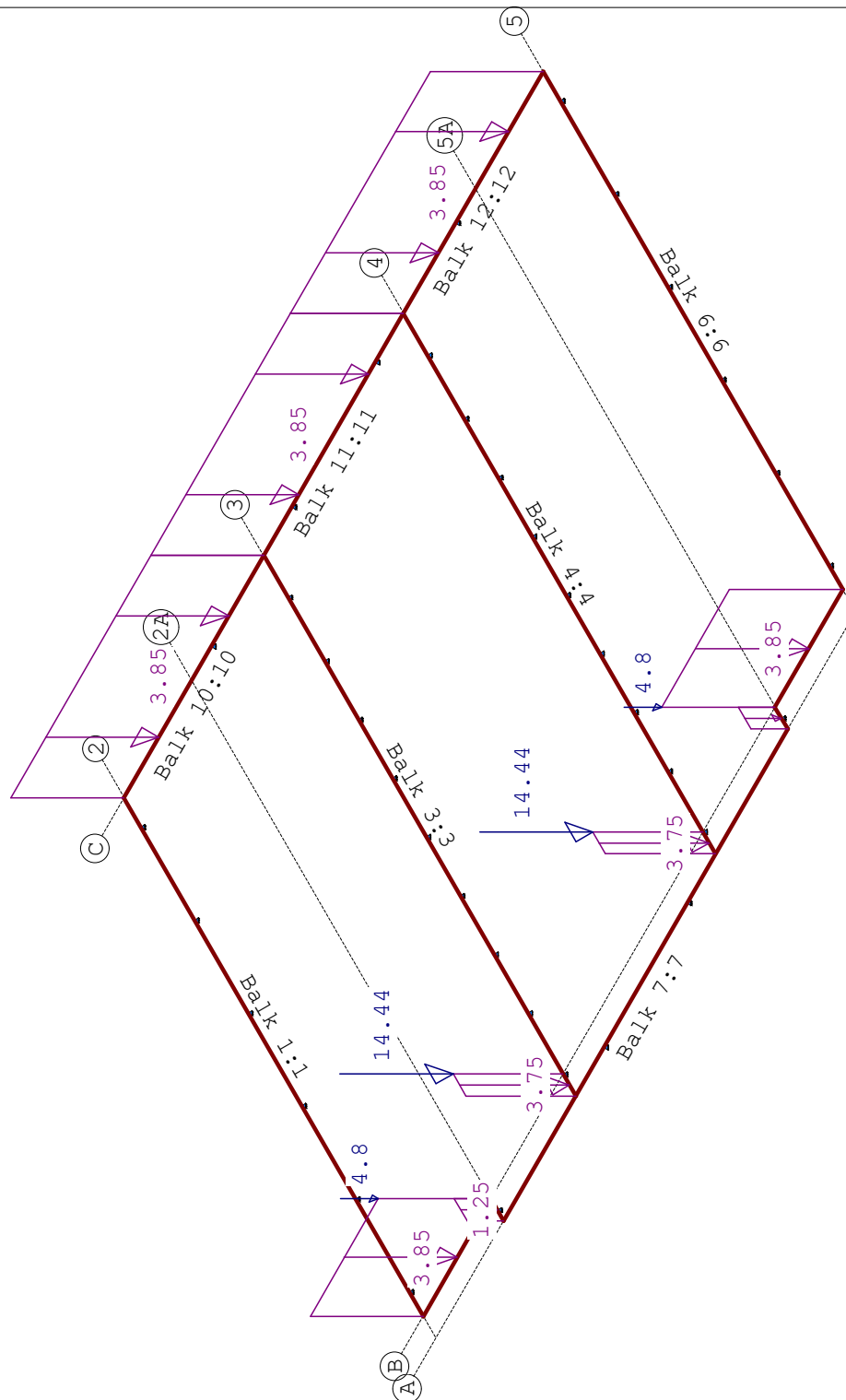
| Balk | Last Type | q1/p/m | q2 | Afstand | Lengte | Exc. |
|------------|--------------|----------|----------|---------|--------|-------|
| Balk 1:1 | 1 1:q-last | -92.180 | -75.020 | 5.300 | 5.300 | 0.000 |
| Balk 1:1 | 2 1:q-last | -75.020 | -92.180 | 0.000 | 5.300 | 0.000 |
| Balk 2:2 | 1 1:q-last | -53.350 | -53.350 | 0.000 | 0.450 | 0.000 |
| Balk 3:3 | 1 1:q-last | -145.560 | -126.840 | 5.750 | 5.300 | 0.000 |
| Balk 3:3 | 2 1:q-last | -126.840 | -145.560 | 0.450 | 5.300 | 0.000 |
| Balk 3:3 | 3 1:q-last | -105.450 | -105.450 | 0.000 | 0.450 | 0.000 |
| Balk 3:3 | 4 8:Puntlast | -23.720 | | 0.450 | | 0.000 |
| Balk 4:4 | 1 1:q-last | -145.560 | -126.840 | 5.750 | 5.300 | 0.000 |
| Balk 4:4 | 2 1:q-last | -126.840 | -145.560 | 0.450 | 5.300 | 0.000 |
| Balk 4:4 | 3 1:q-last | -105.450 | -105.450 | 0.000 | 0.450 | 0.000 |
| Balk 4:4 | 4 8:Puntlast | -23.720 | | 0.450 | | 0.000 |
| Balk 5:5 | 1 1:q-last | -53.350 | -53.350 | 0.000 | 0.450 | 0.000 |
| Balk 6:6 | 1 1:q-last | -92.180 | -75.020 | 5.300 | 5.300 | 0.000 |
| Balk 6:6 | 2 1:q-last | -75.020 | -92.180 | 0.000 | 5.300 | 0.000 |
| Balk 7:7 | 1 1:q-last | -22.880 | -22.880 | 0.000 | 10.050 | 0.000 |
| Balk 8:8 | 1 1:q-last | -26.740 | -26.740 | 0.000 | 2.400 | 0.000 |
| Balk 8:8 | 2 8:Puntlast | -7.900 | | 2.400 | | 0.000 |
| Balk 9:9 | 1 1:q-last | -26.740 | -26.740 | 0.000 | 2.400 | 0.000 |
| Balk 9:9 | 2 8:Puntlast | -7.900 | | -0.000 | | 0.000 |
| Balk 10:10 | 1 1:q-last | -26.740 | -26.740 | 0.000 | 4.950 | 0.000 |
| Balk 11:11 | 1 1:q-last | -26.740 | -26.740 | 0.000 | 4.950 | 0.000 |
| Balk 12:12 | 1 1:q-last | -26.740 | -26.740 | 0.000 | 4.950 | 0.000 |

Project.....: 22-163 - Nieuwbouw 3 woningen Hoek van Holland

Onderdeel...: Fundering

VELDBELASTINGEN

B.G:2 Veranderlijk dak



Project.....: 22-163 - Nieuwbouw 3 woningen Hoek van Holland

Onderdeel.....: Fundering

VELDBELASTINGEN

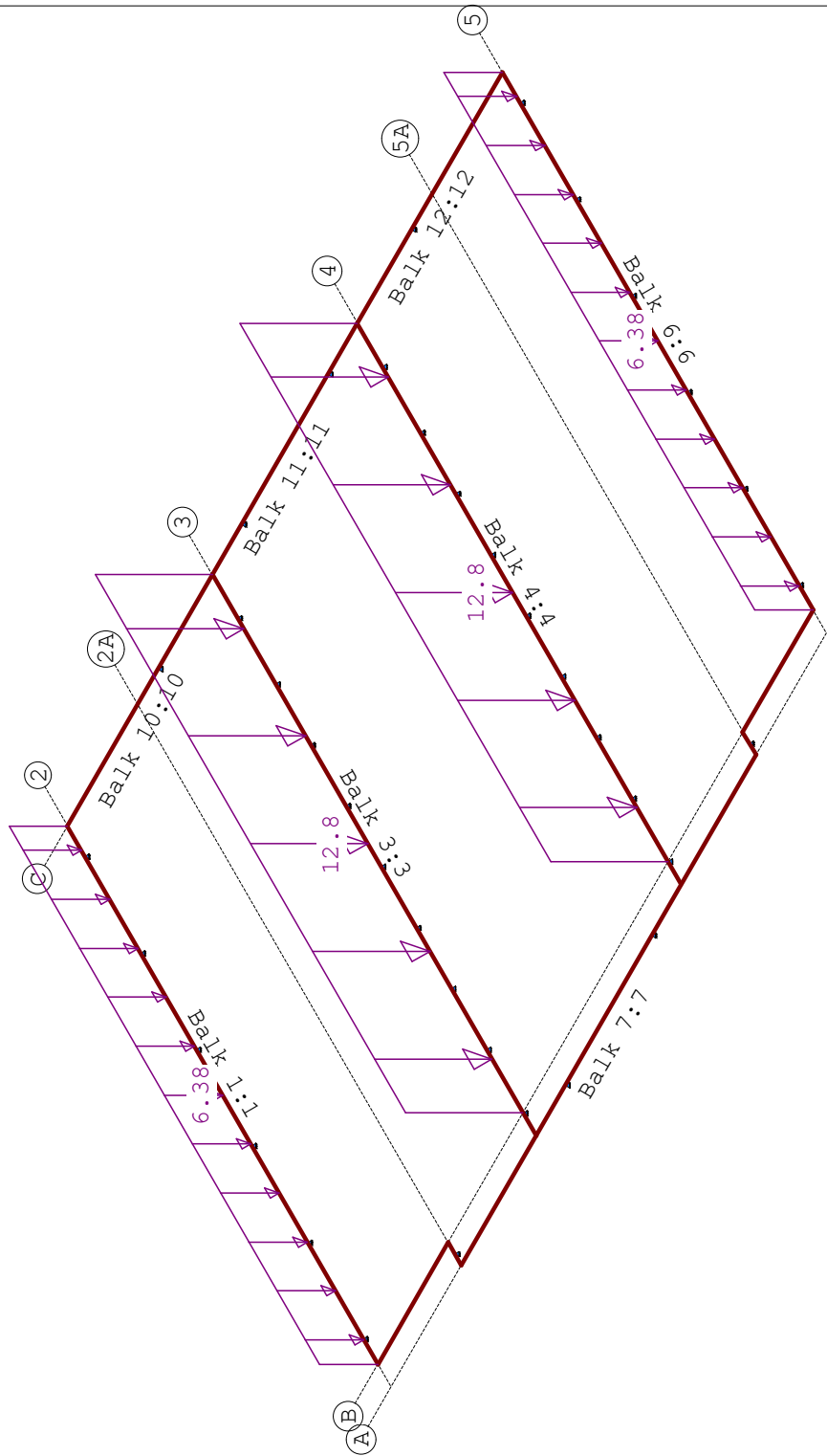
B.G:2 Veranderlijk dak

| Balk | Last Type | q1/p/m | q2 | Afstand | Lengte | Exc. |
|------------|--------------|---------|--------|---------|--------|-------|
| Balk 2:2 | 1 1:q-last | -1.250 | -1.250 | 0.000 | 0.450 | 0.000 |
| Balk 3:3 | 1 8:Puntlast | -14.440 | | 0.450 | | 0.000 |
| Balk 3:3 | 2 1:q-last | -3.750 | -3.750 | 0.000 | 0.450 | 0.000 |
| Balk 4:4 | 1 1:q-last | -3.750 | -3.750 | 0.000 | 0.450 | 0.000 |
| Balk 4:4 | 2 8:Puntlast | -14.440 | | 0.450 | | 0.000 |
| Balk 5:5 | 1 1:q-last | -1.250 | -1.250 | 0.000 | 0.450 | 0.000 |
| Balk 8:8 | 1 1:q-last | -3.850 | -3.850 | 0.000 | 2.400 | 0.000 |
| Balk 8:8 | 2 8:Puntlast | -4.800 | | 2.400 | | 0.000 |
| Balk 9:9 | 1 1:q-last | -3.850 | -3.850 | 0.000 | 2.400 | 0.000 |
| Balk 9:9 | 2 8:Puntlast | -4.800 | | -0.000 | | 0.000 |
| Balk 10:10 | 1 1:q-last | -3.850 | -3.850 | 0.000 | 4.950 | 0.000 |
| Balk 11:11 | 1 1:q-last | -3.850 | -3.850 | 0.000 | 4.950 | 0.000 |
| Balk 12:12 | 1 1:q-last | -3.850 | -3.850 | 0.000 | 4.950 | 0.000 |

Project.....: 22-163 - Nieuwbouw 3 woningen Hoek van Holland
Onderdeel.....: Fundering

VELDBELASTINGEN

B.G:3 Veranderlijk 2e



Project.....: 22-163 - Nieuwbouw 3 woningen Hoek van Holland
Onderdeel.....: Fundering

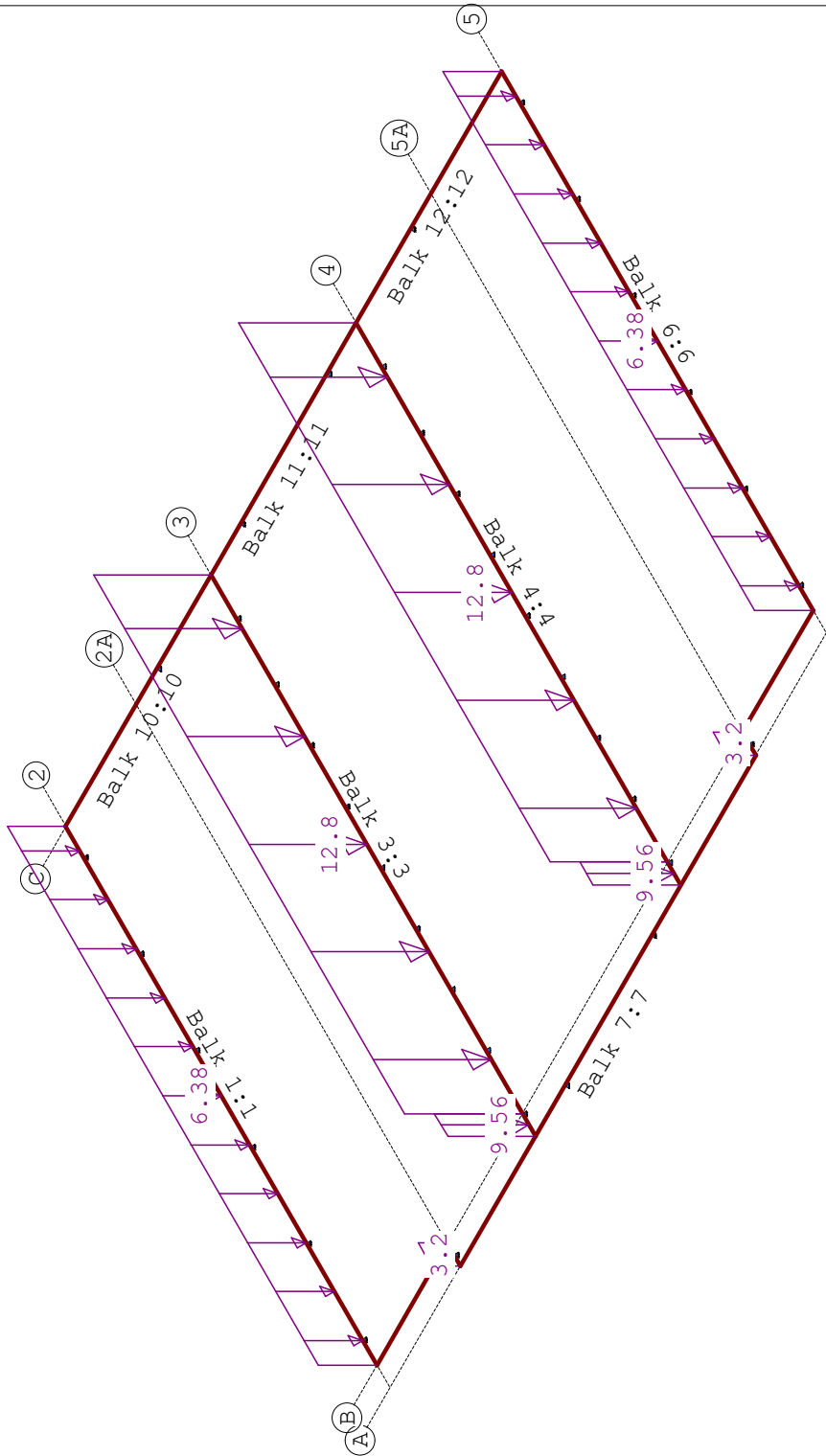
VELDBELASTINGEN

B.G:3 Veranderlijk 2e

| Balk | Last Type | q1/p/m | q2 | Afstand | Lengte | Exc. |
|----------|------------|---------|---------|---------|--------|-------|
| Balk 1:1 | 1 1:q-last | -6.380 | -6.380 | 0.000 | 10.600 | 0.000 |
| Balk 3:3 | 1 1:q-last | -12.800 | -12.800 | 0.450 | 10.600 | 0.000 |
| Balk 4:4 | 1 1:q-last | -12.800 | -12.800 | 0.450 | 10.600 | 0.000 |
| Balk 6:6 | 1 1:q-last | -6.380 | -6.380 | 0.000 | 10.600 | 0.000 |

VELDBELASTINGEN

B.G:4 Veranderlijk 1e



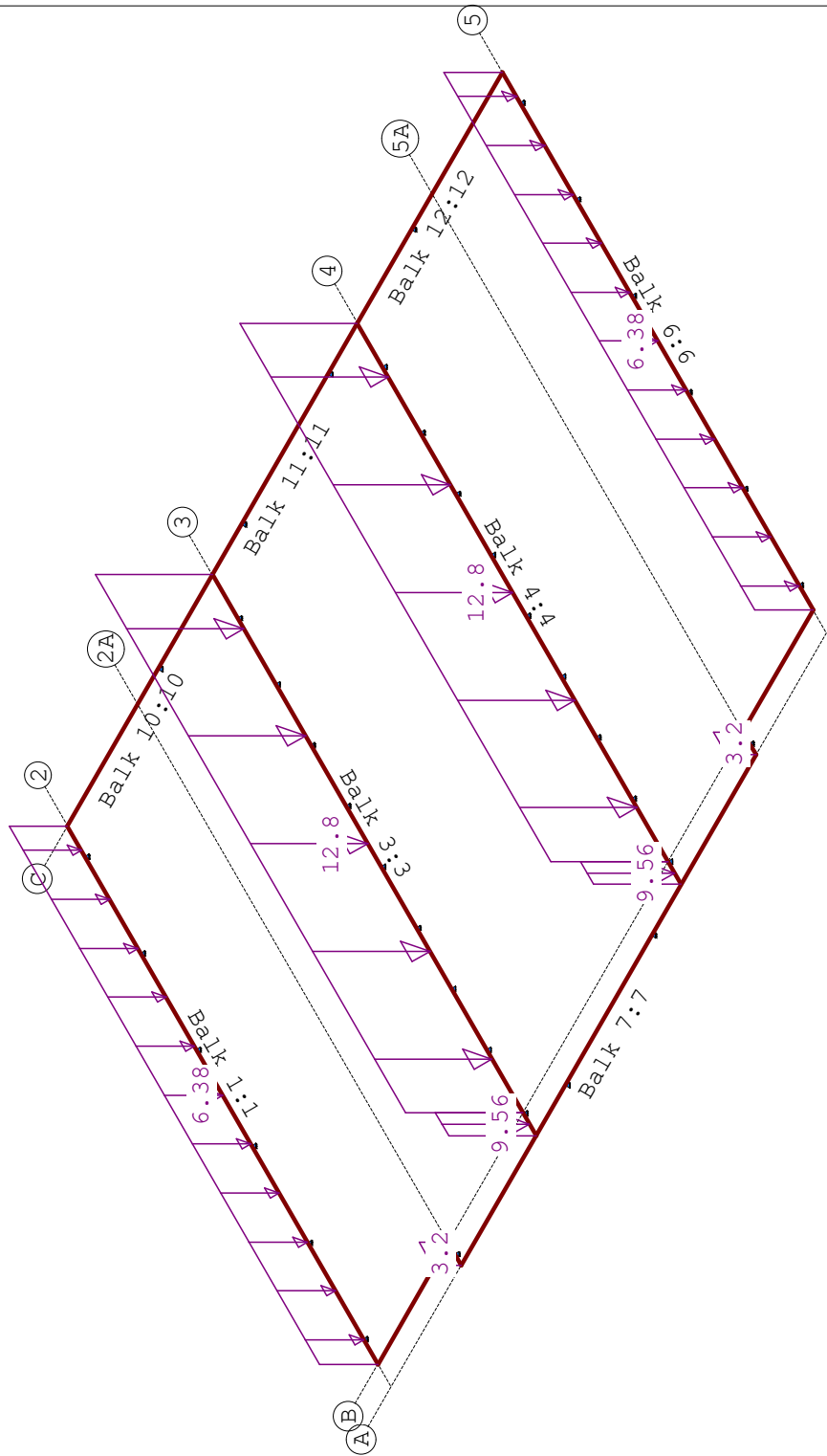
Project.....: 22-163 - Nieuwbouw 3 woningen Hoek van Holland
Onderdeel.....: Fundering

| VELDBELASTINGEN | | | B.G:4 Veranderlijk le | | | | |
|-----------------|------|----------|-----------------------|---------|---------|--------|-------|
| Balk | Last | Type | q1/p/m | q2 | Afstand | Lengte | Exc. |
| Balk 1:1 | 1 | 1:q-last | -6.380 | -6.380 | 0.000 | 10.600 | 0.000 |
| Balk 2:2 | 1 | 1:q-last | -3.200 | -3.200 | 0.000 | 0.450 | 0.000 |
| Balk 3:3 | 1 | 1:q-last | -12.800 | -12.800 | 0.450 | 10.600 | 0.000 |
| Balk 3:3 | 2 | 1:q-last | -9.560 | -9.560 | 0.000 | 0.450 | 0.000 |
| Balk 4:4 | 1 | 1:q-last | -12.800 | -12.800 | 0.450 | 10.600 | 0.000 |
| Balk 4:4 | 2 | 1:q-last | -9.560 | -9.560 | 0.000 | 0.450 | 0.000 |
| Balk 5:5 | 1 | 1:q-last | -3.200 | -3.200 | 0.000 | 0.450 | 0.000 |
| Balk 6:6 | 1 | 1:q-last | -6.380 | -6.380 | 0.000 | 10.600 | 0.000 |

Project.....: 22-163 - Nieuwbouw 3 woningen Hoek van Holland
Onderdeel.....: Fundering

VELDBELASTINGEN

B.G:5 Veranderlijk bg



Project.....: 22-163 - Nieuwbouw 3 woningen Hoek van Holland

Onderdeel.....: Fundering

VELDBELASTINGEN

B.G:5 Veranderlijk bg

| Balk | Last Type | q1/p/m | q2 | Afstand | Lengte | Exc. |
|----------|------------|---------|---------|---------|--------|-------|
| Balk 1:1 | 1 1:q-last | -6.380 | -6.380 | 0.000 | 10.600 | 0.000 |
| Balk 2:2 | 1 1:q-last | -3.200 | -3.200 | 0.000 | 0.450 | 0.000 |
| Balk 3:3 | 1 1:q-last | -12.800 | -12.800 | 0.450 | 10.600 | 0.000 |
| Balk 3:3 | 2 1:q-last | -9.560 | -9.560 | 0.000 | 0.450 | 0.000 |
| Balk 4:4 | 1 1:q-last | -12.800 | -12.800 | 0.450 | 10.600 | 0.000 |
| Balk 4:4 | 2 1:q-last | -9.560 | -9.560 | 0.000 | 0.450 | 0.000 |
| Balk 5:5 | 1 1:q-last | -3.200 | -3.200 | 0.000 | 0.450 | 0.000 |
| Balk 6:6 | 1 1:q-last | -6.380 | -6.380 | 0.000 | 10.600 | 0.000 |

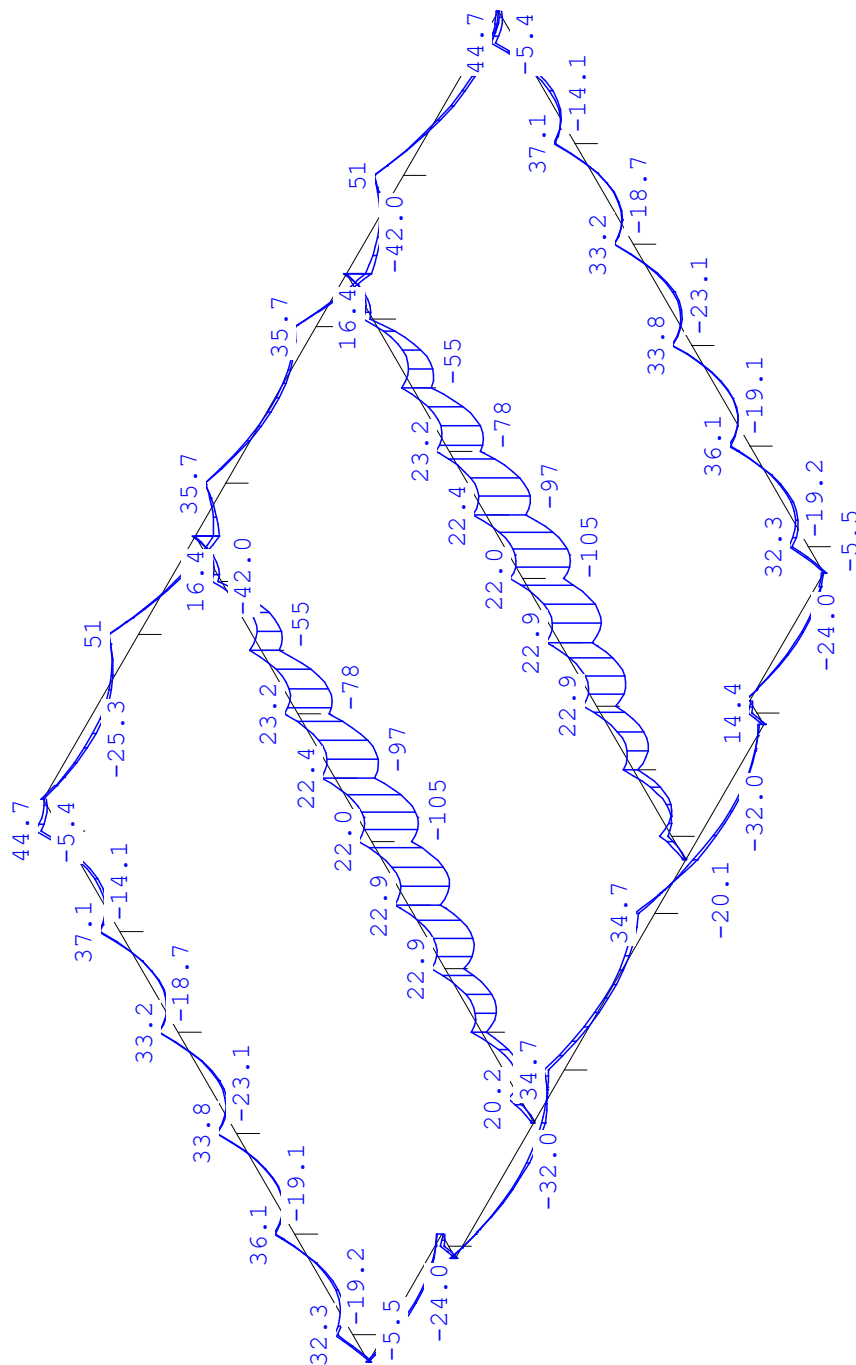
BELASTINGCOMBINATIES

| BC Type | BG Gen. | Factor | BG Gen. | Factor | BG Gen. | Factor | BG Gen. | Factor |
|----------|---------|--------|---------|--------|---------|--------|---------|--------|
| 1 Fund. | 1 Perm | 1.08 | 2 Extr | 1.35 | 3 Extr | 1.35 | 4 psi0 | 1.35 |
| | 5 psi0 | 1.35 | | | | | | |
| 2 Fund. | 1 Perm | 1.08 | 2 Extr | 1.35 | 3 psi0 | 1.35 | 4 psi0 | 1.35 |
| | 5 Extr | 1.35 | | | | | | |
| 3 Fund. | 1 Perm | 1.08 | 2 psi0 | 1.35 | 3 psi0 | 1.35 | 4 Extr | 1.35 |
| | 5 Extr | 1.35 | | | | | | |
| 4 Fund. | 1 Perm | 1.08 | 2 Extr | 1.35 | 3 psi0 | 1.35 | 4 Extr | 1.35 |
| | 5 psi0 | 1.35 | | | | | | |
| 5 Fund. | 1 Perm | 1.08 | 2 psi0 | 1.35 | 3 Extr | 1.35 | 4 Extr | 1.35 |
| | 5 psi0 | 1.35 | | | | | | |
| 6 Fund. | 1 Perm | 1.08 | 2 psi0 | 1.35 | 3 Extr | 1.35 | 4 psi0 | 1.35 |
| | 5 Extr | 1.35 | | | | | | |
| 7 Kar. | 1 Perm | 1.00 | | | | | | |
| 8 Freq. | 1 Perm | 1.00 | | | | | | |
| 9 Quas. | 1 Perm | 1.00 | | | | | | |
| 10 Blij. | 1 Perm | 1.00 | | | | | | |

