



zie voorwaarden  
omgevingsvergunning



## Constructieve rapportage DO

publikatie-exemplaar ter visie

van 2 juli 2021 tot en met 12 augustus 2021

a. De constructie (onderdelen) met bevestigingen en/of  
verbindingen e.a. moeten worden uitgevoerd volgens  
- berekeningsuitgangspunten van de verantwoordelijke  
hoofdconstructeur aan de hand van duidelijke  
werktekeningen.  
- De Omgevingsvergunning.  
- Bouwbesluit 2012 en de Gemeentelijke Bouwverordening.

b. Door of namens de (hoofd) constructeur dient toezicht  
te worden gehouden op een juiste en zorgvuldige  
uitvoering van de betreffende constructies.

c. Eventueel geplaatste opmerkingen (behorend bij het  
Besluit) in berekening(en) en/of op tekening(en) dan  
wel aanwijzingen op het werk moeten worden nagekomen.

d. De vergunninghouder dan wel zijn adviseur(s) en/of  
bouwer zijn verantwoordelijk voor het juist nakomen van  
de verleende omgevingsvergunning.  
De Gemeente is niet verantwoordelijk

Project Woonhuis - Hamerveldseweg

Projectnummer 2010-2

Plaats Leusden

Behoort bij het besluit van  
Het College van gemeente leusden

Opdrachtgever Element Buildings BV

Opgesteld door



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Versie 1

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#### Algemene voorwaarden

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andere manier, zonder voorafgaande schriftelijke toestemming van Solid Timber.

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Bijlage 1 - Projectuitgangspunten en belastingen

Bijlage 2 – Statische berekening CLT en GLT

Bijlage 3 – Gewichtsberekening

Bijlage 4 – Statische hoofdberekening onderbouw

# 1. Algemeen

## 1.1 Inleiding

Voor de advisering van de hoofddraagconstructie voor een woonhuis voor project 'Woonhuis - Hamerveldseweg, te Leusden is door Element Buildings B.V. opdracht verstrekt aan Solid Timber B.V.

Het project omvat een vrijstaande woning van twee bouwlagen met een fundering/begane grondvloer op zand inclusief een vorstrand.

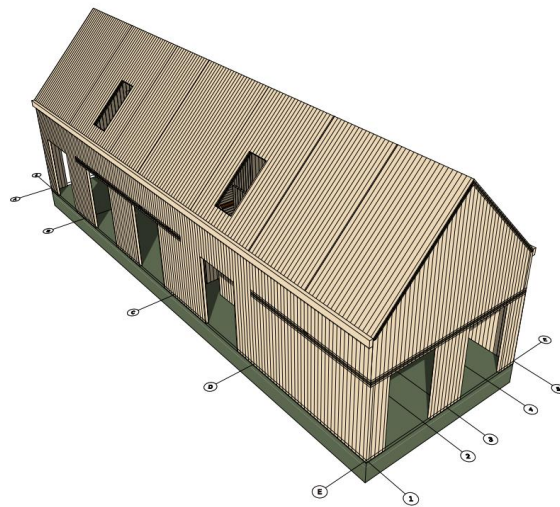
De inhoud van dit rapport bestaat uit een samenvatting van het constructief ontwerp tot en met de Definitief Ontwerp (DO) fase. Hierin worden de uitgangspunten, welke ten grondslag liggen aan het constructief ontwerp, vastgesteld, worden de geldende belastingen op de hoofddraagconstructie bepaald vanuit de Europese normen met Nederlandse bijlagen en wordt de constructieve opzet met het principe van de stabiliteit beschreven. Voor uitwerking van de onderbouw wordt verwezen naar Bijlage 4.

## 1.2 Projectoverzicht

|                                            |                                       |
|--------------------------------------------|---------------------------------------|
| Onderdelen advies                          | Hoofddraagconstructie incl. onderbouw |
| Toegepaste onderleggers architect          | d.d. 04-03-2021                       |
| Toegepaste onderleggers adviseur onderbouw | -                                     |
| Toegepaste onderleggers installateur       | -                                     |
| Toegepaste onderleggers bouwfysicus        | -                                     |

## 1.3 Algemene projectgegevens

Het project bestaat uit een vrijstaande CLT woning waarvan twee identieke woningen worden gerealiseerd aan de Hamerveldseweg 82-84, te Leusden. De woning heeft twee bouwlagen welke geplaatst worden op een betonvloer op zand met een vorstrand.



## 2. Ontwerputgangspunten

Een overzicht van de ontwerputgangspunten en de belastingen is weergegeven in Bijlage 1.

### 2.1 Overzicht

|                             |                                  |
|-----------------------------|----------------------------------|
| Gebouwclassificatie volgens | NEN-EN 1990:2002                 |
| Ontwerplevensduurklasse     | 3                                |
| Ontwerplevensduur           | 50 jaar                          |
| Gevolgklasse                | CC1 (Tabel B1, NEN-EN 1990:2002) |
| Betrouwbaarheidsklasse      | RC1                              |
| $K_{FI}$ factor             | 0,9                              |

### 2.2 Bruikbaarheidscriteria

|                                     |                                                                                                                                          |
|-------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------|
| Doorbuiging vloeren                 | $U_3 \leq 0,003L$ (bijkomende doorbuiging)<br>$U_{eind} \leq 0,004L$ (uiteindelijke doorbuiging)                                         |
| Doorbuiging daken                   | $U_3 \leq 0,004L$ (bijkomende doorbuiging)<br>$U_{eind} \leq 0,004L$ (uiteindelijke doorbuiging)                                         |
| Trillingen vloeren                  | Eigenfrequentie; $f_1 \geq 8,0$ Hz.<br>Als $f_1 < 8,0$ Hz. geldt een maximale verticale versnelling $a_{rms} \leq 0,05$ m/s <sup>2</sup> |
| Vloerdoorbuiging door puntlast 1 kN | max. 1,0 mm                                                                                                                              |
| Horizontale vervorming              | max. $h/300$ (voor één verdieping) / $H/500$ (voor hele constructie)                                                                     |

### 2.3 Belastingcombinaties

De volgende belastingcombinaties conform NEN-EN 1990:2002 zijn van toepassing op de constructieve berekeningen van de houten hoofdconstructie:

#### 2.3.1 Uiterste grenstoestand (inclusief $K_{FI}$ factor 0,9)

|                 |                                                                                                                      |
|-----------------|----------------------------------------------------------------------------------------------------------------------|
| EQU verg. 6.10  | $1,1G_k + 1,5Q_{k,1} + 1,5\Psi_{0,i}Q_{k,i}$ (ongunstig) /<br>$0,9G_k + 1,5Q_{k,1} + 1,5\Psi_{0,i}Q_{k,i}$ (gunstig) |
| STR verg. 6.10a | $1,35G_k + 1,5\Psi_{0,i}Q_{k,i}$ (ongunstig) / $0,9G_k + 1,5\Psi_{0,i}Q_{k,i}$ (gunstig)                             |
| STR verg. 6.10b | $1,2G_k + 1,5Q_{k,1} + 1,5\Psi_{0,i}Q_{k,i}$ (ongunstig) / $0,9G_k + 1,5Q_{k,1} + 1,5\Psi_{0,i}Q_{k,i}$ (gunstig)    |

### 2.3.2 Bruikbaarheidsgrenstoestand

|                                                  |                                                    |
|--------------------------------------------------|----------------------------------------------------|
| Karakteristieke belastingcombinaties verg. 6.14b | $1,0G_k+1,0Q_{k,1}+1,0\Psi_{0,i}Q_{k,i}$           |
| Frequente belastingcombinatie verg. 6.15b        | $1,0G_k+1,0\Psi_{1,1}Q_{k,1}+1,0\Psi_{2,i}Q_{k,i}$ |
| Quasi-blijvende belastingcombinatie verg. 6.16b  | $1,0G_k+1,0\Psi_{2,i}Q_{k,i}$                      |

### 2.3.3 Buitengewone ontwerpsituaties

|                                                 |                                                           |
|-------------------------------------------------|-----------------------------------------------------------|
| Belastingcombinatie brandsituatie verg. 6.11a/b | $1,0G_k+1,0A_d+1,0\Psi_{1,1}Q_{k,1}+1,0\Psi_{2,i}Q_{k,i}$ |
|-------------------------------------------------|-----------------------------------------------------------|

### 2.3.4 $\Psi$ -factoren

Conform Tabel A1.1 in NEN-EN 1990+A1+A1/C2.

## 2.4 Toegepaste normen

De constructieve berekeningen zijn gebaseerd op de volgende Europese normen inclusief Nederlandse nationale bijlagen:

|                                                         |             |
|---------------------------------------------------------|-------------|
| Eurocode 0 – Grondslagen van het constructief ontwerp   | NEN-EN 1990 |
| Eurocode 1 – Belastingen op constructies                | NEN-EN 1991 |
| Eurocode 5 – Ontwerp en berekening van houtconstructies | NEN-EN 1995 |

## 2.5 Materialen

CLT (kruislings verlijmde houten) elementen;

|              |     |
|--------------|-----|
| - Langslagen | C24 |
| - Dwarslagen | C24 |

|                                     |       |
|-------------------------------------|-------|
| Gelamineerde houten elementen (GLT) | GL28h |
|-------------------------------------|-------|

|                       |            |
|-----------------------|------------|
| Leverancier CLT + GLT | Stora Enso |
|-----------------------|------------|

## 2.6 Eurocode 5

|                                                            |                                                                                                                        |
|------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------|
| Toegepaste Europese norm en Nederlandse bijlage:           | NEN-EN 1995-1-1+C1+A1                                                                                                  |
| Kruipvervormingsfactor CLT/GLT; $k_{def}$                  | 0,8                                                                                                                    |
| Partiële factor materiaaleigenschappen CLT/GLT; $\gamma_M$ | 1,25                                                                                                                   |
| Partiële factor materiaaleigenschappen C24; $\gamma_M$     | 1,30                                                                                                                   |
| Klimaatklasse                                              | 1                                                                                                                      |
| Belastingduurklassen                                       | Blijvend: permanente belastingen<br>Middellang: opgelegde vloerbelasting<br>Kort: opgelegde dakbelasting, sneeuw, wind |

## 2.7 Rekenprogramma's

Voor berekening van 2D elementen wordt gebruik gemaakt van 'Statcon Structures Post and Beam' van Elecosoft en Excelbladen. Daarnaast worden 3D situaties geanalyseerd in het EEM-programma 'RFEM 5'.

## 2.8 Brandwerendheid hoofddraagconstructie

|                                   |        |
|-----------------------------------|--------|
| Type gebouw                       | woning |
| Brandeis hoofddraagconstructie; R | geen   |

### 2.8.1 Brandwerendheid CLT

|                           |                                            |
|---------------------------|--------------------------------------------|
| Methode inbrandberekening | cf. CLT leverancier / 0,65 cq. 1,30 mm/min |
|---------------------------|--------------------------------------------|

De inbrandsnelheid van CLT is afhankelijk van de dikte van de lagen en eventuele afwerkingen zoals gipsplaat. Als basis geldt een inbrandsnelheid van 0,65 mm per minuut waarbij bij het bereiken van een volgende laag rekening dient te worden gehouden met een dubbele inbrandsnelheid over de eerste 25 mm in deze volgende laag. De 'nul-sterktedikte',  $d_0$ , bedraagt standaard 7 mm, waarbij rekening dient te worden gehouden met het feit dat de dwarslagen van het CLT geen draagkracht genereren. Er geldt een minimumdikte van 3 mm van een langslaag om nog draagkracht toe te kunnen wijzen. Daarnaast dient het netto-element na het verstrijken van de minimum brandtijdeis nog uit minimaal drie lagen te bestaan.

## 2.9 Stalen componenten en verbindingsmiddelen

|                                                    |                                                                      |
|----------------------------------------------------|----------------------------------------------------------------------|
| Corrosieklasse                                     | C2 voor stalen verbindingen aan buitenzijde houten casco, overige C1 |
| Bescherming van verbindingsmiddelen tegen corrosie | cf. Tabel 4.1 in NEN-EN 1995-1-1+C1+A1                               |
| Uitvoeringsklasse stalen componenten               | EXC2                                                                 |

### 3. Belastingen

#### 3.1 Permanente belastingen

##### 3.1.1 Materialen

|                               |                        |
|-------------------------------|------------------------|
| CLT elementen; C24/C24        | 500 kg/m <sup>3</sup>  |
| Gelamineerde elementen; GL28h | 500 kg/m <sup>3</sup>  |
| Staal; s235JR                 | 7800 kg/m <sup>3</sup> |
| Gezaagd hout C24              | 500 kg/m <sup>3</sup>  |

##### 3.1.2 Bouwdelen

Belastingen exclusief CLT / gelamineerd hout

|                                                                              |                        |
|------------------------------------------------------------------------------|------------------------|
| Begane grondvloer; vloerafwerking, cementdekvloer, isolatie                  | 2,00 kN/m <sup>2</sup> |
| Verdiepingsvloer; vloerafwerking, cement dekvloer, isolatie, installaties    | 1,67 kN/m <sup>2</sup> |
| Dak; PV panelen (mechanisch bevestigd), dakafwerking, isolatie, installaties | 0,48 kN/m <sup>2</sup> |
| Buitenwanden; isolatie, gevel                                                | 0,20 kN/m <sup>2</sup> |
| CLT Binnenwanden; gipsplaat (2x), of gipsplaat en tegels (1x)                | 0,20 kN/m <sup>2</sup> |
| Puien/kozijnen (gewicht per m <sup>2</sup> pui/kozijn)                       | 0,70 kN/m <sup>2</sup> |
| Trappen (gewicht per m <sup>2</sup> vloer)                                   | 1,20 kN/m <sup>2</sup> |

#### 3.2 Opgelegde belastingen

|                                                                                                                                           |                        |
|-------------------------------------------------------------------------------------------------------------------------------------------|------------------------|
| Gelijkmatig verdeelde vloerbelasting; $q_k$ (klasse A-vloeren), Tabel 6.2 in NEN-EN 1991)                                                 | 1,75 kN/m <sup>2</sup> |
| Geconcentreerde vloerbelasting; $Q_k$ (klasse A-vloeren), Tabel 6.2 in NEN-EN 1991)                                                       | 3,0 kN                 |
| Eigen gewicht niet-dragende binnenwanden (alleen begane grond); $q_k$                                                                     | 1,20 kN/m <sup>2</sup> |
| Gelijkmatig verdeelde vloerbelasting; $q_k$ (klasse A-balkons), Tabel 6.2 in NEN-EN 1991)                                                 | 2,50 kN/m <sup>2</sup> |
| Geconcentreerde vloerbelasting; $Q_k$ (klasse A-balkons), Tabel 6.2 in NEN-EN 1991)                                                       | 3,0 kN                 |
| Gelijkmatig verdeelde dakbelasting; $q_k$ (klasse H, 46°, Tabel 6.10 in NEN-EN 1991)<br>Werkend op max. 10 m <sup>2</sup> per dakelement. | 0 kN/m <sup>2</sup>    |
| Geconcentreerde dakbelasting; $Q_k$ (klasse H, Tabel 6.10 in NEN-EN 1991)                                                                 | 1,5 kN                 |
| Opgelegde horizontale belastingen op vloerafscheidingen; $q_{rep}$ (Tabel NB.6 in NEN-EN 1991)                                            | 0,30 kN/m <sup>1</sup> |
| Opgelegde horizontale belastingen op vloerafscheidingen; $F_{rep}$                                                                        | 0,50 kN                |

(Tabel NB.6 in NEN-EN 1991)

### 3.2.1 Toepassing opgelegde vloerbelastingen

Opgelegde vloer- en balkonbelastingen (klasse A) treden gelijktijdig op.

Bij belasting op meer dan twee bouwlagen, twee bouwlagen met grootste belastingeffect vol belast, overige bouwlagen geldt  $\Psi_{0,i} Q_{i,k}$  (ongunstig) (m.u.v. vloeren klasse C5).

Schaakbord-verdeling opgelegde vloer- en dakbelastingen aanhouden.

## 3.3 Sneeuwbelasting

|                                             |                           |
|---------------------------------------------|---------------------------|
| Karakteristieke sneeuwbelasting; $s_k$      | 0,70 kN/m <sup>2</sup>    |
| Sneeuwbelasting op daken ( $C_e=C_t=1,0$ )  | $s=\mu_i C_e C_t s_k$     |
| Sneeuwbelastingvormcoëfficiënt dak; $\mu_i$ | 0,8                       |
| Karakteristieke sneeuwbelasting dak; $s$    | 0,56 kN/m <sup>2</sup>    |
| Sneeuwophoping dak; $\mu_i$                 | cf. 5.3.6 NEN-EN 1991-1-3 |

## 3.4 Wateraccumulatie

Noodafvoeren aan te brengen ter plaatse van balkons en daken zodat maximaal 5 cm water op de balkons/daken blijft staan. Berekening grootte en plaatsing van noodafvoeren conform hoofdstuk 7 van NEN-EN 1991-1-3.

## 3.5 Windbelasting

|                                               |                                                                             |
|-----------------------------------------------|-----------------------------------------------------------------------------|
| Windkrachten op de constructie; $F_w$         | $C_s C_d C_r Q_p(z_e) A_{ref}$                                              |
| Bouwwerkfactor; $C_s C_d$                     | 1,0                                                                         |
| Krachtcoëfficiënt; $C_r$                      | conform h.7+8 in NEN-EN 1991-1-4.                                           |
| Extreme stuwdruk op hoogte $z_e$ ; $q_p(z_e)$ | 0,51 kN/m <sup>2</sup> (op referentiehoogte 8,1 m), Windgebied III, bebouwd |

## 3.6 Bijzondere belastingen

Niet van toepassing.

## 3.7 Voortschrijdende instorting en robuustheid

|                                                     |            |
|-----------------------------------------------------|------------|
| Gevolgklasse (Bijlage A.3, NEN-EN 1991-1-7)         | CC1        |
| Type ontwerpstrategie cf. NEN-EN 1991-1-7 Bijlage A | Geen eisen |

Ondanks dat er voor het constructief ontwerp geen eisen gelden ten behoeve van het tegengaan van voortschrijdende instorting wordt de robuustheid in ogenschouw genomen bij ontwerpkeuzes zoals:

- Vloer- en dakoverspanningen met betrekking tot velden en ondersteuningen;
- Opdeling van CLT elementen;
- Tweede draagwegen;
- Koppelen van elementen en constructieve detaillering.

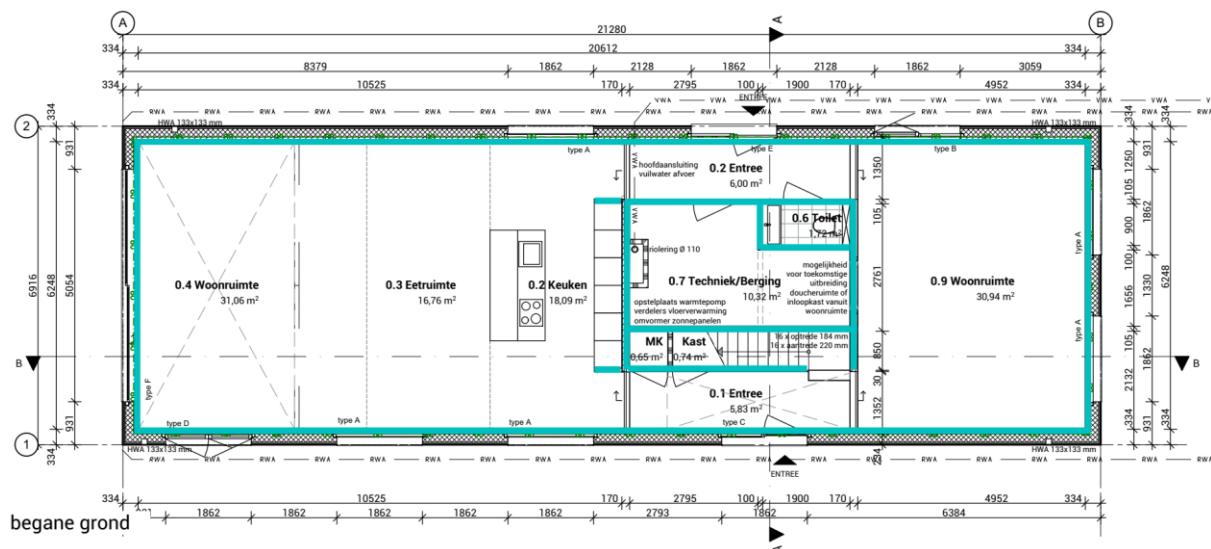
## 4. Constructief ontwerp

### 4.1 Planindeling

De uitwerking van de bovenbouw van de woning is terug te vinden op de tekeningenserie DO.100 en DO.200.

### 4.2 Stabiliteit

De stabiliteit van de woning wordt verzorgd door de CLT wanden. Iedere CLT wand heeft zowel een rol voor horizontale – als verticale krachtenafdracht. De CLT vloeren en – daken zorgen voor schijfwerking in de vloeren en daken daarmee distributie van de horizontale belastingen naar de CLT wanden. De krachtswerking in de wanden zorgt voor reactiekrachten in horizontale richting, een verticaal oploftende kracht aan de loefzijde – en een verticale neerwaartse kracht aan de lijzijde van de betreffende windrichting. Figuur 4.1 t/m 4.2 tonen de stabiliteitswanden op de begane grondvloer.



Figuur 4.1; Stabiliteitswanden begane grond

### 4.3 Verticale belastingafdracht

Verticale belastingen worden afgedragen naar de begane grondvloer middels de CLT vloeren en – daken via de CLT wanden. Overspanningsrichtingen van de vloeren en daken als ook de positionering van de verticale constructie-onderdelen zoals CLT wanden en GLT balken zijn weergegeven op tekening DO.100.

Een gelamineerde houten balk (GLT) wordt toegepast boven de kopgevelsparing op stramien A ten behoeve van krachtenafdracht van de bovenstaande gevel en dak.

De CLT hellende dakelementen dragen af in de hellende richting van de daken.