Onderdeel....: Fundering

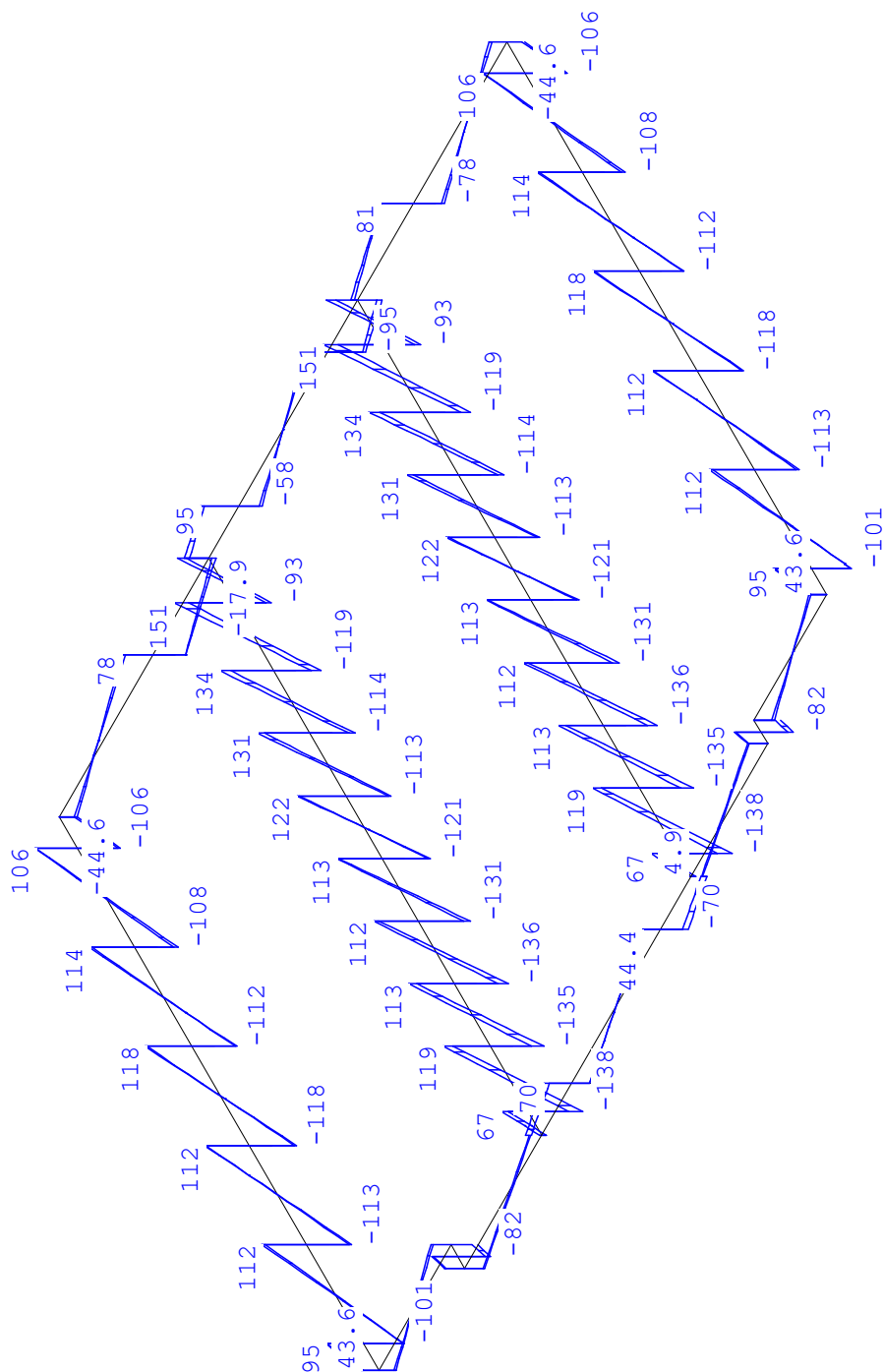
MOMENTEN Fysisch lineair

Fundamentele combinatie



Onderdeel....: Fundering

Fundamentele combinatie

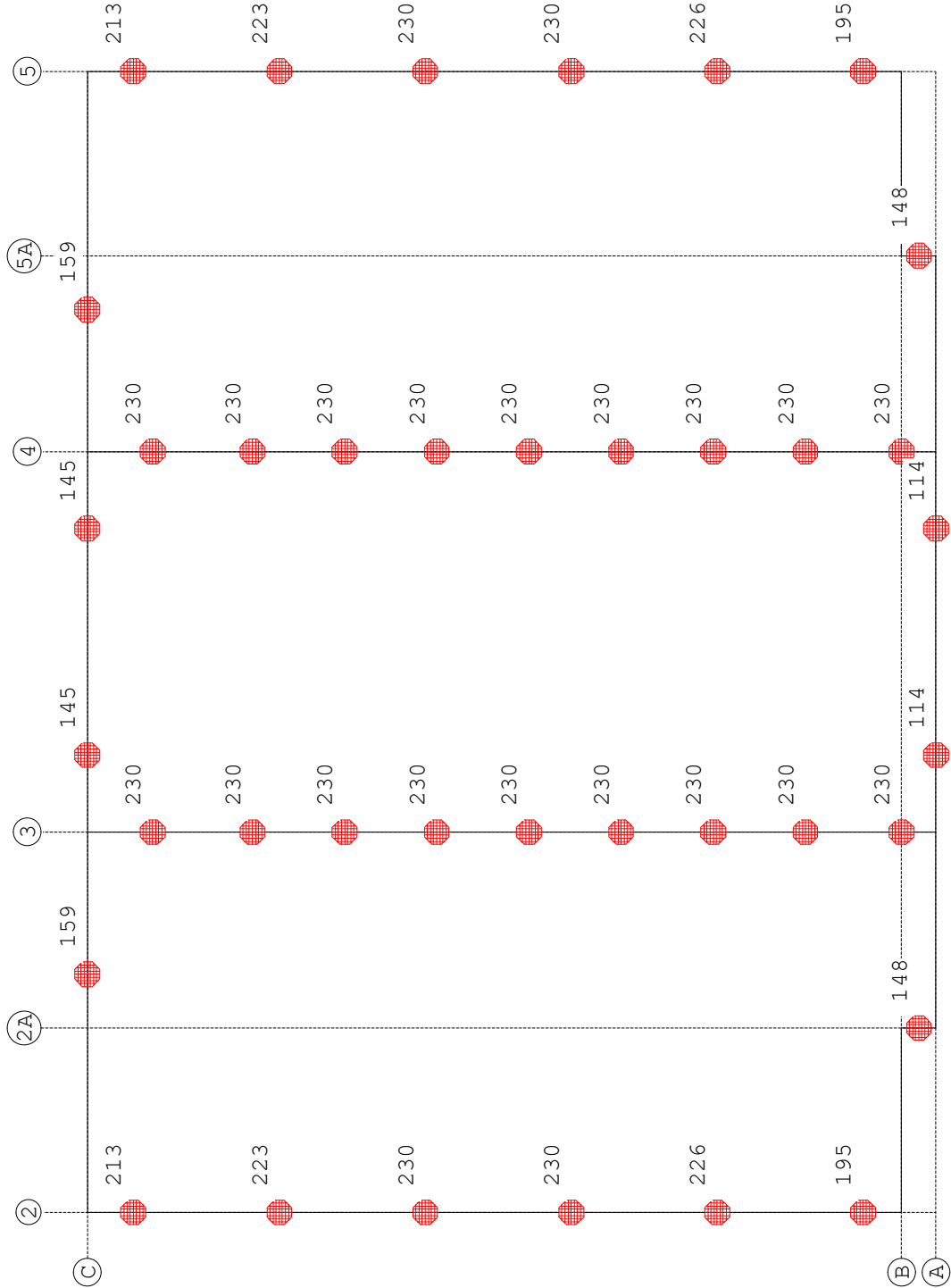


Project.....: 22-163 - Nieuwbouw 3 woningen Hoek van Holland
Onderdeel.....: Fundering

REACTIES

Fysisch lineair

Fundamentele combinatie



REACTIES

Fysisch lineair

Fundamentele combinatie

| Balk Stp | | MX | | Z | | MY | |
|----------|----|------|------|--------|--------|------|------|
| | | min. | max. | min. | max. | min. | max. |
| 1 | 1 | 0.00 | 0.00 | 192.58 | 195.18 | 0.00 | 0.00 |
| 1 | 2 | 0.00 | 0.00 | 209.57 | 225.81 | 0.00 | 0.00 |
| 1 | 3 | 0.00 | 0.00 | 222.46 | 230.00 | 0.00 | 0.00 |
| 1 | 26 | 0.00 | 0.00 | 221.43 | 230.00 | 0.00 | 0.00 |

Project.....: 22-163 - Nieuwbouw 3 woningen Hoek van Holland

Onderdeel.....: Fundering

REACTIES Fysisch lineair Fundamentele combinatie

| Balk Stp | | MX | | Z | | MY | |
|----------|----|------|------|--------|--------|------|------|
| | | min. | max. | min. | max. | min. | max. |
| 1 | 18 | 0.00 | 0.00 | 205.35 | 222.65 | 0.00 | 0.00 |
| 1 | 4 | 0.00 | 0.00 | 207.29 | 212.82 | 0.00 | 0.00 |
| 2 | 5 | 0.00 | 0.00 | 130.41 | 147.88 | 0.00 | 0.00 |
| 3 | 6 | 0.00 | 0.00 | 195.73 | 230.00 | 0.00 | 0.00 |
| 3 | 7 | 0.00 | 0.00 | 221.62 | 230.00 | 0.00 | 0.00 |
| 3 | 27 | 0.00 | 0.00 | 223.83 | 230.00 | 0.00 | 0.00 |
| 3 | 8 | 0.00 | 0.00 | 225.78 | 230.00 | 0.00 | 0.00 |
| 3 | 9 | 0.00 | 0.00 | 228.70 | 230.00 | 0.00 | 0.00 |
| 3 | 28 | 0.00 | 0.00 | 228.74 | 230.00 | 0.00 | 0.00 |
| 3 | 24 | 0.00 | 0.00 | 227.29 | 230.00 | 0.00 | 0.00 |
| 3 | 21 | 0.00 | 0.00 | 226.07 | 230.00 | 0.00 | 0.00 |
| 3 | 10 | 0.00 | 0.00 | 206.92 | 230.00 | 0.00 | 0.00 |
| 4 | 11 | 0.00 | 0.00 | 195.73 | 230.00 | 0.00 | 0.00 |
| 4 | 12 | 0.00 | 0.00 | 221.62 | 230.00 | 0.00 | 0.00 |
| 4 | 13 | 0.00 | 0.00 | 223.83 | 230.00 | 0.00 | 0.00 |
| 4 | 33 | 0.00 | 0.00 | 225.78 | 230.00 | 0.00 | 0.00 |
| 4 | 35 | 0.00 | 0.00 | 228.70 | 230.00 | 0.00 | 0.00 |
| 4 | 19 | 0.00 | 0.00 | 228.74 | 230.00 | 0.00 | 0.00 |
| 4 | 22 | 0.00 | 0.00 | 227.29 | 230.00 | 0.00 | 0.00 |
| 4 | 32 | 0.00 | 0.00 | 226.07 | 230.00 | 0.00 | 0.00 |
| 4 | 14 | 0.00 | 0.00 | 206.92 | 230.00 | 0.00 | 0.00 |
| 5 | 15 | 0.00 | 0.00 | 130.41 | 147.88 | 0.00 | 0.00 |
| 6 | 16 | 0.00 | 0.00 | 192.58 | 195.18 | 0.00 | 0.00 |
| 6 | 17 | 0.00 | 0.00 | 209.57 | 225.81 | 0.00 | 0.00 |
| 6 | 20 | 0.00 | 0.00 | 222.46 | 230.00 | 0.00 | 0.00 |
| 6 | 34 | 0.00 | 0.00 | 221.43 | 230.00 | 0.00 | 0.00 |
| 6 | 25 | 0.00 | 0.00 | 205.35 | 222.65 | 0.00 | 0.00 |
| 6 | 23 | 0.00 | 0.00 | 207.29 | 212.82 | 0.00 | 0.00 |
| 7 | 38 | 0.00 | 0.00 | 99.89 | 114.23 | 0.00 | 0.00 |
| 7 | 36 | 0.00 | 0.00 | 99.89 | 114.23 | 0.00 | 0.00 |
| 10 | 29 | 0.00 | 0.00 | 150.55 | 159.08 | 0.00 | 0.00 |
| 11 | 37 | 0.00 | 0.00 | 145.00 | 145.41 | 0.00 | 0.00 |
| 11 | 30 | 0.00 | 0.00 | 145.00 | 145.41 | 0.00 | 0.00 |
| 12 | 31 | 0.00 | 0.00 | 150.55 | 159.08 | 0.00 | 0.00 |

PROFIELGEGEVENS Balk [N] [mm] t.b.v. profiel:1 B*H 400*500**Algemeen**

Materiaal : C20/25

Project.....: 22-163 - Nieuwbouw 3 woningen Hoek van Holland

Onderdeel....: Fundering

Doorsnede

breedte : 400 hoogte : 500 zwaartepunt tov onderkant : 250
 Fictieve dikte : 222.2

| | | | |
|------------------------------|----------|-----------------|---------|
| Betonkwaliteit element | : C20/25 | Kruipcoëf. | : 3.010 |
| Staalkwaliteit hoofdwapening | : 500 | ϵ_{uk} | : 2.50 |
| Staalkwaliteit beugels | : 500 | | |

Betondekking

| | | Boven | Onder |
|--------------------------|---|-----------|-----------|
| Milieu | : | XC2 | XC2 |
| Hoofdwapening | : | 2de laag | 2de laag |
| Nominale dekking | : | 30 | 30 |
| Toegepaste dekking | : | 43 | 43 |
| Toegepaste zijdekking | : | 43 | |
| Beugel / Verdeelwapening | : | 1ste laag | 1ste laag |
| Nominale dekking | : | 30 | 30 |
| Toegepaste dekking | : | 35 | 35 |
| Toegepaste zijdekking | : | 35 | |

Wapening

| | | Boven | Onder |
|------------------------------|---|-------|-------|
| Basiswapening buitenste laag | : | 4x12 | 4x12 |
| H.o.h.afstand 2e laag | : | 0 | 0 |

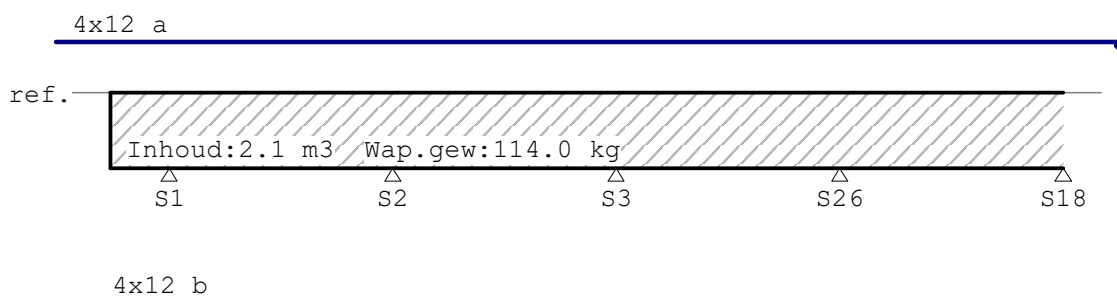
Beugels

Beugeldiameter : 8
 Min. hoek betondrukdiagonaal θ : 21.8 z berekenen via: MRd

Hoofdwapening Fysisch lineair

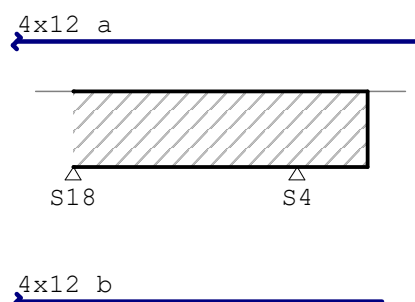
Balk 1:1

Velden: 1 t/m 5

**Hoofdwapening** Fysisch lineair

Balk 1:1

Velden: 6 t/m 7



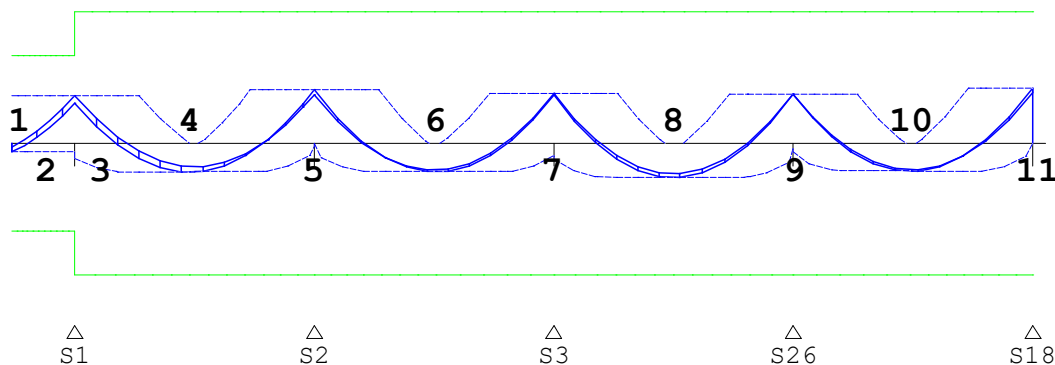
Project.....: 22-163 - Nieuwbouw 3 woningen Hoek van Holland

Onderdeel.....: Fundering

MEd dekkingslijn Fysisch lineair

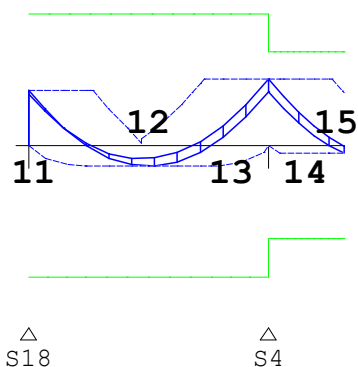
Balk 1:1

Velden: 1 t/m 5

**MEd dekkingslijn** Fysisch lineair

Balk 1:1

Velden: 6 t/m 7

**Hoofdwapening**

Balk 1:1

| Geb. | Pos. [mm] | M_{Ed} [kNm] | M_{Rd} [kNm] | z B/O [mm] | A_b [mm ²] | A_a [mm ²] | Basiswapening +Bijlegwapening | Opm. |
|------|--------------|-------------------|-------------------|---------------|-----------------------------|-----------------------------|----------------------------------|------|
| 1 | S1-500 | -5.48 | -59.01 | 299 Ond | 165* | 453 | 4x12 | 2,54 |
| 2 | S1-0 | 32.32 | 59.01 | 299 Bov | 311* | 453 | 4x12 | 1,2 |
| 3 | S1+0 | 32.32 | 88.47 | 430 Bov | 202* | 453 | 4x12 | 1 |
| 4 | S1+912 | -19.18 | -88.47 | 430 Ond | 165* | 453 | 4x12 | 54 |
| 5 | S2+0 | 36.07 | 88.47 | 430 Bov | 204* | 453 | 4x12 | 1 |
| 6 | S3-932 | -19.07 | -88.47 | 430 Ond | 165* | 453 | 4x12 | 54 |
| 7 | S3+0 | 33.77 | 88.47 | 430 Bov | 204* | 453 | 4x12 | 1 |
| 8 | S3+951 | -23.12 | -88.47 | 430 Ond | 165* | 453 | 4x12 | 54 |
| 9 | S26+0 | 33.22 | 88.47 | 430 Bov | 204* | 453 | 4x12 | 1 |
| 10 | S26+928 | -18.72 | -88.47 | 430 Ond | 165* | 453 | 4x12 | 54 |
| 11 | S18+0 | 37.08 | 88.47 | 430 Bov | 204* | 453 | 4x12 | 1 |
| 12 | S18+949 | -14.12 | -88.47 | 430 Ond | 165* | 453 | 4x12 | 54 |
| 13 | S4-0 | 44.68 | 88.47 | 430 Bov | 224 | 453 | 4x12 | |
| 14 | S4+0 | 44.68 | 62.94 | 320 Bov | 322 | 453 | 4x12 | 2 |
| 15 | S4+600 | -5.40 | -62.94 | 320 Ond | 165* | 453 | 4x12 | 2,54 |

Project.....: 22-163 - Nieuwbouw 3 woningen Hoek van Holland

Onderdeel.....: Fundering

Hoofdwapening

Balk 1:1

| Geb. | Pos. [mm] | M_{Ed} [kNm] | M_{Rd} [kNm] | z B/O [mm] | A_b [mm ²] | A_a [mm ²] | Basiswapening +Bijlegwapening | Opm. |
|------|--------------|-------------------|-------------------|---------------|-----------------------------|-----------------------------|----------------------------------|------|
|------|--------------|-------------------|-------------------|---------------|-----------------------------|-----------------------------|----------------------------------|------|

Opmerkingen

- [1] * = Eisen met betrekking tot minimum wapening zijn toegepast, zie nationale bijlage art. 9.2.1.1(1).
- [2] Benodigde wapening en inwendige hefboomsarm zijn bepaald volgens gedrongen ligger detaillering, zie nationale bijlage art. 6.1(10).
- [54] * = Eisen met betrekking tot minimum wapening ten behoeve van gecontroleerde scheurvorming zijn toegepast volgens art. 7.3.2.

Scheurvorming volgens artikel 7.3.4

Balk 1:1

| Geb. | Pos. [mm] | Zijde | $M_{E,freq}$ [kNm] | $s_{r,max}$ [mm] | $\epsilon_{sm}-\epsilon_{cm}$ [%] | w_k [mm] | k_x | w_{max} [mm] | U.C. | Opm. |
|------|--------------|-------|-----------------------|---------------------|--------------------------------------|---------------|-------|-------------------|------|------|
| 1 | S1-912 | Bov | 26.63 | 367 | 0.415 | 0.153 | 1.17 | 0.350 | 0.44 | |
| 1 | S1-580 | Ond | -0.91 | 367 | 0.014 | 0.005 | 1.17 | 0.350 | 0.01 | |
| 2 | S1+0 | Bov | 26.63 | 367 | 0.415 | 0.153 | 1.17 | 0.350 | 0.44 | |
| 2 | S1+410 | Bov | 26.63 | 367 | 0.415 | 0.153 | 1.17 | 0.350 | 0.44 | |
| 2 | S2-410 | Bov | 26.36 | 367 | 0.411 | 0.151 | 1.17 | 0.350 | 0.43 | |
| 2 | S1+472 | Ond | -11.73 | 367 | 0.183 | 0.067 | 1.17 | 0.350 | 0.19 | |
| 2 | S2-551 | Ond | -11.73 | 367 | 0.183 | 0.067 | 1.17 | 0.350 | 0.19 | |
| 3 | S2+400 | Bov | 26.36 | 367 | 0.411 | 0.151 | 1.17 | 0.350 | 0.43 | |
| 3 | S3-389 | Bov | 26.90 | 367 | 0.420 | 0.154 | 1.17 | 0.350 | 0.44 | |
| 3 | S2+533 | Ond | -14.36 | 367 | 0.224 | 0.082 | 1.17 | 0.350 | 0.24 | |
| 3 | S3-932 | Ond | -14.36 | 367 | 0.224 | 0.082 | 1.17 | 0.350 | 0.24 | |
| 3 | S3-556 | Ond | -14.36 | 367 | 0.224 | 0.082 | 1.17 | 0.350 | 0.24 | |
| 4 | S3+370 | Bov | 26.90 | 367 | 0.420 | 0.154 | 1.17 | 0.350 | 0.44 | |
| 4 | S26-364 | Bov | 26.50 | 367 | 0.413 | 0.152 | 1.17 | 0.350 | 0.43 | |
| 4 | S3+494 | Ond | -16.68 | 367 | 0.260 | 0.096 | 1.17 | 0.350 | 0.27 | |
| 4 | S26-493 | Ond | -16.68 | 367 | 0.260 | 0.096 | 1.17 | 0.350 | 0.27 | |
| 5 | S26+385 | Bov | 26.50 | 367 | 0.413 | 0.152 | 1.17 | 0.350 | 0.43 | |
| 5 | S18-410 | Bov | 27.40 | 367 | 0.427 | 0.157 | 1.17 | 0.350 | 0.45 | |
| 5 | S26+555 | Ond | -14.20 | 367 | 0.222 | 0.081 | 1.17 | 0.350 | 0.23 | |
| 5 | S18-544 | Ond | -14.20 | 367 | 0.222 | 0.081 | 1.17 | 0.350 | 0.23 | |
| 6 | S18+483 | Bov | 27.40 | 367 | 0.427 | 0.157 | 1.17 | 0.350 | 0.45 | |
| 6 | S4-445 | Bov | 35.75 | 367 | 0.558 | 0.205 | 1.17 | 0.350 | 0.59 | |
| 6 | S18+450 | Ond | -6.80 | 367 | 0.106 | 0.039 | 1.17 | 0.350 | 0.11 | |
| 6 | S18+949 | Ond | -6.81 | 367 | 0.106 | 0.039 | 1.17 | 0.350 | 0.11 | |
| 6 | S4-448 | Ond | -6.80 | 367 | 0.106 | 0.039 | 1.17 | 0.350 | 0.11 | |
| 7 | S4+0 | Bov | 35.75 | 367 | 0.558 | 0.205 | 1.17 | 0.350 | 0.59 | |
| 7 | S4+475 | Bov | 35.75 | 367 | 0.558 | 0.205 | 1.17 | 0.350 | 0.59 | |
| 7 | S4+981 | Bov | 28.34 | 367 | 0.442 | 0.162 | 1.17 | 0.350 | 0.46 | |
| 7 | S4+103 | Ond | -0.44 | 367 | 0.007 | 0.003 | 1.17 | 0.350 | 0.01 | |
| 7 | S4+660 | Ond | -0.44 | 367 | 0.007 | 0.003 | 1.17 | 0.350 | 0.01 | |

Project.....: 22-163 - Nieuwbouw 3 woningen Hoek van Holland
Onderdeel....: Fundering

Verloop hoofdwapening

Balk 1:1

| Merk | B/O | Wapening | Vanaf [mm] | Tot [mm] | Lengte [mm] | L _{bd;begin} [mm] | L _{bd;eind} [mm] |
|------|-------|----------|---------------|-------------|----------------|-------------------------------|------------------------------|
| a | Boven | 4x12 | S1-960 | S4+1033 | 11493 | 460 | 433 |
| b | Onder | 4x12 | S1-620 | S4+720 | 10840 | 120 | 120 |

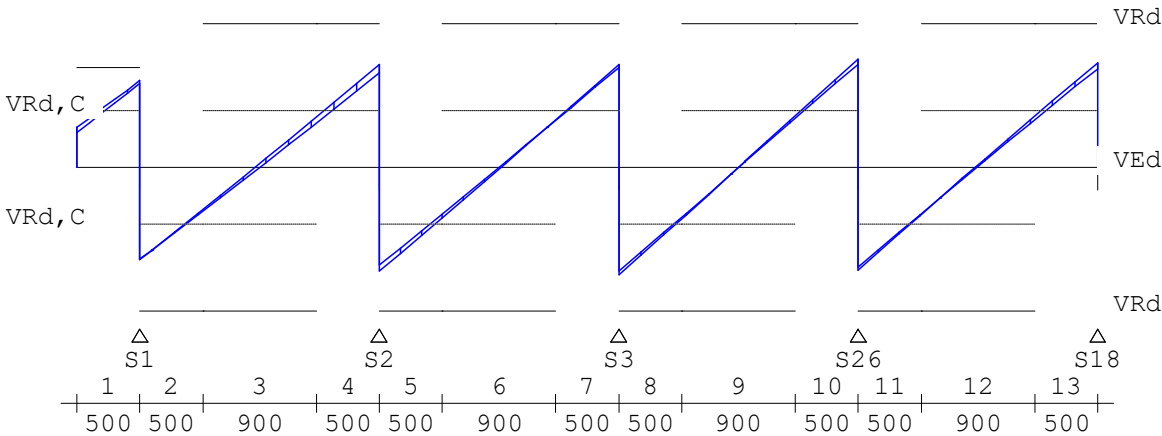
Opmerkingen
Alle maten zijn inclusief verschuiving van de m-lijn en verankering

DWARSKRACHTEN

Fysisch lineair

Balk 1:1 Fundamentele combinatie

Velden: 1 t/m 5

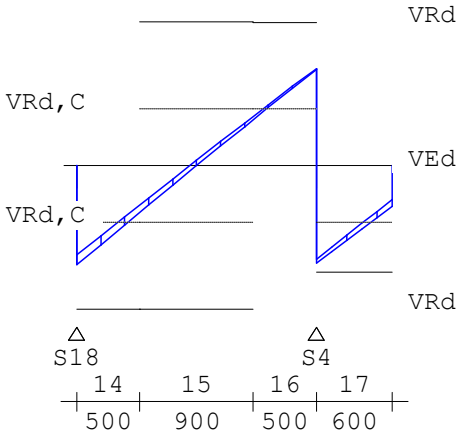


DWARSKRACHTEN

Fysisch lineair

Balk 1:1 Fundamentele combinatie

Velden: 6 t/m 7



Wring- en dwarskrachtwapening

Balk 1:1

| Geb. | Vanaf [mm] | Tot [mm] | Beugels | Lengte [mm] | <Wringing> <Dwarskr.> | | | | V _{Ed} [kN] | T _{Ed} [kNm] | Opm. |
|------|---------------|-------------|---------|----------------|--|--|--|--|-------------------------|--------------------------|------|
| | | | | | A _{langs} [mm ²] | A _{bgl} [mm ² /m] | A _{bgl} [mm ² /m] | A _{opg} [mm ²] | | | |
| 1 | S1-500 | S1+0 | Ø8-300 | 500 | 4 | 0 | 290 | 0 | 94.7 | 0 | 6,59 |
| 2 | S1+0 | S1+500 | Ø8-300 | 500 | 4 | 0 | 286 | 0 | 100.4 | 0 | 6 |
| 3 | S1+500 | S2-500 | Ø8-300 | 900 | 0 | 0 | 286 | 0 | 54.8 | 0 | |
| 4 | S2-500 | S2+0 | Ø8-300 | 500 | 4 | 0 | 286 | 0 | 112.1 | 0 | 6 |

Project.....: 22-163 - Nieuwbouw 3 woningen Hoek van Holland

Onderdeel....: Fundering

Wring- en dwarskrachtwapening

Balk 1:1

| Geb. | Vanaf | Tot | Beugels | Lengte | <Wringing> | | <Dwarskr.> | | | | |
|------|---------|---------|---------|--------|--------------------|----------------------|--------------------|-----------|----------|----------|------|
| | [mm] | [mm] | | [mm] | A_{lang} | A_{bgl} | A_{bgl} | A_{opg} | V_{Ed} | T_{Ed} | Opm. |
| | | | | | [mm ²] | [mm ² /m] | [mm ²] | | [kN] | [kNm] | |
| 5 | S2+0 | S2+500 | Ø8-300 | 500 | 4 | 0 | 286 | 0 | 113.1 | 0 | 6 |
| 6 | S2+500 | S3-500 | Ø8-300 | 900 | 0 | 0 | 286 | 0 | 54.9 | 0 | |
| 7 | S3-500 | S3+0 | Ø8-300 | 500 | 4 | 0 | 286 | 0 | 112.0 | 0 | 6 |
| 8 | S3+0 | S3+500 | Ø8-300 | 500 | 4 | 0 | 286 | 0 | 117.3 | 0 | 6 |
| 9 | S3+500 | S26-500 | Ø8-300 | 900 | 0 | 0 | 286 | 0 | 55.8 | 0 | |
| 10 | S26-500 | S26+0 | Ø8-300 | 500 | 4 | 0 | 286 | 0 | 117.5 | 0 | 6 |
| 11 | S26+0 | S26+500 | Ø8-300 | 500 | 4 | 0 | 286 | 0 | 111.8 | 0 | 6 |
| 12 | S26+500 | S18-500 | Ø8-300 | 900 | 0 | 0 | 286 | 0 | 55.5 | 0 | |
| 13 | S18-500 | S18+0 | Ø8-300 | 500 | 4 | 0 | 286 | 0 | 113.9 | 0 | 6 |
| 14 | S18+0 | S18+500 | Ø8-300 | 500 | 4 | 0 | 286 | 0 | 108.0 | 0 | 6 |
| 15 | S18+500 | S4-500 | Ø8-300 | 900 | 0 | 0 | 286 | 0 | 53.6 | 0 | |
| 16 | S4-500 | S4+0 | Ø8-300 | 500 | 4 | 0 | 286 | 0 | 106.1 | 0 | 6 |
| 17 | S4+0 | S4+600 | Ø8-300 | 600 | 4 | 0 | 305 | 0 | 106.1 | 0 | 6,59 |

Opmerkingen

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

[59] 6.2.3: Z is berekend m.b.v. de gedrongen ligger berekening art 6.1 (10)

Wring- en dwarskrachten

Balk 1:1

| Geb. | Vanaf | Tot | θ | V_{Rd} | V_{Ed} | $V_{Rd,C}$ | $V_{Rd,Max}$ | T_{Ed} | $T_{Rd,C}$ | $T_{Rd,Max}$ | V_{opg} | Opm. |
|------|---------|---------|----------|----------|----------|--------------|--------------|----------|---------------|--------------|-----------|------|
| | [mm] | [mm] | [°] | [kN] | | -----kN----- | | | -----kNm----- | | | |
| 1 | S1-500 | S1+0 | 21.8 | 109 | 95 | 62 | 305 | 0 | 26 | 63 | 0 | 6,59 |
| 2 | S1+0 | S1+500 | 21.8 | 156 | 100 | 62 | 437 | 0 | 26 | 63 | 0 | 6 |
| 3 | S1+500 | S2-500 | 21.8 | 157 | 55 | 62 | 437 | 0 | 26 | 63 | 0 | |
| 4 | S2-500 | S2+0 | 21.8 | 156 | 112 | 62 | 437 | 0 | 26 | 63 | 0 | 6 |
| 5 | S2+0 | S2+500 | 21.8 | 156 | 113 | 62 | 437 | 0 | 26 | 63 | 0 | 6 |
| 6 | S2+500 | S3-500 | 21.8 | 157 | 55 | 62 | 437 | 0 | 26 | 63 | 0 | |
| 7 | S3-500 | S3+0 | 21.8 | 156 | 112 | 62 | 437 | 0 | 26 | 63 | 0 | 6 |
| 8 | S3+0 | S3+500 | 21.8 | 156 | 117 | 62 | 437 | 0 | 26 | 63 | 0 | 6 |
| 9 | S3+500 | S26-500 | 21.8 | 157 | 56 | 62 | 437 | 0 | 26 | 63 | 0 | |
| 10 | S26-500 | S26+0 | 21.8 | 156 | 117 | 62 | 437 | 0 | 26 | 63 | 0 | 6 |
| 11 | S26+0 | S26+500 | 21.8 | 156 | 112 | 62 | 437 | 0 | 26 | 63 | 0 | 6 |
| 12 | S26+500 | S18-500 | 21.8 | 157 | 56 | 62 | 437 | 0 | 26 | 63 | 0 | |
| 13 | S18-500 | S18+0 | 21.8 | 156 | 114 | 62 | 437 | 0 | 26 | 63 | 0 | 6 |
| 14 | S18+0 | S18+500 | 21.8 | 156 | 108 | 62 | 437 | 0 | 26 | 63 | 0 | 6 |
| 15 | S18+500 | S4-500 | 21.8 | 157 | 54 | 62 | 437 | 0 | 26 | 63 | 0 | |
| 16 | S4-500 | S4+0 | 21.8 | 156 | 106 | 62 | 437 | 0 | 26 | 63 | 0 | 6 |
| 17 | S4+0 | S4+600 | 21.8 | 116 | 106 | 62 | 325 | 0 | 26 | 63 | 0 | 6,59 |

Project.....: 22-163 - Nieuwbouw 3 woningen Hoek van Holland

Onderdeel.....: Fundering

Schuifspanningen

Balk 1:1

| Geb. | Vanaf [mm] | Tot [mm] | θ [°] | V_{Ed} [kN] | $V_{Rd,C}$ | $V_{Rd,S}$ | $V_{Ed} < V_{Rd} < V_{Rd,Max}$ [N/mm ²] | Opm. |
|------|---------------|-------------|-----------------|------------------|------------|------------|--|------|
|------|---------------|-------------|-----------------|------------------|------------|------------|--|------|

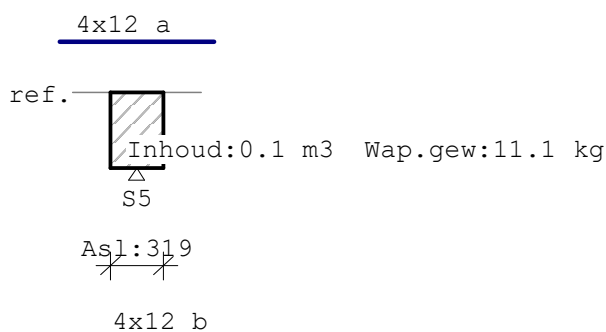
Opmerkingen

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

[59] 6.2.3: Z is berekend m.b.v. de gedrongen ligger berekening art 6.1 (10)

Hoofdwapening Fysisch lineair

Balk 2:2

**MEd dekkingslijn** Fysisch lineair

Balk 2:2



△
S5

Hoofdwapening

Balk 2:2

| Geb. | Pos. [mm] | M_{Ed} [kNm] | M_{Rd} [kNm] | z B/O [mm] | A_b [mm ²] | A_a [mm ²] | Basiswapening +Bijlegwapening | Opm. |
|------|--------------|-------------------|-------------------|---------------|-----------------------------|-----------------------------|----------------------------------|------|
| 1 | S5-225 | -4.15 | -28.32 | 180 Ond | 165* | 453 | 4x12 | 2,54 |
| 2 | S5-0 | 14.42 | 28.32 | 180 Bov | 231* | 453 | 4x12 | 1,2 |
| 3 | S5+0 | 14.42 | 28.32 | 180 Bov | 231* | 453 | 4x12 | 1,2 |
| 4 | S5+225 | -5.48 | -28.32 | 180 Ond | 165* | 453 | 4x12 | 2,54 |

Opmerkingen

[1] * = Eisen met betrekking tot minimum wapening zijn toegepast, zie nationale bijlage art. 9.2.1.1(1).

[2] Benodigde wapening en inwendige hefboomsarm zijn bepaald volgens gedrongen ligger detaillering, zie nationale bijlage art. 6.1(10).

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

Project.....: 22-163 - Nieuwbouw 3 woningen Hoek van Holland

Onderdeel....: Fundering

Scheurvorming volgens artikel 7.3.4

Balk 2:2

| Geb. | Pos. [mm] | Zijde | $M_{E,freq}$ [kNm] | $S_{r,max}$ [mm] | $\epsilon_{sm}-\epsilon_{cm}$ [%] | w_k [mm] | k_x | w_{max} [mm] | U.C. | Opm. |
|------|--------------|-------|-----------------------|---------------------|--------------------------------------|---------------|-------|-------------------|------|------|
| 1 | S5-602 | Bov | 11.62 | 367 | 0.181 | 0.067 | 1.17 | 0.350 | 0.19 | |
| 2 | S5+602 | Bov | 11.62 | 367 | 0.181 | 0.067 | 1.17 | 0.350 | 0.19 | |
| 2 | S5+0 | Ond | -0.91 | 367 | 0.014 | 0.005 | 1.17 | 0.350 | 0.01 | |
| 2 | S5+305 | Ond | -0.91 | 367 | 0.014 | 0.005 | 1.17 | 0.350 | 0.01 | |

Verloop hoofdwapening

Balk 2:2

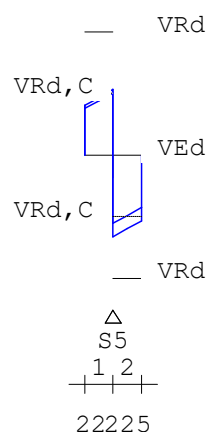
| Merk | B/O | Wapening | Vanaf [mm] | Tot [mm] | Lengte [mm] | $L_{bd,begin}$ [mm] | $L_{bd,eind}$ [mm] |
|------|-------|----------|---------------|-------------|----------------|------------------------|-----------------------|
| a | Boven | 4x12 | S5-653 | S5+653 | 1306 | 428 | 428 |
| b | Onder | 4x12 | S5-345 | S5+345 | 690 | 120 | 120 |

Opmerkingen

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

DWARSKRACHTEN Fysisch lineair

Balk 2:2 Fundamentele combinatie

**Wring- en dwarskrachtwapening**

Balk 2:2

| Geb. | Vanaf [mm] | Tot [mm] | Beugels | Lengte [mm] | <Wringing> <Dwarskr.> | | | | V_{Ed} [kN] | T_{Ed} [kNm] | Opm. |
|------|---------------|-------------|---------|----------------|-----------------------------------|-----------------------------------|-----------------------------------|---------------------------------|------------------|-------------------|------|
| | | | | | A_{langs} [mm ²] | A_{bgl} [mm ² /m] | A_{bgl} [mm ² /m] | A_{opg} [mm ²] | | | |
| 1 | S5-225 | S5+0 | Ø8-150 | 225 | 319 | 38 | 335 | 0 | 65.5 | 9 | 6,59 |
| 2 | S5+0 | S5+225 | Ø8-150 | 225 | 319 | 38 | 419 | 0 | 81.9 | 9 | 6,59 |

Opmerkingen

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

[59] 6.2.3: Z is berekend m.b.v. de gedrongen ligger berekening art 6.1 (10)

Project.....: 22-163 - Nieuwbouw 3 woningen Hoek van Holland
Onderdeel....: Fundering

Wring- en dwarskrachten

Balk 2:2

| Geb. | Vanaf [mm] | Tot [mm] | θ [°] | V_{Rd} [kN] | V_{Ed} | $V_{Rd,C}$ | $V_{Rd,Max}$ | T_{Ed} | $T_{Rd,C}$ | $T_{Rd,Max}$ | V_{opg} | Opm. |
|------|---------------|-------------|-----------------|------------------|--------------|------------|--------------|---------------|------------|--------------|-----------|------|
| | | | | | -----kN----- | | | -----kNm----- | | | | |
| 1 | S5-225 | S5+0 | 21.8 | 116 | 66 | 62 | 183 | 9 | 26 | 63 | 0 | 6,59 |
| 2 | S5+0 | S5+225 | 21.8 | 116 | 82 | 62 | 183 | 9 | 26 | 63 | 0 | 6,59 |

Opmerkingen

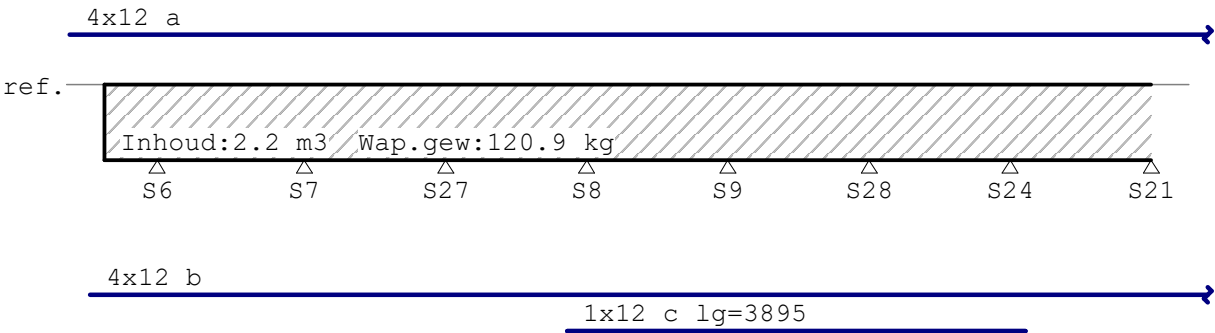
[6] 9.2.2 (4) 50% van de dwarskrachtwapening moet uit beugels bestaan.

[59] 6.2.3: Z is berekend m.b.v. de gedrongen ligger berekening art 6.1 (10)

Hoofdwapening Fysisch lineair

Balk 3:3

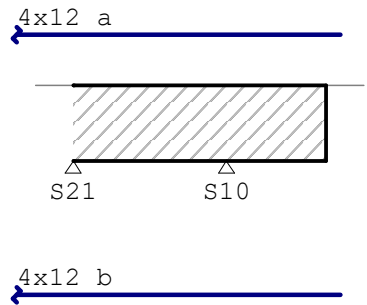
Velden: 1 t/m 8



Hoofdwapening Fysisch lineair

Balk 3:3

Velden: 9 t/m 10



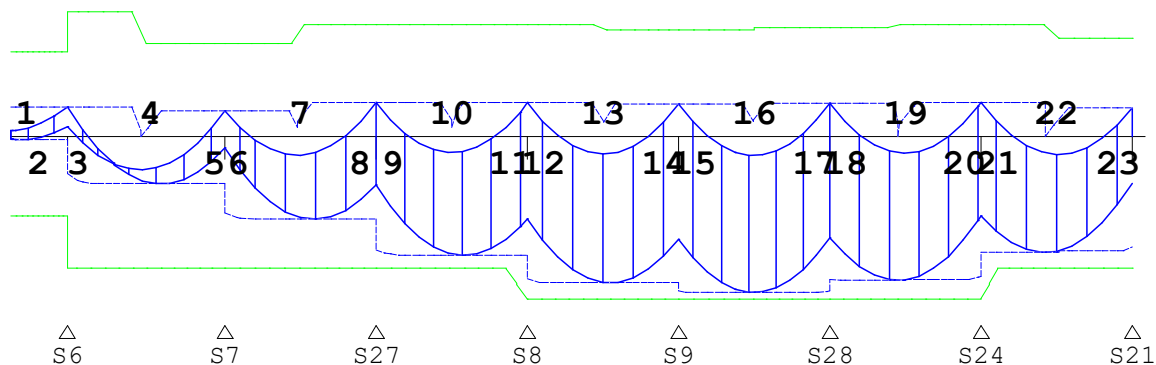
Project.....: 22-163 - Nieuwbouw 3 woningen Hoek van Holland

Onderdeel.....: Fundering

MEd dekkingslijn Fysisch lineair

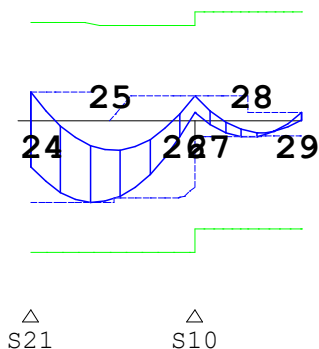
Balk 3:3

Velden: 1 t/m 8

**MEd dekkingslijn** Fysisch lineair

Balk 3:3

Velden: 9 t/m 10

**Hoofdwapening**

Balk 3:3

| Geb. | Pos. [mm] | M_{Ed} [kNm] | M_{Rd} [kNm] | z B/O [mm] | A_b [mm ²] | A_a [mm ²] | Basiswapening +Bijlegwapening | Opm. |
|------|--------------|-------------------|-------------------|---------------|-----------------------------|-----------------------------|----------------------------------|--------|
| 1 | S6-360 | -1.99 | -53.11 | 270 Ond | 165* | 453 | 4x12 | 2,54 |
| 2 | S6-0 | 20.17 | 57.04 | 290 Bov | 201* | 453 | 4x12 | 1,2 |
| 3 | S6+0 | 20.17 | 83.91 | 426 Bov | 165* | 453 | 4x12 | 2,54 |
| 4 | S7-507 | -31.68 | -88.47 | 430 Ond | 198* | 453 | 4x12 | 1,2,68 |
| 5 | S7-0 | 17.47 | 62.61 | 318 Bov | 165* | 453 | 4x12 | 2,54 |
| 6 | S7+0 | 17.47 | 62.61 | 318 Bov | 165* | 453 | 4x12 | 2,54 |
| 7 | S27-491 | -55.47 | -88.47 | 430 Ond | 280 | 453 | 4x12 | 2,68 |
| 8 | S27-0 | 22.85 | 75.38 | 383 Bov | 172* | 453 | 4x12 | 1,2 |
| 9 | S27+0 | 22.85 | 75.38 | 383 Bov | 172* | 453 | 4x12 | 1,2 |
| 10 | S8-503 | -79.78 | -88.47 | 430 Ond | 407 | 453 | 4x12 | 2,68 |
| 11 | S8-0 | 22.93 | 75.31 | 382 Bov | 173* | 453 | 4x12 | 1,2 |
| 12 | S8+0 | 22.93 | 75.31 | 382 Bov | 173* | 453 | 4x12 | 1,2 |
| 13 | S9-541 | -98.21 | -109.35 | 425 Ond | 505 | 453 | 4x12 | 2,68 |
| | | | | Ond | | 114 | +1x12 | |
| 14 | S9-0 | 21.95 | 72.09 | 366 Bov | 173* | 453 | 4x12 | 1,2 |
| 15 | S9+0 | 21.95 | 72.09 | 366 Bov | 173* | 453 | 4x12 | 1,2 |
| 16 | S9+595 | -104.78 | -109.35 | 425 Ond | 541 | 453 | 4x12 | 2,68 |
| | | | | Ond | | 114 | +1x12 | |

Project.....: 22-163 - Nieuwbouw 3 woningen Hoek van Holland

Onderdeel.....: Fundering

Hoofdwapening

Balk 3:3

| Geb. | Pos. [mm] | M_{Ed} [kNm] | M_{Rd} [kNm] | z B/O [mm] | A_b [mm ²] | A_a [mm ²] | Basiswapening +Bijlegwapening | Opm. |
|------|--------------|-------------------|-------------------|---------------|-----------------------------|-----------------------------|----------------------------------|------|
| 17 | S28-0 | 22.45 | 73.31 | 372 Bov | 174* | 453 | 4x12 | 1,2 |
| 18 | S28+0 | 22.45 | 73.31 | 372 Bov | 174* | 453 | 4x12 | 1,2 |
| 19 | S28+537 | -96.52 | -109.35 | 425 Ond | 496 | 453 | 4x12 | 2,68 |
| | | | | Ond | | 114 | +1x12 | |
| 20 | S24-0 | 23.17 | 75.30 | 382 Bov | 175* | 453 | 4x12 | 1,2 |
| 21 | S24+0 | 23.17 | 75.30 | 382 Bov | 175* | 453 | 4x12 | 1,2 |
| 22 | S24+505 | -77.89 | -88.47 | 430 Ond | 397 | 453 | 4x12 | 2,68 |
| 23 | S21-0 | 19.36 | 66.12 | 336 Bov | 167* | 453 | 4x12 | 1,2 |
| 24 | S21+0 | 19.36 | 66.12 | 336 Bov | 167* | 453 | 4x12 | 1,2 |
| 25 | S21+500 | -54.98 | -88.47 | 430 Ond | 277 | 453 | 4x12 | 2,68 |
| 26 | S10-0 | 16.39 | 63.85 | 324 Bov | 165* | 453 | 4x12 | 2,54 |
| 27 | S10+0 | 16.39 | 72.78 | 370 Bov | 165* | 453 | 4x12 | 2,54 |
| 28 | S10+425 | -11.31 | -72.78 | 370 Ond | 165* | 453 | 4x12 | 2,54 |
| 29 | S10+850 | 5.40 | 72.78 | 370 Bov | 165* | 453 | 4x12 | 2,54 |

Project.....: 22-163 - Nieuwbouw 3 woningen Hoek van Holland

Onderdeel.....: Fundering

Hoofdwapening

Balk 3:3

| Geb. | Pos. [mm] | M_{Ed} [kNm] | M_{Rd} [kNm] | z B/O [mm] | A_b [mm ²] | A_a [mm ²] | Basiswapening +Bijlegwapening | Opm. |
|------|--------------|-------------------|-------------------|---------------|-----------------------------|-----------------------------|----------------------------------|------|
|------|--------------|-------------------|-------------------|---------------|-----------------------------|-----------------------------|----------------------------------|------|

Opmerkingen

- [1] * = Eisen met betrekking tot minimum wapening zijn toegepast, zie nationale bijlage art. 9.2.1.1(1).
- [2] Benodigde wapening en inwendige hefboomsarm zijn bepaald volgens gedrongen ligger detaillering, zie nationale bijlage art. 6.1(10).
- [54] * = Eisen met betrekking tot minimum wapening ten behoeve van gecontroleerde scheurvorming zijn toegepast volgens art. 7.3.2.
- [68] MRd als gevolg van de gedrongen ligger berekening (NB. 6.1(10)) is groter dan MRd volgens 6.1(P). De momentweerstand en inwendige hefboomsarm volgens 6.1(P) zijn maatgevend en daarom alsnog toegepast.**