### 4.4 Constructieve dikten

#### 4.4.1 CLT en prefab onderdelen

Buitenwanden

100-5s (20 – 20 – 20 – 20 – 20)

|                 |                                            |
|-----------------|--------------------------------------------|
| Binnenwanden    | 80-3s (20 – 40 – 20)                       |
| Binnenwand vide | 100-5s (20 – 20 – 20 – 20 – 20)            |
| Vloeren         | 220-7s2 (30 – 30 – 30 – 40 – 30 – 30 – 30) |
| Hellende daken  | 120-5s (30 – 20 – 20 – 20 – 30)            |

## 5. Gewichtsberekening

De gewichtsberekening van de hoofddraagconstructie (bovenbouw) is uitgevoerd in het Eindige Elementenprogramma RFEM 5. Dit betekent dat de hoofddraagconstructie gemodelleerd wordt in 3D en geldende belastingen volgens hoofdstuk 3 op de constructieve onderdelen ingevoerd worden.

Modellering wordt gedaan met orthotropische elementen voor CLT en balkelementen voor gelamineerde houten onderdelen. Steunpunten voor de dragende wanden bestaan uit scharnierende lijnondersteuning. Belastingen gelden voor de constructie boven de begane grondvloer en zijn exclusief belastingen direct op de begane grondvloer anders dan vanuit de hoofddraagconstructie van de bovenbouw.

De resultaten zijn samengevat op de tekening DO.1100 en DO.1101. Een uitdraai van de berekening in RFEM 5 is weergegeven in Bijlage 3.

## 6. Stabiliteitsberekening

### 6.1 Ontwerp

Het stabiliteitsprincipe van de woning is uitgelegd in paragraaf 4.2 waar tevens aangegeven is welke wanden onderdeel uitmaken van het stabiliteitsstelsel. Resultaten van de krachten die optreden vanuit de stabiliteit zijn weergegeven op de tekeningen van de gewichtsberekening DO.1100 en DO.1101. Bijlage 3 toont de volledige gewichtsberekening.

De oploftende krachtcomponent wordt, waar aangrenzende dragende wanden ter plaatse van de krachtcomponent aanwezig zijn, gereduceerd door het eigen gewicht van deze aangrenzende wand. Distributie van deze krachten wordt mogelijk gemaakt door de verbindingen in deze aansluiting te dimensioneren voor de te overbrengende krachten (valt buiten bestek van dit rapport).

### 6.2 Controle op verticale krachten

De maximale verticale drukkracht (karakteristiek) vanuit windstabiliteit bevindt zich in W8 (19 kN). Controle van een 1,0 meter breed wandelement wordt uitgevoerd in Excel. Totale rekenwaarde van de verticale belasting in het gecontroleerde wandgedeelte in belastingcombinatie 12 geeft: 34 kN. De Unity Check resulteert in  $14 \% < 100 \%$  (zie Bijlage 2). Akkoord.

Verticale liftkrachten treden op aan de loefzijde van de beschouwde windrichting. Maximale liftkracht treedt eveneens op ter plaatse van W8 -8 kN (karakteristiek) (W10 is karakteristiek hoger, maar rekenwaarde is lager). De rekenwaarde van de liftkracht (verg. 6.10) bedraagt -16 kN. De liftkrachten worden gedistribueerd naar de begane grondvloer met behulp van hoekankers (zie Bijlage 2).

## 7. Dimensionering wanden

Voor iedere CLT dikte voor de wanden wordt aan de hand van de grootste rekenwaarde van verticale krachten een knikcontrole uitgevoerd, te weten:

- CLT 80-3s;
- CLT 100-5s.

### 7.1 CLT 80-3s

Maximale rekenwaarde van de verticaalkracht over een wandlengte van 1,0 meter treedt op ter plaatse van W8. Belastingcombinatie 12 is maatgevend ( $F_{Ed,max} = 34 \text{ kN}$ ), zie tevens paragraaf 7.2. Akkoord.

### 7.2 CLT 100-5s

Hoogst belaste wand bevindt zich ter plaatse van de langsgevel, W6b, over een wandlengte van 1,0 meter;  $F_{Ed,max} = 45 \text{ kN}$ .

Een gelijkmatig verdeelde belasting in de horizontale richting (loodrecht t.o.v. de wandlengte) ontstaat door winddrukzone A. Gerekend wordt met een belasting van  $q_{w,k} = 0,77 \text{ kN/m}^2$  en een werkende lastbreedte van 2,0 meter.

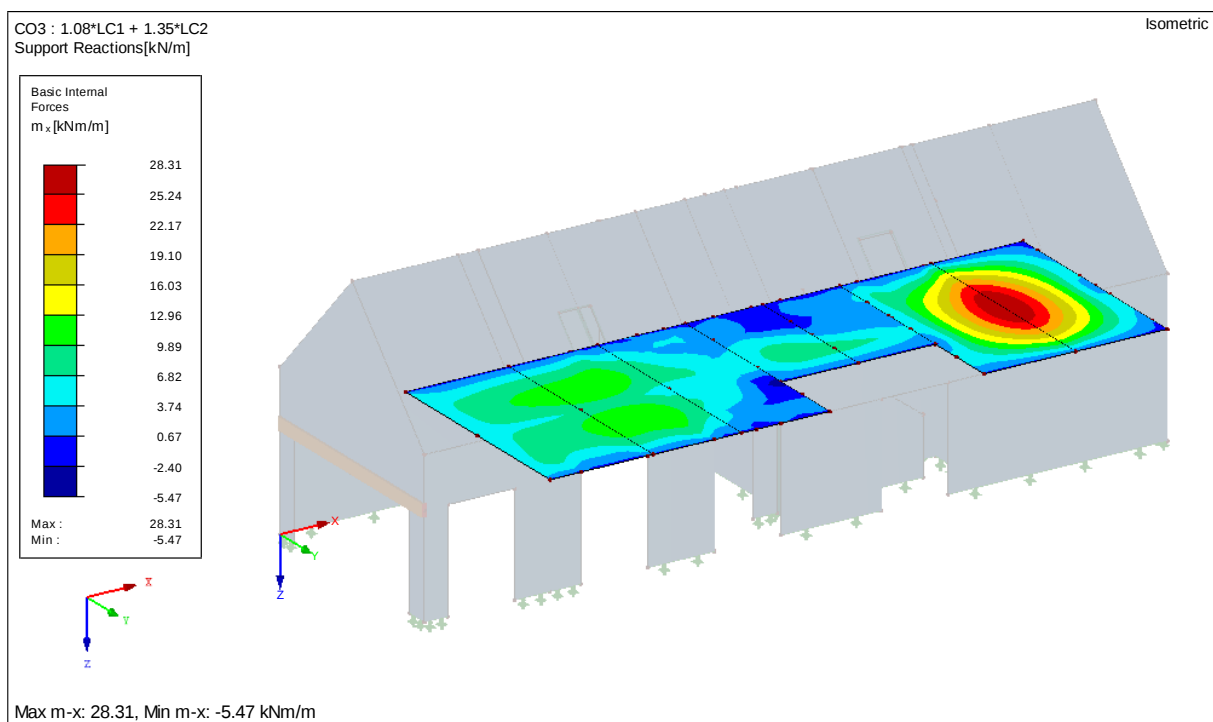
Knikcontrole met een puntlast van 45 kN en een wandbreedte van 1,0 meter geeft een Unity Check van 44% (zie Bijlage 2). Akkoord.

## 8. Dimensionering vloeren

De CLT 220-7s2 vloeren overspannen in de dwarsrichting van de woning met een lengte van ca 6,35 meter. Voor een overzicht van vloerindeling zie tekening DO.100.

### 8.1 Uiterste grenstoestand

De eerste verdiepingsvloer 220-7s2 wordt gecontroleerd op buigspanningen en afschuiving via een Excel berekeningsblad. Omdat de vloer tevens belast wordt door dragende binnenwanden op de eerste verdieping wordt de momentenverdeling gecontroleerd in het RFEM 5 model. Hieruit blijkt (zie Figuur 8.1) dat de grootste momenten niet optreden ter plaatse van de dragende binnenwanden maar in het vrije veld tussen stramien D en E. Dit betekent dat bijvoorbeeld de binnenwand welke direct onder de daknok staat op stramien 3-B/C als een balk fungeert tussen de oplegging op de wand van de begane grond op stramien C en de binnenwand op de eerste verdieping op stramien B (zie tevens hoofdstuk 11 voor aandachtspunten in het technisch ontwerp). Maximale Unity Check bedraagt 24% (buigspanningen), zie Bijlage 2. Akkoord.



Figuur 8.1; Momentenverdeling eerste verdiepingsvloer in de ULS

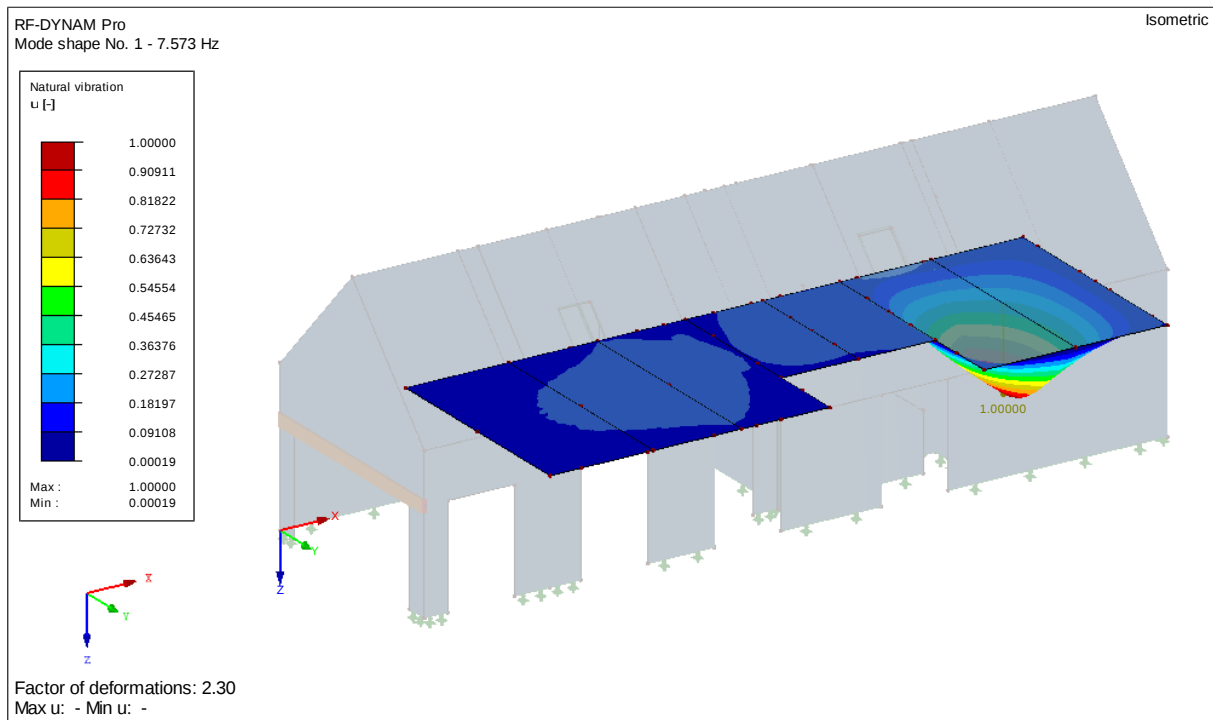
### 8.2 Bruikbaarheidsgrenstoestand

De vloer wordt eveneens in de bruikbaarheidsgrenstoestand gecontroleerd op de bruikbaarheidseisen gesteld in paragraaf 2.2. De resultaten zijn als volgt voor de verdiepingsvloer welke maatgevend is (zie ook Bijlage 2):

|                                              |                                  |
|----------------------------------------------|----------------------------------|
| Bijkomende doorbuiging; $U_3$                | 7 mm = 0,001L ( $\leq 0,003L$ )  |
| Uiteindelijke doorbuiging; $U_{\text{eind}}$ | 18 mm = 0,003L ( $\leq 0,004L$ ) |
| Eigenfrequentie; $f_1$                       | 6,8 Hz. (< 8,0 Hz.)              |
| Max versnelling; $a_{\text{rms}}$            | 0,027 m/s <sup>2</sup>           |

Vloerdoorbuiging door puntlast 1 kN      max. 0,65 mm ( $\leq 1,0$  mm)

Ondanks dat de eigenfrequentie lager is dan de gestelde eis voldoen zowel de doorbuigingen als de maximale verticale versnellingen aan de gestelde eis. De reden voor de lage eigenfrequentie is de relatief hoge permanente belasting op de CLT vloer. Controle van de eigenfrequentie in het RFEM 5 model resulteert in de in Figuur 8.2 getoonde resultaat.



Figuur 8.2; Eerste eigenfrequentie van de eerste verdiepingsvloer

De hogere eigenfrequentie resulteert uit het verstijfende effect van de vloer in de dwarsrichting van de hoofdo overspanning.

Vanuit deze resultaten kan geconcludeerd worden dat de CLT vloerdikte voldoet aan het gewenste comfortniveau.

## 9. Dimensionering daken

De daken bestaan uit CLT 120-5s elementen. De dakhelling bedraagt 46°. In het dak komen dakramen voor met een afmeting van 1,33 x 2,20 meter (bxh). Voor een overzicht zie tekening DO.100.

### 9.1 CLT 120-5s

#### 9.1.1 Uiterste grenstoestand

2D-Berekening van een 1,0 meter dakelement resulteert in een maximale Unity Check van 18% (zie Bijlage 2). Echter maatgevend voor de berekening zijn de dakelementen welke tevens een daksparring hebben. Gerekend wordt met een 1,0 meter breed dakelement en een lastbreedte van  $(1,0 + 1,33/2 =) 1,67$  meter. Dit resulteert in een Unity Check van 32% (zie Bijlage 2). Akkoord.

Horizontale spatkrachten vanuit de dakelementen worden direct overgedragen naar de dwarswanden (gevels en binnenwanden parallel met de letterassen). Ieder dakelement heeft namelijk een directe verbinding met één van deze wanden, waardoor de horizontale krachtencomponent in de dakvoet niet voorkomt.

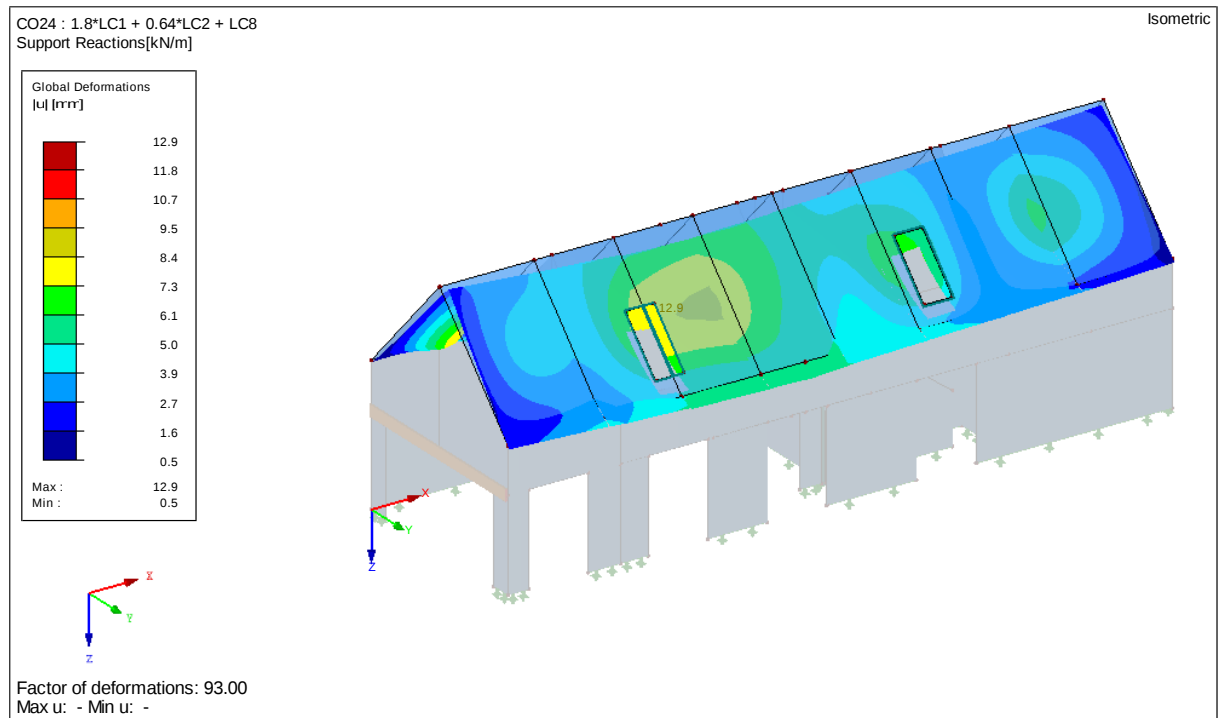
#### 9.1.2 Bruikbaarheidsgrenstoestand

Bovenstaande situatie wordt tevens gecontroleerd voor de doorbuigingseisen gesteld in paragraaf 2.2 (zie Bijlage 2). De resultaten voor met – of zonder dakraamsparring zijn:

Bijkomende doorbuiging;  $U_3$                                        $8 / 5 \text{ mm} = 0,002L / 0,001L (< 0,004L)$

Uiteindelijke doorbuiging;  $U_{\text{eind}}$                                        $22 / 13 \text{ mm} = 0,005L / 0,003L (> 0,004L / < 0,004L)$

De uiteindelijke doorbuiging van het dakelement inclusief dakraamsparring voldoet niet aan de gestelde eisen. De situatie wordt in 3D bekeken in het RFEM 5 model. Figuur 9.1 toont de maatgevende quasi-permanente dakdoorbuigingen.

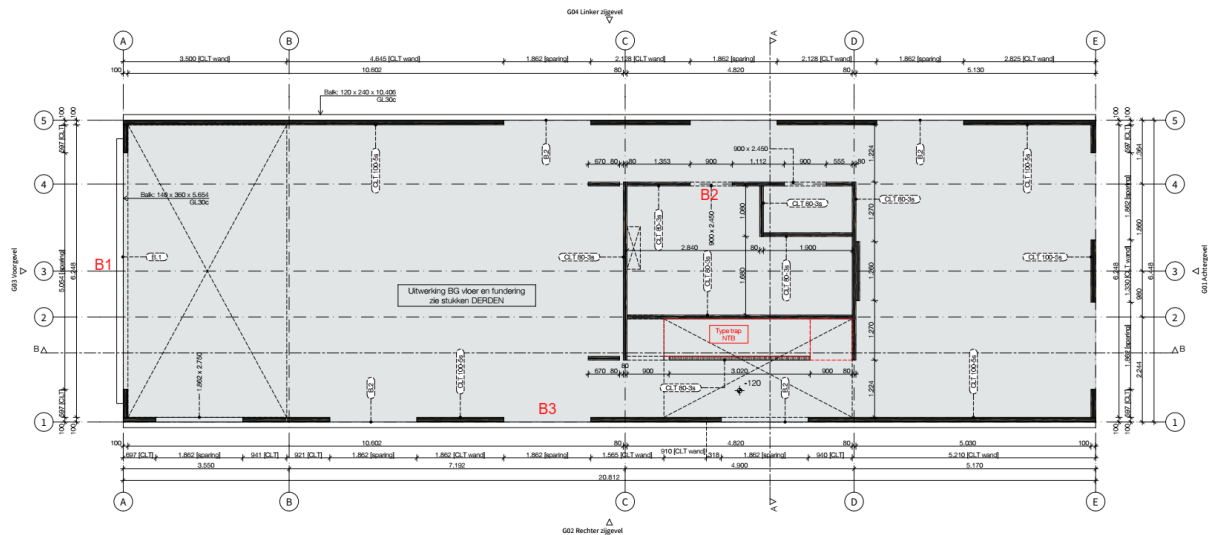


*Figuur 9.1; Quasi-permanente dakdoorbuigingen*

Deze liggen in lijn met de 2D berekening van een dakelement zonder daksparring. Hiermee kan worden geconcludeerd dat de dakconstructie met CLT 120-5s voldoet aan de gestelde eisen.

## 10. Dimensionering balken en kolommen

Balkconstructies komen voor in de hoofdconstructie in verschillende vormen; zowel CLT als GLT. Figuur 10.1 toont drie balken welke worden gedimensioneerd.



Figuur 10.1: Locaties van balkconstructies maatgevend in het ontwerp

### 10.1 Uiterste grenstoestand

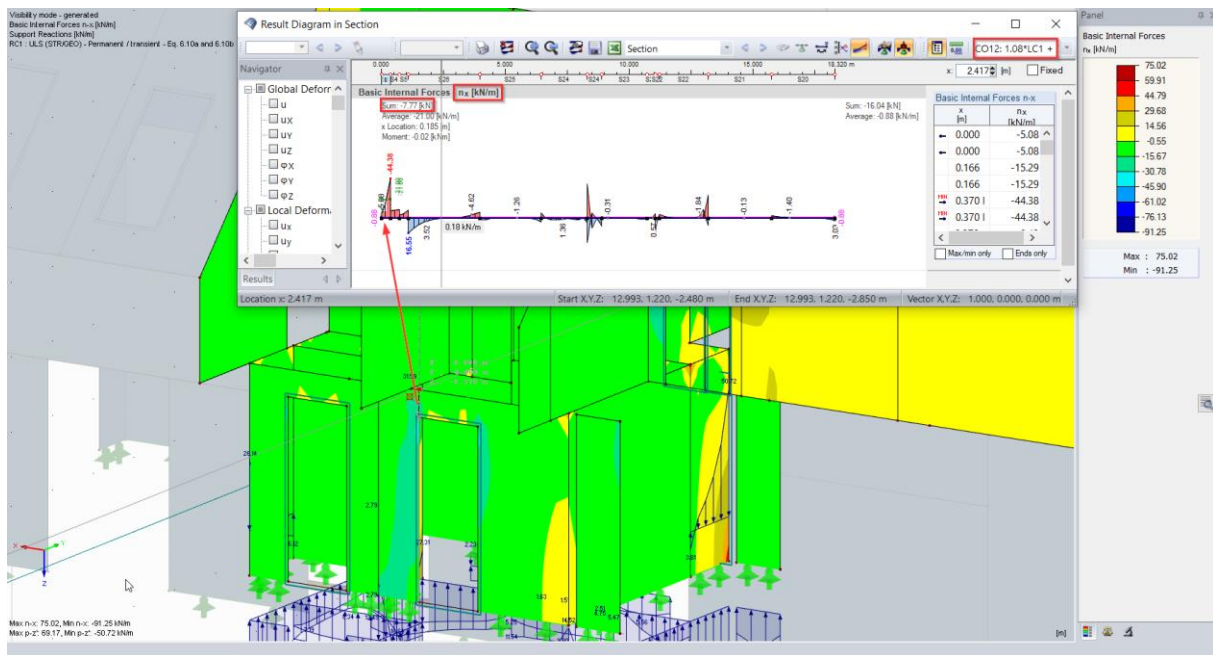
**B1** wordt verticaal belast door bovenliggend wand en dak als ook horizontaal belast vanuit windbelasting. Reken met 1,0 meter lastbreedte voor verticale belasting van het dak en 3,5 meter lastbreedte voor de horizontale windbelasting in zone A. De berekening wordt uitgevoerd in Statcon Structures. Maximale Unity Check ligt op 54% (biaxiale buiging) (zie Bijlage 2). Akkoord.