Scheurvorming volgens artikel 7.3.4

Balk 3:3

| Geb. | Pos. [mm] | Zijde | $M_{E,freq}$ [kNm] | $S_{r,max}$ [mm] | $\epsilon_{sm}-\epsilon_{cm}$ [%] | w_k [mm] | k_x | w_{max} [mm] | U.C. | Opm. |
|------|--------------|-------|-----------------------|---------------------|--------------------------------------|---------------|-------|-------------------|------|------|
| 1 | S6-703 | Bov | 11.09 | 367 | 0.173 | 0.064 | 1.17 | 0.350 | 0.18 | |
| 1 | S6-530 | Ond | -0.45 | 367 | 0.007 | 0.003 | 1.17 | 0.350 | 0.01 | |
| 1 | S6-360 | Ond | -0.45 | 367 | 0.007 | 0.003 | 1.17 | 0.350 | 0.01 | |
| 2 | S6+508 | Bov | 11.09 | 367 | 0.173 | 0.064 | 1.17 | 0.350 | 0.18 | |
| 2 | S7-398 | Bov | 14.77 | 367 | 0.230 | 0.085 | 1.17 | 0.350 | 0.24 | |
| 2 | S6+75 | Ond | -13.25 | 367 | 0.207 | 0.076 | 1.17 | 0.350 | 0.22 | |
| 2 | S7-619 | Ond | -13.24 | 367 | 0.207 | 0.076 | 1.17 | 0.350 | 0.22 | |
| 2 | S7+0 | Ond | -12.00 | 367 | 0.187 | 0.069 | 1.17 | 0.350 | 0.20 | |
| 3 | S7+417 | Bov | 14.77 | 367 | 0.230 | 0.085 | 1.17 | 0.350 | 0.24 | |
| 3 | S27-465 | Bov | 17.38 | 367 | 0.271 | 0.100 | 1.17 | 0.350 | 0.28 | |
| 3 | S7+118 | Ond | -8.75 | 367 | 0.137 | 0.050 | 1.17 | 0.350 | 0.14 | |
| 3 | S7+591 | Ond | -8.85 | 367 | 0.138 | 0.051 | 1.17 | 0.350 | 0.14 | |
| 3 | S27+0 | Ond | -7.78 | 367 | 0.121 | 0.045 | 1.17 | 0.350 | 0.13 | |
| 4 | S27+489 | Bov | 17.38 | 367 | 0.271 | 0.100 | 1.17 | 0.350 | 0.28 | |
| 4 | S8-488 | Bov | 17.39 | 367 | 0.271 | 0.100 | 1.17 | 0.350 | 0.28 | |
| 4 | S8+0 | Bov | 17.39 | 367 | 0.271 | 0.100 | 1.17 | 0.350 | 0.28 | |
| 4 | S27+116 | Ond | -8.26 | 367 | 0.129 | 0.047 | 1.17 | 0.350 | 0.14 | |
| 4 | S27+581 | Ond | -8.26 | 367 | 0.129 | 0.047 | 1.17 | 0.350 | 0.14 | |
| 4 | S8-168 | Ond | -7.62 | 367 | 0.119 | 0.044 | 1.17 | 0.350 | 0.12 | |
| 5 | S8+412 | Bov | 17.39 | 367 | 0.271 | 0.100 | 1.17 | 0.350 | 0.28 | |
| 5 | S9-461 | Bov | 16.72 | 367 | 0.261 | 0.096 | 1.17 | 0.350 | 0.27 | |
| 5 | S8+110 | Ond | -9.38 | 322 | 0.118 | 0.038 | 1.17 | 0.350 | 0.11 | |
| 5 | S9-541 | Ond | -9.20 | 322 | 0.115 | 0.037 | 1.17 | 0.350 | 0.11 | |
| 5 | S9-108 | Ond | -9.17 | 322 | 0.115 | 0.037 | 1.17 | 0.350 | 0.11 | |
| 6 | S9+0 | Bov | 16.72 | 367 | 0.261 | 0.096 | 1.17 | 0.350 | 0.27 | |
| 6 | S9+478 | Bov | 16.72 | 367 | 0.261 | 0.096 | 1.17 | 0.350 | 0.27 | |
| 6 | S28-483 | Bov | 17.18 | 367 | 0.268 | 0.098 | 1.17 | 0.350 | 0.28 | |
| 6 | S9+119 | Ond | -10.00 | 322 | 0.126 | 0.041 | 1.17 | 0.350 | 0.12 | |
| 6 | S28-101 | Ond | -10.00 | 322 | 0.126 | 0.041 | 1.17 | 0.350 | 0.12 | |
| 7 | S28+454 | Bov | 17.18 | 367 | 0.268 | 0.098 | 1.17 | 0.350 | 0.28 | |
| 7 | S24-444 | Bov | 17.86 | 367 | 0.279 | 0.102 | 1.17 | 0.350 | 0.29 | |
| 7 | S24+0 | Bov | 17.86 | 367 | 0.279 | 0.102 | 1.17 | 0.350 | 0.29 | |
| 7 | S28+107 | Ond | -8.72 | 322 | 0.110 | 0.035 | 1.17 | 0.350 | 0.10 | |
| 7 | S24-110 | Ond | -8.72 | 322 | 0.110 | 0.035 | 1.17 | 0.350 | 0.10 | |
| 8 | S24+0 | Bov | 17.86 | 367 | 0.279 | 0.102 | 1.17 | 0.350 | 0.29 | |
| 8 | S24+497 | Bov | 17.86 | 367 | 0.279 | 0.102 | 1.17 | 0.350 | 0.29 | |

Project.....: 22-163 - Nieuwbouw 3 woningen Hoek van Holland

Onderdeel....: Fundering

Scheurvorming volgens artikel 7.3.4

Balk 3:3

| Geb. | Pos. [mm] | Zijde | $M_{E,freq}$ [kNm] | $s_{r,max}$ [mm] | $\epsilon_{sm}-\epsilon_{cm}$ [%] | w_k [mm] | k_x | w_{max} [mm] | U.C. | Opm. |
|------|--------------|-------|-----------------------|---------------------|--------------------------------------|---------------|-------|-------------------|------|------|
| 8 | S21-464 | Bov | 15.22 | 367 | 0.237 | 0.087 | 1.17 | 0.350 | 0.25 | |
| 8 | S24+127 | Ond | -8.96 | 367 | 0.140 | 0.051 | 1.17 | 0.350 | 0.15 | |
| 8 | S21-116 | Ond | -8.96 | 367 | 0.140 | 0.051 | 1.17 | 0.350 | 0.15 | |
| 9 | S21+426 | Bov | 15.22 | 367 | 0.237 | 0.087 | 1.17 | 0.350 | 0.25 | |
| 9 | S10-402 | Bov | 13.40 | 367 | 0.209 | 0.077 | 1.17 | 0.350 | 0.22 | |
| 9 | S21+250 | Ond | -14.67 | 367 | 0.229 | 0.084 | 1.17 | 0.350 | 0.24 | |
| 9 | S10-164 | Ond | -14.67 | 367 | 0.229 | 0.084 | 1.17 | 0.350 | 0.24 | |
| 10 | S10+361 | Bov | 13.40 | 367 | 0.209 | 0.077 | 1.17 | 0.350 | 0.22 | |
| 10 | S10+910 | Bov | 0.44 | 367 | 0.007 | 0.003 | 1.17 | 0.350 | 0.01 | |
| 10 | S10+76 | Ond | -5.98 | 367 | 0.093 | 0.034 | 1.17 | 0.350 | 0.10 | |
| 10 | S10+910 | Ond | -5.98 | 367 | 0.093 | 0.034 | 1.17 | 0.350 | 0.10 | |

Verloop hoofdwapening

Balk 3:3

| Merk | B/O | Wapening | Vanaf [mm] | Tot [mm] | Lengte [mm] | $L_{bd,begin}$ [mm] | $L_{bd,eind}$ [mm] |
|------|-------|----------|---------------|-------------|----------------|------------------------|-----------------------|
| a | Boven | 4x12 | S6-747 | S10+970 | 11467 | 297 | 120 |
| b | Onder | 4x12 | S6-570 | S10+970 | 11290 | 120 | 120 |
| c | Onder | 1x12 | S8-168 | S24+127 | 3895 | 168 | 127 |

Project.....: 22-163 - Nieuwbouw 3 woningen Hoek van Holland

Onderdeel....: Fundering

Verloop hoofdwapening

Balk 3:3

| Merk | B/O | Wapening | Vanaf [mm] | Tot [mm] | Lengte [mm] | L _{bd;begin} [mm] | L _{bd;eind} [mm] |
|------|-----|----------|---------------|-------------|----------------|-------------------------------|------------------------------|
|------|-----|----------|---------------|-------------|----------------|-------------------------------|------------------------------|

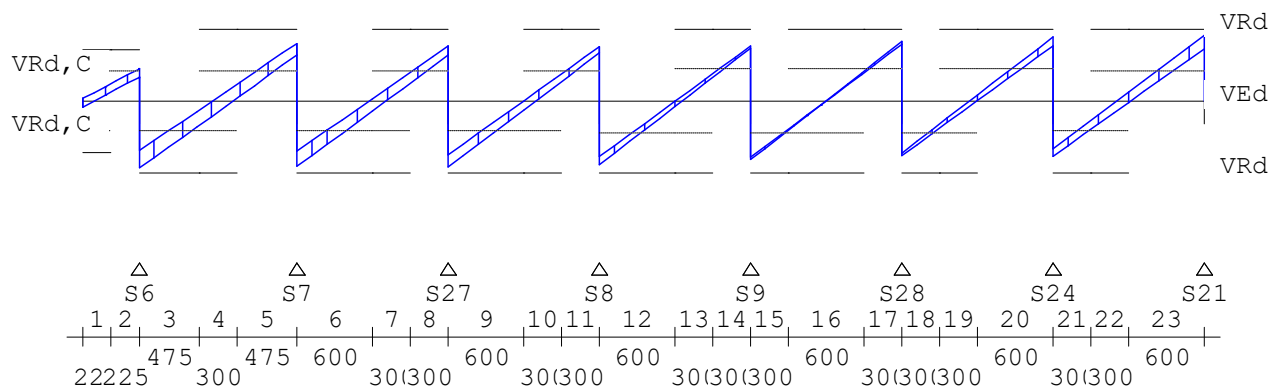
Opmerkingen

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

DWARSKRACHTEN Fysisch lineair

Balk 3:3 Fundamentele combinatie

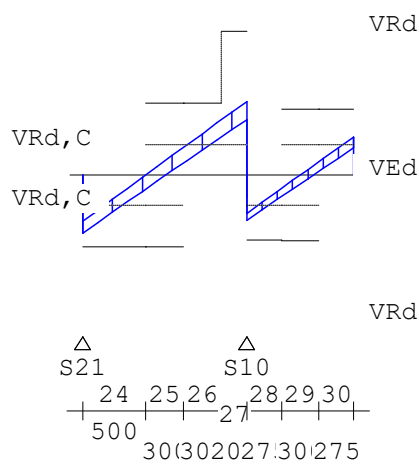
Velden: 1 t/m 8



DWARSKRACHTEN Fysisch lineair

Balk 3:3 Fundamentele combinatie

Velden: 9 t/m 10



Wring- en dwarskrachtwapening

Balk 3:3

| Geb. | Vanaf | Tot | Beugels | Lengte | <Wringing > | | | | <Dwarskr.> | | Opm. |
|------|--------|--------|---------|--------|--|--|--|--|-------------------------|--------------------------|------|
| | [mm] | [mm] | | [mm] | A _{langs} [mm ²] | A _{bgl} [mm ² /m] | A _{bgl} [mm ²] | A _{opg} [mm ²] | V _{Ed} [kN] | T _{Ed} [kNm] | |
| 1 | S6-450 | S6-225 | Ø8-300 | 225 | 0 | 0 | 286 | 0 | 35.4 | 0 | 59 |
| 2 | S6-225 | S6+0 | Ø8-300 | 225 | 4 | 0 | 286 | 0 | 66.4 | 0 | 6,59 |
| 3 | S6+0 | S6+475 | Ø8-300 | 475 | 4 | 0 | 311 | 0 | 137.1 | 0 | 6,58 |
| 4 | S6+475 | S7-475 | Ø8-300 | 300 | 0 | 0 | 286 | 0 | 49.3 | 0 | 58 |

Project.....: 22-163 - Nieuwbouw 3 woningen Hoek van Holland

Onderdeel....: Fundering

Wring- en dwarskrachtwapening

Balk 3:3

| Geb. | Vanaf | Tot | Beugels | Lengte | <Wringing > | | <Dwarskr.> | | | | |
|------|---------|---------|---------|--------|----------------------------------|-----------------------------------|---------------------------------|---------------------------------|------------------|-------------------|------|
| | [mm] | [mm] | | [mm] | A_{lang} [mm ²] | A_{bgl} [mm ² /m] | A_{bgl} [mm ²] | A_{opg} [mm ²] | V_{Ed} [kN] | T_{Ed} [kNm] | Opm. |
| 5 | S7-475 | S7+0 | Ø8-300 | 475 | 4 | 0 | 286 | 0 | 118.1 | 0 | 6,58 |
| 6 | S7+0 | S7+600 | Ø8-300 | 600 | 4 | 0 | 304 | 0 | 134.3 | 0 | 6,58 |
| 7 | S7+600 | S27-300 | Ø8-300 | 300 | 0 | 0 | 286 | 0 | 58.3 | 0 | 58 |
| 8 | S27-300 | S27+0 | Ø8-300 | 300 | 4 | 0 | 286 | 0 | 112.9 | 0 | 6,58 |
| 9 | S27+0 | S27+600 | Ø8-300 | 600 | 4 | 0 | 306 | 0 | 135.2 | 0 | 6,58 |
| 10 | S27+600 | S8-300 | Ø8-300 | 300 | 0 | 0 | 286 | 0 | 55.1 | 0 | 58 |
| 11 | S8-300 | S8+0 | Ø8-300 | 300 | 4 | 0 | 286 | 0 | 111.1 | 0 | 6,58 |
| 12 | S8+0 | S8+600 | Ø8-300 | 600 | 4 | 0 | 296 | 0 | 130.5 | 0 | 6,58 |
| 13 | S8+600 | S9-300 | Ø8-300 | 300 | 0 | 0 | 286 | 0 | 55.5 | 0 | 58 |
| 14 | S9-300 | S9+0 | Ø8-300 | 300 | 4 | 0 | 286 | 0 | 112.9 | 0 | 6,58 |
| 15 | S9+0 | S9+300 | Ø8-300 | 300 | 4 | 0 | 286 | 0 | 120.4 | 0 | 6,58 |
| 16 | S9+300 | S28-300 | Ø8-300 | 600 | 0 | 0 | 286 | 0 | 61.3 | 0 | 58 |
| 17 | S28-300 | S28+0 | Ø8-300 | 300 | 4 | 0 | 286 | 0 | 121.8 | 0 | 6,58 |
| 18 | S28+0 | S28+300 | Ø8-300 | 300 | 4 | 0 | 286 | 0 | 112.4 | 0 | 6,58 |
| 19 | S28+300 | S28+600 | Ø8-300 | 300 | 0 | 0 | 286 | 0 | 55.3 | 0 | 58 |
| 20 | S28+600 | S24+0 | Ø8-300 | 600 | 4 | 0 | 296 | 0 | 130.6 | 0 | 6,58 |
| 21 | S24+0 | S24+300 | Ø8-300 | 300 | 4 | 0 | 286 | 0 | 113.5 | 0 | 6,58 |
| 22 | S24+300 | S24+600 | Ø8-300 | 300 | 0 | 0 | 286 | 0 | 57.8 | 0 | 58 |
| 23 | S24+600 | S21+0 | Ø8-300 | 600 | 4 | 0 | 303 | 0 | 133.8 | 0 | 6,58 |
| 24 | S21+0 | S21+500 | Ø8-300 | 500 | 4 | 0 | 286 | 0 | 118.8 | 0 | 6,58 |
| 25 | S21+500 | S10-500 | Ø8-300 | 300 | 0 | 0 | 286 | 0 | 56.2 | 0 | 58 |
| 26 | S10-500 | S10-200 | Ø8-300 | 300 | 4 | 0 | 286 | 0 | 112.8 | 0 | 6,58 |
| 27 | S10-200 | S10+0 | Ø8-150 | 200 | 4 | 0 | 341 | 0 | 150.3 | 0 | 6,58 |
| 28 | S10+0 | S10+275 | Ø8-300 | 275 | 4 | 0 | 286 | 0 | 92.7 | 0 | 6,59 |
| 29 | S10+275 | S10+575 | Ø8-300 | 300 | 0 | 0 | 286 | 0 | 44.3 | 0 | 59 |
| 30 | S10+575 | S10+850 | Ø8-300 | 275 | 4 | 0 | 286 | 0 | 77.9 | 0 | 6,59 |

Project.....: 22-163 - Nieuwbouw 3 woningen Hoek van Holland

Onderdeel.....: Fundering

Dwarskrachtwapening

Balk 3:3

| Geb. | Vanaf [mm] | Tot [mm] | Beugels | Lengte [mm] | A_{sw} [mm ² /m] | V_{Ed} [kN] | A_{opg} [mm ²] | Opm. |
|------|---------------|-------------|---------|----------------|----------------------------------|------------------|---------------------------------|------|
|------|---------------|-------------|---------|----------------|----------------------------------|------------------|---------------------------------|------|

Opmerkingen

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

[58] 6.2.3: Z is berekend m.b.v. 0.9d

[59] 6.2.3: Z is berekend m.b.v. de gedrongen ligger berekening art 6.1 (10)

Wring- en dwarskrachten

Balk 3:3

| Geb. | Vanaf [mm] | Tot [mm] | θ [°] | V_{Rd} [kN] | V_{Ed} | $V_{Rd,C}$ | $V_{Rd,Max}$ | T_{Ed} | $T_{Rd,C}$ | $T_{Rd,Max}$ | V_{opg} | Opm. |
|------|---------------|-------------|-----------------|------------------|--------------|------------|--------------|---------------|------------|--------------|-----------|------|
| | | | | | -----kN----- | | | -----kNm----- | | | | |
| 1 | S6-450 | S6-225 | 21.8 | 106 | 35 | 62 | 294 | 0 | 26 | 63 | 0 | 59 |
| 2 | S6-225 | S6+0 | 21.8 | 105 | 66 | 62 | 294 | 0 | 26 | 63 | 0 | 6,59 |
| 3 | S6+0 | S6+475 | 21.8 | 147 | 137 | 62 | 412 | 0 | 26 | 63 | 0 | 6,58 |
| 4 | S6+475 | S7-475 | 21.8 | 148 | 49 | 62 | 412 | 0 | 26 | 63 | 0 | 58 |
| 5 | S7-475 | S7+0 | 21.8 | 147 | 118 | 62 | 412 | 0 | 26 | 63 | 0 | 6,58 |
| 6 | S7+0 | S7+600 | 21.8 | 147 | 134 | 62 | 412 | 0 | 26 | 63 | 0 | 6,58 |
| 7 | S7+600 | S27-300 | 21.8 | 148 | 58 | 62 | 412 | 0 | 26 | 63 | 0 | 58 |
| 8 | S27-300 | S27+0 | 21.8 | 147 | 113 | 62 | 412 | 0 | 26 | 63 | 0 | 6,58 |
| 9 | S27+0 | S27+600 | 21.8 | 147 | 135 | 62 | 412 | 0 | 26 | 63 | 0 | 6,58 |
| 10 | S27+600 | S8-300 | 21.8 | 148 | 55 | 62 | 412 | 0 | 26 | 63 | 0 | 58 |
| 11 | S8-300 | S8+0 | 21.8 | 147 | 111 | 62 | 412 | 0 | 26 | 63 | 0 | 6,58 |
| 12 | S8+0 | S8+600 | 21.8 | 147 | 131 | 66 | 412 | 0 | 26 | 63 | 0 | 6,58 |
| 13 | S8+600 | S9-300 | 21.8 | 148 | 55 | 66 | 412 | 0 | 26 | 63 | 0 | 58 |
| 14 | S9-300 | S9+0 | 21.8 | 147 | 113 | 66 | 412 | 0 | 26 | 63 | 0 | 6,58 |
| 15 | S9+0 | S9+300 | 21.8 | 147 | 120 | 66 | 412 | 0 | 26 | 63 | 0 | 6,58 |
| 16 | S9+300 | S28-300 | 21.8 | 148 | 61 | 66 | 412 | 0 | 26 | 63 | 0 | 58 |
| 17 | S28-300 | S28+0 | 21.8 | 147 | 122 | 66 | 412 | 0 | 26 | 63 | 0 | 6,58 |
| 18 | S28+0 | S28+300 | 21.8 | 147 | 112 | 66 | 412 | 0 | 26 | 63 | 0 | 6,58 |
| 19 | S28+300 | S28+600 | 21.8 | 148 | 55 | 66 | 412 | 0 | 26 | 63 | 0 | 58 |
| 20 | S28+600 | S24+0 | 21.8 | 147 | 131 | 66 | 412 | 0 | 26 | 63 | 0 | 6,58 |
| 21 | S24+0 | S24+300 | 21.8 | 147 | 113 | 62 | 412 | 0 | 26 | 63 | 0 | 6,58 |
| 22 | S24+300 | S24+600 | 21.8 | 148 | 58 | 62 | 412 | 0 | 26 | 63 | 0 | 58 |
| 23 | S24+600 | S21+0 | 21.8 | 147 | 134 | 62 | 412 | 0 | 26 | 63 | 0 | 6,58 |
| 24 | S21+0 | S21+500 | 21.8 | 147 | 119 | 62 | 412 | 0 | 26 | 63 | 0 | 6,58 |
| 25 | S21+500 | S10-500 | 21.8 | 148 | 56 | 62 | 412 | 0 | 26 | 63 | 0 | 58 |
| 26 | S10-500 | S10-200 | 21.8 | 147 | 113 | 62 | 412 | 0 | 26 | 63 | 0 | 6,58 |
| 27 | S10-200 | S10+0 | 21.8 | 295 | 150 | 62 | 412 | 0 | 26 | 63 | 0 | 6,58 |
| 28 | S10+0 | S10+275 | 21.8 | 134 | 93 | 62 | 376 | 0 | 26 | 63 | 0 | 6,59 |
| 29 | S10+275 | S10+575 | 21.8 | 135 | 44 | 62 | 376 | 0 | 26 | 63 | 0 | 59 |
| 30 | S10+575 | S10+850 | 21.8 | 134 | 78 | 62 | 376 | 0 | 26 | 63 | 0 | 6,59 |

Project.....: 22-163 - Nieuwbouw 3 woningen Hoek van Holland

Onderdeel.....: Fundering

Schuifspanningen

Balk 3:3

| Geb. | Vanaf [mm] | Tot [mm] | θ [°] | V_{Ed} [kN] | $V_{Rd,C}$ | $V_{Rd,S}$ | $V_{Ed} < V_{Rd} < V_{Rd,Max}$ [N/mm ²] | Opm. |
|------|---------------|-------------|-----------------|------------------|------------|------------|--|------|
|------|---------------|-------------|-----------------|------------------|------------|------------|--|------|

Opmerkingen

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

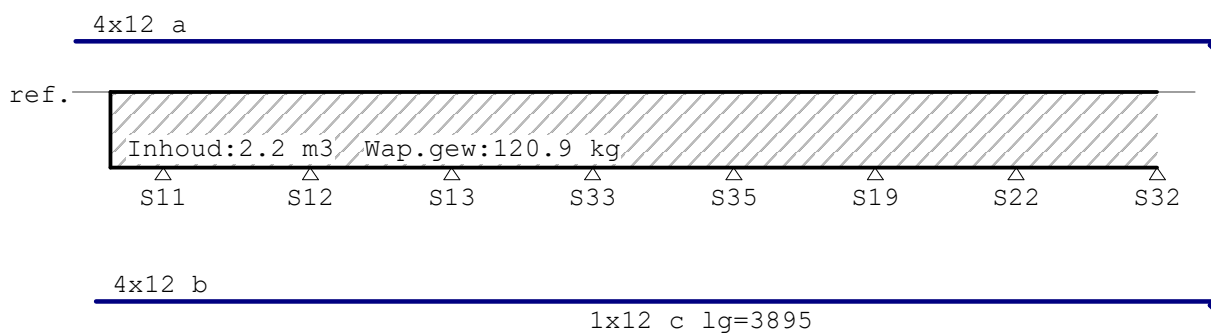
[58] 6.2.3: Z is berekend m.b.v. 0.9d

[59] 6.2.3: Z is berekend m.b.v. de gedrongen ligger berekening art 6.1 (10)

Hoofdwapening Fysisch lineair

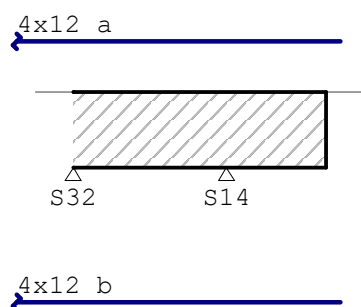
Balk 4:4

Velden: 1 t/m 8

**Hoofdwapening** Fysisch lineair

Balk 4:4

Velden: 9 t/m 10

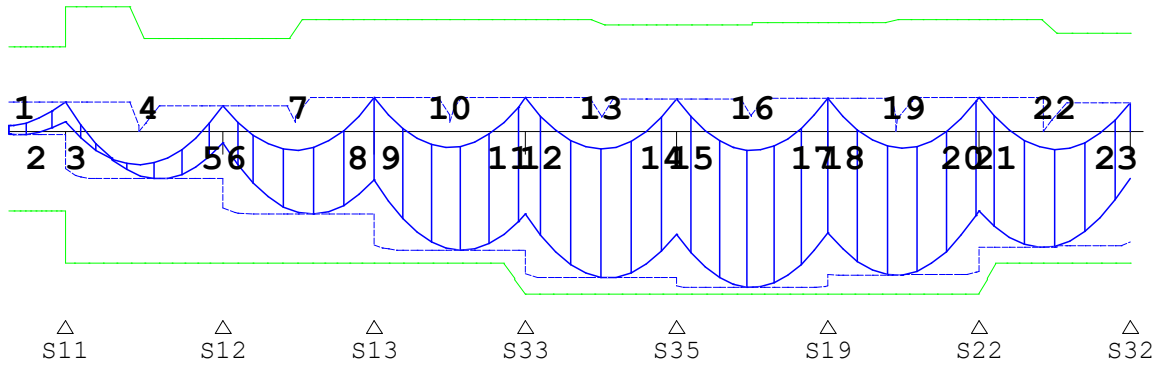


Project.....: 22-163 - Nieuwbouw 3 woningen Hoek van Holland
Onderdeel....: Fundering

MEd dekkingslijn Fysisch lineair

Balk 4:4

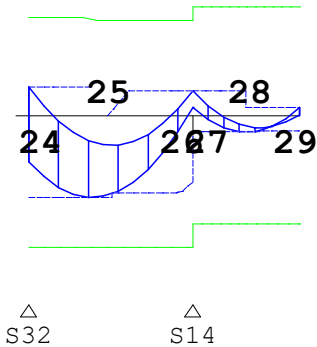
Velden: 1 t/m 8



MEd dekkingslijn Fysisch lineair

Balk 4:4

Velden: 9 t/m 10



Hoofdwapening

Balk 4:4

| Geb. | Pos. [mm] | M _{Ed} [kNm] | M _{Rd} [kNm] | z | B/O | A _b [mm ²] | A _a [mm ²] | Basiswapening +Bijlegwapening | Opm. |
|------|--------------|--------------------------|--------------------------|-----|-----|--------------------------------------|--------------------------------------|----------------------------------|--------|
| 1 | S11-360 | -1.99 | -53.11 | 270 | Ond | 165* | 453 | 4x12 | 2,54 |
| 2 | S11-0 | 20.17 | 57.04 | 290 | Bov | 201* | 453 | 4x12 | 1,2 |
| 3 | S11+0 | 20.17 | 83.91 | 426 | Bov | 165* | 453 | 4x12 | 2,54 |
| 4 | S12-507 | -31.68 | -88.47 | 430 | Ond | 198* | 453 | 4x12 | 1,2,68 |
| 5 | S12-0 | 17.47 | 62.61 | 318 | Bov | 165* | 453 | 4x12 | 2,54 |
| 6 | S12+0 | 17.47 | 62.61 | 318 | Bov | 165* | 453 | 4x12 | 2,54 |
| 7 | S13-491 | -55.47 | -88.47 | 430 | Ond | 280 | 453 | 4x12 | 2,68 |
| 8 | S13-0 | 22.85 | 75.38 | 383 | Bov | 172* | 453 | 4x12 | 1,2 |
| 9 | S13+0 | 22.85 | 75.38 | 383 | Bov | 172* | 453 | 4x12 | 1,2 |
| 10 | S33-503 | -79.78 | -88.47 | 430 | Ond | 407 | 453 | 4x12 | 2,68 |
| 11 | S33-0 | 22.93 | 75.31 | 382 | Bov | 173* | 453 | 4x12 | 1,2 |
| 12 | S33+0 | 22.93 | 75.31 | 382 | Bov | 173* | 453 | 4x12 | 1,2 |
| 13 | S35-541 | -98.21 | -109.35 | 425 | Ond | 505 | 453 | 4x12 | 2,68 |
| | | | | | Ond | | 114 | +1x12 | |
| 14 | S35-0 | 21.95 | 72.09 | 366 | Bov | 173* | 453 | 4x12 | 1,2 |
| 15 | S35+0 | 21.95 | 72.09 | 366 | Bov | 173* | 453 | 4x12 | 1,2 |
| 16 | S35+595 | -104.78 | -109.35 | 425 | Ond | 541 | 453 | 4x12 | 2,68 |
| | | | | | Ond | | 114 | +1x12 | |

Project.....: 22-163 - Nieuwbouw 3 woningen Hoek van Holland

Onderdeel.....: Fundering

Hoofdwapening

Balk 4:4

| Geb. | Pos. [mm] | M_{Ed} [kNm] | M_{Rd} [kNm] | z B/O [mm] | A_b [mm ²] | A_a [mm ²] | Basiswapening +Bijlegwapening | Opm. |
|------|--------------|-------------------|-------------------|---------------|-----------------------------|-----------------------------|----------------------------------|------|
| 17 | S19-0 | 22.45 | 73.31 | 372 Bov | 174* | 453 | 4x12 | 1,2 |
| 18 | S19+0 | 22.45 | 73.31 | 372 Bov | 174* | 453 | 4x12 | 1,2 |
| 19 | S19+537 | -96.52 | -109.35 | 425 Ond | 496 | 453 | 4x12 | 2,68 |
| | | | | Ond | | 114 | +1x12 | |
| 20 | S22-0 | 23.17 | 75.30 | 382 Bov | 175* | 453 | 4x12 | 1,2 |
| 21 | S22+0 | 23.17 | 75.30 | 382 Bov | 175* | 453 | 4x12 | 1,2 |
| 22 | S22+505 | -77.89 | -88.47 | 430 Ond | 397 | 453 | 4x12 | 2,68 |
| 23 | S32-0 | 19.36 | 66.12 | 336 Bov | 167* | 453 | 4x12 | 1,2 |
| 24 | S32+0 | 19.36 | 66.12 | 336 Bov | 167* | 453 | 4x12 | 1,2 |
| 25 | S32+500 | -54.98 | -88.47 | 430 Ond | 277 | 453 | 4x12 | 2,68 |
| 26 | S14-0 | 16.39 | 63.85 | 324 Bov | 165* | 453 | 4x12 | 2,54 |
| 27 | S14+0 | 16.39 | 72.78 | 370 Bov | 165* | 453 | 4x12 | 2,54 |
| 28 | S14+425 | -11.31 | -72.78 | 370 Ond | 165* | 453 | 4x12 | 2,54 |
| 29 | S14+850 | 5.40 | 72.78 | 370 Bov | 165* | 453 | 4x12 | 2,54 |

Project.....: 22-163 - Nieuwbouw 3 woningen Hoek van Holland

Onderdeel.....: Fundering

Hoofdwapening

Balk 4:4

| Geb. | Pos. [mm] | M_{Ed} [kNm] | M_{Rd} [kNm] | z B/O [mm] | A_b [mm ²] | A_a [mm ²] | Basiswapening +Bijlegwapening | Opm. |
|------|--------------|-------------------|-------------------|---------------|-----------------------------|-----------------------------|----------------------------------|------|
|------|--------------|-------------------|-------------------|---------------|-----------------------------|-----------------------------|----------------------------------|------|

Opmerkingen

- [1] * = Eisen met betrekking tot minimum wapening zijn toegepast, zie nationale bijlage art. 9.2.1.1(1).
- [2] Benodigde wapening en inwendige hefboomsarm zijn bepaald volgens gedrongen ligger detaillering, zie nationale bijlage art. 6.1(10).
- [54] * = Eisen met betrekking tot minimum wapening ten behoeve van gecontroleerde scheurvorming zijn toegepast volgens art. 7.3.2.
- [68] MRd als gevolg van de gedrongen ligger berekening (NB. 6.1(10)) is groter dan MRd volgens 6.1(P). De momentweerstand en inwendige hefboomsarm volgens 6.1(P) zijn maatgevend en daarom alsnog toegepast.**

Scheurvorming volgens artikel 7.3.4

Balk 4:4

| Geb. | Pos. [mm] | Zijde | $M_{E,freq}$ [kNm] | $S_{r,max}$ [mm] | $\epsilon_{sm}-\epsilon_{cm}$ [%] | w_k [mm] | k_x | w_{max} [mm] | U.C. | Opm. |
|------|--------------|-------|-----------------------|---------------------|--------------------------------------|---------------|-------|-------------------|------|------|
| 1 | S11-703 | Bov | 11.09 | 367 | 0.173 | 0.064 | 1.17 | 0.350 | 0.18 | |
| 1 | S11-530 | Ond | -0.45 | 367 | 0.007 | 0.003 | 1.17 | 0.350 | 0.01 | |
| 1 | S11-360 | Ond | -0.45 | 367 | 0.007 | 0.003 | 1.17 | 0.350 | 0.01 | |
| 2 | S11+0 | Bov | 11.09 | 367 | 0.173 | 0.064 | 1.17 | 0.350 | 0.18 | |
| 2 | S11+508 | Bov | 11.09 | 367 | 0.173 | 0.064 | 1.17 | 0.350 | 0.18 | |
| 2 | S12-398 | Bov | 14.77 | 367 | 0.230 | 0.085 | 1.17 | 0.350 | 0.24 | |
| 2 | S11+75 | Ond | -13.25 | 367 | 0.207 | 0.076 | 1.17 | 0.350 | 0.22 | |
| 2 | S12-619 | Ond | -13.24 | 367 | 0.207 | 0.076 | 1.17 | 0.350 | 0.22 | |
| 2 | S12+0 | Ond | -12.00 | 367 | 0.187 | 0.069 | 1.17 | 0.350 | 0.20 | |
| 3 | S12+0 | Bov | 14.77 | 367 | 0.230 | 0.085 | 1.17 | 0.350 | 0.24 | |
| 3 | S12+417 | Bov | 14.77 | 367 | 0.230 | 0.085 | 1.17 | 0.350 | 0.24 | |
| 3 | S13-465 | Bov | 17.38 | 367 | 0.271 | 0.100 | 1.17 | 0.350 | 0.28 | |
| 3 | S12+118 | Ond | -8.75 | 367 | 0.137 | 0.050 | 1.17 | 0.350 | 0.14 | |
| 3 | S12+591 | Ond | -8.85 | 367 | 0.138 | 0.051 | 1.17 | 0.350 | 0.14 | |
| 3 | S13+0 | Ond | -7.78 | 367 | 0.121 | 0.045 | 1.17 | 0.350 | 0.13 | |
| 4 | S13+489 | Bov | 17.38 | 367 | 0.271 | 0.100 | 1.17 | 0.350 | 0.28 | |
| 4 | S33-488 | Bov | 17.39 | 367 | 0.271 | 0.100 | 1.17 | 0.350 | 0.28 | |
| 4 | S33+0 | Bov | 17.39 | 367 | 0.271 | 0.100 | 1.17 | 0.350 | 0.28 | |
| 4 | S13+116 | Ond | -8.26 | 367 | 0.129 | 0.047 | 1.17 | 0.350 | 0.14 | |
| 4 | S13+581 | Ond | -8.26 | 367 | 0.129 | 0.047 | 1.17 | 0.350 | 0.14 | |
| 4 | S33-168 | Ond | -7.62 | 367 | 0.119 | 0.044 | 1.17 | 0.350 | 0.12 | |
| 5 | S33+412 | Bov | 17.39 | 367 | 0.271 | 0.100 | 1.17 | 0.350 | 0.28 | |
| 5 | S35-461 | Bov | 16.72 | 367 | 0.261 | 0.096 | 1.17 | 0.350 | 0.27 | |
| 5 | S33+110 | Ond | -9.38 | 322 | 0.118 | 0.038 | 1.17 | 0.350 | 0.11 | |
| 5 | S35-541 | Ond | -9.20 | 322 | 0.115 | 0.037 | 1.17 | 0.350 | 0.11 | |
| 5 | S35-108 | Ond | -9.17 | 322 | 0.115 | 0.037 | 1.17 | 0.350 | 0.11 | |
| 6 | S35+478 | Bov | 16.72 | 367 | 0.261 | 0.096 | 1.17 | 0.350 | 0.27 | |
| 6 | S19-483 | Bov | 17.18 | 367 | 0.268 | 0.098 | 1.17 | 0.350 | 0.28 | |
| 6 | S35+119 | Ond | -10.00 | 322 | 0.126 | 0.041 | 1.17 | 0.350 | 0.12 | |
| 6 | S19-101 | Ond | -10.00 | 322 | 0.126 | 0.041 | 1.17 | 0.350 | 0.12 | |
| 7 | S19+454 | Bov | 17.18 | 367 | 0.268 | 0.098 | 1.17 | 0.350 | 0.28 | |
| 7 | S22-444 | Bov | 17.86 | 367 | 0.279 | 0.102 | 1.17 | 0.350 | 0.29 | |
| 7 | S22+0 | Bov | 17.86 | 367 | 0.279 | 0.102 | 1.17 | 0.350 | 0.29 | |
| 7 | S19+107 | Ond | -8.72 | 322 | 0.110 | 0.035 | 1.17 | 0.350 | 0.10 | |
| 7 | S22-110 | Ond | -8.72 | 322 | 0.110 | 0.035 | 1.17 | 0.350 | 0.10 | |
| 8 | S22+0 | Bov | 17.86 | 367 | 0.279 | 0.102 | 1.17 | 0.350 | 0.29 | |

Project.....: 22-163 - Nieuwbouw 3 woningen Hoek van Holland

Onderdeel....: Fundering

Scheurvorming volgens artikel 7.3.4

Balk 4:4

| Geb. | Pos. [mm] | Zijde | $M_{E,freq}$ [kNm] | $s_{r,max}$ [mm] | $\epsilon_{sm}-\epsilon_{cm}$ [‰] | w_k [mm] | k_x | w_{max} [mm] | U.C. | Opm. |
|------|--------------|-------|-----------------------|---------------------|--------------------------------------|---------------|-------|-------------------|------|------|
| 8 | S22+497 | Bov | 17.86 | 367 | 0.279 | 0.102 | 1.17 | 0.350 | 0.29 | |
| 8 | S32-464 | Bov | 15.22 | 367 | 0.237 | 0.087 | 1.17 | 0.350 | 0.25 | |
| 8 | S22+127 | Ond | -8.96 | 367 | 0.140 | 0.051 | 1.17 | 0.350 | 0.15 | |
| 8 | S32-116 | Ond | -8.96 | 367 | 0.140 | 0.051 | 1.17 | 0.350 | 0.15 | |
| 9 | S32+426 | Bov | 15.22 | 367 | 0.237 | 0.087 | 1.17 | 0.350 | 0.25 | |
| 9 | S14-402 | Bov | 13.40 | 367 | 0.209 | 0.077 | 1.17 | 0.350 | 0.22 | |
| 9 | S14+0 | Bov | 13.40 | 367 | 0.209 | 0.077 | 1.17 | 0.350 | 0.22 | |
| 9 | S32+250 | Ond | -14.67 | 367 | 0.229 | 0.084 | 1.17 | 0.350 | 0.24 | |
| 9 | S14-164 | Ond | -14.67 | 367 | 0.229 | 0.084 | 1.17 | 0.350 | 0.24 | |
| 10 | S14+0 | Bov | 13.40 | 367 | 0.209 | 0.077 | 1.17 | 0.350 | 0.22 | |
| 10 | S14+361 | Bov | 13.40 | 367 | 0.209 | 0.077 | 1.17 | 0.350 | 0.22 | |
| 10 | S14+910 | Bov | 0.44 | 367 | 0.007 | 0.003 | 1.17 | 0.350 | 0.01 | |
| 10 | S14+76 | Ond | -5.98 | 367 | 0.093 | 0.034 | 1.17 | 0.350 | 0.10 | |
| 10 | S14+910 | Ond | -5.98 | 367 | 0.093 | 0.034 | 1.17 | 0.350 | 0.10 | |

Verloop hoofdwapening

Balk 4:4

| Merk | B/O | Wapening | Vanaf [mm] | Tot [mm] | Lengte [mm] | $L_{bd;begin}$ [mm] | $L_{bd;eind}$ [mm] |
|------|-------|----------|---------------|-------------|----------------|------------------------|-----------------------|
| a | Boven | 4x12 | S11-747 | S14+970 | 11467 | 297 | 120 |
| b | Onder | 4x12 | S11-570 | S14+970 | 11290 | 120 | 120 |
| c | Onder | 1x12 | S33-168 | S22+127 | 3895 | 168 | 127 |

Project.....: 22-163 - Nieuwbouw 3 woningen Hoek van Holland
Onderdeel.....: Fundering

Verloop hoofdwapening

Balk 4:4

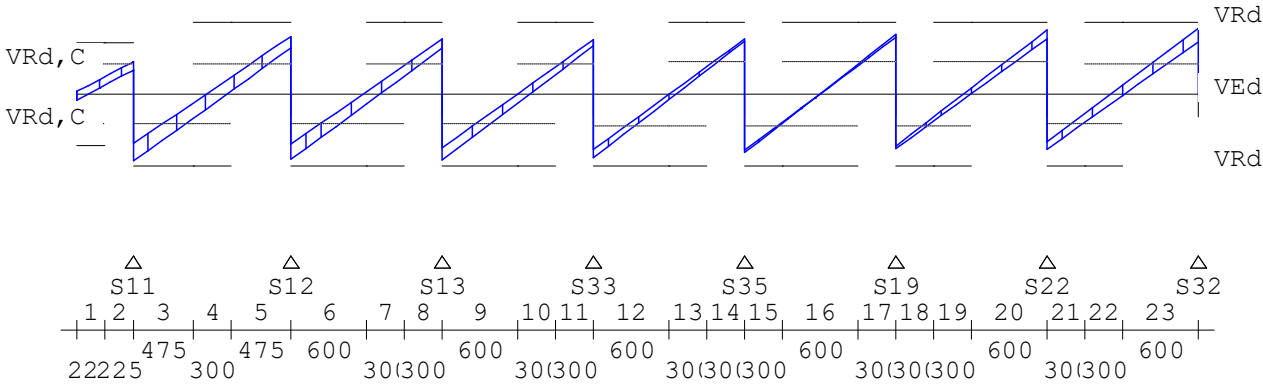
| Merk | B/O | Wapening | Vanaf [mm] | Tot [mm] | Lengte [mm] | L _{bd;begin} [mm] | L _{bd;eind} [mm] |
|------|-----|----------|---------------|-------------|----------------|-------------------------------|------------------------------|
|------|-----|----------|---------------|-------------|----------------|-------------------------------|------------------------------|

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

DWARSKRACHTEN Fysisch lineair

Balk 4:4 Fundamentele combinatie

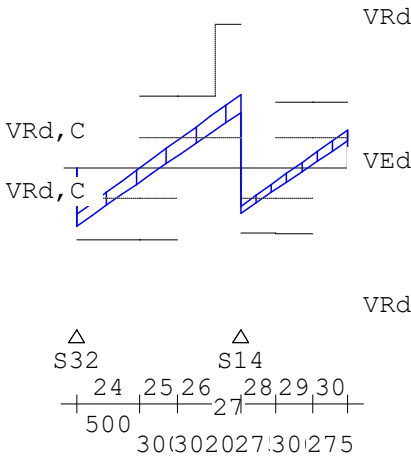
Velden: 1 t/m 8



DWARSKRACHTEN Fysisch lineair

Balk 4:4 Fundamentele combinatie

Velden: 9 t/m 10



Wring- en dwarskrachtwapening

Balk 4:4

| Geb. | Vanaf [mm] | Tot [mm] | Beugels | Lengte [mm] | <Wringing> <Dwarskr.> | | | | V _{Ed} [kN] | T _{Ed} [kNm] | Opm. |
|------|---------------|-------------|---------|----------------|--|--|--|--|-------------------------|--------------------------|------|
| | | | | | A _{langs} [mm ²] | A _{bgl} [mm ² /m] | A _{bgl} [mm ²] | A _{opg} [mm ²] | | | |
| 1 | S11-450 | S11-225 | Ø8-300 | 225 | 0 | 0 | 286 | 0 | 35.4 | 0 | 59 |
| 2 | S11-225 | S11+0 | Ø8-300 | 225 | 4 | 0 | 286 | 0 | 66.4 | 0 | 6,59 |
| 3 | S11+0 | S11+475 | Ø8-300 | 475 | 4 | 0 | 311 | 0 | 137.1 | 0 | 6,58 |
| 4 | S11+475 | S12-475 | Ø8-300 | 300 | 0 | 0 | 286 | 0 | 49.3 | 0 | 58 |

Project.....: 22-163 - Nieuwbouw 3 woningen Hoek van Holland

Onderdeel.....: Fundering

Wring- en dwarskrachtwapening

Balk 4:4

| Geb. Vanaf | Tot | Beugels | Lengte | <Wringing > | | <Dwarskr.> | | | | |
|------------|---------|---------|--------|----------------------------------|-----------------------------------|---------------------------------|---------------------------------|------------------|-------------------|--------|
| [mm] | [mm] | | [mm] | A_{lang} [mm ²] | A_{bgl} [mm ² /m] | A_{bgl} [mm ²] | A_{opg} [mm ²] | V_{Ed} [kN] | T_{Ed} [kNm] | Opm. |
| 5 | S12-475 | S12+0 | Ø8-300 | 475 | 4 | 0 | 286 | 0 | 118.1 | 0 6,58 |
| 6 | S12+0 | S12+600 | Ø8-300 | 600 | 4 | 0 | 304 | 0 | 134.3 | 0 6,58 |
| 7 | S12+600 | S13-300 | Ø8-300 | 300 | 0 | 0 | 286 | 0 | 58.3 | 0 58 |
| 8 | S13-300 | S13+0 | Ø8-300 | 300 | 4 | 0 | 286 | 0 | 112.9 | 0 6,58 |
| 9 | S13+0 | S13+600 | Ø8-300 | 600 | 4 | 0 | 306 | 0 | 135.2 | 0 6,58 |
| 10 | S13+600 | S33-300 | Ø8-300 | 300 | 0 | 0 | 286 | 0 | 55.1 | 0 58 |
| 11 | S33-300 | S33+0 | Ø8-300 | 300 | 4 | 0 | 286 | 0 | 111.1 | 0 6,58 |
| 12 | S33+0 | S33+600 | Ø8-300 | 600 | 4 | 0 | 296 | 0 | 130.5 | 0 6,58 |
| 13 | S33+600 | S35-300 | Ø8-300 | 300 | 0 | 0 | 286 | 0 | 55.5 | 0 58 |
| 14 | S35-300 | S35+0 | Ø8-300 | 300 | 4 | 0 | 286 | 0 | 112.9 | 0 6,58 |
| 15 | S35+0 | S35+300 | Ø8-300 | 300 | 4 | 0 | 286 | 0 | 120.4 | 0 6,58 |
| 16 | S35+300 | S19-300 | Ø8-300 | 600 | 0 | 0 | 286 | 0 | 61.3 | 0 58 |
| 17 | S19-300 | S19+0 | Ø8-300 | 300 | 4 | 0 | 286 | 0 | 121.8 | 0 6,58 |
| 18 | S19+0 | S19+300 | Ø8-300 | 300 | 4 | 0 | 286 | 0 | 112.4 | 0 6,58 |
| 19 | S19+300 | S19+600 | Ø8-300 | 300 | 0 | 0 | 286 | 0 | 55.3 | 0 58 |
| 20 | S19+600 | S22+0 | Ø8-300 | 600 | 4 | 0 | 296 | 0 | 130.6 | 0 6,58 |
| 21 | S22+0 | S22+300 | Ø8-300 | 300 | 4 | 0 | 286 | 0 | 113.5 | 0 6,58 |
| 22 | S22+300 | S22+600 | Ø8-300 | 300 | 0 | 0 | 286 | 0 | 57.8 | 0 58 |
| 23 | S22+600 | S32+0 | Ø8-300 | 600 | 4 | 0 | 303 | 0 | 133.8 | 0 6,58 |
| 24 | S32+0 | S32+500 | Ø8-300 | 500 | 4 | 0 | 286 | 0 | 118.8 | 0 6,58 |
| 25 | S32+500 | S14-500 | Ø8-300 | 300 | 0 | 0 | 286 | 0 | 56.2 | 0 58 |
| 26 | S14-500 | S14-200 | Ø8-300 | 300 | 4 | 0 | 286 | 0 | 112.8 | 0 6,58 |
| 27 | S14-200 | S14+0 | Ø8-150 | 200 | 4 | 0 | 341 | 0 | 150.3 | 0 6,58 |
| 28 | S14+0 | S14+275 | Ø8-300 | 275 | 4 | 0 | 286 | 0 | 92.7 | 0 6,59 |
| 29 | S14+275 | S14+575 | Ø8-300 | 300 | 0 | 0 | 286 | 0 | 44.3 | 0 59 |
| 30 | S14+575 | S14+850 | Ø8-300 | 275 | 4 | 0 | 286 | 0 | 77.9 | 0 6,59 |

Project.....: 22-163 - Nieuwbouw 3 woningen Hoek van Holland

Onderdeel.....: Fundering

Dwarskrachtwapening

Balk 4:4

| Geb. | Vanaf [mm] | Tot [mm] | Beugels | Lengte [mm] | A_{sw} [mm ² /m] | V_{Ed} [kN] | A_{opg} [mm ²] | Opm. |
|------|---------------|-------------|---------|----------------|----------------------------------|------------------|---------------------------------|------|
|------|---------------|-------------|---------|----------------|----------------------------------|------------------|---------------------------------|------|

Opmerkingen

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

[58] 6.2.3: Z is berekend m.b.v. 0.9d

[59] 6.2.3: Z is berekend m.b.v. de gedrongen ligger berekening art 6.1 (10)

Wring- en dwarskrachten

Balk 4:4

| Geb. | Vanaf [mm] | Tot [mm] | θ [°] | V_{Rd} [kN] | V_{Ed} | $V_{Rd,C}$ | $V_{Rd,Max}$ | T_{Ed} | $T_{Rd,C}$ | $T_{Rd,Max}$ | V_{opg} | Opm. |
|------|---------------|-------------|-----------------|------------------|--------------|------------|--------------|---------------|------------|--------------|-----------|------|
| | | | | | -----kN----- | | | -----kNm----- | | | | |
| 1 | S11-450 | S11-225 | 21.8 | 106 | 35 | 62 | 294 | 0 | 26 | 63 | 0 | 59 |
| 2 | S11-225 | S11+0 | 21.8 | 105 | 66 | 62 | 294 | 0 | 26 | 63 | 0 | 6,59 |
| 3 | S11+0 | S11+475 | 21.8 | 147 | 137 | 62 | 412 | 0 | 26 | 63 | 0 | 6,58 |
| 4 | S11+475 | S12-475 | 21.8 | 148 | 49 | 62 | 412 | 0 | 26 | 63 | 0 | 58 |
| 5 | S12-475 | S12+0 | 21.8 | 147 | 118 | 62 | 412 | 0 | 26 | 63 | 0 | 6,58 |
| 6 | S12+0 | S12+600 | 21.8 | 147 | 134 | 62 | 412 | 0 | 26 | 63 | 0 | 6,58 |
| 7 | S12+600 | S13-300 | 21.8 | 148 | 58 | 62 | 412 | 0 | 26 | 63 | 0 | 58 |
| 8 | S13-300 | S13+0 | 21.8 | 147 | 113 | 62 | 412 | 0 | 26 | 63 | 0 | 6,58 |
| 9 | S13+0 | S13+600 | 21.8 | 147 | 135 | 62 | 412 | 0 | 26 | 63 | 0 | 6,58 |
| 10 | S13+600 | S33-300 | 21.8 | 148 | 55 | 62 | 412 | 0 | 26 | 63 | 0 | 58 |
| 11 | S33-300 | S33+0 | 21.8 | 147 | 111 | 62 | 412 | 0 | 26 | 63 | 0 | 6,58 |
| 12 | S33+0 | S33+600 | 21.8 | 147 | 131 | 66 | 412 | 0 | 26 | 63 | 0 | 6,58 |
| 13 | S33+600 | S35-300 | 21.8 | 148 | 55 | 66 | 412 | 0 | 26 | 63 | 0 | 58 |
| 14 | S35-300 | S35+0 | 21.8 | 147 | 113 | 66 | 412 | 0 | 26 | 63 | 0 | 6,58 |
| 15 | S35+0 | S35+300 | 21.8 | 147 | 120 | 66 | 412 | 0 | 26 | 63 | 0 | 6,58 |
| 16 | S35+300 | S19-300 | 21.8 | 148 | 61 | 66 | 412 | 0 | 26 | 63 | 0 | 58 |
| 17 | S19-300 | S19+0 | 21.8 | 147 | 122 | 66 | 412 | 0 | 26 | 63 | 0 | 6,58 |
| 18 | S19+0 | S19+300 | 21.8 | 147 | 112 | 66 | 412 | 0 | 26 | 63 | 0 | 6,58 |
| 19 | S19+300 | S19+600 | 21.8 | 148 | 55 | 66 | 412 | 0 | 26 | 63 | 0 | 58 |
| 20 | S19+600 | S22+0 | 21.8 | 147 | 131 | 66 | 412 | 0 | 26 | 63 | 0 | 6,58 |
| 21 | S22+0 | S22+300 | 21.8 | 147 | 113 | 62 | 412 | 0 | 26 | 63 | 0 | 6,58 |
| 22 | S22+300 | S22+600 | 21.8 | 148 | 58 | 62 | 412 | 0 | 26 | 63 | 0 | 58 |
| 23 | S22+600 | S32+0 | 21.8 | 147 | 134 | 62 | 412 | 0 | 26 | 63 | 0 | 6,58 |
| 24 | S32+0 | S32+500 | 21.8 | 147 | 119 | 62 | 412 | 0 | 26 | 63 | 0 | 6,58 |
| 25 | S32+500 | S14-500 | 21.8 | 148 | 56 | 62 | 412 | 0 | 26 | 63 | 0 | 58 |
| 26 | S14-500 | S14-200 | 21.8 | 147 | 113 | 62 | 412 | 0 | 26 | 63 | 0 | 6,58 |
| 27 | S14-200 | S14+0 | 21.8 | 295 | 150 | 62 | 412 | 0 | 26 | 63 | 0 | 6,58 |
| 28 | S14+0 | S14+275 | 21.8 | 134 | 93 | 62 | 376 | 0 | 26 | 63 | 0 | 6,59 |
| 29 | S14+275 | S14+575 | 21.8 | 135 | 44 | 62 | 376 | 0 | 26 | 63 | 0 | 59 |
| 30 | S14+575 | S14+850 | 21.8 | 134 | 78 | 62 | 376 | 0 | 26 | 63 | 0 | 6,59 |

Project.....: 22-163 - Nieuwbouw 3 woningen Hoek van Holland

Onderdeel....: Fundering

Schuifspanningen

Balk 4:4

| Geb. | Vanaf [mm] | Tot [mm] | θ [°] | V_{Ed} [kN] | $V_{Rd,C}$ | $V_{Rd,S}$ | $V_{Ed} < V_{Rd} < V_{Rd,Max}$ [N/mm ²] | Opm. |
|------|---------------|-------------|-----------------|------------------|------------|------------|--|------|
|------|---------------|-------------|-----------------|------------------|------------|------------|--|------|

Opmerkingen

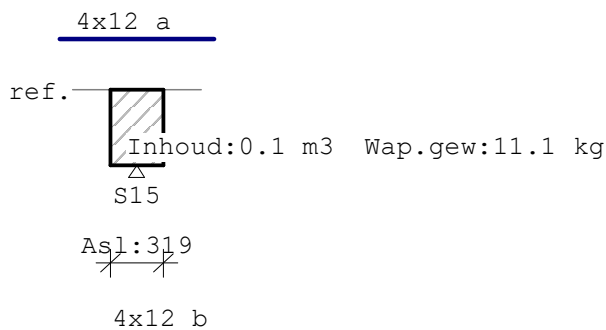
[6] 9.2.2 (4) 50% van de dwarskrachtwapening moet uit beugels bestaan.