**B2** bestaat uit een wandbalk boven een deursparing in de CLT 80-3s binnenwand op stramien 4. De hoogte boven de deur tot onderzijde verdiepingvloer bedraagt 300 mm en de deurbreedte is ca 1,0 meter. Verticale belasting komt uit een combinatie van dak, binnenwanden eerste verdieping en eerste verdiepingvloer. De verticale oplegreactie wordt verkregen vanuit het RFEM 5 model. Maatgevende belastingcombinatie 12 resulteert in  $V_{Ed} = 8 \text{ kN}$  (zie Figuur 10.2).

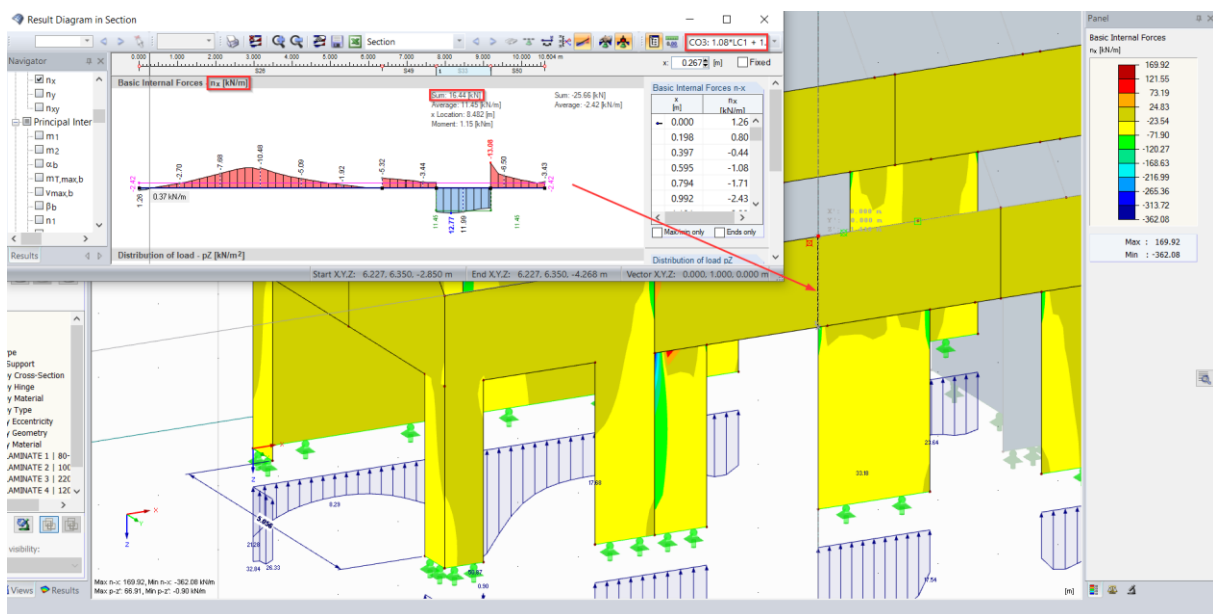
De berekening wordt vervolgens uitgevoerd in Excel door de lastbreedte zo te kiezen dat de oplegreactie ca 8 kN bedraagt (zie Bijlage 2). Maximale Unity Check ligt op 75% (buiging) (zie Bijlage 2). Akkoord.

**B3** met een hoogte van 1,3 meter bevindt zich boven de gevelsparing op stramien 1 op de eerste verdieping. Dit betekent dat de eerste verdiepingvloer aan de wandbalk 100-5s wordt opgehangen. Daarnaast belast bovenliggend dak de balk. Net als bij B2 wordt de rekenwaarde van de oplegreactie verkregen uit het RFEM 5 model. Figuur 10.3 toont het resultaat.

Berekening in Excel resulteert in een Maximale Unity Check van 9% (afschuiving) (zie Bijlage 2). Akkoord.



Figuur 10.2; Verticale oplegreactie boven deursparing B2 in RFEM 5



Figuur 10.3; Verticale oplegreactie boven gevelsparing B3 in RFEM 5

## 10.2 Bruikbaarheidsgrenstoestand

De in de ULS gedimensioneerde balken zijn onderdeel van het vloersysteem, waar zowel de totale doorbuigingen als de totale eigenfrequentie dient te voldoen aan de eisen gesteld in paragraaf 2.2. De gehele vloerconstructie wordt gedimensioneerd in de bruikbaarheidsgrenstoestand in RFEM 5.

De resultaten zijn als volgt:

Bijkomende doorbuiging;  $U_3$   $7,4 \text{ mm} = 0,001L (\leq 0,003L)$

Uiteindelijke doorbuiging;  $U_{\text{eind}}$   $20,0 \text{ mm} = 0,003L (\leq 0,004L)$

Eigenfrequentie;  $f_{\text{tot}}$

7,6 Hz. (< 8,0 Hz.). Zie paragraaf 7.2. Akkoord.

De doorbuigingen voldoen aan de gestelde eisen. Akkoord.



## Bijlage 1 – Projectuitgangspunten en belastingen

Referentie nummer: Solid Timber  
2010-2

Project: Woonhuis - Hamerveldseweg  
Datum: 29-4-2021  
Onderwerp: uitgangspunten constructie  
Referenties: NEN-EN 1990 t/m NEN-EN 1995



#### Gebouw & locatie

|                          |                      |
|--------------------------|----------------------|
| Ontwerplevensduurklasse: | 3                    |
| Ontwerplevensduur:       | 50 jaar              |
| Gevolgklasse:            | CC1                  |
| Windgebied:              | III                  |
| Terreincategorie:        | III (bebouwd gebied) |

#### Permanente belastingen

Conform document "permanente belastingen".

#### Opgelegde vloerbelastingen

|                                                      |                                                     |
|------------------------------------------------------|-----------------------------------------------------|
| Klasse woonvloeren:                                  | A - vloeren                                         |
| $q_k$ [kN/m <sup>2</sup> ]:                          | 1,75                                                |
| Verplaatsbare scheidingswanden [kN/m <sup>2</sup> ]: | 1,20 (begane grondvloer)                            |
| Horizontale belastingen:                             | Balustrade trappen $q_k = 0,3$ kN/m, $F_k = 0,5$ kN |
| Klasse dakvloeren:                                   | H - daken                                           |
| $q_k$ [kN/m <sup>2</sup> ]:                          | 0,00                                                |

#### Bijzondere belastingen

|                      |        |
|----------------------|--------|
| Aanrijdbelasting:    | n.v.t. |
| Inwendige explosies: | n.v.t. |

#### Voortschrijdende instorting

|               |      |
|---------------|------|
| Gevolgklasse: | 1    |
| Ontwerp:      | Geen |

#### Brand

|                                       |      |
|---------------------------------------|------|
| Classificatie hoofddraagconstructie:* | Geen |
|---------------------------------------|------|

\* Ter controle en bevestiging vanuit bouwfysicus/hoofdconstructeur

Referentie nummer: Solid Timber  
2010-2

Project: Woonhuis - Hamerveldseweg  
Datum: 29-4-2021  
Onderwerp: permanente belastingen



| Bouwdeel                  | Dikte [mm] | Gewicht [kg/m <sup>2</sup> ] |
|---------------------------|------------|------------------------------|
| <i>Begane grondvloer</i>  |            |                              |
| Vloerafwerking            | 18         | 24,0                         |
| Cementdekvloer            | 70         | 175,0                        |
| Isolatie                  | 50         | 0,3                          |
| <b>Betonvloer op zand</b> | <b>180</b> | <b>450,0</b>                 |
| Isolatie                  | 120        | 0,6                          |
| <b>Totaal excl. beton</b> | <b>258</b> | <b>200</b>                   |
| <b>Totaal incl. beton</b> | <b>438</b> | <b>650</b>                   |

|                         |            |              |
|-------------------------|------------|--------------|
| <i>Verdiepingsvloer</i> |            |              |
| Vloerafwerking          | 18         | 10,0         |
| Cementdekvloer          | 70         | 154,0        |
| Isolatie                | 50         | 0,3          |
| <b>CLT 220-L7s-2</b>    | <b>220</b> | <b>104,5</b> |
| Installaties            | -          | 3,0          |
| <b>Totaal excl. CLT</b> | <b>138</b> | <b>167</b>   |
| <b>Totaal incl. CLT</b> | <b>358</b> | <b>272</b>   |

|                         |            |             |
|-------------------------|------------|-------------|
| <i>Dak</i>              |            |             |
| PV-panelen              | -          | 25,0        |
| Dakafwerking            | 54         | 15,0        |
| Isolatie                | 160        | 4,8         |
| <b>CLT 120-5s</b>       | <b>120</b> | <b>57,0</b> |
| Installaties            | -          | 3,0         |
| <b>Totaal excl. CLT</b> | <b>214</b> | <b>48</b>   |
| <b>Totaal incl. CLT</b> | <b>334</b> | <b>105</b>  |

|                         |            |             |
|-------------------------|------------|-------------|
| <i>Wanden - gevel</i>   |            |             |
| Gevelafwerking          | 54         | 15,0        |
| Isolatie                | 180        | 5,4         |
| <b>CLT 100-5s</b>       | <b>100</b> | <b>47,5</b> |
| <b>Totaal excl. CLT</b> | <b>234</b> | <b>20</b>   |
| <b>Totaal incl. CLT</b> | <b>334</b> | <b>68</b>   |

|                               |            |             |
|-------------------------------|------------|-------------|
| <i>Wanden - interieur CLT</i> |            |             |
| Gipsplaat                     | 13         | 10,0        |
| <b>CLT 80-3s</b>              | <b>80</b>  | <b>38,0</b> |
| Gipsplaat                     | 13         | 10,0        |
| <b>Totaal excl. CLT</b>       | <b>26</b>  | <b>20</b>   |
| <b>Totaal incl. CLT</b>       | <b>106</b> | <b>58</b>   |

Referentie nummer: Solid Timber  
2010-2

Project: Woonhuis - Hamerveldseweg  
Datum: 29-4-2021  
Onderwerp: permanente belastingen



| Bouwdeel                  | Dikte [mm] | Gewicht [kg/m <sup>2</sup> ] |
|---------------------------|------------|------------------------------|
| <i>Begane grondvloer</i>  |            |                              |
| Vloerafwerking            | 18         | 24,0                         |
| Cementdekvloer            | 70         | 175,0                        |
| Isolatie                  | 50         | 0,3                          |
| <b>Betonvloer op zand</b> | <b>180</b> | <b>450,0</b>                 |
| Isolatie                  | 120        | 0,6                          |
| <b>Totaal excl. beton</b> | <b>258</b> | <b>200</b>                   |
| <b>Totaal incl. beton</b> | <b>438</b> | <b>650</b>                   |

|                                        |          |           |
|----------------------------------------|----------|-----------|
| <i>Puien, deuren en raamkozijnen</i>   |          |           |
| Gewicht per m <sup>2</sup> wandopening | -        | 70        |
| <b>Totaal</b>                          | <b>-</b> | <b>70</b> |



## Bijlage 2 – Statische berekening CLT en GLT

# CLT wand ULS

## W8 - stabiliteit

Project: Woonhuis - Hamerveldseweg  
Projectnummer: 2010-2  
Constructeur: BB

Printdatum: 29-4-2021  
Status: Definitief  
Opmerkingen:

### Geometrie

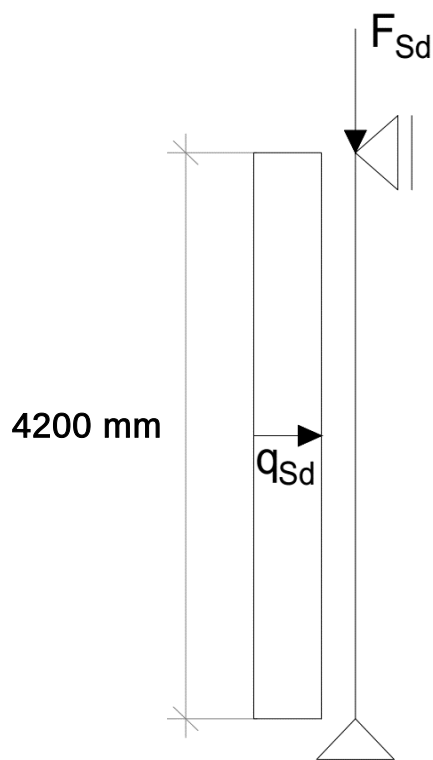
CLT element 80-3s  
b [mm] 1000  
h [mm] 4200

### Belastingen

$F_{Sd}$  [kN] 34  
 $q_{Sd}$  [kN/m] 0,00

### Randvoorwaarden

Belastingsduur Kort  
Klimaatklasse 1



### Resultaat

Unity Check 0,29

### Berekeningswaarden

$M_{Sd}$  0,00 [kN/m]  
 $k_{mod}$  0,9  
 $\lambda_y$  161,24  $\lambda_y \leq 150$   
 $\ell_{k,i}$  4200 [mm]  
 $i_{x,eff}$  26,05 [mm]  
 $I_{x,eff}$  4,07E+07 [mm<sup>4</sup>]

$W_{x,net}$  1050000 [mm<sup>3</sup>]  
 $A_{x,net}$  60000 [mm<sup>2</sup>]  
 $\lambda_{rel,y}$  2,73  
 $k_y$  4,36  
 $k_{c,y}$  0,13  
 $f_{c,0,d}$  15,12 [N/mm<sup>2</sup>]  
 $f_{m,d}$  17,28 [N/mm<sup>2</sup>]

# CLT wand ULS

## W6b - ULS

Project: Woonhuis - Hamerveldseweg  
Projectnummer: 2010-2  
Constructeur: BB

Printdatum: 29-4-2021  
Status: Definitief  
Opmerkingen:

### Geometrie

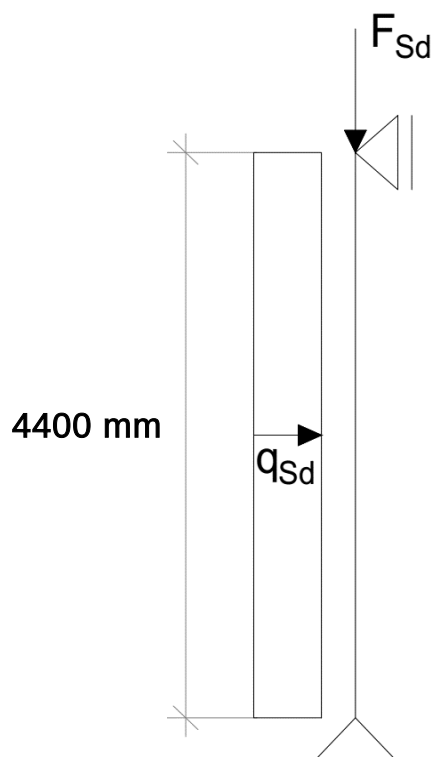
CLT element 100-5s  
b [mm] 1000  
h [mm] 4400

### Belastingen

$F_{Sd}$  [kN] 45  
 $q_{Sd}$  [kN/m] 1,54

### Randvoorwaarden

Belastingsduur Kort  
Klimaatklasse 1



### Resultaat

Unity Check 0,44

### Berekeningswaarden

$M_{Sd}$  3,73 [kN/m]  
 $k_{mod} =$  0,9  
 $\lambda_y =$  135,52  $\lambda_y \leq 150$   
 $\ell_{k,i} =$  4400 [mm]  
 $i_{x,eff} =$  32,47 [mm]  
 $I_{x,eff} =$  6,33E+07 [mm<sup>4</sup>]

$W_{x,net} =$  1320000 [mm<sup>3</sup>]  
 $A_{x,net} =$  60000 [mm<sup>2</sup>]  
 $\lambda_{rel,y} =$  2,30  
 $k_y =$  3,24  
 $k_{c,y} =$  0,18  
 $f_{c,0,d} =$  15,12 [N/mm<sup>2</sup>]  
 $f_{m,d} =$  17,28 [N/mm<sup>2</sup>]

**CLT vloer ULS**

Verdiepingsvloer 6,35m

Project:

Woonhuis - Hamersv

Printdatum:

2021-04-29

Projectnummer:

2010-2

Status:

Definitief

Constructeur:

BB

Opmerkingen:

**Geometrie**

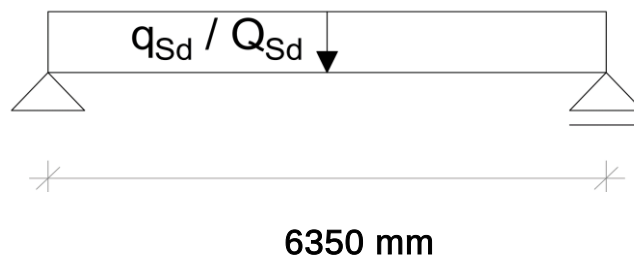
|                       |         |
|-----------------------|---------|
| CLT element           | 220-7s2 |
| Lamelrichting         | Langs   |
| Helling; $\alpha$ [°] | 0       |
| b [mm]                | 1000    |
| $l$ [mm]              | 6350    |

**Randvoorwaarden**

|               |     |
|---------------|-----|
| RC-klasse     | RC1 |
| Klimaatklasse | 1   |

**Belastingen**

|                                      |             |
|--------------------------------------|-------------|
| Lastbreedte; $b_l$ [mm]              | 1000        |
| Permanent; $q_{p,k}$ [kN/m²]         | 1,67        |
| Opgelegde belasting                  | A - vloeren |
| Opgelegd; $q_{o,k}$ [kN/m²]          | 1,75        |
| Opgelegd; $Q_{o,k}$ [kN]             | 3           |
| Scheidingswanden; $q_{o,k}$ [kN/m²]  | 0,00        |
| Sneeuwbelasting; $s_k$ [kN/m²]       | 0,70        |
| Vormcoëfficiënt; $\mu_i$             | 0,00        |
| Windbelasting dak; $q_{w,k}$ [kN/m²] | 0,80        |
| Vormfactor; $c_f$                    | 0,00        |

**Resultaat**Unity Check;  $\sigma_{b,0,d}/f_{m,0,d}$  0,24 OK!Unity Check;  $\tau_{R,d}/f_{v,d}$  0,22 OK!**Berekeningswaarden**

|               |                |                    |               |
|---------------|----------------|--------------------|---------------|
| $K_{FI}$ =    | 0,9            | $\sigma_{b,0,d}$ = | 3,63 [N/mm²]  |
| $k_{mod}$ =   | 0,8            | $f_{m,0,d}$ =      | 15,36 [N/mm²] |
| $I_x$ =       | 8,09E+08 [mm⁴] | $V_{min,d}$ =      | 7,76 [kN]     |
| $W_x$ =       | 7357576 [mm³]  | $V_{max,d}$ =      | 16,81 [kN]    |
| $SR_x$ =      | 4800000 [mm²]  | $\tau_{R,d}$ =     | 0,10 [N/mm²]  |
| $M_{min,d}$ = | 12,32 [kNm]    | $f_{v,d}$ =        | 0,45 [N/mm²]  |
| $M_{max,d}$ = | 26,69 [kNm]    |                    |               |

**CLT vloer SLS**

Verdiepingsvloer 6,35m

Project:

Woonhuis - Hamersv

Printdatum:

2021-04-29

Projectnummer:

2010-2

Status:

Definitief

Constructeur:

BB

Opmerkingen:

**Geometrie**

CLT element 220-7s2  
 Lamelrichting Langs  
 Helling;  $\alpha$  [°] 0  
 b [mm] 1000  
 $\ell$  [mm] 6350

**Randvoorwaarden**

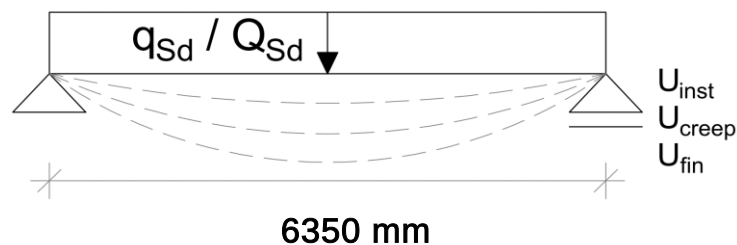
Klimaatklasse 1  
 Vervormingsfactor;  $k_{\text{def}}$  0,80

**Vervormingseisen**

$U_{\text{creep,tot}} \leq 0,003 \ell$  19,1 [mm]  
 $U_{\text{fin}} \leq 0,004 \ell$  25,4 [mm]

**Invoer trillingen**

Massa; m 271,5 [kg/m²]  
 Vloercategorie I  
 CLT oplegging twee zijden  
 Dempingsfactor;  $\xi$  0,040  
 Invloed elast. oplegging Nee

**Resultaat**

$U_{\text{creep,tot}} =$  0,0011  $\ell$  OK!  
 $U_{\text{fin}} =$  0,0029  $\ell$  OK!  
 $U_{1\text{kN}} \leq 1,0$  mm 0,65 [mm] OK!  
 $f_{\text{tot}} \geq 8,0$  Hz. 6,8 [Hz.] NIET OK!  
 Snelheidsresp;  $v \leq b^{(f_1 \xi - 1)}$  1,98E-09 [m/Ns²] OK!  
 Versnellingen;  $a_{\text{rms}}$  0,027 [m/s²] OK!