[58] 6.2.3: Z is berekend m.b.v. 0.9d

[59] 6.2.3: Z is berekend m.b.v. de gedrongen ligger berekening art 6.1 (10)

Hoofdwapening Fysisch lineair

Balk 5:5

**MEd dekkingslijn** Fysisch lineair

Balk 5:5



△
S15

Hoofdwapening

Balk 5:5

| Geb. | Pos. [mm] | M_{Ed} [kNm] | M_{Rd} [kNm] | z B/O [mm] | A_b [mm ²] | A_a [mm ²] | Basiswapening +Bijlegwapening | Opm. |
|------|--------------|-------------------|-------------------|---------------|-----------------------------|-----------------------------|----------------------------------|------|
| 1 | S15-225 | -4.15 | -28.32 | 180 Ond | 165* | 453 | 4x12 | 2,54 |
| 2 | S15-0 | 14.42 | 28.32 | 180 Bov | 231* | 453 | 4x12 | 1,2 |
| 3 | S15+0 | 14.42 | 28.32 | 180 Bov | 231* | 453 | 4x12 | 1,2 |
| 4 | S15+225 | -5.48 | -28.32 | 180 Ond | 165* | 453 | 4x12 | 2,54 |

Project.....: 22-163 - Nieuwbouw 3 woningen Hoek van Holland

Onderdeel.....: Fundering

Hoofdwapening

Balk 5:5

| Geb. | Pos. [mm] | M_{Ed} [kNm] | M_{Rd} [kNm] | z B/O [mm] | A_b [mm ²] | A_a [mm ²] | Basiswapening +Bijlegwapening | Opm. |
|------|--------------|-------------------|-------------------|---------------|-----------------------------|-----------------------------|----------------------------------|------|
|------|--------------|-------------------|-------------------|---------------|-----------------------------|-----------------------------|----------------------------------|------|

Opmerkingen

- [1] * = Eisen met betrekking tot minimum wapening zijn toegepast, zie nationale bijlage art. 9.2.1.1(1).
- [2] Benodigde wapening en inwendige hefboomsarm zijn bepaald volgens gedrongen ligger detaillering, zie nationale bijlage art. 6.1(10).
- [54] * = Eisen met betrekking tot minimum wapening ten behoeve van gecontroleerde scheurvorming zijn toegepast volgens art. 7.3.2.

Scheurvorming volgens artikel 7.3.4

Balk 5:5

| Geb. | Pos. [mm] | Zijde | $M_{E,freq}$ [kNm] | $s_{r,max}$ [mm] | $\epsilon_{sm}-\epsilon_{cm}$ [%] | w_k [mm] | k_x | w_{max} [mm] | U.C. | Opm. |
|------|--------------|-------|-----------------------|---------------------|--------------------------------------|---------------|-------|-------------------|------|------|
| 1 | S15-602 | Bov | 11.62 | 367 | 0.181 | 0.067 | 1.17 | 0.350 | 0.19 | |
| 2 | S15+602 | Bov | 11.62 | 367 | 0.181 | 0.067 | 1.17 | 0.350 | 0.19 | |
| 2 | S15+0 | Ond | -0.91 | 367 | 0.014 | 0.005 | 1.17 | 0.350 | 0.01 | |
| 2 | S15+305 | Ond | -0.91 | 367 | 0.014 | 0.005 | 1.17 | 0.350 | 0.01 | |

Verloop hoofdwapening

Balk 5:5

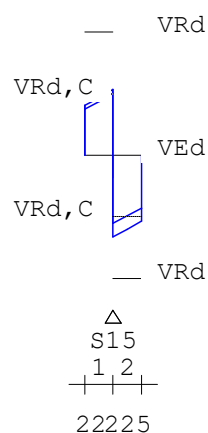
| Merk | B/O | Wapening | Vanaf [mm] | Tot [mm] | Lengte [mm] | $L_{bd,begin}$ [mm] | $L_{bd,eind}$ [mm] |
|------|-------|----------|---------------|-------------|----------------|------------------------|-----------------------|
| a | Boven | 4x12 | S15-653 | S15+653 | 1306 | 428 | 428 |
| b | Onder | 4x12 | S15-345 | S15+345 | 690 | 120 | 120 |

Opmerkingen

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

DWARSKRACHTEN Fysisch lineair

Balk 5:5 Fundamentele combinatie



Project.....: 22-163 - Nieuwbouw 3 woningen Hoek van Holland

Onderdeel....: Fundering

Wring- en dwarskrachtwapening

Balk 5:5

| Geb. | Vanaf | Tot | Beugels | Lengte | <Wringing> | <Dwarskr.> | | | | | | |
|------|---------|---------|---------|--------|----------------------------------|-----------------------------------|---------------------------------|---------------------------------|------------------|-------------------|------|--|
| | [mm] | [mm] | | [mm] | A_{lang} [mm ²] | A_{bgl} [mm ² /m] | A_{bgl} [mm ²] | A_{opg} [mm ²] | V_{Ed} [kN] | T_{Ed} [kNm] | Opm. | |
| 1 | S15-225 | S15+0 | Ø8-150 | 225 | 319 | 38 | 335 | 0 | 65.5 | 9 | 6,59 | |
| 2 | S15+0 | S15+225 | Ø8-150 | 225 | 319 | 38 | 419 | 0 | 81.9 | 9 | 6,59 | |

Opmerkingen

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

[59] 6.2.3: Z is berekend m.b.v. de gedrongen ligger berekening art 6.1 (10)

Wring- en dwarskrachten

Balk 5:5

| Geb. | Vanaf | Tot | θ | V_{Rd} | V_{Ed} | $V_{Rd,C}$ | $V_{Rd,Max}$ | T_{Ed} | $T_{Rd,C}$ | $T_{Rd,Max}$ | V_{opg} | Opm. |
|------|---------|---------|----------|----------|----------|------------|--------------|----------|------------|--------------|-----------|------|
| | [mm] | [mm] | [°] | [kN] | | | | | | | | |
| 1 | S15-225 | S15+0 | 21.8 | 116 | 66 | 62 | 183 | 9 | 26 | 63 | 0 | 6,59 |
| 2 | S15+0 | S15+225 | 21.8 | 116 | 82 | 62 | 183 | 9 | 26 | 63 | 0 | 6,59 |

Opmerkingen

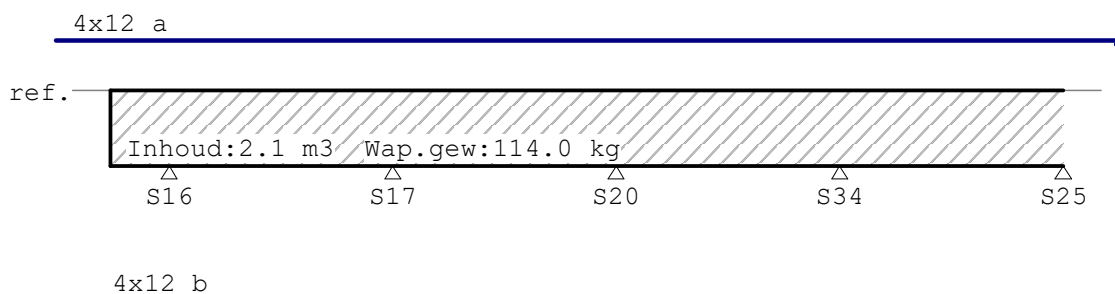
[6] 9.2.2 (4) 50% van de dwarskrachtwapening moet uit beugels bestaan.

[59] 6.2.3: Z is berekend m.b.v. de gedrongen ligger berekening art 6.1 (10)

Hoofdwapening Fysisch lineair

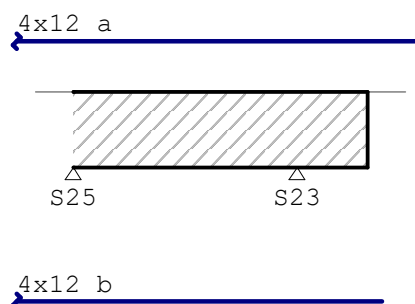
Balk 6:6

Velden: 1 t/m 5

**Hoofdwapening** Fysisch lineair

Balk 6:6

Velden: 6 t/m 7



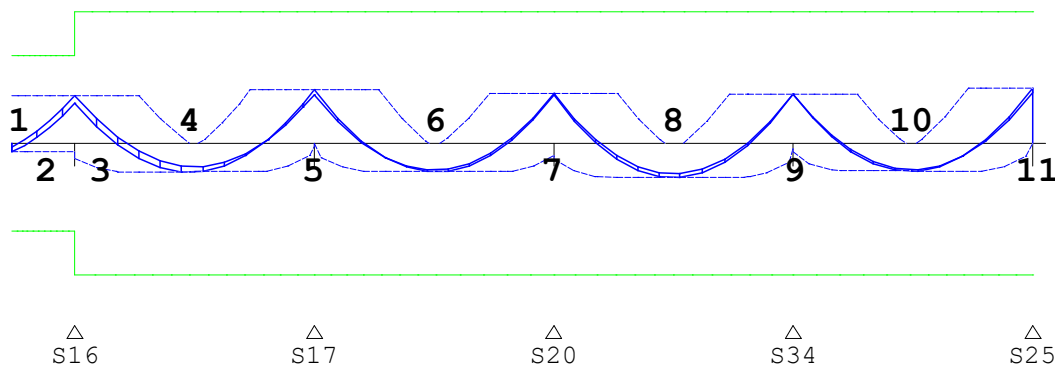
Project.....: 22-163 - Nieuwbouw 3 woningen Hoek van Holland

Onderdeel.....: Fundering

MEd dekkingslijn Fysisch lineair

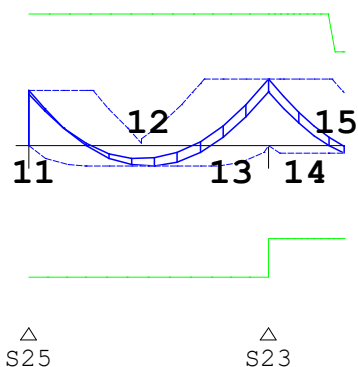
Balk 6:6

Velden: 1 t/m 5

**MEd dekkingslijn** Fysisch lineair

Balk 6:6

Velden: 6 t/m 7

**Hoofdwapening**

Balk 6:6

| Geb. | Pos. [mm] | M_{Ed} [kNm] | M_{Rd} [kNm] | z B/O [mm] | A_b [mm ²] | A_a [mm ²] | Basiswapening +Bijlegwapening | Opm. |
|------|--------------|-------------------|-------------------|---------------|-----------------------------|-----------------------------|----------------------------------|------|
| 1 | S16-500 | -5.48 | -59.01 | 299 Ond | 165* | 453 | 4x12 | 2,54 |
| 2 | S16-0 | 32.32 | 59.01 | 299 Bov | 311* | 453 | 4x12 | 1,2 |
| 3 | S16+0 | 32.32 | 88.47 | 430 Bov | 202* | 453 | 4x12 | 1 |
| 4 | S16+912 | -19.18 | -88.47 | 430 Ond | 165* | 453 | 4x12 | 54 |
| 5 | S17+0 | 36.07 | 88.47 | 430 Bov | 204* | 453 | 4x12 | 1 |
| 6 | S20-932 | -19.07 | -88.47 | 430 Ond | 165* | 453 | 4x12 | 54 |
| 7 | S20+0 | 33.77 | 88.47 | 430 Bov | 204* | 453 | 4x12 | 1 |
| 8 | S20+951 | -23.12 | -88.47 | 430 Ond | 165* | 453 | 4x12 | 54 |
| 9 | S34+0 | 33.22 | 88.47 | 430 Bov | 204* | 453 | 4x12 | 1 |
| 10 | S34+928 | -18.72 | -88.47 | 430 Ond | 165* | 453 | 4x12 | 54 |
| 11 | S25+0 | 37.08 | 88.47 | 430 Bov | 204* | 453 | 4x12 | 1 |
| 12 | S25+949 | -14.12 | -88.47 | 430 Ond | 165* | 453 | 4x12 | 54 |
| 13 | S23-0 | 44.68 | 88.47 | 430 Bov | 224 | 453 | 4x12 | |
| 14 | S23+0 | 44.68 | 62.94 | 320 Bov | 322 | 453 | 4x12 | 2 |
| 15 | S23+600 | -5.40 | -62.94 | 320 Ond | 165* | 453 | 4x12 | 2,54 |

Project.....: 22-163 - Nieuwbouw 3 woningen Hoek van Holland

Onderdeel....: Fundering

Hoofdwapening

Balk 6:6

| Geb. | Pos. [mm] | M_{Ed} [kNm] | M_{Rd} [kNm] | z B/O [mm] | A_b [mm ²] | A_a [mm ²] | Basiswapening +Bijlegwapening | Opm. |
|------|--------------|-------------------|-------------------|---------------|-----------------------------|-----------------------------|----------------------------------|------|
|------|--------------|-------------------|-------------------|---------------|-----------------------------|-----------------------------|----------------------------------|------|

Opmerkingen

- [1] * = Eisen met betrekking tot minimum wapening zijn toegepast, zie nationale bijlage art. 9.2.1.1(1).
- [2] Benodigde wapening en inwendige hefboomsarm zijn bepaald volgens gedrongen ligger detaillering, zie nationale bijlage art. 6.1(10).
- [54] * = Eisen met betrekking tot minimum wapening ten behoeve van gecontroleerde scheurvorming zijn toegepast volgens art. 7.3.2.

Scheurvorming volgens artikel 7.3.4

Balk 6:6

| Geb. | Pos. [mm] | Zijde | $M_{E,freq}$ [kNm] | $s_{r,max}$ [mm] | $\epsilon_{sm}-\epsilon_{cm}$ [%] | w_k [mm] | k_x | w_{max} [mm] | U.C. | Opm. |
|------|--------------|-------|-----------------------|---------------------|--------------------------------------|---------------|-------|-------------------|------|------|
| 1 | S16-912 | Bov | 26.63 | 367 | 0.415 | 0.153 | 1.17 | 0.350 | 0.44 | |
| 1 | S16-580 | Ond | -0.91 | 367 | 0.014 | 0.005 | 1.17 | 0.350 | 0.01 | |
| 2 | S16+0 | Bov | 26.63 | 367 | 0.415 | 0.153 | 1.17 | 0.350 | 0.44 | |
| 2 | S16+410 | Bov | 26.63 | 367 | 0.415 | 0.153 | 1.17 | 0.350 | 0.44 | |
| 2 | S17-410 | Bov | 26.36 | 367 | 0.411 | 0.151 | 1.17 | 0.350 | 0.43 | |
| 2 | S16+472 | Ond | -11.73 | 367 | 0.183 | 0.067 | 1.17 | 0.350 | 0.19 | |
| 2 | S17-551 | Ond | -11.73 | 367 | 0.183 | 0.067 | 1.17 | 0.350 | 0.19 | |
| 3 | S17+400 | Bov | 26.36 | 367 | 0.411 | 0.151 | 1.17 | 0.350 | 0.43 | |
| 3 | S20-389 | Bov | 26.90 | 367 | 0.420 | 0.154 | 1.17 | 0.350 | 0.44 | |
| 3 | S17+533 | Ond | -14.36 | 367 | 0.224 | 0.082 | 1.17 | 0.350 | 0.24 | |
| 3 | S20-932 | Ond | -14.36 | 367 | 0.224 | 0.082 | 1.17 | 0.350 | 0.24 | |
| 3 | S20-556 | Ond | -14.36 | 367 | 0.224 | 0.082 | 1.17 | 0.350 | 0.24 | |
| 4 | S20+370 | Bov | 26.90 | 367 | 0.420 | 0.154 | 1.17 | 0.350 | 0.44 | |
| 4 | S34-364 | Bov | 26.50 | 367 | 0.413 | 0.152 | 1.17 | 0.350 | 0.43 | |
| 4 | S20+494 | Ond | -16.68 | 367 | 0.260 | 0.096 | 1.17 | 0.350 | 0.27 | |
| 4 | S34-493 | Ond | -16.68 | 367 | 0.260 | 0.096 | 1.17 | 0.350 | 0.27 | |
| 5 | S34+385 | Bov | 26.50 | 367 | 0.413 | 0.152 | 1.17 | 0.350 | 0.43 | |
| 5 | S25-410 | Bov | 27.40 | 367 | 0.427 | 0.157 | 1.17 | 0.350 | 0.45 | |
| 5 | S34+555 | Ond | -14.20 | 367 | 0.222 | 0.081 | 1.17 | 0.350 | 0.23 | |
| 5 | S25-544 | Ond | -14.20 | 367 | 0.222 | 0.081 | 1.17 | 0.350 | 0.23 | |
| 6 | S25+483 | Bov | 27.40 | 367 | 0.427 | 0.157 | 1.17 | 0.350 | 0.45 | |
| 6 | S23-445 | Bov | 35.75 | 367 | 0.558 | 0.205 | 1.17 | 0.350 | 0.59 | |
| 6 | S25+450 | Ond | -6.80 | 367 | 0.106 | 0.039 | 1.17 | 0.350 | 0.11 | |
| 6 | S25+949 | Ond | -6.81 | 367 | 0.106 | 0.039 | 1.17 | 0.350 | 0.11 | |
| 6 | S23-448 | Ond | -6.80 | 367 | 0.106 | 0.039 | 1.17 | 0.350 | 0.11 | |
| 7 | S23+0 | Bov | 35.75 | 367 | 0.558 | 0.205 | 1.17 | 0.350 | 0.59 | |
| 7 | S23+475 | Bov | 35.75 | 367 | 0.558 | 0.205 | 1.17 | 0.350 | 0.59 | |
| 7 | S23+981 | Bov | 28.34 | 367 | 0.442 | 0.162 | 1.17 | 0.350 | 0.46 | |
| 7 | S23+103 | Ond | -0.44 | 367 | 0.007 | 0.003 | 1.17 | 0.350 | 0.01 | |
| 7 | S23+660 | Ond | -0.44 | 367 | 0.007 | 0.003 | 1.17 | 0.350 | 0.01 | |

Project.....: 22-163 - Nieuwbouw 3 woningen Hoek van Holland

Onderdeel....: Fundering

Verloop hoofdwapening

Balk 6:6

| Merk | B/O | Wapening | Vanaf [mm] | Tot [mm] | Lengte [mm] | $L_{bd;begin}$ [mm] | $L_{bd;eind}$ [mm] |
|------|-------|----------|---------------|-------------|----------------|------------------------|-----------------------|
| a | Boven | 4x12 | S16-960 | S23+1033 | 11493 | 460 | 433 |
| b | Onder | 4x12 | S16-620 | S23+720 | 10840 | 120 | 120 |

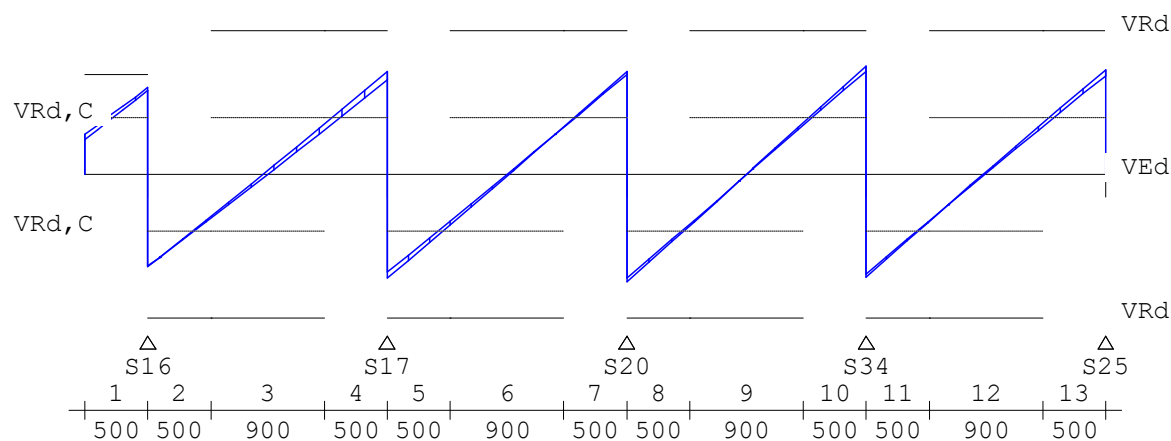
Opmerkingen

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

DWARSKRACHTEN Fysisch lineair

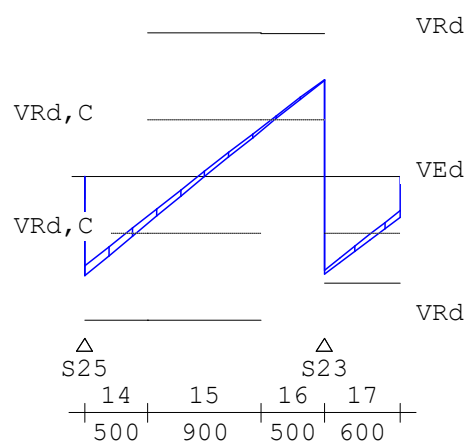
Balk 6:6 Fundamentele combinatie

Velden: 1 t/m 5

**DWARSKRACHTEN** Fysisch lineair

Balk 6:6 Fundamentele combinatie

Velden: 6 t/m 7

**Wring- en dwarskrachtwapening**

Balk 6:6

| Geb. | Vanaf [mm] | Tot [mm] | Beugels | Lengte [mm] | <Wringing> <Dwarskr.> | | | | V_{Ed} [kN] | T_{Ed} [kNm] | Opm. |
|------|---------------|-------------|---------|----------------|-----------------------------------|-----------------------------------|---------------------------------|---------------------------------|------------------|-------------------|------|
| | | | | | A_{langs} [mm ²] | A_{bgl} [mm ² /m] | A_{bgl} [mm ²] | A_{opg} [mm ²] | | | |
| 1 | S16-500 | S16+0 | Ø8-300 | 500 | 4 | 0 | 290 | 0 | 94.7 | 0 | 6,59 |
| 2 | S16+0 | S16+500 | Ø8-300 | 500 | 4 | 0 | 286 | 0 | 100.4 | 0 | 6 |
| 3 | S16+500 | S17-500 | Ø8-300 | 900 | 0 | 0 | 286 | 0 | 54.8 | 0 | |
| 4 | S17-500 | S17+0 | Ø8-300 | 500 | 4 | 0 | 286 | 0 | 112.1 | 0 | 6 |

Project.....: 22-163 - Nieuwbouw 3 woningen Hoek van Holland

Onderdeel....: Fundering

Wring- en dwarskrachtwapening

Balk 6:6

| Geb. | Vanaf | Tot | Beugels | Lengte | <Wringing> | | <Dwarskr.> | | | | |
|------|---------|---------|---------|--------|--------------------|----------------------|--------------------|-----------|----------|----------|------|
| | [mm] | [mm] | | [mm] | A_{lang} | A_{bgl} | A_{bgl} | A_{opg} | V_{Ed} | T_{Ed} | Opm. |
| | | | | | [mm ²] | [mm ² /m] | [mm ²] | | [kN] | [kNm] | |
| 5 | S17+0 | S17+500 | Ø8-300 | 500 | 4 | 0 | 286 | 0 | 113.1 | 0 | 6 |
| 6 | S17+500 | S20-500 | Ø8-300 | 900 | 0 | 0 | 286 | 0 | 54.9 | 0 | |
| 7 | S20-500 | S20+0 | Ø8-300 | 500 | 4 | 0 | 286 | 0 | 112.0 | 0 | 6 |
| 8 | S20+0 | S20+500 | Ø8-300 | 500 | 4 | 0 | 286 | 0 | 117.3 | 0 | 6 |
| 9 | S20+500 | S34-500 | Ø8-300 | 900 | 0 | 0 | 286 | 0 | 55.8 | 0 | |
| 10 | S34-500 | S34+0 | Ø8-300 | 500 | 4 | 0 | 286 | 0 | 117.5 | 0 | 6 |
| 11 | S34+0 | S34+500 | Ø8-300 | 500 | 4 | 0 | 286 | 0 | 111.8 | 0 | 6 |
| 12 | S34+500 | S25-500 | Ø8-300 | 900 | 0 | 0 | 286 | 0 | 55.5 | 0 | |
| 13 | S25-500 | S25+0 | Ø8-300 | 500 | 4 | 0 | 286 | 0 | 113.9 | 0 | 6 |
| 14 | S25+0 | S25+500 | Ø8-300 | 500 | 4 | 0 | 286 | 0 | 108.0 | 0 | 6 |
| 15 | S25+500 | S23-500 | Ø8-300 | 900 | 0 | 0 | 286 | 0 | 53.6 | 0 | |
| 16 | S23-500 | S23+0 | Ø8-300 | 500 | 4 | 0 | 286 | 0 | 106.1 | 0 | 6 |
| 17 | S23+0 | S23+600 | Ø8-300 | 600 | 4 | 0 | 305 | 0 | 106.1 | 0 | 6,59 |

Opmerkingen

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

[59] 6.2.3: Z is berekend m.b.v. de gedrongen ligger berekening art 6.1 (10)

Wring- en dwarskrachten

Balk 6:6

| Geb. | Vanaf | Tot | θ | V_{Rd} | V_{Ed} | $V_{Rd,C}$ | $V_{Rd,Max}$ | T_{Ed} | $T_{Rd,C}$ | $T_{Rd,Max}$ | V_{opg} | Opm. |
|------|---------|---------|----------|----------|----------|--------------|--------------|----------|---------------|--------------|-----------|------|
| | [mm] | [mm] | [°] | [kN] | | -----kN----- | | | -----kNm----- | | | |
| 1 | S16-500 | S16+0 | 21.8 | 109 | 95 | 62 | 305 | 0 | 26 | 63 | 0 | 6,59 |
| 2 | S16+0 | S16+500 | 21.8 | 156 | 100 | 62 | 437 | 0 | 26 | 63 | 0 | 6 |
| 3 | S16+500 | S17-500 | 21.8 | 157 | 55 | 62 | 437 | 0 | 26 | 63 | 0 | |
| 4 | S17-500 | S17+0 | 21.8 | 156 | 112 | 62 | 437 | 0 | 26 | 63 | 0 | 6 |
| 5 | S17+0 | S17+500 | 21.8 | 156 | 113 | 62 | 437 | 0 | 26 | 63 | 0 | 6 |
| 6 | S17+500 | S20-500 | 21.8 | 157 | 55 | 62 | 437 | 0 | 26 | 63 | 0 | |
| 7 | S20-500 | S20+0 | 21.8 | 156 | 112 | 62 | 437 | 0 | 26 | 63 | 0 | 6 |
| 8 | S20+0 | S20+500 | 21.8 | 156 | 117 | 62 | 437 | 0 | 26 | 63 | 0 | 6 |
| 9 | S20+500 | S34-500 | 21.8 | 157 | 56 | 62 | 437 | 0 | 26 | 63 | 0 | |
| 10 | S34-500 | S34+0 | 21.8 | 156 | 117 | 62 | 437 | 0 | 26 | 63 | 0 | 6 |
| 11 | S34+0 | S34+500 | 21.8 | 156 | 112 | 62 | 437 | 0 | 26 | 63 | 0 | 6 |
| 12 | S34+500 | S25-500 | 21.8 | 157 | 56 | 62 | 437 | 0 | 26 | 63 | 0 | |
| 13 | S25-500 | S25+0 | 21.8 | 156 | 114 | 62 | 437 | 0 | 26 | 63 | 0 | 6 |
| 14 | S25+0 | S25+500 | 21.8 | 156 | 108 | 62 | 437 | 0 | 26 | 63 | 0 | 6 |
| 15 | S25+500 | S23-500 | 21.8 | 157 | 54 | 62 | 437 | 0 | 26 | 63 | 0 | |
| 16 | S23-500 | S23+0 | 21.8 | 156 | 106 | 62 | 437 | 0 | 26 | 63 | 0 | 6 |
| 17 | S23+0 | S23+600 | 21.8 | 116 | 106 | 62 | 325 | 0 | 26 | 63 | 0 | 6,59 |

Project.....: 22-163 - Nieuwbouw 3 woningen Hoek van Holland
Onderdeel.....: Fundering

Schuifspanningen

Balk 6:6

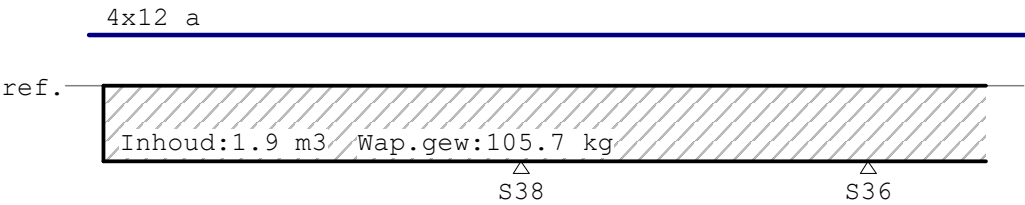
| Geb. | Vanaf | Tot | θ | V_{Ed} | $V_{Rd,C}$ | $V_{Rd,S}$ | $V_{Ed} < V_{Rd} < V_{Rd,Max}$ | Opm. |
|------|-------|------|----------|----------|---------------------|------------|--------------------------------|------|
| | [mm] | [mm] | [°] | [kN] | ----- [N/mm²] ----- | | | |

Opmerkingen
[6] 9.2.2 (4) 50% van de dwarskrachtwapening moet uit beugels bestaan.
[59] 6.2.3: Z is berekend m.b.v. de gedrongen ligger berekening art 6.1 (10)

Hoofdwapening Fysisch lineair

Balk 7:7

Velden: 1 t/m 4

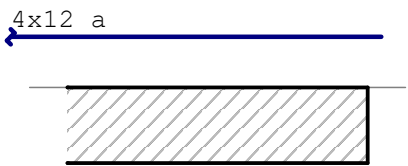


4x12 b

Hoofdwapening Fysisch lineair

Balk 7:7

Velden: 5 t/m 5



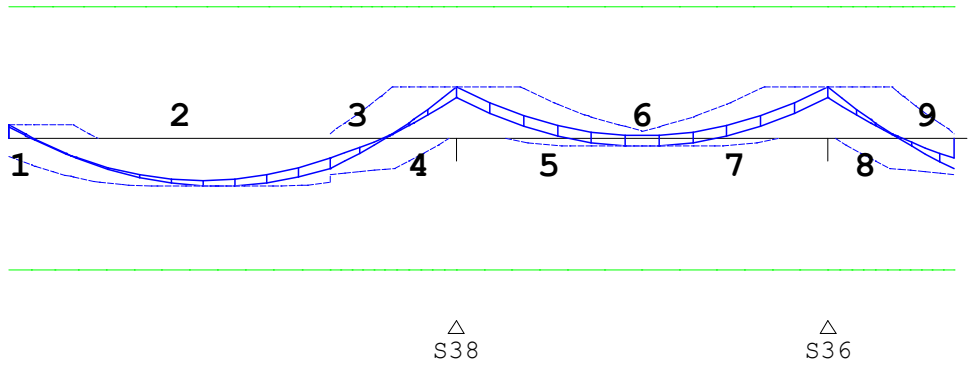
4x12 b

Project.....: 22-163 - Nieuwbouw 3 woningen Hoek van Holland
Onderdeel.....: Fundering

MEd dekkingslijn Fysisch lineair

Balk 7:7

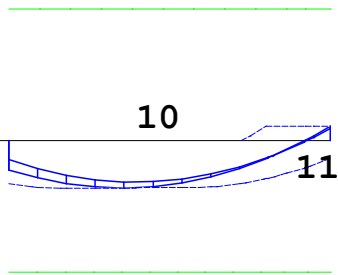
Velden: 1 t/m 4



MEd dekkingslijn Fysisch lineair

Balk 7:7

Velden: 5 t/m 5



Hoofdwapening

Balk 7:7

| Geb. | Pos. [mm] | M _{Ed} [kNm] | M _{Rd} [kNm] | z B/O [mm] | A _b [mm ²] | A _a [mm ²] | Basiswapening +Bijlegwapening | Opm. |
|------|--------------|--------------------------|--------------------------|---------------|--------------------------------------|--------------------------------------|----------------------------------|---------|
| 1 | S38-3550 | 9.20 | 88.47 | 430 Bov | 165* | 453 | 4x12 | 54 |
| 2 | S38-1895 | -32.05 | -88.47 | 430 Ond | 201* | 453 | 4x12 | 1 |
| 3 | S38-1000 | -20.10 | -88.47 | 430 Ond | 165* | 453 | 4x12 | 54 |
| 4 | S38-0 | 34.67 | 88.47 | 430 Bov | 204* | 453 | 4x12 | 1 |
| 5 | S38+0 | 34.67 | 88.47 | 430 Bov | 204* | 453 | 4x12 | 1 |
| 6 | S38+1475 | -5.23 | -88.47 | 430 Ond | 165* | 453 | 4x12 | 54 |
| 7 | S36-0 | 34.67 | 88.47 | 430 Bov | 204* | 453 | 4x12 | 1 |
| 8 | S36+0 | 34.67 | 88.47 | 430 Bov | 204* | 453 | 4x12 | 1,2,68 |
| 9 | S36+1000 | -20.10 | -88.47 | 430 Ond | 165* | 453 | 4x12 | 2,54,68 |
| 10 | S36+1895 | -32.05 | -88.47 | 430 Ond | 201* | 453 | 4x12 | 1 |
| 11 | S36+3550 | 9.20 | 88.47 | 430 Bov | 165* | 453 | 4x12 | 54 |

Project.....: 22-163 - Nieuwbouw 3 woningen Hoek van Holland

Onderdeel.....: Fundering

Hoofdwapening

Balk 7:7

| Geb. | Pos. [mm] | M_{Ed} [kNm] | M_{Rd} [kNm] | z B/O [mm] | A_b [mm ²] | A_a [mm ²] | Basiswapening +Bijlegwapening | Opm. |
|------|--------------|-------------------|-------------------|---------------|-----------------------------|-----------------------------|----------------------------------|------|
|------|--------------|-------------------|-------------------|---------------|-----------------------------|-----------------------------|----------------------------------|------|

Opmerkingen

- [1] * = Eisen met betrekking tot minimum wapening zijn toegepast, zie nationale bijlage art. 9.2.1.1(1).
- [2] Benodigde wapening en inwendige hefboomsarm zijn bepaald volgens gedrongen ligger detaillering, zie nationale bijlage art. 6.1(10).
- [54] * = Eisen met betrekking tot minimum wapening ten behoeve van gecontroleerde scheurvorming zijn toegepast volgens art. 7.3.2.
- [68] MRd als gevolg van de gedrongen ligger berekening (NB. 6.1(10)) is groter dan MRd volgens 6.1(P). De momentweerstand en inwendige hefboomsarm volgens 6.1(P) zijn maatgevend en daarom alsnog toegepast.**

Scheurvorming volgens artikel 7.3.4

Balk 7:7

| Geb. | Pos. [mm] | Zijde | $M_{E,freq}$ [kNm] | $s_{r,max}$ [mm] | $\epsilon_{sm}-\epsilon_{cm}$ [%] | w_k [mm] | k_x | w_{max} [mm] | U.C. | Opm. |
|------|--------------|-------|-----------------------|---------------------|--------------------------------------|---------------|-------|-------------------|------|------|
| 1 | S38-3550 | Bov | 7.57 | 367 | 0.118 | 0.043 | 1.17 | 0.350 | 0.12 | |
| 1 | S38-3199 | Bov | 7.57 | 367 | 0.118 | 0.043 | 1.17 | 0.350 | 0.12 | |
| 1 | S38-2557 | Ond | -25.74 | 367 | 0.402 | 0.147 | 1.17 | 0.350 | 0.42 | |
| 1 | S38-1895 | Ond | -25.61 | 367 | 0.400 | 0.147 | 1.17 | 0.350 | 0.42 | |
| 1 | S38-1447 | Ond | -25.60 | 367 | 0.399 | 0.147 | 1.17 | 0.350 | 0.42 | |
| 2 | S38-493 | Bov | 29.30 | 367 | 0.457 | 0.168 | 1.17 | 0.350 | 0.48 | |
| 2 | S38-565 | Ond | -11.82 | 367 | 0.184 | 0.068 | 1.17 | 0.350 | 0.19 | |
| 3 | S38+295 | Bov | 29.30 | 367 | 0.457 | 0.168 | 1.17 | 0.350 | 0.48 | |
| 3 | S36-295 | Bov | 29.30 | 367 | 0.457 | 0.168 | 1.17 | 0.350 | 0.48 | |
| 3 | S38+1180 | Ond | -1.02 | 367 | 0.016 | 0.006 | 1.17 | 0.350 | 0.02 | |
| 3 | S36-1180 | Ond | -1.02 | 367 | 0.016 | 0.006 | 1.17 | 0.350 | 0.02 | |
| 4 | S36+0 | Bov | 29.30 | 367 | 0.457 | 0.168 | 1.17 | 0.350 | 0.48 | |
| 4 | S36+493 | Bov | 29.30 | 367 | 0.457 | 0.168 | 1.17 | 0.350 | 0.48 | |
| 4 | S36+565 | Ond | -11.82 | 367 | 0.184 | 0.068 | 1.17 | 0.350 | 0.19 | |
| 5 | S36+3199 | Bov | 7.57 | 367 | 0.118 | 0.043 | 1.17 | 0.350 | 0.12 | |
| 5 | S36+3550 | Bov | 7.57 | 367 | 0.118 | 0.043 | 1.17 | 0.350 | 0.12 | |
| 5 | S36+1671 | Ond | -25.77 | 367 | 0.402 | 0.148 | 1.17 | 0.350 | 0.42 | |
| 5 | S36+2336 | Ond | -25.77 | 367 | 0.402 | 0.148 | 1.17 | 0.350 | 0.42 | |

Verloop hoofdwapening

Balk 7:7

| Merk | B/O | Wapening | Vanaf [mm] | Tot [mm] | Lengte [mm] | $L_{bd,begin}$ [mm] | $L_{bd,eind}$ [mm] |
|------|-------|----------|---------------|-------------|----------------|------------------------|-----------------------|
| a | Boven | 4x12 | S38-3670 | S36+3670 | 10290 | 120 | 120 |
| b | Onder | 4x12 | S38-3670 | S36+3670 | 10290 | 120 | 120 |

Project.....: 22-163 - Nieuwbouw 3 woningen Hoek van Holland
Onderdeel....: Fundering

Verloop hoofdwapening

Balk 7:7

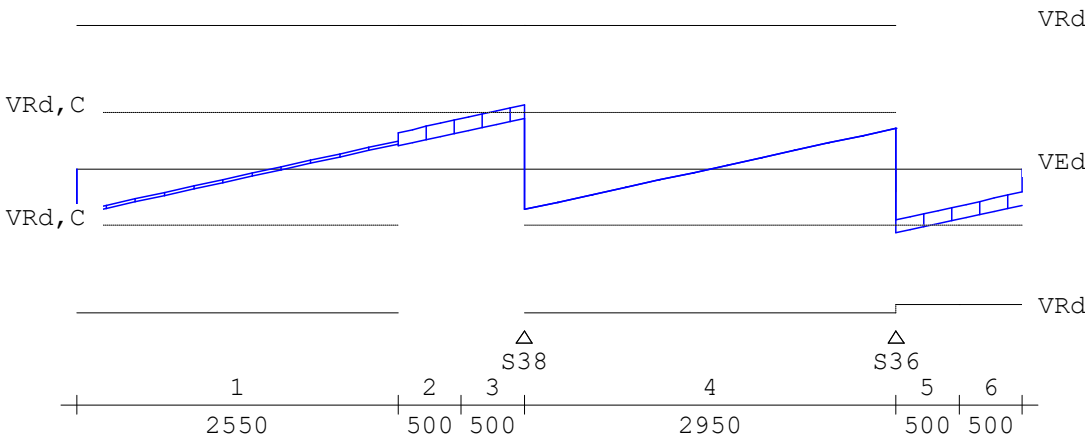
| Merk | B/O | Wapening | Vanaf [mm] | Tot [mm] | Lengte [mm] | L _{bd;begin} [mm] | L _{bd;eind} [mm] |
|------|-----|----------|---------------|-------------|----------------|-------------------------------|------------------------------|
|------|-----|----------|---------------|-------------|----------------|-------------------------------|------------------------------|

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

DWARSKRACHTEN Fysisch lineair

Balk 7:7 Fundamentele combinatie

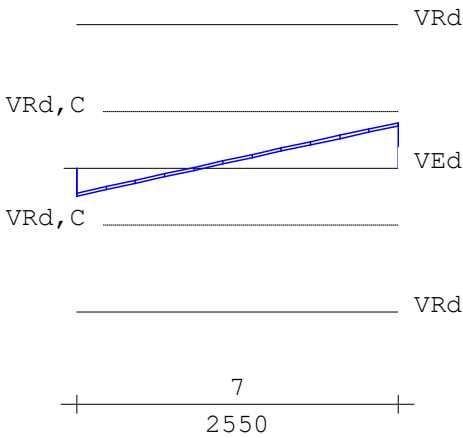
Velden: 1 t/m 4



DWARSKRACHTEN Fysisch lineair

Balk 7:7 Fundamentele combinatie

Velden: 5 t/m 5



Wring- en dwarskrachtwapening

Balk 7:7

| Geb. | Vanaf | Tot | Beugels | Lengte | <Wringing > <Dwarskr.> | | | | V _{Ed} | T _{Ed} | Opm. |
|------|----------|----------|---------|--------|--|--|------------------|--|-----------------|-----------------|------|
| | [mm] | [mm] | | [mm] | A _{langs} [mm ²] | A _{bgl} [mm ² /m] | A _{bgl} | A _{opg} [mm ²] | [kN] | [kNm] | |
| 1 | S38-3550 | S38-1000 | Ø8-300 | 2550 | 0 | 0 | 286 | 0 | 49.7 | 4 | |
| 2 | S38-1000 | S38-500 | Ø8-300 | 500 | 0 | 0 | 286 | 0 | 54.7 | 4 | |
| 3 | S38-500 | S38+0 | Ø8-300 | 500 | 0 | 0 | 286 | 0 | 69.7 | 0 | 6 |
| 4 | S38+0 | S36+0 | Ø8-300 | 2950 | 0 | 0 | 286 | 0 | 44.3 | 0 | |
| 5 | S36+0 | S36+500 | Ø8-300 | 500 | 0 | 0 | 286 | 0 | 69.7 | 0 | 6,58 |

Project.....: 22-163 - Nieuwbouw 3 woningen Hoek van Holland
Onderdeel.....: Fundering

Wring- en dwarskrachtwapening

Balk 7:7

| Geb. | Vanaf | Tot | Beugels | Lengte | <Wringing > | | <Dwarskr.> | | | | |
|------|----------|----------|---------|--------|--------------------|----------------------|--------------------|-----------|----------|----------|------|
| | [mm] | [mm] | | [mm] | A_{lang} | A_{bgl} | A_{bgl} | A_{opg} | V_{Ed} | T_{Ed} | Opm. |
| | | | | | [mm ²] | [mm ² /m] | [mm ²] | | [kN] | [kNm] | |
| 6 | S36+500 | S36+1000 | Ø8-300 | 500 | 0 | 0 | 286 | 0 | 54.7 | 0 | 58 |
| 7 | S36+1000 | S36+3550 | Ø8-300 | 2550 | 0 | 0 | 286 | 0 | 49.7 | 4 | |

Opmerkingen

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

[58] 6.2.3: Z is berekend m.b.v. 0.9d

Wring- en dwarskrachten

Balk 7:7

| Geb. | Vanaf | Tot | θ | V_{Rd} | V_{Ed} | $V_{Rd,C}$ | $V_{Rd,Max}$ | T_{Ed} | $T_{Rd,C}$ | $T_{Rd,Max}$ | V_{opg} | Opm. |
|------|----------|----------|----------|----------|--------------|------------|--------------|---------------|------------|--------------|-----------|------|
| | [mm] | [mm] | [°] | [kN] | -----kN----- | | | -----kNm----- | | | | |
| 1 | S38-3550 | S38-1000 | 21.8 | 157 | 50 | 62 | 437 | 4 | 26 | 63 | 0 | |
| 2 | S38-1000 | S38-500 | 21.8 | 157 | 55 | 62 | 437 | 4 | 26 | 63 | 0 | |
| 3 | S38-500 | S38+0 | 21.8 | 157 | 70 | 62 | 437 | 0 | 26 | 63 | 0 | 6 |
| 4 | S38+0 | S36+0 | 21.8 | 157 | 44 | 62 | 437 | 0 | 26 | 63 | 0 | |
| 5 | S36+0 | S36+500 | 21.8 | 148 | 70 | 62 | 412 | 0 | 26 | 63 | 0 | 6,58 |
| 6 | S36+500 | S36+1000 | 21.8 | 148 | 55 | 62 | 412 | 0 | 26 | 63 | 0 | 58 |
| 7 | S36+1000 | S36+3550 | 21.8 | 157 | 50 | 62 | 437 | 4 | 26 | 63 | 0 | |

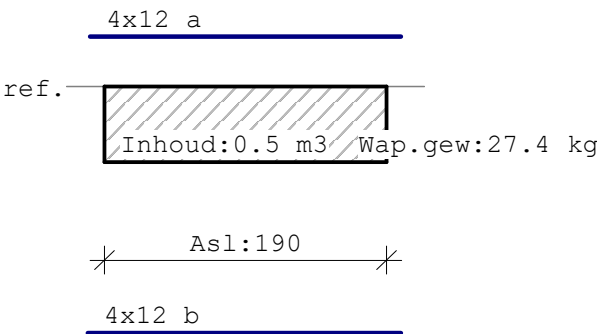
Opmerkingen

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

[58] 6.2.3: Z is berekend m.b.v. 0.9d

Hoofdwapening Fysisch lineair

Balk 8:8



Project.....: 22-163 - Nieuwbouw 3 woningen Hoek van Holland

Onderdeel....: Fundering

MEd dekkingslijn Fysisch lineair

Balk 8:8

**Hoofdwapening**

Balk 8:8

| Geb. | Pos. [mm] | M_{Ed} [kNm] | M_{Rd} [kNm] | z B/O [mm] | A_b [mm ²] | A_a [mm ²] | Basiswapening +Bijlegwapening | Opm. |
|------|--------------|-------------------|-------------------|---------------|-----------------------------|-----------------------------|----------------------------------|------|
| 1 | 0 | 3.60 | 88.47 | 430 Bov | 165* | 453 | 4x12 | 54 |
| 2 | 1104 | -24.01 | -88.47 | 430 Ond | 165* | 453 | 4x12 | 54 |
| 3 | 2400 | 9.20 | 88.47 | 430 Bov | 165* | 453 | 4x12 | 54 |

Opmerkingen

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

Scheurvorming volgens artikel 7.3.4

Balk 8:8

| Geb. | Pos. [mm] | Zijde | $M_{E,freq}$ [kNm] | $s_{r,max}$ [mm] | $\epsilon_{sm}-\epsilon_{cm}$ [%] | w_k [mm] | k_x | w_{max} [mm] | U.C. | Opm. |
|------|--------------|-------|-----------------------|---------------------|--------------------------------------|---------------|-------|-------------------|------|------|
| 1 | 2049 | Bov | 7.57 | 367 | 0.118 | 0.043 | 1.17 | 0.350 | 0.12 | |
| 1 | 2400 | Bov | 7.57 | 367 | 0.118 | 0.043 | 1.17 | 0.350 | 0.12 | |
| 1 | 736 | Ond | -19.22 | 367 | 0.300 | 0.110 | 1.17 | 0.350 | 0.31 | |
| 1 | 1104 | Ond | -19.22 | 367 | 0.300 | 0.110 | 1.17 | 0.350 | 0.31 | |
| 1 | 1476 | Ond | -19.22 | 367 | 0.300 | 0.110 | 1.17 | 0.350 | 0.31 | |

Verloop hoofdwapening

Balk 8:8

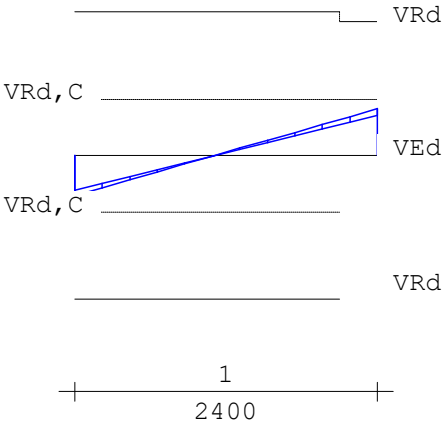
| Merk | B/O | Wapening | Vanaf [mm] | Tot [mm] | Lengte [mm] | $L_{bd;begin}$ [mm] | $L_{bd;eind}$ [mm] |
|------|-------|----------|---------------|-------------|----------------|------------------------|-----------------------|
| a | Boven | 4x12 | -120 | 2520 | 2640 | 120 | 120 |
| b | Onder | 4x12 | -143 | 2520 | 2663 | 143 | 120 |

Opmerkingen

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

Project.....: 22-163 - Nieuwbouw 3 woningen Hoek van Holland
Onderdeel....: Fundering

DWARSKRACHTEN Fysisch lineair Balk 8:8 Fundamentele combinatie



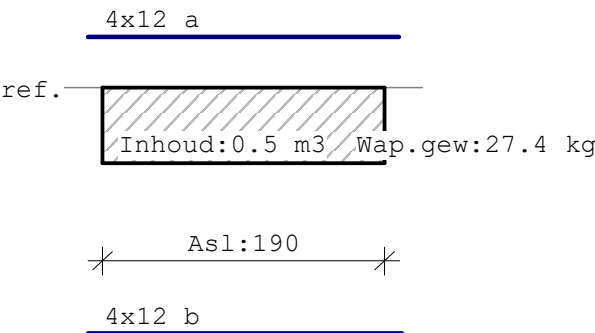
Wring- en dwarskrachtwapening Balk 8:8

| Geb. | Vanaf | Tot | Beugels | Lengte | <Wringing > <Dwarskr.> | | | | | | |
|------|-------|------|---------|--------|------------------------|----------------------|--------------------|--------------------|----------|----------|------|
| | [mm] | [mm] | | [mm] | A_{lang} | A_{bgl} | A_{bgl} | A_{opg} | V_{Ed} | T_{Ed} | Opm. |
| | | | | | [mm ²] | [mm ² /m] | [mm ²] | [mm ²] | [kN] | [kNm] | |
| 1 | 0 | 2400 | Ø8-300 | 2400 | 190 | 22 | 286 | 0 | 51.1 | 5 | |

Wring- en dwarskrachten Balk 8:8

| Geb. | Vanaf | Tot | θ | V_{Rd} | V_{Ed} | $V_{Rd,C}$ | $V_{Rd,Max}$ | T_{Ed} | $T_{Rd,C}$ | $T_{Rd,Max}$ | V_{opg} | Opm. |
|------|-------|------|----------|----------|--------------|------------|--------------|---------------|------------|--------------|-----------|------|
| | [mm] | [mm] | [°] | [kN] | -----kN----- | | | -----kNm----- | | | | |
| 1 | 0 | 2400 | 21.8 | 136 | 51 | 62 | 437 | 5 | 26 | 63 | 0 | |

Hoofdwapening Fysisch lineair Balk 9:9

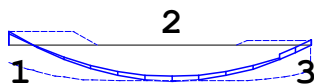


Project.....: 22-163 - Nieuwbouw 3 woningen Hoek van Holland

Onderdeel....: Fundering

MEd dekkingslijn Fysisch lineair

Balk 9:9

**Hoofdwapening**

Balk 9:9

| Geb. | Pos. [mm] | M_{Ed} [kNm] | M_{Rd} [kNm] | z B/O [mm] | A_b [mm ²] | A_a [mm ²] | Basiswapening +Bijlegwapening | Opm. |
|------|--------------|-------------------|-------------------|---------------|-----------------------------|-----------------------------|----------------------------------|------|
| 1 | 0 | 9.20 | 88.47 | 430 Bov | 165* | 453 | 4x12 | 54 |
| 2 | 1296 | -24.01 | -88.47 | 430 Ond | 165* | 453 | 4x12 | 54 |
| 3 | 2400 | 3.60 | 88.47 | 430 Bov | 165* | 453 | 4x12 | 54 |

Opmerkingen

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

Scheurvorming volgens artikel 7.3.4

Balk 9:9

| Geb. | Pos. [mm] | Zijde | $M_{E,freq}$ [kNm] | $s_{r,max}$ [mm] | $\epsilon_{sm}-\epsilon_{cm}$ [%] | w_k [mm] | k_x | w_{max} [mm] | U.C. | Opm. |
|------|--------------|-------|-----------------------|---------------------|--------------------------------------|---------------|-------|-------------------|------|------|
| 1 | 0 | Bov | 7.57 | 367 | 0.118 | 0.043 | 1.17 | 0.350 | 0.12 | |
| 1 | 351 | Bov | 7.57 | 367 | 0.118 | 0.043 | 1.17 | 0.350 | 0.12 | |
| 1 | 924 | Ond | -19.22 | 367 | 0.300 | 0.110 | 1.17 | 0.350 | 0.31 | |
| 1 | 1296 | Ond | -19.22 | 367 | 0.300 | 0.110 | 1.17 | 0.350 | 0.31 | |
| 1 | 1664 | Ond | -19.22 | 367 | 0.300 | 0.110 | 1.17 | 0.350 | 0.31 | |