**Berekeningswaarden**

$E_{0,\text{mean}} =$  11000 [N/mm²]  $U_{1\text{kN}} =$  0,65 [mm]  
 $E_{90,\text{mean}} =$  7000 [N/mm²]  $f_1 =$  6,8 [Hz.]  
 $I_{0,\text{eff}} =$  7,41E+08 [mm⁴]  $f_{\text{tot}} = (\sqrt{1/f_1^2 + 1/f_2^2})^{-1}$  6,8 [Hz.]  
 $I_{90,\text{eff}} =$  75096995 [mm⁴]  $n_{40} =$  0,76  
 $U_{\text{inst,tot}} =$  11,59 [mm]  $v =$  1,98E-09 [m/Ns²]  
 $U_{\text{creep,tot}} =$  6,73 [mm]  $b =$  120  
 $U_{\text{fin}} =$  18,32 [mm]  $b^{(f_1 \xi - 1)} =$  0,030  
 $(EI)_{\ell} =$  8156178 [N/m²]  $b_{\text{ef,B}} =$  1000 [mm]  
 $(EI)_T =$  525679 [N/m²]  $M^* =$  862 [kg]  
 $b_{\text{ef}} =$  1000 [mm]  $a_{\text{rms}} =$  0,027 m/s²

# CLT vloer ULS

Dak 4,584m

Project:

Woonhuis - Hamerve

Printdatum: 2021-04-29

Projectnummer:

2010-2

Status:

Definitief

Constructeur:

BB

Opmerkingen:

## Geometrie

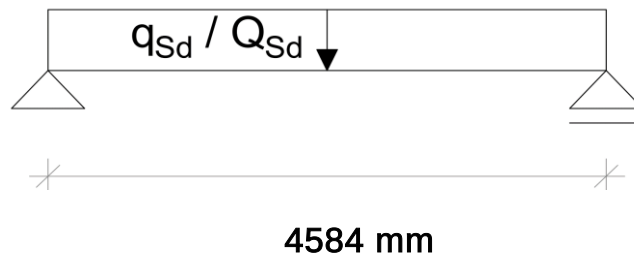
|                       |        |
|-----------------------|--------|
| CLT element           | 120-5s |
| Lamelrichting         | Langs  |
| Helling; $\alpha$ [°] | 46     |
| b [mm]                | 1000   |
| $l$ [mm]              | 4584   |

## Randvoorwaarden

|               |     |
|---------------|-----|
| RC-klasse     | RC1 |
| Klimaatklasse | 1   |

## Belastingen

|                                      |           |
|--------------------------------------|-----------|
| Lastbreedte; $b_l$ [mm]              | 1000      |
| Permanent; $q_{p,k}$ [kN/m²]         | 0,48      |
| Opgelegde belasting                  | H - daken |
| Opgelegd; $q_{o,k}$ [kN/m²]          | 0         |
| Opgelegd; $Q_{o,k}$ [kN]             | 1,5       |
| Scheidingswanden; $q_{o,k}$ [kN/m²]  | 0,00      |
| Sneeuwbelasting; $s_k$ [kN/m²]       | 0,70      |
| Vormcoëfficiënt; $\mu_i$             | 0,80      |
| Windbelasting dak; $q_{w,k}$ [kN/m²] | 0,80      |
| Vormfactor; $c_f$                    | 0,26      |



## Resultaat

Unity Check;  $\sigma_{b,0,d}/f_{m,0,d}$  0,18 OK!

Unity Check;  $\tau_{R,d}/f_{v,d}$  0,09 OK!

## Berekeningswaarden

|               |                |                    |               |
|---------------|----------------|--------------------|---------------|
| $K_{FI}$ =    | 0,9            | $\sigma_{b,0,d}$ = | 3,12 [N/mm²]  |
| $k_{mod}$ =   | 0,9            | $f_{m,0,d}$ =      | 17,28 [N/mm²] |
| $I_x$ =       | 1,02E+08 [mm⁴] | $V_{min,d}$ =      | 2,17 [kN]     |
| $W_x$ =       | 1700000 [mm³]  | $V_{max,d}$ =      | 4,62 [kN]     |
| $SR_x$ =      | 1000000 [mm²]  | $\tau_{R,d}$ =     | 0,05 [N/mm²]  |
| $M_{min,d}$ = | 2,48 [kNm]     | $f_{v,d}$ =        | 0,50 [N/mm²]  |
| $M_{max,d}$ = | 5,30 [kNm]     |                    |               |

**CLT vloer SLS****Dak 4,584m****Project:**

Woonhuis - Hamerve

**Printdatum:** 2021-04-29**Projectnummer:**

2010-2

**Status:**

Definitief

**Constructeur:**

BB

**Opmerkingen:**

0

**Geometrie**

CLT element 120-5s  
 Lamelrichting Langs  
 Helling;  $\alpha$  [°] 46  
 b [mm] 1000  
 $\ell$  [mm] 4584

**Randvoorwaarden**

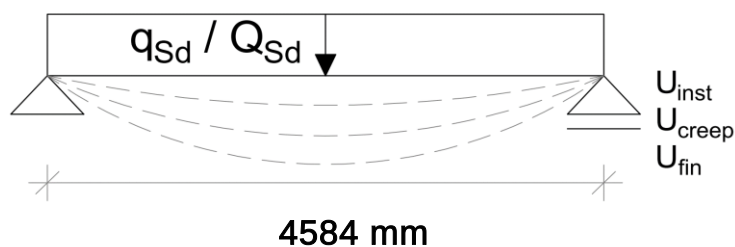
Klimaatklasse 1  
 Vervormingsfactor;  $k_{\text{def}}$  0,80

**Vervormingseisen**

$U_{\text{creep,tot}} \leq 0,003 \ell$  13,8 [mm]  
 $U_{\text{fin}} \leq 0,004 \ell$  18,3 [mm]

**Invoer trillingen**

Massa; m - [kg/m²]  
 Vloercategorie III  
 CLT oplegging twee zijden  
 Dempingsfactor;  $\xi$  -  
 Invloed elast. oplegging Nee

**Resultaat**

$U_{\text{creep,tot}} =$  0,0010  $\ell$  OK!  
 $U_{\text{fin}} =$  0,0029  $\ell$  OK!  
 $U_{1\text{kN}} \leq 1,0$  mm - [mm]  
 $f_{\text{tot}} \geq 8,0$  Hz. - [Hz.]  
 Snelheidsresp;  $v \leq b^{(f_1 \xi - 1)}$  - [m/Ns²]  
 Versnellingen;  $a_{\text{rms}}$  - [m/s²]

**Berekeningswaarden**

$E_{0,\text{mean}} =$  11000 [N/mm²]  $U_{1\text{kN}} =$  - [mm]  
 $E_{90,\text{mean}} =$  7000 [N/mm²]  $f_1 =$  - [Hz.]  
 $I_{0,\text{eff}} =$  96162050 [mm⁴]  $f_{\text{tot}} = (\sqrt{1/f_1^2 + 1/f_2^2})^{-1}$  - [Hz.]  
 $I_{90,\text{eff}} =$  40576636 [mm⁴]  $n_{40} =$  -  
 $U_{\text{inst,tot}} =$  8,75 [mm]  $v =$  - [m/Ns²]  
 $U_{\text{creep,tot}} =$  4,57 [mm]  $b =$  -  
 $U_{\text{fin}} =$  13,32 [mm]  $b^{(f_1 \xi - 1)} =$  -  
 $(EI)_{\ell} =$  - [N/m²]  $b_{\text{ef,B}} =$  - [mm]  
 $(EI)_T =$  - [N/m²]  $M^* =$  #WAARDE! [kg]  
 $b_{\text{ef}} =$  - [mm]  $a_{\text{rms}} =$  #WAARDE! m/s²

## CLT vloer ULS

Dak 4,584m incl. dakraam

Project:

Woonhuis - Hamerve

Printdatum: 2021-04-29

Projectnummer:

2010-2

Status:

Definitief

Constructeur:

BB

Opmerkingen:

### Geometrie

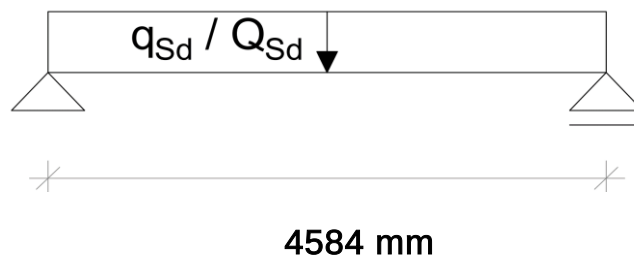
|                       |        |
|-----------------------|--------|
| CLT element           | 120-5s |
| Lamelrichting         | Langs  |
| Helling; $\alpha$ [°] | 46     |
| b [mm]                | 1000   |
| $l$ [mm]              | 4584   |

### Randvoorwaarden

|               |     |
|---------------|-----|
| RC-klasse     | RC1 |
| Klimaatklasse | 1   |

### Belastingen

|                                      |           |
|--------------------------------------|-----------|
| Lastbreedte; $b_l$ [mm]              | 1670      |
| Permanent; $q_{p,k}$ [kN/m²]         | 0,72      |
| Opgelegde belasting                  | H - daken |
| Opgelegd; $q_{o,k}$ [kN/m²]          | 0         |
| Opgelegd; $Q_{o,k}$ [kN]             | 1,5       |
| Scheidingswanden; $q_{o,k}$ [kN/m²]  | 0,00      |
| Sneeuwbelasting; $s_k$ [kN/m²]       | 0,70      |
| Vormcoëfficiënt; $\mu_i$             | 0,80      |
| Windbelasting dak; $q_{w,k}$ [kN/m²] | 0,80      |
| Vormfactor; $c_f$                    | 0,26      |



### Resultaat

Unity Check;  $\sigma_{b,0,d}/f_{m,0,d}$  0,32 OK!

Unity Check;  $\tau_{R,d}/f_{v,d}$  0,16 OK!

### Berekeningswaarden

|               |                |                    |               |
|---------------|----------------|--------------------|---------------|
| $K_{FI}$ =    | 0,9            | $\sigma_{b,0,d}$ = | 4,91 [N/mm²]  |
| $k_{mod}$ =   | 0,8            | $f_{m,0,d}$ =      | 15,36 [N/mm²] |
| $I_x$ =       | 1,02E+08 [mm⁴] | $V_{min,d}$ =      | 3,66 [kN]     |
| $W_x$ =       | 1700000 [mm³]  | $V_{max,d}$ =      | 7,28 [kN]     |
| $SR_x$ =      | 1000000 [mm²]  | $\tau_{R,d}$ =     | 0,07 [N/mm²]  |
| $M_{min,d}$ = | 4,19 [kNm]     | $f_{v,d}$ =        | 0,45 [N/mm²]  |
| $M_{max,d}$ = | 8,35 [kNm]     |                    |               |

# CLT vloer SLS

Dak 4,584m incl. dakraam

Project:

Woonhuis - Hamerve

2021-04-29

Projectnummer:

2010-2

Status:

Definitief

Constructeur:

BB

Opmerkingen:

## Geometrie

CLT element 120-5s  
Lamelrichting Langs  
Helling;  $\alpha$  [°] 46  
b [mm] 1000  
 $\ell$  [mm] 4584

## Randvoorwaarden

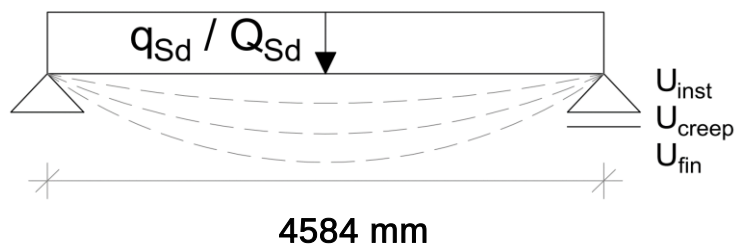
Klimaatklasse 1  
Vervormingsfactor;  $k_{def}$  0,80

## Vervormingseisen

$U_{creep,tot} \leq 0,003 \ell$  13,8 [mm]  
 $U_{fin} \leq 0,004 \ell$  18,3 [mm]

## Invoer trillingen

Massa; m - [kg/m²]  
Vloercategorie III  
CLT oplegging twee zijden  
Dempingsfactor;  $\xi$  -  
Invloed elast. oplegging Nee



## Resultaat

$U_{creep,tot} = 0,0017 \ell$  OK!  
 $U_{fin} = 0,0049 \ell$  NIET OK!  
 $U_{1kN} \leq 1,0$  mm - [mm]  
 $f_{tot} \geq 8,0$  Hz. - [Hz.]  
Snelheidsresp;  $v \leq b^{(f1\xi-1)}$  - [m/Ns²]  
Versnellingen;  $a_{rms}$  - [m/s²]

## Berekeningswaarden

$E_{0,mean} = 11000$  [N/mm²]  $U_{1kN} =$  - [mm]  
 $E_{90,mean} = 7000$  [N/mm²]  $f_1 =$  - [Hz.]  
 $I_{0,eff} = 96162050$  [mm⁴]  $f_{tot} = (\sqrt{1/f_1^2 + 1/f_2^2})^{-1}$  - [Hz.]  
 $I_{90,eff} = 40576636$  [mm⁴]  $n_{40} =$  -  
 $U_{inst,tot} = 14,72$  [mm]  $v =$  - [m/Ns²]  
 $U_{creep,tot} = 7,71$  [mm]  $b =$  -  
 $U_{fin} = 22,44$  [mm]  $b^{(f1\xi-1)} =$  -  
 $(EI)_\ell =$  - [N/m²]  $b_{ef,B} =$  - [mm]  
 $(EI)_T =$  - [N/m²]  $M^* =$  #WAARDE! [kg]  
 $b_{ef} =$  - [mm]  $a_{rms} =$  #WAARDE! m/s²

## CLT balk

B2

Project:

Woonhuis - Hamerve

Printdatum:

29-4-2021

Projectnummer:

2010-2

Status:

Definitief

Constructeur:

BB

Opmerkingen:

### Geometrie

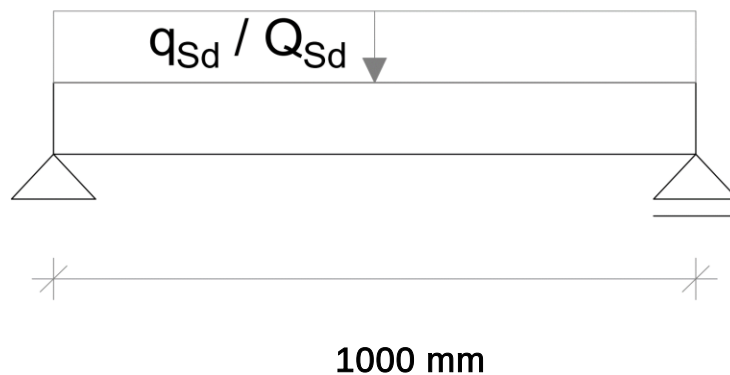
|                       |       |
|-----------------------|-------|
| CLT element           | 80-3s |
| Lamelrichting         | Dwars |
| Helling; $\alpha$ [°] | 0     |
| h [mm]                | 300   |
| l [mm]                | 1000  |

### Randvoorwaarden

|               |     |
|---------------|-----|
| RC-klasse     | RC1 |
| Klimaatklasse | 1   |

### Belastingen

|                                      |             |
|--------------------------------------|-------------|
| Lastbreedte; $b_l$ [mm]              | 3000        |
| Permanent; $q_{p,k}$ [kN/m²]         | 2,43        |
| Opgelegde belasting                  | A - vloeren |
| Opgelegd; $q_{o,k}$ [kN/m²]          | 1,75        |
| Opgelegd; $Q_{o,k}$ [kN]             | 3           |
| Scheidingswanden; $q_{o,k}$ [kN/m²]  | 0,00        |
| Sneeuwbelasting; $s_k$ [kN/m²]       | 0,70        |
| Vormcoëfficiënt; $\mu_i$             | 0,80        |
| Windbelasting dak; $q_{w,k}$ [kN/m²] | 0,51        |
| Vormfactor; $c_f$                    | 0,50        |



### Resultaat

Unity Check;  $\sigma_{b,0,d}/f_{m,0,d}$  0,75 OK!

Unity Check;  $\tau_{xy,d}/f_{vxy,d}$  0,38 OK!

Unity Check;  $\tau_{M,d}/f_{M,d}$  0,23 OK!

### Berekeningswaarden

|                    |              |                 |              |
|--------------------|--------------|-----------------|--------------|
| $K_{FI}$ =         | 0,9          | $V_{max,d}$ =   | 8,05 [kN]    |
| $k_{mod}$ =        | 0,8          | $A_{min}$ =     | 6000 [mm²]   |
| $W_{z,y}$ =        | 300000 [mm³] | $\tau_{xy,d}$ = | 1,34 [N/mm²] |
| $M_{min,d}$ =      | 0,83 [kNm]   | $f_{vxy,d}$ =   | 3,52 [N/mm²] |
| $M_{max,d}$ =      | 2,01 [kNm]   | $\tau_{0,d}$ =  | 0,67 [N/mm²] |
| $\sigma_{b,0,d}$ = | 6,71 [N/mm²] | $\tau_{M,d}$ =  | 0,37 [N/mm²] |
| $f_{m,0,d}$ =      | 8,96 [N/mm²] | $f_{M,d}$ =     | 1,60 [N/mm²] |
| $V_{min,d}$ =      | 3,33 [kN]    |                 |              |

## CLT balk

B3

Project:

Woonhuis - Hamerve

Printdatum:

29-4-2021

Projectnummer:

2010-2

Status:

Definitief

Constructeur:

BB

Opmerkingen:

### Geometrie

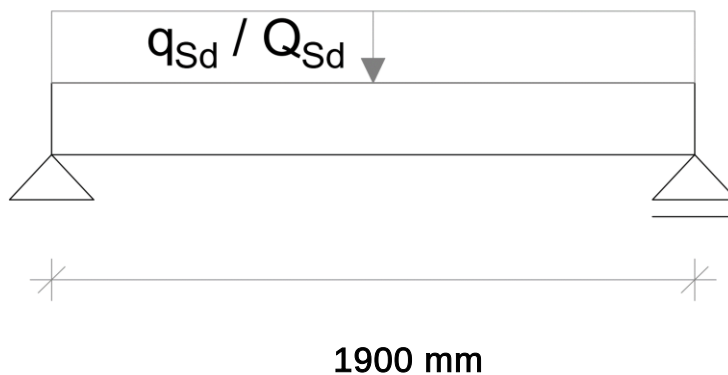
|                       |        |
|-----------------------|--------|
| CLT element           | 100-5s |
| Lamelrichting         | Dwars  |
| Helling; $\alpha$ [°] | 0      |
| h [mm]                | 1300   |
| l [mm]                | 1900   |

### Randvoorwaarden

|               |     |
|---------------|-----|
| RC-klasse     | RC1 |
| Klimaatklasse | 1   |

### Belastingen

|                                      |             |
|--------------------------------------|-------------|
| Lastbreedte; $b_l$ [mm]              | 3400        |
| Permanent; $q_{p,k}$ [kN/m²]         | 2,43        |
| Opgelegde belasting                  | A - vloeren |
| Opgelegd; $q_{o,k}$ [kN/m²]          | 1,75        |
| Opgelegd; $Q_{o,k}$ [kN]             | 3           |
| Scheidingswanden; $q_{o,k}$ [kN/m²]  | 0,00        |
| Sneeuwbelasting; $s_k$ [kN/m²]       | 0,70        |
| Vormcoëfficiënt; $\mu_i$             | 0,80        |
| Windbelasting dak; $q_{w,k}$ [kN/m²] | 0,51        |
| Vormfactor; $c_f$                    | 0,50        |



### Resultaat

|                                         |          |
|-----------------------------------------|----------|
| Unity Check; $\sigma_{b,0,d}/f_{m,0,d}$ | 0,05 OK! |
| Unity Check; $\tau_{xy,d}/f_{vxy,d}$    | 0,09 OK! |
| Unity Check; $\tau_{M,d}/f_{M,d}$       | 0,04 OK! |

### Berekeningswaarden

|                    |                |                 |              |
|--------------------|----------------|-----------------|--------------|
| $K_{FI} =$         | 0,9            | $V_{max,d} =$   | 16,74 [kN]   |
| $k_{mod} =$        | 0,8            | $A_{min} =$     | 52000 [mm²]  |
| $W_{z,y} =$        | 11266667 [mm³] | $\tau_{xy,d} =$ | 0,32 [N/mm²] |
| $M_{min,d} =$      | 3,61 [kNm]     | $f_{vxy,d} =$   | 3,52 [N/mm²] |
| $M_{max,d} =$      | 7,95 [kNm]     | $\tau_{0,d} =$  | 0,16 [N/mm²] |
| $\sigma_{b,0,d} =$ | 0,71 [N/mm²]   | $\tau_{M,d} =$  | 0,07 [N/mm²] |
| $f_{m,0,d} =$      | 15,36 [N/mm²]  | $f_{M,d} =$     | 1,60 [N/mm²] |
| $V_{min,d} =$      | 7,59 [kN]      |                 |              |

|                                                                                                 |                                                                                   |                                                                                                                           |
|-------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------|
|  <b>Statcon</b> | <b>Construction</b> <span style="float: right;">B1</span><br>2010-2 > Balkar > B1 |  <span style="float: right;">2010-2</span> |
|                                                                                                 | <b>Object reference</b><br><b>Customer</b><br>4-11-2020                           | basbo                                                                                                                     |

**Building parameters [Gable×Length×Height]:** 7000×21000×8100 - Roof shape: Duo-pitched roof  
**Building site:** Nederländerna **Meters above sea level [m]:** 100  
**Site Snow Load:** 0,700 kN/m², Snow topography: Normal Ce [ 1 ]  
**Site Wind Speed [m/s]:** 24,5 **Wind pressure:** 0,509 kN/m², III. Urban area