Verloop hoofdwapening

Balk 9:9

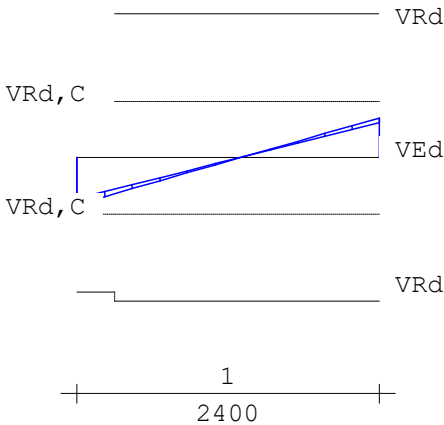
| Merk | B/O | Wapening | Vanaf [mm] | Tot [mm] | Lengte [mm] | $L_{bd,begin}$ [mm] | $L_{bd,eind}$ [mm] |
|------|-------|----------|---------------|-------------|----------------|------------------------|-----------------------|
| a | Boven | 4x12 | -120 | 2520 | 2640 | 120 | 120 |
| b | Onder | 4x12 | -120 | 2543 | 2663 | 120 | 143 |

Opmerkingen

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

Project.....: 22-163 - Nieuwbouw 3 woningen Hoek van Holland
Onderdeel....: Fundering

DWARSKRACHTEN Fysisch lineair Balk 9:9 Fundamentele combinatie



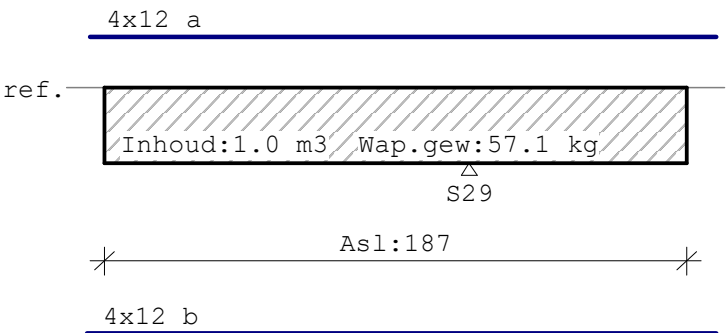
Wring- en dwarskrachtwapening Balk 9:9

| Geb. | Vanaf | Tot | Beugels | Lengte | <Wringing > <Dwarskr.> | | | | V _{Ed} | T _{Ed} | Opm. |
|------|-------|------|---------|--------|------------------------|----------------------|--------------------|--------------------|-----------------|-----------------|------|
| | [mm] | [mm] | | [mm] | A _{langs} | A _{bgl} | A _{bgl} | A _{opg} | [kN] | [kNm] | |
| | | | | | [mm ²] | [mm ² /m] | [mm ²] | [mm ²] | | | |
| 1 | 0 | 2400 | Ø8-300 | 2400 | 190 | 22 | 286 | 0 | 51.1 | 5 | |

Wring- en dwarskrachten Balk 9:9

| Geb. | Vanaf | Tot | θ | V _{Rd} | V _{Ed} | V _{Rd,C} | V _{Rd,Max} | T _{Ed} | T _{Rd,C} | T _{Rd,Max} | V _{opg} | Opm. |
|------|-------|------|------|-----------------|-----------------|-------------------|---------------------|-----------------|-------------------|---------------------|------------------|------|
| | [mm] | [mm] | [°] | [kN] | | | | | | | | |
| 1 | 0 | 2400 | 21.8 | 136 | 51 | 62 | 437 | 5 | 26 | 63 | 0 | |

Hoofdwapening Fysisch lineair Balk 10:10

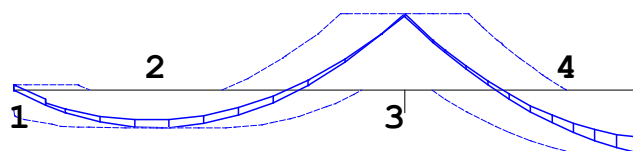


Project.....: 22-163 - Nieuwbouw 3 woningen Hoek van Holland

Onderdeel.....: Fundering

MEd dekkingslijn Fysisch lineair

Balk 10:10


 Δ
S29
Hoofdwapening

Balk 10:10

| Geb. | Pos. [mm] | M_{Ed} [kNm] | M_{Rd} [kNm] | z B/O [mm] | A_b [mm ²] | A_a [mm ²] | Basiswapening +Bijlegwapening | Opm. |
|------|--------------|-------------------|-------------------|---------------|-----------------------------|-----------------------------|----------------------------------|------|
| 1 | S29-3100 | 3.79 | 88.47 | 430 Bov | 165* | 453 | 4x12 | 54 |
| 2 | S29-1969 | -25.26 | -88.47 | 430 Ond | 165* | 453 | 4x12 | 54 |
| 3 | S29+0 | 51.29 | 88.47 | 430 Bov | 258 | 453 | 4x12 | |
| 4 | S29+1850 | -41.99 | -88.47 | 430 Ond | 211 | 453 | 4x12 | |

Opmerkingen

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

Scheurvorming volgens artikel 7.3.4

Balk 10:10

| Geb. | Pos. [mm] | Zijde | $M_{E,freq}$ [kNm] | $s_{r,max}$ [mm] | $\epsilon_{sm}-\epsilon_{cm}$ [%] | w_k [mm] | k_x | w_{max} [mm] | U.C. | Opm. |
|------|--------------|-------|-----------------------|---------------------|--------------------------------------|---------------|-------|-------------------|------|------|
| 1 | S29-468 | Bov | 40.55 | 367 | 0.633 | 0.232 | 1.17 | 0.350 | 0.66 | |
| 1 | S29-1969 | Ond | -20.55 | 367 | 0.321 | 0.118 | 1.17 | 0.350 | 0.34 | |
| 2 | S29+466 | Bov | 40.55 | 367 | 0.633 | 0.232 | 1.17 | 0.350 | 0.66 | |
| 2 | S29+1431 | Ond | -23.77 | 367 | 0.371 | 0.136 | 1.17 | 0.350 | 0.39 | |
| 2 | S29+1974 | Ond | -23.77 | 367 | 0.371 | 0.136 | 1.17 | 0.350 | 0.39 | |

Verloop hoofdwapening

Balk 10:10

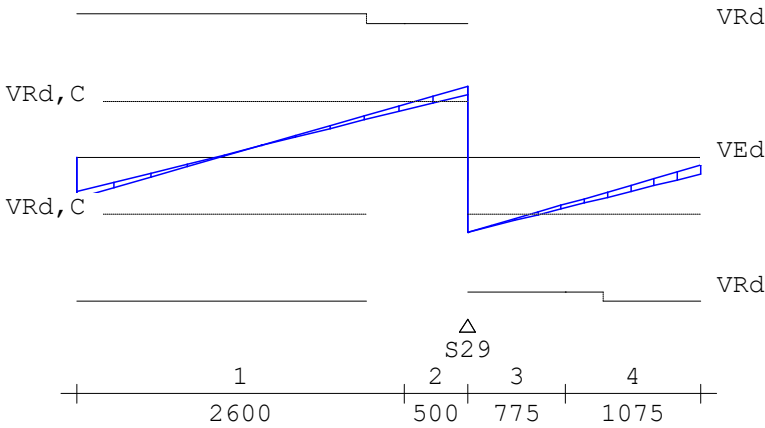
| Merk | B/O | Wapening | Vanaf [mm] | Tot [mm] | Lengte [mm] | $L_{bd,begin}$ [mm] | $L_{bd,eind}$ [mm] |
|------|-------|----------|---------------|-------------|----------------|------------------------|-----------------------|
| a | Boven | 4x12 | S29-3220 | S29+2103 | 5323 | 120 | 253 |
| b | Onder | 4x12 | S29-3249 | S29+2099 | 5348 | 149 | 249 |

Opmerkingen

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

Project.....: 22-163 - Nieuwbouw 3 woningen Hoek van Holland
Onderdeel....: Fundering

DWARSKRACHTEN Fysisch lineair Balk 10:10 Fundamentele combinatie



Wring- en dwarskrachtwapening Balk 10:10

| Geb. | Vanaf | Tot | Beugels | Lengte | <Wringing > <Dwarskr.> | | | | V _{Ed} | T _{Ed} | Opm. |
|------|----------|----------|---------|--------|------------------------|----------------------|--------------------|--------------------|-----------------|-----------------|------|
| | [mm] | [mm] | | [mm] | A _{langs} | A _{bgl} | A _{bgl} | A _{opg} | [kN] | [kNm] | |
| | | | | | [mm ²] | [mm ² /m] | [mm ²] | [mm ²] | | | |
| 1 | S29-3100 | S29-500 | Ø8-300 | 2600 | 187 | 22 | 286 | 0 | 57.9 | 5 | |
| 2 | S29-500 | S29+0 | Ø8-300 | 500 | 187 | 22 | 286 | 0 | 77.6 | 5 | 6 |
| 3 | S29+0 | S29+775 | Ø8-300 | 775 | 187 | 22 | 286 | 0 | 81.2 | 5 | 6 |
| 4 | S29+775 | S29+1850 | Ø8-300 | 1075 | 187 | 22 | 286 | 0 | 54.7 | 5 | |

Opmerkingen

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

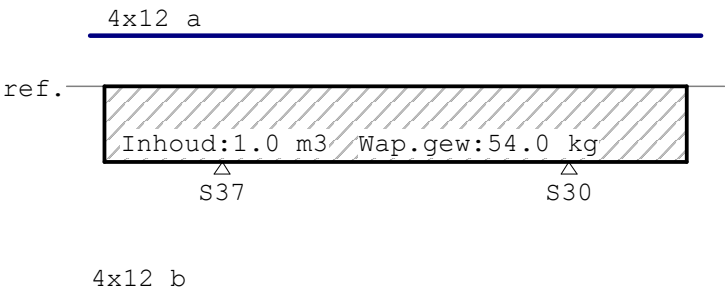
Wring- en dwarskrachten Balk 10:10

| Geb. | Vanaf | Tot | θ | V _{Rd} | V _{Ed} | V _{Rd, C} | V _{Rd, Max} | T _{Ed} | T _{Rd, C} | T _{Rd, Max} | V _{opg} | Opm. |
|------|----------|----------|------|-----------------|-----------------|--------------------|----------------------|-----------------|--------------------|----------------------|------------------|------|
| | [mm] | [mm] | [°] | [kN] | | | | | | | | |
| 1 | S29-3100 | S29-500 | 21.8 | 136 | 58 | 62 | 437 | 5 | 26 | 63 | 0 | |
| 2 | S29-500 | S29+0 | 21.8 | 136 | 78 | 62 | 437 | 5 | 26 | 63 | 0 | 6 |
| 3 | S29+0 | S29+775 | 21.8 | 136 | 81 | 62 | 437 | 5 | 26 | 63 | 0 | 6 |
| 4 | S29+775 | S29+1850 | 21.8 | 136 | 55 | 62 | 437 | 5 | 26 | 63 | 0 | |

Opmerkingen

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

Hoofdwapening Fysisch lineair Balk 11:11

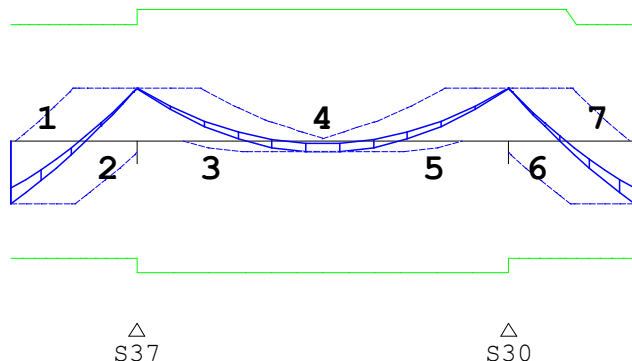


Project.....: 22-163 - Nieuwbouw 3 woningen Hoek van Holland

Onderdeel.....: Fundering

MEd dekkingslijn Fysisch lineair

Balk 11:11

**Hoofdwapening**

Balk 11:11

| Geb. | Pos. [mm] | M_{Ed} [kNm] | M_{Rd} [kNm] | z B/O [mm] | A_b [mm ²] | A_a [mm ²] | Basiswapening +Bijlegwapening | Opm. |
|------|--------------|-------------------|-------------------|---------------|-----------------------------|-----------------------------|----------------------------------|------|
| 1 | S37-1000 | -41.96 | -78.68 | 399 Ond | 242 | 453 | 4x12 | 2 |
| 2 | S37-0 | 35.75 | 78.68 | 399 Bov | 234* | 453 | 4x12 | 1,2 |
| 3 | S37+0 | 35.75 | 88.47 | 430 Bov | 204* | 453 | 4x12 | 1 |
| 4 | S37+1475 | -7.42 | -88.47 | 430 Ond | 165* | 453 | 4x12 | 54 |
| 5 | S30-0 | 35.75 | 88.47 | 430 Bov | 204* | 453 | 4x12 | 1 |
| 6 | S30-0 | 35.75 | 78.68 | 400 Bov | 234* | 453 | 4x12 | 1,2 |
| 7 | S30+1000 | -41.96 | -78.68 | 400 Ond | 242 | 453 | 4x12 | 2 |

Opmerkingen

[1] * = Eisen met betrekking tot minimum wapening zijn toegepast, zie nationale bijlage art. 9.2.1.1(1).

[2] Benodigde wapening en inwendige hefboomsarm zijn bepaald volgens gedrongen ligger detaillering, zie nationale bijlage art. 6.1(10).

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

Scheurvorming volgens artikel 7.3.4

Balk 11:11

| Geb. | Pos. [mm] | Zijde | $M_{E,freq}$ [kNm] | $s_{r,max}$ [mm] | $\epsilon_{sm}-\epsilon_{cm}$ [%] | w_k [mm] | k_x | w_{max} [mm] | U.C. | Opm. |
|------|--------------|-------|-----------------------|---------------------|--------------------------------------|---------------|-------|-------------------|------|------|
| 1 | S37-457 | Bov | 28.01 | 367 | 0.437 | 0.160 | 1.17 | 0.350 | 0.46 | |
| 1 | S37-1186 | Ond | -23.67 | 367 | 0.369 | 0.136 | 1.17 | 0.350 | 0.39 | |
| 1 | S37-540 | Ond | -23.67 | 367 | 0.369 | 0.136 | 1.17 | 0.350 | 0.39 | |
| 2 | S37-0 | Bov | 28.01 | 367 | 0.437 | 0.160 | 1.17 | 0.350 | 0.46 | |
| 2 | S37+294 | Bov | 28.01 | 367 | 0.437 | 0.160 | 1.17 | 0.350 | 0.46 | |
| 2 | S30-294 | Bov | 28.01 | 367 | 0.437 | 0.160 | 1.17 | 0.350 | 0.46 | |
| 2 | S37+1066 | Ond | -6.52 | 367 | 0.102 | 0.037 | 1.17 | 0.350 | 0.11 | |
| 2 | S30-1066 | Ond | -6.52 | 367 | 0.102 | 0.037 | 1.17 | 0.350 | 0.11 | |
| 3 | S30-0 | Bov | 28.01 | 367 | 0.437 | 0.160 | 1.17 | 0.350 | 0.46 | |
| 3 | S30+457 | Bov | 28.01 | 367 | 0.437 | 0.160 | 1.17 | 0.350 | 0.46 | |
| 3 | S30+540 | Ond | -23.67 | 367 | 0.369 | 0.136 | 1.17 | 0.350 | 0.39 | |
| 3 | S30+1186 | Ond | -23.67 | 367 | 0.369 | 0.136 | 1.17 | 0.350 | 0.39 | |

Project.....: 22-163 - Nieuwbouw 3 woningen Hoek van Holland

Onderdeel.....: Fundering

Verloop hoofdwapening

Balk 11:11

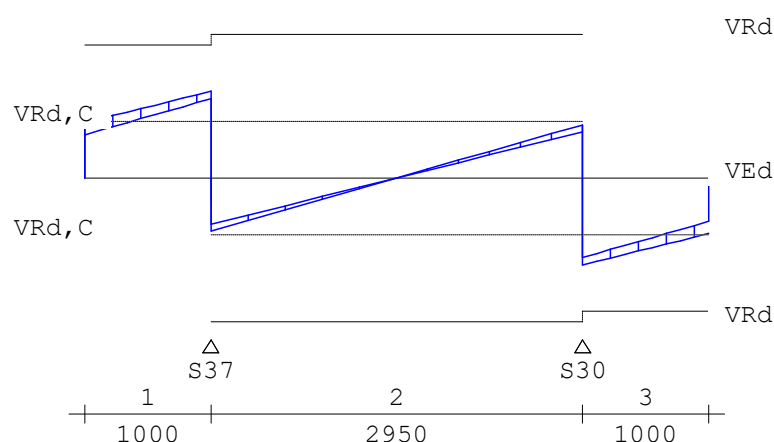
| Merk | B/O | Wapening | Vanaf [mm] | Tot [mm] | Lengte [mm] | $L_{bd;begin}$ [mm] | $L_{bd;eind}$ [mm] |
|------|-------|----------|---------------|-------------|----------------|------------------------|-----------------------|
| a | Boven | 4x12 | S37-1120 | S30+1120 | 5190 | 120 | 120 |
| b | Onder | 4x12 | S37-1251 | S30+1251 | 5452 | 251 | 251 |

Opmerkingen

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

DWARSKRACHTEN Fysisch lineair

Balk 11:11 Fundamentele combinatie

**Wring- en dwarskrachtwapening**

Balk 11:11

| Geb. | Vanaf [mm] | Tot [mm] | Beugels | Lengte [mm] | <Wringing> <Dwarskr.> | | | | V_{Ed} [kN] | T_{Ed} [kNm] | Opm. |
|------|---------------|-------------|---------|----------------|----------------------------------|-----------------------------------|---------------------------------|---|------------------|-------------------|------|
| | | | | | A_{lang} [mm ²] | A_{bgl} [mm ² /m] | A_{opg} [mm ²] | | | | |
| 1 | S37-1000 | S37+0 | Ø8-300 | 1000 | 0 | 0 | 286 | 0 | 94.7 | 0 | 6,59 |
| 2 | S37+0 | S30+0 | Ø8-300 | 2950 | 0 | 0 | 286 | 0 | 58.1 | 0 | |
| 3 | S30+0 | S30+1000 | Ø8-300 | 1000 | 0 | 0 | 286 | 0 | 94.7 | 0 | 6,59 |

Opmerkingen

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

[59] 6.2.3: Z is berekend m.b.v. de gedrongen ligger berekening art 6.1 (10)

Wring- en dwarskrachten

Balk 11:11

| Geb. | Vanaf [mm] | Tot [mm] | θ [°] | V_{Rd} [kN] | V_{Ed} [kN] | $V_{Rd,C}$ [kN] | $V_{Rd,Max}$ [kN] | T_{Ed} [kNm] | $T_{Rd,C}$ [kNm] | $T_{Rd,Max}$ [kNm] | V_{opg} [kN] | Opm. |
|------|---------------|-------------|-----------------|------------------|------------------|--------------------|----------------------|-------------------|---------------------|-----------------------|-------------------|------|
| 1 | S37-1000 | S37+0 | 21.8 | 146 | 95 | 62 | 406 | 0 | 26 | 63 | 0 | 6,59 |
| 2 | S37+0 | S30+0 | 21.8 | 157 | 58 | 62 | 437 | 0 | 26 | 63 | 0 | |
| 3 | S30+0 | S30+1000 | 21.8 | 146 | 95 | 62 | 406 | 0 | 26 | 63 | 0 | 6,59 |

Opmerkingen

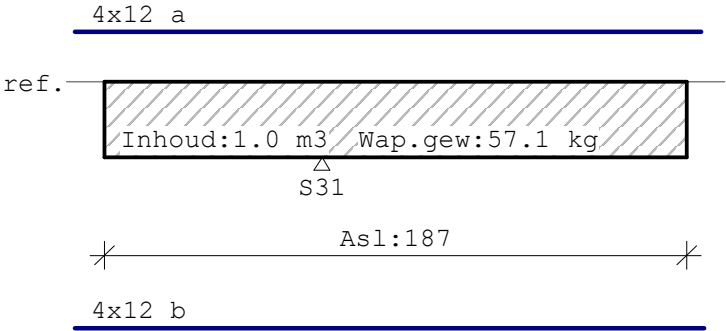
[6] 9.2.2 (4) 50% van de dwarskrachtwapening moet uit beugels bestaan.

[59] 6.2.3: Z is berekend m.b.v. de gedrongen ligger berekening art 6.1 (10)

Project.....: 22-163 - Nieuwbouw 3 woningen Hoek van Holland
Onderdeel.....: Fundering

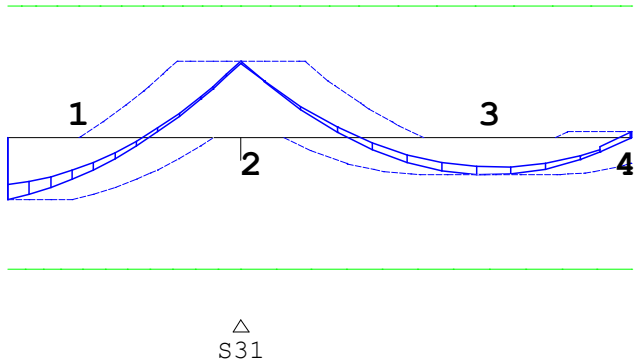
Hoofdwapening Fysisch lineair

Balk 12:12



MEd dekkingslijn Fysisch lineair

Balk 12:12



Hoofdwapening

Balk 12:12

| Geb. | Pos. [mm] | M_{Ed} [kNm] | M_{Rd} [kNm] | z B/O [mm] | A_b [mm ²] | A_a [mm ²] | Basiswapening +Bijlegwapening | Opm. |
|------|--------------|-------------------|-------------------|-----------------|-----------------------------|-----------------------------|----------------------------------|------|
| 1 | S31-1850 | -41.99 | -88.47 | 430 Ond | 211 | 453 | 4x12 | |
| 2 | S31+0 | 51.29 | 88.47 | 430 Bov | 258 | 453 | 4x12 | |
| 3 | S31+1969 | -25.26 | -88.47 | 430 Ond | 165* | 453 | 4x12 | 54 |
| 4 | S31+3100 | 3.79 | 88.47 | 430 Bov | 165* | 453 | 4x12 | 54 |

Opmerkingen

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

Scheurvorming volgens artikel 7.3.4

Balk 12:12

| Geb. | Pos. [mm] | Zijde | $M_{E;freq}$ [kNm] | $s_{r,max}$ [mm] | $\epsilon_{sm}-\epsilon_{cm}$ [%] | w_k [mm] | k_x | w_{max} [mm] | U.C. | Opm. |
|------|--------------|-------|-----------------------|---------------------|--------------------------------------|---------------|-------|-------------------|------|------|
| 1 | S31-466 | Bov | 40.55 | 367 | 0.633 | 0.232 | 1.17 | 0.350 | 0.66 | |
| 1 | S31-1974 | Ond | -23.77 | 367 | 0.371 | 0.136 | 1.17 | 0.350 | 0.39 | |
| 1 | S31-1431 | Ond | -23.77 | 367 | 0.371 | 0.136 | 1.17 | 0.350 | 0.39 | |
| 2 | S31-0 | Bov | 40.55 | 367 | 0.633 | 0.232 | 1.17 | 0.350 | 0.66 | |
| 2 | S31+468 | Bov | 40.55 | 367 | 0.633 | 0.232 | 1.17 | 0.350 | 0.66 | |
| 2 | S31+1404 | Ond | -20.51 | 367 | 0.320 | 0.118 | 1.17 | 0.350 | 0.34 | |
| 2 | S31+1969 | Ond | -20.55 | 367 | 0.321 | 0.118 | 1.17 | 0.350 | 0.34 | |

Project.....: 22-163 - Nieuwbouw 3 woningen Hoek van Holland

Onderdeel.....: Fundering

Verloop hoofdwapening

Balk 12:12

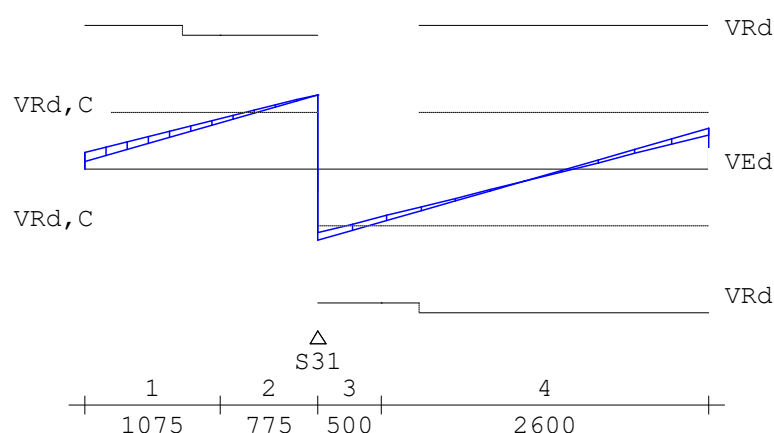
| Merk | B/O | Wapening | Vanaf [mm] | Tot [mm] | Lengte [mm] | $L_{bd;begin}$ [mm] | $L_{bd;eind}$ [mm] |
|------|-------|----------|---------------|-------------|----------------|------------------------|-----------------------|
| a | Boven | 4x12 | S31-2103 | S31+3220 | 5323 | 253 | 120 |
| b | Onder | 4x12 | S31-2099 | S31+3249 | 5348 | 249 | 149 |

Opmerkingen

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

DWARSKRACHTEN Fysisch lineair

Balk 12:12 Fundamentele combinatie

**Wring- en dwarskrachtwapening**

Balk 12:12

| Geb. | Vanaf [mm] | Tot [mm] | Beugels | Lengte [mm] | <Wringing> <Dwarskr.> | | | | V_{Ed} [kN] | T_{Ed} [kNm] | Opm. |
|------|---------------|-------------|---------|----------------|-----------------------------------|-----------------------------------|---------------------------------|---|------------------|-------------------|------|
| | | | | | A_{langs} [mm ²] | A_{bgl} [mm ² /m] | A_{opg} [mm ²] | | | | |
| 1 | S31-1850 | S31-775 | Ø8-300 | 1075 | 187 | 22 | 286 | 0 | 54.7 | 5 | |
| 2 | S31-775 | S31+0 | Ø8-300 | 775 | 187 | 22 | 286 | 0 | 81.2 | 5 | 6 |
| 3 | S31+0 | S31+500 | Ø8-300 | 500 | 187 | 22 | 286 | 0 | 77.6 | 5 | 6 |
| 4 | S31+500 | S31+3100 | Ø8-300 | 2600 | 187 | 22 | 286 | 0 | 57.9 | 5 | |

Opmerkingen

[6] 9.2.2 (4) 50% van de dwarskrachtwapening moet uit beugels bestaan.**Wring- en dwarskrachten**

Balk 12:12

| Geb. | Vanaf [mm] | Tot [mm] | θ [°] | V_{Rd} [kN] | V_{Ed} [kN] | $V_{Rd,C}$ [kN] | $V_{Rd,Max}$ [kN] | T_{Ed} [kNm] | $T_{Rd,C}$ [kNm] | $T_{Rd,Max}$ [kNm] | V_{opg} [kN] | Opm. |
|------|---------------|-------------|-----------------|------------------|------------------|--------------------|----------------------|-------------------|---------------------|-----------------------|-------------------|------|
| 1 | S31-1850 | S31-775 | 21.8 | 136 | 55 | 62 | 437 | 5 | 26 | 63 | 0 | |
| 2 | S31-775 | S31+0 | 21.8 | 136 | 81 | 62 | 437 | 5 | 26 | 63 | 0 | 6 |
| 3 | S31+0 | S31+500 | 21.8 | 136 | 78 | 62 | 437 | 5 | 26 | 63 | 0 | 6 |
| 4 | S31+500 | S31+3100 | 21.8 | 136 | 58 | 62 | 437 | 5 | 26 | 63 | 0 | |

Opmerkingen

[6] 9.2.2 (4) 50% van de dwarskrachtwapening moet uit beugels bestaan.**Wapeningsgewicht**Inhoud:14.6 m³ Wap.gewicht:820.8 kg, 56.1 kg/m³