**Service Class:** SC1  
**Safety Class:** CC1 - K.FI=0.9

**Profile:** R- 140×360 GL 30c 5100 mm 0,257 m³ 100,2 kg γm=1.25, Shear force reduction: Yes, kCr = 1.00

| Forces and moments |                     | Load Combination | C.S.I                     |
|--------------------|---------------------|------------------|---------------------------|
| Nx [kN]            | 0,000 (@2550,0,0)   | #4               |                           |
| My [kNm]           | -13,928 (@2550,0,0) | #4               | → 54,0 % ; CC1 - K.FI=0.9 |
| Mz [kNm]           | 9,437 (@2550,0,0)   | #4               |                           |
| Vy [kN]            | 0,000 (@0,0,0)      | #2               |                           |
| Vz [kN]            | -12,289 (@0,0,0)    | #2               | → 22,4 % ; CC1 - K.FI=0.9 |

| Bearing                                | Needed bearing length [mm]                | Current bearing length [mm] | C.S.I [ %] |
|----------------------------------------|-------------------------------------------|-----------------------------|------------|
| @ Upplag 1                             | L.phys. = 20. {L.eff = 30 + L.phys. = 50} | -                           | - %        |
| @ Upplag 2                             | L.phys. = 20. {L.eff = 30 + L.phys. = 50} | -                           | - %        |
| Bearing check method EN 1995-1-1 6.1.5 |                                           |                             |            |

| Spans                                                    | Buckl. length |          | Deflections - Span option for relative deflections: Horizontal length, L.x |                        |                           |                   |                      |                  |
|----------------------------------------------------------|---------------|----------|----------------------------------------------------------------------------|------------------------|---------------------------|-------------------|----------------------|------------------|
|                                                          | L.span [mm]   | Lcy [mm] | Lcz [mm]                                                                   | Abs. - total load [mm] | Abs. - variable load [mm] | Rel. - total load | Rel. - variable load | Load Combination |
| Fält:1                                                   | 5100          | 5100¹    | 5100¹                                                                      | -20                    | -18                       | L/257             | L/285                | #7               |
| ¹ Both edges - ² Top edge/Outside - ³ Bottom edge/Inside |               |          |                                                                            |                        |                           |                   |                      |                  |

| Support material check | Support reactions |               |               | Support reactions |               |               | Serv. |
|------------------------|-------------------|---------------|---------------|-------------------|---------------|---------------|-------|
|                        | C.S.I [ %]        | Max (Rz) [kN] | Max (Rx) [kN] | Max (My) [kNm]    | Max (Rz) [kN] | Max (Rx) [kN] |       |
|                        | C.S.I (edge) [ %] | Min (Rz) [kN] | Min (Rx) [kN] | Min (My) [kNm]    | Min (Rz) [kN] | Min (Rx) [kN] |       |
| Upplag 1               |                   |               |               |                   |               |               |       |
| -                      |                   | 12,852        | 0,000         | 0,000             | 11,543        | 0,000         | 0,000 |
|                        |                   | 9,103         | 0,000         | 0,000             | 10,115        | 0,000         | 0,000 |
| Upplag 2               |                   |               |               |                   |               |               |       |
| -                      |                   | 12,852        | 0,000         | 0,000             | 11,543        | 0,000         | 0,000 |
|                        |                   | 9,103         | 0,000         | 0,000             | 10,115        | 0,000         | 0,000 |

| Standard loads   | Apply eigen load:                                  | Yes                          | Use load sharing: | No |
|------------------|----------------------------------------------------|------------------------------|-------------------|----|
|                  | Use alternative live load layout:                  | Normal; EN 1991-1-1 3.3.1(2) |                   |    |
| Load surface     | Start X [mm]: 0                                    | Load width, start [mm]: 4000 | Pitch [°]:        | 0  |
| Gevel            | End X [mm]: 5100                                   | Load width, end [mm]: 4000   |                   |    |
| Permanent Loads: | 0,680 kN/m²                                        |                              |                   |    |
| Live Loads:      | -                                                  |                              |                   |    |
| Snow Loads:      | -                                                  |                              |                   |    |
| Wind Load:       | -                                                  |                              |                   |    |
| Load surface     | Start X [mm]: 0                                    | Load width, start [mm]: 1000 | Pitch [°]:        | 0  |
| Dak              | End X [mm]: 5100                                   | Load width, end [mm]: 1000   |                   |    |
| Permanent Loads: | 1,050 kN/m²                                        |                              |                   |    |
| Live Loads:      | -                                                  |                              |                   |    |
| Snow Loads:      | 0,700 kN/m² (ST), Ct [ 1 ], μ-from=0,80, μ-to=0,80 | Snow guard: Yes              | Apply Snow Overh  | No |
| Wind Load:       | -                                                  |                              |                   |    |

**Extra loads**  
Wind horizontaal, Wind, (ST), Standard, 2,150 kN/m<2,150 kN/m, @0 mm<>5100 mm, Perpendicular (Global Y)



**Statcon**

Construction

B1



2010-2

2010-2 > Balkar > B1

Object reference

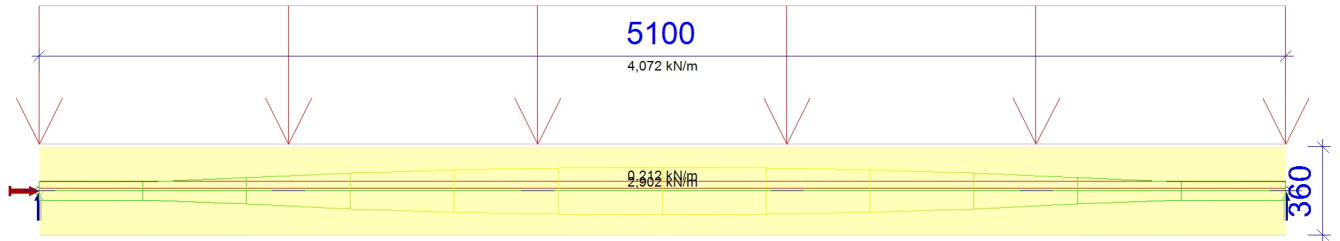
Customer

4-11-2020

basbo

### Ultimate Limit State

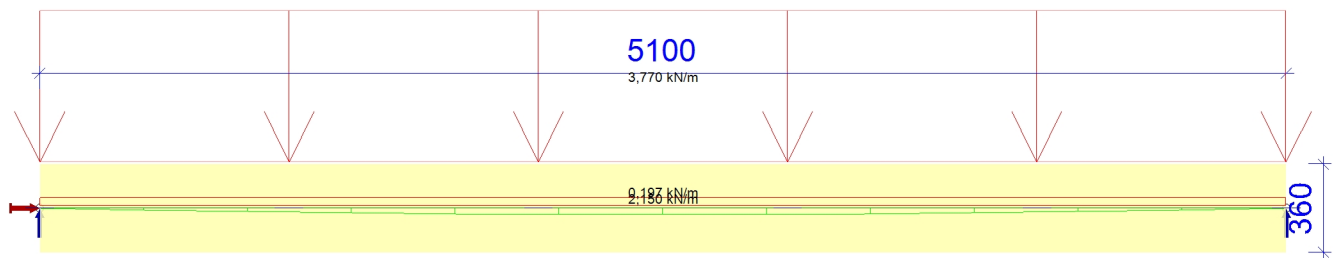
#4  $0,90 \times 1,20 \times \text{Permanent} + 0,90 \times 1,50 \times \text{Wind [From left +]}^* \{ST\} < \text{Ult. 6.10b -A1.2(B) [STR/GEO:SetB]} > - : \{Ult.\}$



Scale: 1:31

### Serv. Limit State

#7  $\text{Permanent} + \text{Wind [From left +]}^* < \text{Serv. 6.14b -6.5.3 [CHAR]} > - : \{Serv.\}$



Scale: 1:31

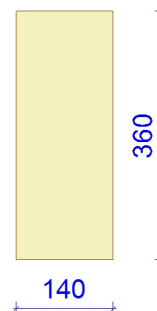
### Section

R- 140x360 GL 30c

A= 50400 mm<sup>2</sup>  
I.y= 544320000 mm<sup>4</sup>  
I.z= 82320000 mm<sup>4</sup>  
W.y= 3024000 mm<sup>3</sup>  
W.z= 1176000 mm<sup>3</sup>

GL 30c

Dens.k = 390,00 N/mm<sup>2</sup>  
Dens.mean = 430 kg/m<sup>3</sup>  
E.005 = 10800,00 N/mm<sup>2</sup>  
E.mean = 13000,00 N/mm<sup>2</sup>  
E90.mean = 300,00 N/mm<sup>2</sup>  
fc90k = 2,50 N/mm<sup>2</sup>  
fck = 24,50 N/mm<sup>2</sup>  
fmk = 30,00 N/mm<sup>2</sup>  
ft90k = 0,50 N/mm<sup>2</sup>  
ftk = 19,50 N/mm<sup>2</sup>  
fvk = 3,50 N/mm<sup>2</sup>  
G.005 = 675,00 N/mm<sup>2</sup>  
G.mean = 650,00 N/mm<sup>2</sup>  
fmk.flat = 30,00 N/mm<sup>2</sup>



|                                                                                                 |                                             |                                                                                                                                                                                                                                 |
|-------------------------------------------------------------------------------------------------|---------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  <b>Statcon</b> | <b>Construction</b><br>2010-2 > Balkar > B1 | <div> <div>B1</div> <div>  </div> </div> <div> <b>Object reference</b><br/> <b>Customer</b><br/> 4-11-2020 </div> <div> 2010-2<br/> basbo </div> |
|-------------------------------------------------------------------------------------------------|---------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

#### Load Combinations

- #1 0,90 × Permanent + 0,90 × 1,50 × Wind [From left +]\* {ST} <Ult. 6.10 -A1.2(A)[EQU:SetA] >
- #2 0,90 × 1,35 × Permanent\* {P} <Ult. 6.10a -A1.2(B) [STR/GEO:SetB] >
- #3 0,90 × 1,20 × Permanent + 0,90 × 1,50 × Snow [μ1]\* {ST} <Ult. 6.10b -A1.2(B) [STR/GEO:SetB] >
- #4 0,90 × 1,20 × Permanent + 0,90 × 1,50 × Wind [From left +]\* {ST} <Ult. 6.10b -A1.2(B) [STR/GEO:SetB] >
- #5 0,90 × 1,00 × Permanent + 0,90 × 1,50 × Wind [From left +]\* {ST} <Ult. 6.10b -A1.2(B) [STR/GEO:SetB] >
- #6 Permanent + Snow [μ1]\* <Serv. 6.14b -6.5.3 [CHAR] >
- #7 Permanent + Wind [From left +]\* <Serv. 6.14b -6.5.3 [CHAR] >
- #8 Permanent\* <Serv. 6.14b -6.5.3 [CHAR] >

#### Implemented code standards

|                                         |                               |
|-----------------------------------------|-------------------------------|
| General Design                          | NEN-EN 1990+A1+A1/C2          |
| Live Loads                              | NEN-EN 1991-1-1+C1:2011       |
| Snow Loads                              | NEN-EN 1991-1-3+C1:2011       |
| Wind Loads                              | NEN-EN 1991-1-4+A1+C2:2011    |
| Actions induced by cranes and machinery | NEN-EN 1991-3:2006            |
| Steel Design                            | EN 1993-1-1                   |
| Wood Design                             | NEN-EN 1995-1-1+C1+A1-A2:2014 |



## Bijlage 3 – Gewichtsberekening



Project: 2010-2

Model: 2010-2

Date: 29-4-2021

## STRUCTURAL ANALYSIS

PROJECT

**2010-2 Woonhuis - Hamerveldseweg**

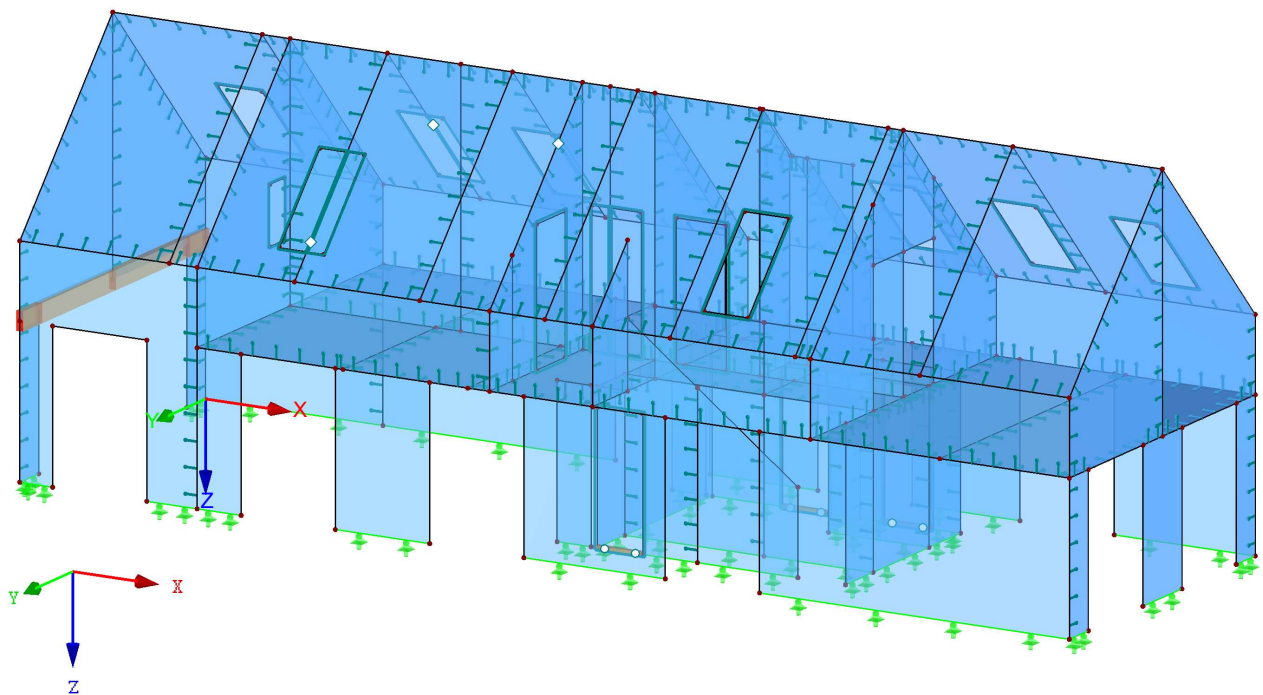
CLIENT

**Element Buildings BV**

CREATED BY



Isometric





Project: 2010-2

Model: 2010-2

Date: 29-4-2021

## ■ MODEL - GENERAL DATA

|   |         |                                                                                                             |   |                                                                                           |
|---|---------|-------------------------------------------------------------------------------------------------------------|---|-------------------------------------------------------------------------------------------|
|   | General | Model name                                                                                                  | : | 2010-2                                                                                    |
|   |         | Project name                                                                                                | : | 2010-2                                                                                    |
|   |         | Type of model                                                                                               | : | 3D                                                                                        |
|   |         | Positive direction of global axis Z                                                                         | : | Downward                                                                                  |
|   |         | Classification of load cases and combinations                                                               | : | According to Standard: EN 1990 + EN 1995 (Wood)<br>National Annex: NEN:2011 - Netherlands |
|   |         | <input checked="" type="checkbox"/> Automatically create combinations                                       | : | <input checked="" type="checkbox"/> Load Combinations                                     |
|   |         |                                                                                                             |   |                                                                                           |
|   | Options | <input type="checkbox"/> RF-FORM-FINDING - Find initial equilibrium shapes of membrane and cable structures |   |                                                                                           |
|   |         | <input type="checkbox"/> RF-CUTTING-PATTERN                                                                 |   |                                                                                           |
|   |         | <input type="checkbox"/> Piping analysis                                                                    |   |                                                                                           |
|   |         | <input type="checkbox"/> Use CQC Rule                                                                       |   |                                                                                           |
|   |         | <input type="checkbox"/> Enable CAD/BIM model                                                               |   |                                                                                           |
|   |         |                                                                                                             |   |                                                                                           |
|   |         | Standard Gravity                                                                                            | : | 10.00 m/s²                                                                                |
| g |         | :                                                                                                           |   |                                                                                           |

## ■ FE MESH SETTINGS

|  |          |                                                                                                                        |            |   |                                      |
|--|----------|------------------------------------------------------------------------------------------------------------------------|------------|---|--------------------------------------|
|  | General  | Target length of finite elements                                                                                       | $l_{FE}$   | : | 0.200 m                              |
|  |          | Maximum distance between a node and a line to integrate it into the line                                               | $\epsilon$ | : | 0.001 m                              |
|  |          | Maximum number of mesh nodes (in thousands)                                                                            |            | : | 500                                  |
|  |          |                                                                                                                        |            |   |                                      |
|  | Members  | Number of divisions of members with cable, elastic foundation, taper, or plastic characteristic                        |            | : | 10                                   |
|  |          | <input checked="" type="checkbox"/> Activate member divisions for large deformation or post-critical analysis          |            |   |                                      |
|  |          | <input checked="" type="checkbox"/> Use division also for straight members, which are not integrated in surfaces, with |            | : | Target length LFE of finite elements |
|  |          | Minimum number of member divisions                                                                                     |            | : | 2                                    |
|  |          | <input checked="" type="checkbox"/> Use division for members with node lying on them                                   |            |   |                                      |
|  | Surfaces | Maximum ratio of FE rectangle diagonals                                                                                | $\Delta_D$ | : | 1.800                                |
|  |          | Maximum out-of-plane inclination of two finite elements                                                                | $\alpha$   | : | 0.50 °                               |
|  |          | Shape direction of finite elements                                                                                     |            | : | Triangles and quadrangles            |
|  |          | <input checked="" type="checkbox"/> Same squares where possible                                                        |            |   |                                      |

## ■ 1.3 MATERIALS

| Matl. No. | Modulus E [kN/cm <sup>2</sup> ]                                    | Modulus G [kN/cm <sup>2</sup> ] | Poisson's Ratio $\nu$ [-] | Spec. Weight $\gamma$ [kN/m <sup>3</sup> ] | Coeff. of Th. Exp. $\alpha$ [1/°C] | Partial Factor $\gamma_M$ [-] | Material Model           |
|-----------|--------------------------------------------------------------------|---------------------------------|---------------------------|--------------------------------------------|------------------------------------|-------------------------------|--------------------------|
| 4         | RF-LAMINATE 1   80-3s<br>Created by RF-LAMINATE module             |                                 |                           |                                            |                                    |                               |                          |
| 5         | RF-LAMINATE 2   100-5s<br>Created by RF-LAMINATE module            |                                 |                           |                                            |                                    |                               |                          |
| 6         | RF-LAMINATE 3   220-L7s-2<br>Created by RF-LAMINATE module         |                                 |                           |                                            |                                    |                               |                          |
| 7         | Poplar and Softwood Timber C14   NEN EN 1995-1-1:2009-11<br>700.00 | 44.00                           | 6.955                     | 3.50                                       | 5.00E-06                           | 1.30                          | Isotropic Linear Elastic |
| 8         | RF-LAMINATE 4   120-5s<br>Created by RF-LAMINATE module            |                                 |                           |                                            |                                    |                               |                          |
| 11        | Glulam Timber GL28h   NEN EN 1995-1-1:2009-11<br>1260.00           | 78.00                           | 7.077                     | 4.00                                       | 5.00E-06                           | 1.30                          | Isotropic Linear Elastic |



Project: 2010-2

Model: 2010-2

Date: 29-4-2021

## ■ 1.4 SURFACES

| Surface No. | Surface Type |           | Boundary Lines No.                                  | Matl. No. | Thickness |        | Area A [m²] | Weight W [kg] |
|-------------|--------------|-----------|-----------------------------------------------------|-----------|-----------|--------|-------------|---------------|
|             | Geometry     | Stiffness |                                                     |           | Type      | d [mm] |             |               |
| 3           | Plane        | Laminate  | 86,10,59,377,157,12,60,161                          | 4         | Constant  | 80.0   | 11.200      | 448.02        |
| 4           | Plane        | Laminate  | 82,85,323,88,136                                    | 4         | Constant  | 80.0   | 3.078       | 123.12        |
| 5           | Plane        | Laminate  | 17,53,62,18,19,61,143,54,16,200,20                  | 4         | Constant  | 80.0   | 11.200      | 448.02        |
| 6           | Plane        | Laminate  | 21-24                                               | 5         | Constant  | 100.0  | 1.844       | 92.20         |
| 7           | Plane        | Laminate  | 25-28                                               | 5         | Constant  | 100.0  | 1.844       | 92.20         |
| 8           | Plane        | Laminate  | 30,31,133,350,351                                   | 5         | Constant  | 100.0  | 13.082      | 654.07        |
| 9           | Plane        | Laminate  | 33-35,109,174,36                                    | 5         | Constant  | 100.0  | 6.070       | 303.52        |
| 10          | Plane        | Laminate  | 37-39,43,40                                         | 5         | Constant  | 100.0  | 6.070       | 303.52        |
| 11          | Plane        | Laminate  | 41,24,103,45,44                                     | 5         | Constant  | 100.0  | 7.923       | 396.15        |
| 12          | Plane        | Laminate  | 87,90,65,138,94,97,20,47,42,9,320,329,330,86        | 4         | Constant  | 80.0   | 9.501       | 380.04        |
| 13          | Plane        | Laminate  | 102,50,51,136                                       | 4         | Constant  | 80.0   | 5.643       | 225.72        |
| 14          | Plane        | Laminate  | 13,14,48,32,63,58,110                               | 4         | Constant  | 80.0   | 10.590      | 423.58        |
| 15          | Plane        | Laminate  | 7,66,67,242,69,70,127,348,349,345,135               | 5         | Constant  | 100.0  | 9.637       | 481.85        |
| 16          | Plane        | Laminate  | 71,72,127,359                                       | 5         | Constant  | 100.0  | 2.471       | 123.55        |
| 17          | Plane        | Laminate  | 73-76,116                                           | 5         | Constant  | 100.0  | 5.301       | 265.05        |
| 18          | Plane        | Laminate  | 77-79,107,80                                        | 5         | Constant  | 100.0  | 7.951       | 397.57        |
| 19          | Plane        | Laminate  | 81,26,105,112,83,84                                 | 5         | Constant  | 100.0  | 17.422      | 871.10        |
| 20          | Plane        | Laminate  | 103-105,27,358,356,132,150,23                       | 6         | Constant  | 220.0  | 16.224      | 1784.67       |
| 21          | Plane        | Laminate  | 104,45,106,39,111,200,16,54,143,61,19,117,112       | 6         | Constant  | 220.0  | 16.224      | 1784.67       |
| 22          | Plane        | Laminate  | 43,119,113,321,333,328,64,61,143,54,16,200,111      | 6         | Constant  | 220.0  | 9.051       | 995.66        |
| 23          | Plane        | Laminate  | 35,122,335,346,118,328,333,321,113,121,177          | 6         | Constant  | 220.0  | 9.052       | 995.67        |
| 24          | Plane        | Laminate  | 107,213,126,337,125,115,174,109,122,335,346,210,123 | 6         | Constant  | 220.0  | 15.621      | 1718.31       |
| 25          | Plane        | Laminate  | 76,120,337,125,129,31,130,339                       | 6         | Constant  | 220.0  | 15.621      | 1718.31       |
| 26          | Plane        | Laminate  | 72,128,116,339,130,133,134,108                      | 6         | Constant  | 220.0  | 18.288      | 2011.68       |
| 27          | Plane        | Laminate  | 1-3,137,331,140,114                                 | 5         | Constant  | 100.0  | 11.596      | 579.80        |
| 29          | Plane        | Laminate  | 5-7,135,142,331,352                                 | 5         | Constant  | 100.0  | 11.596      | 579.80        |
| 30          | Plane        | Laminate  | 23,145,153,131,132,150                              | 5         | Constant  | 100.0  | 9.752       | 487.60        |
| 32          | Plane        | Laminate  | 27,358,356,131,155,148                              | 5         | Constant  | 100.0  | 9.752       | 487.60        |
| 33          | Plane        | Laminate  | 156,265,341,158,340,159                             | 4         | Constant  | 80.0   | 15.923      | 636.93        |
| 34          | Plane        | Laminate  | 160,215,270,159,162,338,217,231,225,228             | 4         | Constant  | 80.0   | 12.982      | 519.26        |
| 35          | Plane        | Laminate  | 208,167,275,228,225,226,229,171,220,336,224,166     | 4         | Constant  | 80.0   | 9.818       | 392.74        |
| 36          | Plane        | Laminate  | 166,169,327,170,347,179,285,280                     | 4         | Constant  | 80.0   | 13.372      | 534.87        |
| 37          | Plane        | Laminate  | 165,216,218,236,211,163                             | 4         | Constant  | 80.0   | 5.802       | 232.06        |
| 38          | Plane        | Laminate  | 212,214,163,232                                     | 4         | Constant  | 80.0   | 1.412       | 56.47         |
| 39          | Plane        | Laminate  | 206,207,98,209,123                                  | 4         | Constant  | 80.0   | 2.452       | 98.06         |
| 40          | Plane        | Laminate  | 185,166,182,184                                     | 4         | Constant  | 80.0   | 4.259       | 170.37        |
| 41          | Plane        | Laminate  | 176,178,181,332,180                                 | 4         | Constant  | 80.0   | 5.493       | 219.71        |



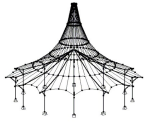
Project: 2010-2

Model: 2010-2

Date: 29-4-2021

## ■ 1.4 SURFACES

| Surface No. | Surface Type |           | Boundary Lines No.                                                  | Matl. No. | Thickness |        | Area A [m²] | Weight W [kg] |
|-------------|--------------|-----------|---------------------------------------------------------------------|-----------|-----------|--------|-------------|---------------|
|             | Geometry     | Stiffness |                                                                     |           | Type      | d [mm] |             |               |
| 42          | Plane        | Laminate  | 191,192,183,186,343,187-189,324,334,190                             | 4         | Constant  | 80.0   | 6.785       | 271.42        |
| 43          | Plane        | Laminate  | 200,111,196,201,199,204                                             | 4         | Constant  | 80.0   | 5.420       | 216.78        |
| 44          | Plane        | Laminate  | 15,197,19,117,193,194,203                                           | 4         | Constant  | 80.0   | 5.420       | 216.78        |
| 45          | Plane        | Laminate  | 195,198,203,202,205,199                                             | 4         | Constant  | 80.0   | 3.324       | 132.98        |
| 46          | Plane        | Laminate  | 161,238,164,172,144                                                 | 4         | Constant  | 80.0   | 8.340       | 333.61        |
| 47          | Plane        | Laminate  | 164,239,173,175                                                     | 4         | Constant  | 80.0   | 1.412       | 56.47         |
| 48          | Plane        | Laminate  | 108,348,371,341                                                     | 5         | Constant  | 100.0  | 9.202       | 460.10        |
| 49          | Plane        | Laminate  | 31,133,241,266,271,276,244,173,174,115,129                          | 5         | Constant  | 100.0  | 10.210      | 510.48        |
| 50          | Plane        | Laminate  | 72,348,267,272,251,212,126,120,76,116,128                           | 5         | Constant  | 100.0  | 8.182       | 409.09        |
| 51          | Plane        | Laminate  | 213,107,79,247,83,112,105,148,254-256,286,281,257,277,212           | 5         | Constant  | 100.0  | 16.222      | 811.10        |
| 52          | Plane        | Laminate  | 173,109,35,177,121,119,43,39,106,45,103,145,261,258,263,287,264,282 | 5         | Constant  | 100.0  | 14.194      | 709.71        |
| 53          | Plane        | Laminate  | 168,249,142,345                                                     | 8         | Constant  | 120.0  | 13.524      | 811.44        |
| 54          | Plane        | Laminate  | 250,265,294,289,260,267,349,168                                     | 8         | Constant  | 120.0  | 10.247      | 614.79        |
| 55          | Plane        | Laminate  | 272,268,270,156,294,289,260                                         | 8         | Constant  | 120.0  | 10.648      | 638.85        |
| 56          | Plane        | Laminate  | 251,277,273,275,160,215,268                                         | 8         | Constant  | 120.0  | 11.324      | 679.41        |
| 57          | Plane        | Laminate  | 257,281,278,280,208,167,273                                         | 8         | Constant  | 120.0  | 11.324      | 679.41        |
| 58          | Plane        | Laminate  | 286,283,285,278                                                     | 8         | Constant  | 120.0  | 9.570       | 574.17        |
| 59          | Plane        | Laminate  | 256,255,252,288,179,283                                             | 8         | Constant  | 120.0  | 11.278      | 676.66        |
| 60          | Plane        | Laminate  | 259,155,254,252                                                     | 8         | Constant  | 120.0  | 13.524      | 811.44        |
| 61          | Plane        | Laminate  | 249,140,248,246                                                     | 8         | Constant  | 120.0  | 11.771      | 706.23        |
| 62          | Plane        | Laminate  | 124,246,250,265,322,369,326,266                                     | 8         | Constant  | 120.0  | 10.172      | 610.29        |
| 63          | Plane        | Laminate  | 141,149,269,270,156,322,369,326,271                                 | 8         | Constant  | 120.0  | 9.204       | 552.21        |
| 64          | Plane        | Laminate  | 275,160,215,269,149,141,276,274                                     | 8         | Constant  | 120.0  | 11.088      | 665.25        |
| 65          | Plane        | Laminate  | 244,274,167,208,280,279,344,282                                     | 8         | Constant  | 120.0  | 11.324      | 679.41        |
| 66          | Plane        | Laminate  | 285,279,344,264,287,284                                             | 8         | Constant  | 120.0  | 9.570       | 574.17        |
| 67          | Plane        | Laminate  | 258,263,284,179,288,253                                             | 8         | Constant  | 120.0  | 9.524       | 571.42        |
| 68          | Plane        | Laminate  | 261,253,259,153                                                     | 8         | Constant  | 120.0  | 11.771      | 706.26        |
| 70          | Plane        | Laminate  | 1,353,350,241,124,248,114                                           | 5         | Constant  | 100.0  | 14.938      | 746.90        |
| 71          | Plane        | Laminate  | 354-356,132,357                                                     | 5         | Constant  | 100.0  | 3.790       | 189.52        |
| 72          | Plane        | Laminate  | 360-363                                                             | 4         | Constant  | 80.0   | 1.910       | 76.38         |
| 73          | Plane        | Laminate  | 364-367                                                             | 4         | Constant  | 80.0   | 1.910       | 76.38         |
| 74          | Plane        | Laminate  | 48,49,197,56,46,32                                                  | 4         | Constant  | 80.0   | 8.879       | 355.18        |
| 75          | Plane        | Laminate  | 99,209,101,100,368,378,377,157                                      | 4         | Constant  | 80.0   | 4.460       | 178.42        |
| 77          | Plane        | Laminate  | 57,55,52,100                                                        | 4         | Constant  | 80.0   | 4.644       | 185.76        |
| 78          | Plane        | Laminate  | 241,68,341,134                                                      | 5         | Constant  | 100.0  | 9.752       | 487.60        |



Project: 2010-2

Model: 2010-2

Date: 29-4-2021

## 1.4.2 SURFACES - INTEGRATED OBJECTS

| Surface No. | Integrated Objects No. |                                                                                  |          | Comment |
|-------------|------------------------|----------------------------------------------------------------------------------|----------|---------|
|             | Nodes                  | Lines                                                                            | Openings |         |
| 3           |                        | 58                                                                               |          |         |
| 5           |                        | 50,56                                                                            |          |         |
| 12          |                        | 85                                                                               | 2,3      |         |
| 14          |                        | 118                                                                              |          |         |
| 22          |                        | 9,42,47,51,88,189,323,324,327                                                    |          |         |
| 23          |                        | 169,180,182,190,191,224,320,329,332,334,336                                      |          |         |
| 24          |                        | 12,60,99,110,161,171,175,211,217,218,220,226,229,231,232,236,238,330,338,363,367 |          |         |
| 25          |                        | 162,340                                                                          |          |         |
| 26          |                        | 158                                                                              |          |         |
| 27          |                        | 4                                                                                |          |         |
| 29          |                        | 8                                                                                |          |         |
| 34          |                        | 216                                                                              | 7        |         |
| 35          |                        | 144                                                                              | 5,6      |         |
| 37          |                        |                                                                                  | 8        |         |
| 42          |                        | 181,184                                                                          |          |         |
| 45          |                        | 347                                                                              |          |         |
| 48          |                        |                                                                                  | 20       |         |
| 51          |                        | 193,206                                                                          |          |         |
| 52          |                        | 176,196                                                                          |          |         |
| 54          |                        | 371                                                                              | 9        |         |
| 55          |                        |                                                                                  | 10       |         |
| 56          |                        | 165,214                                                                          |          |         |
| 57          |                        | 207                                                                              |          |         |
| 58          |                        |                                                                                  | 11       |         |
| 59          |                        | 194,198                                                                          |          |         |
| 61          |                        |                                                                                  | 12       |         |
| 62          |                        | 68                                                                               | 19       |         |
| 63          |                        |                                                                                  | 17,18    |         |
| 64          |                        |                                                                                  | 16       |         |
| 65          |                        | 172,183,185,186,239                                                              |          |         |
| 66          |                        | 178,187,343                                                                      | 15       |         |
| 67          |                        | 195,201                                                                          | 14       |         |
| 68          |                        |                                                                                  | 13       |         |
| 74          |                        | 64                                                                               |          |         |
| 75          |                        |                                                                                  | 21       |         |

## 1.6 OPENINGS

| Opening No. | Boundary Lines No.  | In Surface No. | Area A [m <sup>2</sup> ] | Comment |
|-------------|---------------------|----------------|--------------------------|---------|
| 2           | 89-92               | 12             | 2.232                    |         |
| 3           | 93-96               | 12             | 2.232                    |         |
| 5           | 219,220,336,221,222 | 35             | 2.539                    |         |
| 6           | 223,225-227         | 35             | 1.582                    |         |
| 7           | 230,231,225,233     | 34             | 0.957                    |         |
| 8           | 234-237             | 37             | 2.539                    |         |
| 9           | 289-292             | 54             | 1.077                    |         |
| 10          | 293,295,289,297     | 55             | 0.676                    |         |
| 11          | 298-301             | 58             | 1.754                    |         |
| 12          | 302-305             | 61             | 1.753                    |         |
| 13          | 306-309             | 68             | 1.753                    |         |
| 14          | 310-313             | 67             | 1.754                    |         |
| 15          | 314-317             | 66             | 1.754                    |         |
| 16          | 139,146,147,149     | 64             | 0.236                    |         |
| 17          | 151,152,154,149     | 63             | 1.518                    |         |
| 18          | 370,319,262,369     | 63             | 0.602                    |         |
| 19          | 325,296,318,369     | 62             | 1.152                    |         |
| 20          | 372-375             | 48             | 0.550                    |         |
| 21          | 376-379             | 75             | 2.232                    |         |

## 1.8 LINE SUPPORTS

| Support No. | Lines No.                                                                                                 | Reference System | Rotation $\beta$ [°] | Wall in Z                | Support Conditions                  |                                     |                                     |                          |                          |                          |
|-------------|-----------------------------------------------------------------------------------------------------------|------------------|----------------------|--------------------------|-------------------------------------|-------------------------------------|-------------------------------------|--------------------------|--------------------------|--------------------------|
|             |                                                                                                           |                  |                      |                          | $u_x$                               | $u_y$                               | $u_z$                               | $\phi_x$                 | $\phi_y$                 | $\phi_z$                 |
| 1           | 2,6,10,17,21,25,33,37,41,46,52,53,59,62,63,65,66,70,74,77,81,82,87,97,102,138,351,353,354,359,361,365,368 | Global           |                      | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

## 1.13 CROSS-SECTIONS

T-Rectangle 100/100 T-Rectangle 140/360



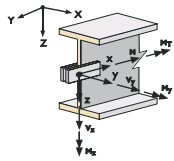
| Section No. | Matl. No.                 | J [cm <sup>4</sup> ]<br>A [cm <sup>2</sup> ] | I <sub>y</sub> [cm <sup>4</sup> ]<br>A <sub>y</sub> [cm <sup>2</sup> ] | I <sub>z</sub> [cm <sup>4</sup> ]<br>A <sub>z</sub> [cm <sup>2</sup> ] | Principal Axes<br>$\alpha$ [°] | Rotation<br>$\alpha'$ [°] | Overall Dimensions [mm] |          |
|-------------|---------------------------|----------------------------------------------|------------------------------------------------------------------------|------------------------------------------------------------------------|--------------------------------|---------------------------|-------------------------|----------|
|             |                           |                                              |                                                                        |                                                                        |                                |                           | Width b                 | Height h |
| 1           | T-Rectangle 100/100<br>7  | 1406.67<br>100.00                            | 833.33<br>83.33                                                        | 833.33<br>83.33                                                        | 0.00                           | 0.00                      | 100.0                   | 100.0    |
| 2           | T-Rectangle 140/360<br>11 | 24875.87<br>504.00                           | 54432.00<br>420.00                                                     | 8232.00<br>420.00                                                      | 0.00                           | 0.00                      | 140.0                   | 360.0    |



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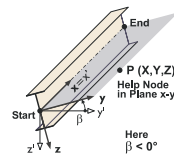
Model: 2010-2

Date: 29-4-2021



## 1.14 MEMBER HINGES

| Release No. | Reference System | Axial/Shear Release or Spring[kN/m] |                          |                          | Moment Release or Spring[kNm/rad] |                                     |                                     | Comment |
|-------------|------------------|-------------------------------------|--------------------------|--------------------------|-----------------------------------|-------------------------------------|-------------------------------------|---------|
|             |                  | $u_x$                               | $u_y$                    | $u_z$                    | $\varphi_x$                       | $\varphi_y$                         | $\varphi_z$                         |         |
| 1           | Local x,y,z      | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>          | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |         |
| 2           | Local x,y,z      | 1.000                               | 1.000                    | <input type="checkbox"/> | <input type="checkbox"/>          | 10.000                              | 10.000                              |         |



## 1.17 MEMBERS

| Mbr. No. | Line No. | Member       | Rotation |             | Cross-Section |     | Hinge No. |     | Ecc. No. | Div. No. | Length L [m] |    |
|----------|----------|--------------|----------|-------------|---------------|-----|-----------|-----|----------|----------|--------------|----|
|          |          |              | Type     | $\beta$ [°] | Start         | End | Start     | End |          |          |              |    |
| 1        | 94       | Beam         | Angle    | 0.00        | 1             | 1   | 1         | 1   | -        | -        | 0.900        | X  |
| 2        | 90       | Beam         | Angle    | 0.00        | 1             | 1   | 1         | 1   | -        | -        | 0.900        | X  |
| 5        | 4        | Beam         | Angle    | 0.00        | 2             | 2   | -         | -   | -        | -        | 0.647        | Y  |
| 7        | 137      | Beam         | Angle    | 0.00        | 2             | 2   | -         | -   | -        | -        | 2.528        | Y  |
| 9        | 8        | Beam         | Angle    | 0.00        | 2             | 2   | -         | -   | -        | -        | 0.647        | Y  |
| 10       | 352      | Beam         | Angle    | 0.00        | 2             | 2   | -         | -   | -        | -        | 2.528        | Y  |
| 11       | 149      | Rigid Member | Angle    | 0.00        | 0             | 0   | 2         | -   | -        | -        | 2.000        | YZ |
| 12       | 289      | Rigid Member | Angle    | 0.00        | 0             | 0   | 2         | -   | -        | -        | 2.000        | YZ |
| 13       | 369      | Rigid Member | Angle    | 0.00        | 0             | 0   | 2         | -   | -        | -        | 2.000        | YZ |
| 14       | 378      | Beam         | Angle    | 0.00        | 1             | 1   | 1         | 1   | -        | -        | 0.900        | X  |



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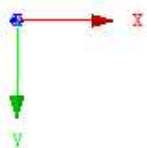
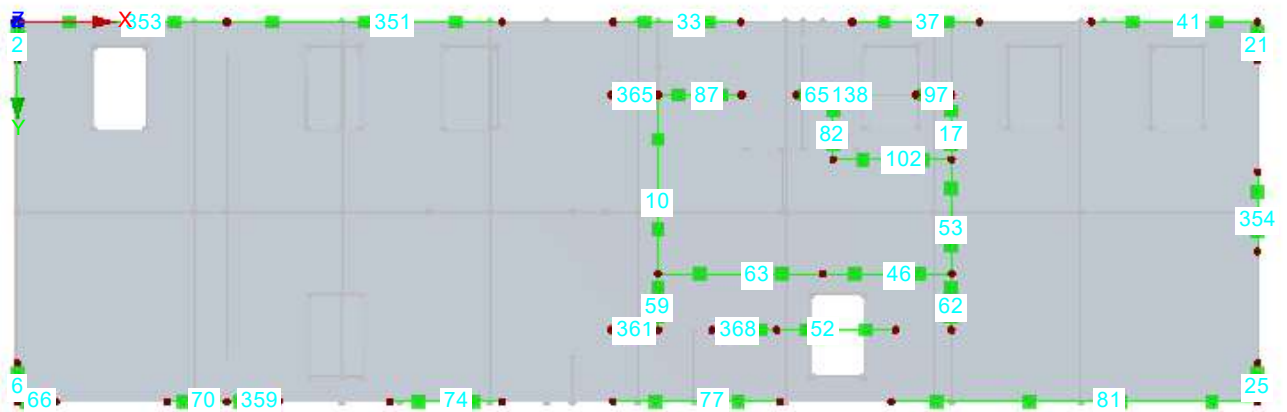
Model: 2010-2

Date: 29-4-2021

■ LIJNNUMMERS WANDSTEUNPUNTEN BEGANE GROND

Line Numbering

In Z-direction



2.528 m



Project: 2010-2

Model: 2010-2

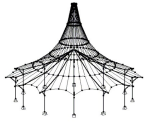
Date: 29-4-2021

## 2.1 LOAD CASES

| Load Case | Load Case Description    | Action Category                                   | Active                              | Self-Weight - Factor in Direction |       |       | EN 1990 + 1995   NEN:201<br>Load Duration |
|-----------|--------------------------|---------------------------------------------------|-------------------------------------|-----------------------------------|-------|-------|-------------------------------------------|
|           |                          |                                                   |                                     | X                                 | Y     | Z     |                                           |
| LC1       | Permanent                | Permanent                                         | <input checked="" type="checkbox"/> | 0.000                             | 0.000 | 1.000 | Permanent                                 |
| LC2       | Opgelegde vloerbelasting | Imposed - Category A: domestic, residential areas | <input type="checkbox"/>            |                                   |       |       | Medium-term                               |
| LC3       | Sneeuw                   | Snow ( $H \leq 1000$ m a.s.l.)                    | <input type="checkbox"/>            |                                   |       |       | Short-term                                |
| LC4       | Sneeuw 0,5 - 1           | Snow ( $H \leq 1000$ m a.s.l.)                    | <input type="checkbox"/>            |                                   |       |       | Short-term                                |
| LC5       | Sneeuw 0,5 - 2           | Snow ( $H \leq 1000$ m a.s.l.)                    | <input type="checkbox"/>            |                                   |       |       | Short-term                                |
| LC6       | Wind X+                  | Wind                                              | <input type="checkbox"/>            |                                   |       |       | Short-term                                |
| LC7       | Wind X-                  | Wind                                              | <input type="checkbox"/>            |                                   |       |       | Short-term                                |
| LC8       | Wind Y+                  | Wind                                              | <input type="checkbox"/>            |                                   |       |       | Short-term                                |
| LC9       | Wind Y-                  | Wind                                              | <input type="checkbox"/>            |                                   |       |       | Short-term                                |

## 2.5 LOAD COMBINATIONS

| Load Combin. | DS   | Load Combination Description   | No. | Factor |     |  | Load Case                |
|--------------|------|--------------------------------|-----|--------|-----|--|--------------------------|
|              |      |                                |     |        |     |  |                          |
| CO1          | ULS' | 1.22*LC1                       | 1   | 1.22   | LC1 |  | Permanent                |
| CO2          | ULS' | 1.22*LC1 + 0.54*LC2            | 1   | 1.22   | LC1 |  | Permanent                |
|              |      |                                | 2   | 0.54   | LC2 |  | Opgelegde vloerbelasting |
| CO3          | ULS' | 1.08*LC1 + 1.35*LC2            | 1   | 1.08   | LC1 |  | Permanent                |
|              |      |                                | 2   | 1.35   | LC2 |  | Opgelegde vloerbelasting |
| CO4          | ULS' | 1.08*LC1 + 1.35*LC3            | 1   | 1.08   | LC1 |  | Permanent                |
|              |      |                                | 2   | 1.35   | LC3 |  | Sneeuw                   |
| CO5          | ULS' | 1.08*LC1 + 0.54*LC2 + 1.35*LC3 | 1   | 1.08   | LC1 |  | Permanent                |
|              |      |                                | 2   | 0.54   | LC2 |  | Opgelegde vloerbelasting |
|              |      |                                | 3   | 1.35   | LC3 |  | Sneeuw                   |
| CO6          | ULS' | 1.08*LC1 + 1.35*LC6            | 1   | 1.08   | LC1 |  | Permanent                |
|              |      |                                | 2   | 1.35   | LC6 |  | Wind X+                  |
| CO7          | ULS' | 1.08*LC1 + 1.35*LC7            | 1   | 1.08   | LC1 |  | Permanent                |
|              |      |                                | 2   | 1.35   | LC7 |  | Wind X-                  |
| CO8          | ULS' | 1.08*LC1 + 1.35*LC8            | 1   | 1.08   | LC1 |  | Permanent                |
|              |      |                                | 2   | 1.35   | LC8 |  | Wind Y+                  |
| CO9          | ULS' | 1.08*LC1 + 1.35*LC9            | 1   | 1.08   | LC1 |  | Permanent                |
|              |      |                                | 2   | 1.35   | LC9 |  | Wind Y-                  |
| CO10         | ULS' | 1.08*LC1 + 0.54*LC2 + 1.35*LC6 | 1   | 1.08   | LC1 |  | Permanent                |
|              |      |                                | 2   | 0.54   | LC2 |  | Opgelegde vloerbelasting |
|              |      |                                | 3   | 1.35   | LC6 |  | Wind X+                  |
| CO11         | ULS' | 1.08*LC1 + 0.54*LC2 + 1.35*LC7 | 1   | 1.08   | LC1 |  | Permanent                |
|              |      |                                | 2   | 0.54   | LC2 |  | Opgelegde vloerbelasting |
|              |      |                                | 3   | 1.35   | LC7 |  | Wind X-                  |
| CO12         | ULS' | 1.08*LC1 + 0.54*LC2 + 1.35*LC8 | 1   | 1.08   | LC1 |  | Permanent                |
|              |      |                                | 2   | 0.54   | LC2 |  | Opgelegde vloerbelasting |
|              |      |                                | 3   | 1.35   | LC8 |  | Wind Y+                  |
| CO13         | ULS' | 1.08*LC1 + 0.54*LC2 + 1.35*LC9 | 1   | 1.08   | LC1 |  | Permanent                |
|              |      |                                | 2   | 0.54   | LC2 |  | Opgelegde vloerbelasting |
|              |      |                                | 3   | 1.35   | LC9 |  | Wind Y-                  |
| CO14         | S Qp | 1.8*LC1                        | 1   | 1.80   | LC1 |  | Permanent                |
| CO15         | S Qp | 1.8*LC1 + 1.24*LC2             | 1   | 1.80   | LC1 |  | Permanent                |
|              |      |                                | 2   | 1.24   | LC2 |  | Opgelegde vloerbelasting |
| CO16         | S Qp | 1.8*LC1 + LC3                  | 1   | 1.80   | LC1 |  | Permanent                |
|              |      |                                | 2   | 1.00   | LC3 |  | Sneeuw                   |
| CO17         | S Qp | 1.8*LC1 + 0.64*LC2 + LC3       | 1   | 1.80   | LC1 |  | Permanent                |
|              |      |                                | 2   | 0.64   | LC2 |  | Opgelegde vloerbelasting |
|              |      |                                | 3   | 1.00   | LC3 |  | Sneeuw                   |
| CO18         | S Qp | 1.8*LC1 + LC6                  | 1   | 1.80   | LC1 |  | Permanent                |
|              |      |                                | 2   | 1.00   | LC6 |  | Wind X+                  |
| CO19         | S Qp | 1.8*LC1 + LC7                  | 1   | 1.80   | LC1 |  | Permanent                |
|              |      |                                | 2   | 1.00   | LC7 |  | Wind X-                  |
| CO20         | S Qp | 1.8*LC1 + LC8                  | 1   | 1.80   | LC1 |  | Permanent                |
|              |      |                                | 2   | 1.00   | LC8 |  | Wind Y+                  |
| CO21         | S Qp | 1.8*LC1 + LC9                  | 1   | 1.80   | LC1 |  | Permanent                |
|              |      |                                | 2   | 1.00   | LC9 |  | Wind Y-                  |
| CO22         | S Qp | 1.8*LC1 + 0.64*LC2 + LC6       | 1   | 1.80   | LC1 |  | Permanent                |
|              |      |                                | 2   | 0.64   | LC2 |  | Opgelegde vloerbelasting |
|              |      |                                | 3   | 1.00   | LC6 |  | Wind X+                  |
| CO23         | S Qp | 1.8*LC1 + 0.64*LC2 + LC7       | 1   | 1.80   | LC1 |  | Permanent                |
|              |      |                                | 2   | 0.64   | LC2 |  | Opgelegde vloerbelasting |
|              |      |                                | 3   | 1.00   | LC7 |  | Wind X-                  |
| CO24         | S Qp | 1.8*LC1 + 0.64*LC2 + LC8       | 1   | 1.80   | LC1 |  | Permanent                |
|              |      |                                | 2   | 0.64   | LC2 |  | Opgelegde vloerbelasting |
|              |      |                                | 3   | 1.00   | LC8 |  | Wind Y+                  |



LOADS

Project: 2010-2

Model: 2010-2

Date: 29-4-2021

## 2.5 LOAD COMBINATIONS

| Load<br>Combin. | Load Combination |                          | No. | Load Case |     |                          |
|-----------------|------------------|--------------------------|-----|-----------|-----|--------------------------|
|                 | DS               | Description              |     | Factor    |     |                          |
| CO25            | S Qp             | 1.8*LC1 + 0.64*LC2 + LC9 | 1   | 1.80      | LC1 | Permanent                |
|                 |                  |                          | 2   | 0.64      | LC2 | Opgelegde vloerbelasting |
|                 |                  |                          | 3   | 1.00      | LC9 | Wind Y-                  |
| CO26            | EQU              | 0.9*LC1 + 1.35*LC6       | 1   | 0.90      | LC1 | Permanent                |
|                 |                  |                          | 2   | 1.35      | LC6 | Wind X+                  |
| CO27            | EQU              | 0.9*LC1 + 1.35*LC7       | 1   | 0.90      | LC1 | Permanent                |
|                 |                  |                          | 2   | 1.35      | LC7 | Wind X-                  |
| CO28            | EQU              | 0.9*LC1 + 1.35*LC8       | 1   | 0.90      | LC1 | Permanent                |
|                 |                  |                          | 2   | 1.35      | LC8 | Wind Y+                  |
| CO29            | EQU              | 0.9*LC1 + 1.35*LC9       | 1   | 0.90      | LC1 | Permanent                |
|                 |                  |                          | 2   | 1.35      | LC9 | Wind Y-                  |
| CO62            | ACC              | 1.0*LC1 + 0.2*LC3        | 1   | 1.00      | LC1 | Permanent                |
|                 |                  |                          | 2   | 0.20      | LC3 | Sneeuw                   |

## 2.7 RESULT COMBINATIONS

| Result Combin | Description                                                 | Loading           |
|---------------|-------------------------------------------------------------|-------------------|
| RC1           | ULS (STR/GEO) - Permanent / transient - Eq. 6.10a and 6.10b | CO1/p or to CO13  |
| RC2           | SLS - Quasi-permanent                                       | CO14/p or to CO25 |
| RC3           | ULS (EQU) - Permanent / transient                           | CO26/p or to CO29 |

LC1  
Permanent

## 3.3 LINE LOADS

LC1: Permanent

| No. | Reference to | On Lines No.                                            | Load Type | Load Distribution | Load Direction | Symbol | Load Parameters |      |
|-----|--------------|---------------------------------------------------------|-----------|-------------------|----------------|--------|-----------------|------|
|     |              |                                                         |           |                   |                |        | Value           | Unit |
| 1   | Lines        | 22,28,30,34,36,38,40,44,67,69,71,73,75,78,80,84,355,357 | Force     | Uniform           | ZL             | p      | 0.651           | kN/m |
| 2   | Lines        | 3,5                                                     | Force     | Uniform           | ZL             | p      | 1.770           | kN/m |
| 3   | Lines        | 210                                                     | Force     | Uniform           | ZL             | p      | 3.100           | kN/m |
| 4   | Lines        | 15,197,204,227,230                                      | Force     | Uniform           | ZL             | p      | 0.350           | kN/m |
| 5   | Lines        | 170                                                     | Force     | Uniform           | ZL             | p      | 0.690           | kN/m |

## 3.4 SURFACE LOADS

LC1: Permanent

| No. | On Surfaces No.                 | Load Type | Load Distribution | Load Direction | Symbol | Load Parameters |                   |
|-----|---------------------------------|-----------|-------------------|----------------|--------|-----------------|-------------------|
|     |                                 |           |                   |                |        | Value           | Unit              |
| 1   | 3-19,27,29,30,32-52,70-75,77,78 | Force     | Uniform           | ZL             | p      | 0.20            | kN/m <sup>2</sup> |
| 2   | 20-26                           | Force     | Uniform           | ZL             | p      | 1.67            | kN/m <sup>2</sup> |
| 3   | 53-68                           | Force     | Uniform           | ZL             | p      | 0.48            | kN/m <sup>2</sup> |

## 3.15 GENERATED LOADS

LC1: Permanent

| No. | Load Description                    |  |  |                                                          |  |   |                                          |
|-----|-------------------------------------|--|--|----------------------------------------------------------|--|---|------------------------------------------|
| 1   | <b>From Area Loads on Openings</b>  |  |  |                                                          |  |   |                                          |
|     | Area load direction                 |  |  | Global relative to the true area:                        |  |   | : <input checked="" type="checkbox"/> ZL |
|     | Load distribution type:             |  |  | <input checked="" type="checkbox"/> Combined             |  |   |                                          |
|     | Area load magnitude                 |  |  | <input checked="" type="checkbox"/> Constant             |  |   | : 0.70 kN/m <sup>2</sup>                 |
|     | Openings with area load             |  |  | Openings : 2,3,5,8,9,10,11,12,13,14,15,16,17,18,19,20,21 |  |   |                                          |
|     | Generating total loads in direction |  |  | $\Sigma P_{Areas}$                                       |  | X | : 0.000 kN                               |
|     |                                     |  |  |                                                          |  | Y | : 0.000 kN                               |
|     |                                     |  |  |                                                          |  | Z | : 18.447 kN                              |
|     |                                     |  |  | $\Sigma P_{Lines}$                                       |  | X | : 0.000 kN                               |
|     |                                     |  |  |                                                          |  | Y | : 0.000 kN                               |
|     |                                     |  |  |                                                          |  | Z | : 18.447 kN                              |
|     | Total moment to the origin          |  |  | $\Sigma M_{Areas}$                                       |  | X | : 42.453 kNm                             |
|     |                                     |  |  |                                                          |  | Y | : -196.065 kNm                           |
|     |                                     |  |  |                                                          |  | Z | : 0.000 kNm                              |
|     |                                     |  |  | $\Sigma M_{Lines}$                                       |  | X | : 47.501 kNm                             |
|     |                                     |  |  |                                                          |  | Y | : -202.005 kNm                           |
|     |                                     |  |  |                                                          |  | Z | : 0.000 kNm                              |



Project: 2010-2

Model: 2010-2

Date: 29-4-2021

LC2  
Opgelegde vloerbelasting

### 3.4 SURFACE LOADS

LC2: Opgelegde vloerbelasting

| No. | On Surfaces No. | Load Type | Load Distribution | Load Direction | Symbol | Load Parameters Value | Unit              |
|-----|-----------------|-----------|-------------------|----------------|--------|-----------------------|-------------------|
| 1   | 20-26           | Force     | Uniform           | ZL             | p      | 1.75                  | kN/m <sup>2</sup> |

LC3  
Sneeuw

### 3.15 GENERATED LOADS

LC3: Sneeuw

| No. | Load Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|-----|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1   | <p><b>From Snow Loads (Duopitch Roof)</b></p> <p>Snow load parameters<br/>According to Standard : EN 1991-1-3<br/>National Annex : Netherlands<br/>Ground snow load <math>s_k</math> : 0.70 kN/m<sup>2</sup></p> <p>Coefficients<br/>Exposure <math>C_e</math> : 1.00<br/>Thermal coefficient <math>C_t</math> : 1.00</p> <p>Roof geometry<br/>Node : A : 95<br/>B : 97<br/>C : 112<br/>D : 98<br/>E : 96<br/>F : 111</p> <p>Generate LC<br/><input checked="" type="checkbox"/> LC s1,a : LC3<br/><input checked="" type="checkbox"/> LC s1,b : LC4<br/><input checked="" type="checkbox"/> LC s1,c : LC5</p> <p>Create load type<br/><input checked="" type="radio"/> Surface loads</p> <p>Generate snow loads on surfaces No. : 53-68</p> <p>Parameters<br/><math>A_R</math> : 189.887 m<sup>2</sup><br/><math>\alpha_1</math> : 46.2 °<br/><math>\alpha_2</math> : 46.2 °<br/><math>S_k</math> : 0.70 kN/m<sup>2</sup></p> <p>Side with <math>\alpha_1</math><br/><math>\mu_1</math> : 0.369<br/><math>s_1</math> : 0.26 kN/m<sup>2</sup></p> <p>Side with <math>\alpha_2</math><br/><math>\mu_1</math> : 0.369<br/><math>s_1</math> : 0.26 kN/m<sup>2</sup></p> <p>Generated total loads<br/><math>\Sigma P_{Areas}</math> : 33.959 kN<br/><math>\Sigma P</math> : 33.959 kN</p> <p>Total moment to the origin<br/><math>\Sigma M_{Areas}</math> : 367.799 kNm<br/><math>\Sigma M</math> : 367.799 kNm</p> |

LC4  
Sneeuw 0,5 - 1

### 3.15 GENERATED LOADS

LC4: Sneeuw 0,5 - 1

| No. | Load Description                |
|-----|---------------------------------|
| 1   | From Snow Loads (Duopitch Roof) |



Project: 2010-2

Model: 2010-2

Date: 29-4-2021

### 3.15 GENERATED LOADS

LC4: Sneeuw 0,5 - 1

| No.                                 | Load Description                               |            |                        |
|-------------------------------------|------------------------------------------------|------------|------------------------|
|                                     |                                                |            |                        |
| Snow load parameters                | According to Standard                          | :          | EN 1991-1-3            |
|                                     | National Annex                                 | :          | Netherlands            |
|                                     | Ground snow load                               | $s_k$      | 0.70 kN/m <sup>2</sup> |
| Coefficients                        | Exposure                                       | $C_e$      | 1.00                   |
|                                     | Thermal coefficient                            | $C_t$      | 1.00                   |
| Roof geometry                       | Node                                           |            |                        |
|                                     | A                                              | :          | 95                     |
|                                     | B                                              | :          | 97                     |
|                                     | C                                              | :          | 112                    |
|                                     | D                                              | :          | 98                     |
|                                     | E                                              | :          | 96                     |
|                                     | F                                              | :          | 111                    |
| Generate LC                         | <input checked="" type="checkbox"/> LC s1,a    | :          | LC3                    |
|                                     | <input checked="" type="checkbox"/> LC s1,b    | :          | LC4                    |
|                                     | <input checked="" type="checkbox"/> LC s1,c    | :          | LC5                    |
| Create load type                    | <input checked="" type="radio"/> Surface loads |            |                        |
| Generate snow loads on surfaces No. |                                                | :          | 53-68                  |
| Parameters                          |                                                | $A_R$      | 189.887 m <sup>2</sup> |
|                                     |                                                | $\alpha_1$ | 46.2 °                 |
|                                     |                                                | $\alpha_2$ | 46.2 °                 |
|                                     |                                                | $s_k$      | 0.70 kN/m <sup>2</sup> |
|                                     | Side with $\alpha_1$                           | $\mu_1$    | 0.369                  |
|                                     |                                                | $s_1$      | 0.13 kN/m <sup>2</sup> |
|                                     | Side with $\alpha_2$                           | $\mu_1$    | 0.369                  |
|                                     |                                                | $s_1$      | 0.26 kN/m <sup>2</sup> |
| Generated total loads               | $\Sigma P_{Areas}$                             | :          | 25.469 kN              |
|                                     | $\Sigma P$                                     | :          | 25.469 kN              |
| Total moment to the origin          | $\Sigma M_{Areas}$                             | :          | 280.097 kNm            |
|                                     | $\Sigma M$                                     | :          | 280.097 kNm            |

LC5  
Sneeuw 0,5 - 2

### 3.15 GENERATED LOADS

LC5: Sneeuw 0,5 - 2

| No. | Load Description                |
|-----|---------------------------------|
| 1   | From Snow Loads (Duopitch Roof) |



Project: 2010-2

Model: 2010-2

Date: 29-4-2021

### 3.15 GENERATED LOADS

LC5: Sneeuw 0,5 - 2

| No.                                 | Load Description |                                                |                          |
|-------------------------------------|------------------|------------------------------------------------|--------------------------|
|                                     |                  |                                                |                          |
| Snow load parameters                |                  | According to Standard                          | : EN 1991-1-3            |
|                                     |                  | National Annex                                 | : Netherlands            |
| Ground snow load                    |                  | $S_k$                                          | : 0.70 kN/m <sup>2</sup> |
| Coefficients                        |                  | Exposure                                       | $C_e$ : 1.00             |
|                                     |                  | Thermal coefficient                            | $C_t$ : 1.00             |
| Roof geometry                       |                  | Node                                           | A : 95                   |
|                                     |                  |                                                | B : 97                   |
|                                     |                  |                                                | C : 112                  |
|                                     |                  |                                                | D : 98                   |
|                                     |                  |                                                | E : 96                   |
|                                     |                  |                                                | F : 111                  |
| Generate LC                         |                  | <input checked="" type="checkbox"/> LC s1,a    | : LC3                    |
|                                     |                  | <input checked="" type="checkbox"/> LC s1,b    | : LC4                    |
|                                     |                  | <input checked="" type="checkbox"/> LC s1,c    | : LC5                    |
| Create load type                    |                  | <input checked="" type="radio"/> Surface loads |                          |
| Generate snow loads on surfaces No. |                  |                                                | : 53-68                  |
| Parameters                          |                  | $A_R$                                          | : 189.887 m <sup>2</sup> |
|                                     |                  | $\alpha_1$                                     | : 46.2 °                 |
|                                     |                  | $\alpha_2$                                     | : 46.2 °                 |
|                                     |                  | $S_k$                                          | : 0.70 kN/m <sup>2</sup> |
| Side with $\alpha_1$                |                  | $\mu_1$                                        | : 0.369                  |
|                                     |                  | $s_1$                                          | : 0.26 kN/m <sup>2</sup> |
| Side with $\alpha_2$                |                  | $\mu_1$                                        | : 0.369                  |
|                                     |                  | $s_1$                                          | : 0.13 kN/m <sup>2</sup> |
| Generated total loads               |                  | $\Sigma P_{Areas}$                             | : 25.469 kN              |
|                                     |                  | $\Sigma P$                                     | : 25.469 kN              |
| Total moment to the origin          |                  | $\Sigma M_{Areas}$                             | : 272.204 kNm            |
|                                     |                  | $\Sigma M$                                     | : 272.204 kNm            |

LC6  
Wind X+

### 3.3 LINE LOADS

LC6: Wind X+

| No. | Reference to | On Lines No.  | Load Type | Load Distribution | Load Direction | Symbol | Value | Unit |
|-----|--------------|---------------|-----------|-------------------|----------------|--------|-------|------|
| 1   | Lines        | 3,5           | Force     | Uniform           | XL             | p      | 0.810 | kN/m |
| 2   | Lines        | 22,28,355,357 | Force     | Uniform           | XL             | p      | 0.186 | kN/m |

### 3.15 GENERATED LOADS

LC6: Wind X+

| No. | Load Description           |
|-----|----------------------------|
| 1   | From Wind Loads (Building) |



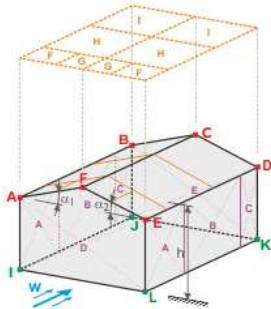
Project: 2010-2

Model: 2010-2

Date: 29-4-2021

### 3.15 GENERATED LOADS

LC6: Wind X+

| No.                                 | Load Description                                                                   |           |                                                |                |
|-------------------------------------|------------------------------------------------------------------------------------|-----------|------------------------------------------------|----------------|
|                                     |  |           |                                                |                |
| Velocity pressure                   | According to Standard                                                              | :         | EN 1991-1-4                                    |                |
|                                     | National Annex                                                                     | :         | Netherlands                                    |                |
|                                     | Wind zone                                                                          | :         | III                                            |                |
|                                     | Terrain category                                                                   | :         | Category III                                   |                |
|                                     | Structure height                                                                   | h         | 8.000                                          | m              |
|                                     | Fundamental wind velocity                                                          | $v_{b,0}$ | 24.5                                           | m/s            |
|                                     | Lack of correlation acc. to 7.2.2(3)                                               | :         | <input checked="" type="checkbox"/>            |                |
| Base geometry                       | Node                                                                               | I         | :                                              | 1              |
|                                     |                                                                                    | J         | :                                              | 3              |
|                                     |                                                                                    | K         | :                                              | 4              |
|                                     |                                                                                    | L         | :                                              | 2              |
| Roof type and geometry              | Type                                                                               | :         | <input checked="" type="radio"/> Duopitch roof |                |
|                                     | Node                                                                               | A         | :                                              | 95             |
|                                     |                                                                                    | B         | :                                              | 97             |
|                                     |                                                                                    | C         | :                                              | 112            |
|                                     |                                                                                    | D         | :                                              | 98             |
|                                     |                                                                                    | E         | :                                              | 96             |
|                                     |                                                                                    | F         | :                                              | 111            |
| Generate LC                         | <input checked="" type="checkbox"/> LC w+                                          | :         | LC6                                            |                |
| Set wind on side                    | <input checked="" type="radio"/> E - F - A                                         | :         |                                                |                |
| Create load type                    | <input checked="" type="radio"/> Surface loads                                     | :         |                                                |                |
| Generate wind loads on surfaces No. |                                                                                    | :         | 6-11,15-19,27,29,30,32,49-68,70,71             |                |
| Building dimensions                 | h                                                                                  | :         | 8.000                                          | m              |
|                                     | b                                                                                  | :         | 6.350                                          | m              |
|                                     | d                                                                                  | :         | 20.710                                         | m              |
|                                     | e Walls                                                                            | :         | 6.350                                          | m              |
|                                     | e Roof                                                                             | :         | 6.350                                          | m              |
|                                     | A Walls                                                                            | :         | 251.984                                        | m <sup>2</sup> |
|                                     | A Roof                                                                             | :         | 189.887                                        | m <sup>2</sup> |
|                                     | $\alpha_1$                                                                         | :         | 46.2                                           | °              |
|                                     | $\alpha_2$                                                                         | :         | 46.2                                           | °              |
|                                     | d <sub>A</sub>                                                                     | :         | 1.270                                          | m              |
|                                     | d <sub>B</sub>                                                                     | :         | 5.080                                          | m              |
|                                     | d <sub>C</sub>                                                                     | :         | 14.360                                         | m              |
|                                     | b <sub>F</sub>                                                                     | :         | 1.587                                          | m              |
|                                     | d <sub>F</sub>                                                                     | :         | 0.635                                          | m              |
|                                     | d <sub>H</sub>                                                                     | :         | 2.540                                          | m              |
|                                     | d <sub>I</sub>                                                                     | :         | 17.535                                         | m              |
|                                     | $\Theta$                                                                           | :         | 90.0                                           | °              |
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LOADS

Project: 2010-2

Model: 2010-2

Date: 29-4-2021

LC7  
Wind X-

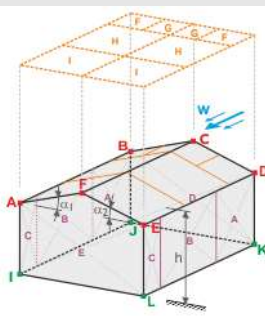
3.3 LINE LOADS

LC7: Wind X-

| No. | Reference to | On Lines No.  | Load Type | Load Distribution | Load Direction | Symbol | Load Parameters |      |
|-----|--------------|---------------|-----------|-------------------|----------------|--------|-----------------|------|
|     |              |               |           |                   |                |        | Value           | Unit |
| 1   | Lines        | 3,5           | Force     | Uniform           | XL             | p      | -0.510          | kN/m |
| 2   | Lines        | 22,28,355,357 | Force     | Uniform           | XL             | p      | -0.300          | kN/m |

3.15 GENERATED LOADS

LC7: Wind X-

| No.                                                                                | Load Description           |                                            |                                              |
|------------------------------------------------------------------------------------|----------------------------|--------------------------------------------|----------------------------------------------|
| 1                                                                                  | From Wind Loads (Building) |                                            |                                              |
|  |                            |                                            |                                              |
| Velocity pressure                                                                  |                            | According to Standard                      | : EN 1991-1-4                                |
|                                                                                    |                            | National Annex                             | : Netherlands                                |
|                                                                                    |                            | Wind zone                                  | : III                                        |
|                                                                                    |                            | Terrain category                           | : Category III                               |
| Structure height                                                                   |                            | h                                          | : 8.000 m                                    |
| Fundamental wind velocity                                                          |                            | $v_{b,0}$                                  | : 24.5 m/s                                   |
| Lack of correlation acc. to 7.2.2(3)                                               |                            |                                            | : <input checked="" type="checkbox"/>        |
| Base geometry                                                                      |                            | Node                                       | I : 1                                        |
|                                                                                    |                            |                                            | J : 3                                        |
|                                                                                    |                            |                                            | K : 4                                        |
|                                                                                    |                            |                                            | L : 2                                        |
| Roof type and geometry                                                             |                            | Type                                       | : ☉ Duopitch roof                            |
|                                                                                    |                            | Node                                       | A : 95                                       |
|                                                                                    |                            |                                            | B : 97                                       |
|                                                                                    |                            |                                            | C : 112                                      |
|                                                                                    |                            |                                            | D : 98                                       |
|                                                                                    |                            |                                            | E : 96                                       |
|                                                                                    |                            |                                            | F : 111                                      |
| Generate LC                                                                        |                            | <input checked="" type="checkbox"/> LC w+  | : LC7                                        |
| Set wind on side                                                                   |                            | ☉ B - C - D                                |                                              |
| Create load type                                                                   |                            | ☉ Surface loads                            |                                              |
| Generate wind loads on surfaces No.                                                |                            |                                            | : 6-11,15-19,27,29,30,32,49-68,70,71         |
| Building dimensions                                                                |                            | h                                          | : 8.000 m                                    |
|                                                                                    |                            | b                                          | : 6.350 m                                    |
|                                                                                    |                            | d                                          | : 20.710 m                                   |
|                                                                                    |                            | e <sub>Walls</sub>                         | : 6.350 m                                    |
|                                                                                    |                            | e <sub>Roof</sub>                          | : 6.350 m                                    |
|                                                                                    |                            | A <sub>Walls</sub>                         | : 251.984 m <sup>2</sup>                     |
|                                                                                    |                            | A <sub>Roof</sub>                          | : 189.887 m <sup>2</sup>                     |
|                                                                                    |                            | $\alpha_1$                                 | : 46.2 °                                     |
|                                                                                    |                            | $\alpha_2$                                 | : 46.2 °                                     |
|                                                                                    |                            | d <sub>A</sub>                             | : 1.270 m                                    |
|                                                                                    |                            | d <sub>B</sub>                             | : 5.080 m                                    |
|                                                                                    |                            | d <sub>C</sub>                             | : 14.360 m                                   |
|                                                                                    |                            | b <sub>F</sub>                             | : 1.587 m                                    |
|                                                                                    |                            | d <sub>F</sub>                             | : 0.635 m                                    |
|                                                                                    |                            | d <sub>H</sub>                             | : 2.540 m                                    |
|                                                                                    |                            | d <sub>I</sub>                             | : 17.535 m                                   |
|                                                                                    |                            | $\Theta$                                   | : 90.0 °                                     |
| Zone                                                                               |                            | External pressure coefficient $c_{pe, 10}$ | External pressure $w_e$ [kN/m <sup>2</sup> ] |
| A                                                                                  |                            | -1.200                                     | -0.61                                        |
| B                                                                                  |                            | -0.800                                     | -0.41                                        |
| C                                                                                  |                            | -0.500                                     | -0.25                                        |
| D                                                                                  |                            | 0.800                                      | 0.34                                         |
| E                                                                                  |                            | -0.500                                     | -0.22                                        |
| F                                                                                  |                            | 0.000                                      | 0.00                                         |
| G                                                                                  |                            | 0.000                                      | 0.00                                         |
| H                                                                                  |                            | 0.000                                      | 0.00                                         |
| I                                                                                  |                            | 0.000                                      | 0.00                                         |
| Generated total loads                                                              |                            | $\Sigma P_{Areas}$                         | : 19.849 kN                                  |
|                                                                                    |                            | $\Sigma P$                                 | : 0.859 kN                                   |



**LOADS**

Project: 2010-2

Model: 2010-2

Date: 29-4-2021

■ **3.15 GENERATED LOADS**

LC7: Wind X-

| No. | Load Description           |                    |          |     |
|-----|----------------------------|--------------------|----------|-----|
|     | Total moment to the origin | $\Sigma M_{Areas}$ | : 87.431 | kNm |
|     |                            | $\Sigma M$         | : 36.151 | kNm |

■ **3.3 LINE LOADS**

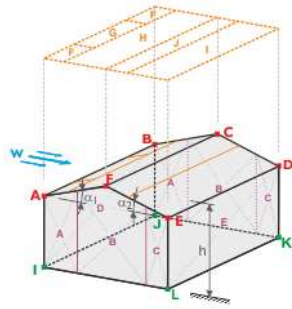
LC8: Wind Y+

| No. | Reference to | On Lines No.            | Load Type | Load Distribution | Load Direction | Symbol | Load Parameters |      |
|-----|--------------|-------------------------|-----------|-------------------|----------------|--------|-----------------|------|
| 1   | Lines        | 30,34,36,38,40,44       | Force     | Uniform           | YL             | p      | Value           | Unit |
| 2   | Lines        | 67,69,71,73,75,78,80,84 | Force     | Uniform           | YL             | p      | 0.320           | kN/m |
|     |              |                         |           |                   |                |        | 0.210           | kN/m |

LC8  
Wind Y+

■ **3.15 GENERATED LOADS**

LC8: Wind Y+

| No. | Load Description                                                                    |                                           |                                              |                                     |
|-----|-------------------------------------------------------------------------------------|-------------------------------------------|----------------------------------------------|-------------------------------------|
| 1   | <b>From Wind Loads (Building)</b>                                                   |                                           |                                              |                                     |
|     |  |                                           |                                              |                                     |
|     | Velocity pressure                                                                   | According to Standard                     | :                                            | EN 1991-1-4                         |
|     |                                                                                     | National Annex                            | :                                            | Netherlands                         |
|     |                                                                                     | Wind zone                                 | :                                            | III                                 |
|     |                                                                                     | Terrain category                          | :                                            | Category III                        |
|     |                                                                                     | Structure height                          | h                                            | 8.000 m                             |
|     |                                                                                     | Fundamental wind velocity                 | $v_{b,0}$                                    | 24.5 m/s                            |
|     |                                                                                     | Lack of correlation acc. to 7.2.2(3)      | :                                            | <input checked="" type="checkbox"/> |
|     | Base geometry                                                                       | Node                                      | I                                            | 1                                   |
|     |                                                                                     |                                           | J                                            | 3                                   |
|     |                                                                                     |                                           | K                                            | 4                                   |
|     |                                                                                     |                                           | L                                            | 2                                   |
|     | Roof type and geometry                                                              | Type                                      | :                                            | ☉ Duopitch roof                     |
|     |                                                                                     | Node                                      | A                                            | 95                                  |
|     |                                                                                     |                                           | B                                            | 97                                  |
|     |                                                                                     |                                           | C                                            | 112                                 |
|     |                                                                                     |                                           | D                                            | 98                                  |
|     |                                                                                     |                                           | E                                            | 96                                  |
|     |                                                                                     |                                           | F                                            | 111                                 |
|     | Generate LC                                                                         | <input checked="" type="checkbox"/> LC w+ | :                                            | LC8                                 |
|     | Set wind on side                                                                    | ☉ A - B                                   | :                                            |                                     |
|     | Create load type                                                                    | ☉ Surface loads                           | :                                            |                                     |
|     | Generate wind loads on surfaces No.                                                 |                                           | :                                            | 6-11,15-19,27,29,30,32,49-68,70,71  |
|     | Building dimensions                                                                 | h                                         | :                                            | 8.000 m                             |
|     |                                                                                     | b                                         | :                                            | 20.710 m                            |
|     |                                                                                     | d                                         | :                                            | 6.350 m                             |
|     |                                                                                     | e Walls                                   | :                                            | 16.000 m                            |
|     |                                                                                     | e Roof                                    | :                                            | 16.000 m                            |
|     |                                                                                     | A Walls                                   | :                                            | 251.984 m <sup>2</sup>              |
|     |                                                                                     | A Roof                                    | :                                            | 189.887 m <sup>2</sup>              |
|     |                                                                                     | $\alpha_1$                                | :                                            | 46.2 °                              |
|     |                                                                                     | $\alpha_2$                                | :                                            | 46.2 °                              |
|     |                                                                                     | d <sub>A</sub>                            | :                                            | 3.200 m                             |
|     |                                                                                     | d <sub>B</sub>                            | :                                            | 3.150 m                             |
|     |                                                                                     | d <sub>C</sub>                            | :                                            | 0.000 m                             |
|     |                                                                                     | b <sub>F</sub>                            | :                                            | 4.000 m                             |
|     |                                                                                     | d <sub>F</sub>                            | :                                            | 1.600 m                             |
|     |                                                                                     | d <sub>H</sub>                            | :                                            | 1.575 m                             |
|     |                                                                                     | d <sub>I</sub>                            | :                                            | 1.575 m                             |
|     |                                                                                     | d <sub>J</sub>                            | :                                            | 1.600 m                             |
|     |                                                                                     | $\Theta$                                  | :                                            | 0.0 °                               |
|     | Zone                                                                                | External pressure coefficient $c_{pe,10}$ | External pressure $w_e$ [kN/m <sup>2</sup> ] |                                     |
|     | A                                                                                   | -1.200                                    | -0.61                                        |                                     |



## LOADS

Project: 2010-2

Model: 2010-2

Date: 29-4-2021

### ■ 3.15 GENERATED LOADS

LC8: Wind Y+

| No. | Load Description                   |                                     |                                              |                                                         |
|-----|------------------------------------|-------------------------------------|----------------------------------------------|---------------------------------------------------------|
|     | B                                  | -0.800                              | -0.41                                        |                                                         |
|     | C                                  | -0.500                              | -0.25                                        |                                                         |
|     | D                                  | 0.800                               | 0.34                                         |                                                         |
|     | E                                  | -0.513                              | -0.22                                        |                                                         |
|     | F                                  | 0.700                               | 0.35                                         |                                                         |
|     | G                                  | 0.700                               | 0.35                                         |                                                         |
|     | H                                  | 0.608                               | 0.31                                         |                                                         |
|     | I                                  | 0.000                               | 0.00                                         |                                                         |
|     | J                                  | 0.000                               | 0.00                                         |                                                         |
|     | Generated total loads              |                                     |                                              |                                                         |
|     |                                    | $\Sigma P_{Areas}$                  | : 75.863                                     | kN                                                      |
|     |                                    | $\Sigma P$                          | : 34.210                                     | kN                                                      |
|     |                                    | Total moment to the origin          |                                              |                                                         |
|     |                                    | $\Sigma M_{Areas}$                  | : 831.678                                    | kNm                                                     |
|     |                                    | $\Sigma M$                          | : 362.622                                    | kNm                                                     |
| 2   | <b>From Area Loads on Openings</b> |                                     |                                              |                                                         |
|     |                                    | Area load direction                 | Perpendicular to the plane                   | : <input checked="" type="checkbox"/> z                 |
|     |                                    | Member load direction               | Direction of generated member loads:         | : <input checked="" type="checkbox"/> Global in X, Y, Z |
|     |                                    | Load distribution type:             | <input checked="" type="checkbox"/> Combined |                                                         |
|     |                                    | Area load magnitude                 | <input checked="" type="checkbox"/> Constant | : 0.35 kN/m <sup>2</sup>                                |
|     |                                    | Openings with area load             | Openings                                     | : 12,13,14,15                                           |
|     |                                    | Generating total loads in direction |                                              |                                                         |
|     |                                    | $\Sigma P_{Areas}$                  | X                                            | : 0.000 kN                                              |
|     |                                    |                                     | Y                                            | : 1.771 kN                                              |
|     |                                    |                                     | Z                                            | : 1.700 kN                                              |
|     |                                    | $\Sigma P_{Lines}$                  | X                                            | : 0.000 kN                                              |
|     |                                    |                                     | Y                                            | : 1.771 kN                                              |
|     |                                    |                                     | Z                                            | : 1.700 kN                                              |
|     |                                    | Total moment to the origin          |                                              |                                                         |
|     |                                    | $\Sigma M_{Areas}$                  | X                                            | : 11.492 kNm                                            |
|     |                                    |                                     | Y                                            | : -22.389 kNm                                           |
|     |                                    |                                     | Z                                            | : 23.320 kNm                                            |
|     |                                    | $\Sigma M_{Lines}$                  | X                                            | : 11.492 kNm                                            |
|     |                                    |                                     | Y                                            | : -22.389 kNm                                           |
|     |                                    |                                     | Z                                            | : 23.320 kNm                                            |

LC9  
Wind Y-

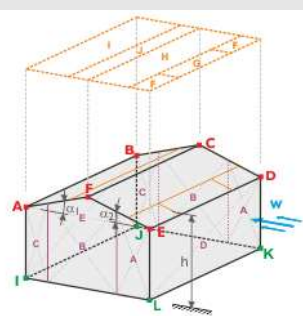
### ■ 3.3 LINE LOADS

LC9: Wind Y-

| No. | Reference to | On Lines No.            | Load Type | Load Distribution | Load Direction | Symbol | Load Parameters |      |
|-----|--------------|-------------------------|-----------|-------------------|----------------|--------|-----------------|------|
| 1   | Lines        | 67,69,71,73,75,78,80,84 | Force     | Uniform           | YL             | p      | -0.320          | kN/m |
| 2   | Lines        | 30,34,36,38,40,44       | Force     | Uniform           | YL             | p      | -0.210          | kN/m |

### ■ 3.15 GENERATED LOADS

LC9: Wind Y-

| No.                    | Load Description                                                                                                                                                                                                                                                                                                                                                |
|------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1                      | <div><div>From Wind Loads (Building)</div><div></div></div>                                                                                                                                                                                                                 |
| Velocity pressure      | <div>According to Standard : EN 1991-1-4</div> <div>National Annex : Netherlands</div> <div>Wind zone : III</div> <div>Terrain category : Category III</div> <div>Structure height h : 8.000 m</div> <div>Fundamental wind velocity <math>v_{b,0}</math> : 24.5 m/s</div> <div>Lack of correlation acc. to 7.2.2(3) : <input checked="" type="checkbox"/></div> |
| Base geometry          | <div>Node I : 1</div> <div>J : 3</div> <div>K : 4</div> <div>L : 2</div>                                                                                                                                                                                                                                                                                        |
| Roof type and geometry | <div>Type : ☉ Duopitch roof</div> <div>Node A : 95</div> <div>B : 97</div>                                                                                                                                                                                                                                                                                      |



LOADS

Project: 2010-2

Model: 2010-2

Date: 29-4-2021

3.15 GENERATED LOADS

LC9: Wind Y-

| No.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Load Description                               |                                                         |      |                                            |                                              |   |        |       |   |        |       |   |        |       |   |       |      |   |        |       |   |       |      |   |       |      |   |       |      |   |       |      |   |       |      |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------|---------------------------------------------------------|------|--------------------------------------------|----------------------------------------------|---|--------|-------|---|--------|-------|---|--------|-------|---|-------|------|---|--------|-------|---|-------|------|---|-------|------|---|-------|------|---|-------|------|---|-------|------|
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | C                                              | : 112                                                   |      |                                            |                                              |   |        |       |   |        |       |   |        |       |   |       |      |   |        |       |   |       |      |   |       |      |   |       |      |   |       |      |   |       |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | D                                              | : 98                                                    |      |                                            |                                              |   |        |       |   |        |       |   |        |       |   |       |      |   |        |       |   |       |      |   |       |      |   |       |      |   |       |      |   |       |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | E                                              | : 96                                                    |      |                                            |                                              |   |        |       |   |        |       |   |        |       |   |       |      |   |        |       |   |       |      |   |       |      |   |       |      |   |       |      |   |       |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | F                                              | : 111                                                   |      |                                            |                                              |   |        |       |   |        |       |   |        |       |   |       |      |   |        |       |   |       |      |   |       |      |   |       |      |   |       |      |   |       |      |
| Generate LC                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | <input checked="" type="checkbox"/> LC w+      | : LC9                                                   |      |                                            |                                              |   |        |       |   |        |       |   |        |       |   |       |      |   |        |       |   |       |      |   |       |      |   |       |      |   |       |      |   |       |      |
| Set wind on side                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | <input checked="" type="radio"/> D - E         |                                                         |      |                                            |                                              |   |        |       |   |        |       |   |        |       |   |       |      |   |        |       |   |       |      |   |       |      |   |       |      |   |       |      |   |       |      |
| Create load type                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | <input checked="" type="radio"/> Surface loads |                                                         |      |                                            |                                              |   |        |       |   |        |       |   |        |       |   |       |      |   |        |       |   |       |      |   |       |      |   |       |      |   |       |      |   |       |      |
| Generate wind loads on surfaces No.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                | : 6-11,15-19,27,29,30,32,49-68,70,71                    |      |                                            |                                              |   |        |       |   |        |       |   |        |       |   |       |      |   |        |       |   |       |      |   |       |      |   |       |      |   |       |      |   |       |      |
| Building dimensions                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | h                                              | : 8.000 m                                               |      |                                            |                                              |   |        |       |   |        |       |   |        |       |   |       |      |   |        |       |   |       |      |   |       |      |   |       |      |   |       |      |   |       |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | b                                              | : 20.710 m                                              |      |                                            |                                              |   |        |       |   |        |       |   |        |       |   |       |      |   |        |       |   |       |      |   |       |      |   |       |      |   |       |      |   |       |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | d                                              | : 6.350 m                                               |      |                                            |                                              |   |        |       |   |        |       |   |        |       |   |       |      |   |        |       |   |       |      |   |       |      |   |       |      |   |       |      |   |       |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | e Walls                                        | : 16.000 m                                              |      |                                            |                                              |   |        |       |   |        |       |   |        |       |   |       |      |   |        |       |   |       |      |   |       |      |   |       |      |   |       |      |   |       |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | e Roof                                         | : 16.000 m                                              |      |                                            |                                              |   |        |       |   |        |       |   |        |       |   |       |      |   |        |       |   |       |      |   |       |      |   |       |      |   |       |      |   |       |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | A Walls                                        | : 251.984 m <sup>2</sup>                                |      |                                            |                                              |   |        |       |   |        |       |   |        |       |   |       |      |   |        |       |   |       |      |   |       |      |   |       |      |   |       |      |   |       |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | A Roof                                         | : 189.887 m <sup>2</sup>                                |      |                                            |                                              |   |        |       |   |        |       |   |        |       |   |       |      |   |        |       |   |       |      |   |       |      |   |       |      |   |       |      |   |       |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | $\alpha_1$                                     | : 46.2 °                                                |      |                                            |                                              |   |        |       |   |        |       |   |        |       |   |       |      |   |        |       |   |       |      |   |       |      |   |       |      |   |       |      |   |       |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | $\alpha_2$                                     | : 46.2 °                                                |      |                                            |                                              |   |        |       |   |        |       |   |        |       |   |       |      |   |        |       |   |       |      |   |       |      |   |       |      |   |       |      |   |       |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | d <sub>A</sub>                                 | : 3.200 m                                               |      |                                            |                                              |   |        |       |   |        |       |   |        |       |   |       |      |   |        |       |   |       |      |   |       |      |   |       |      |   |       |      |   |       |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | d <sub>B</sub>                                 | : 3.150 m                                               |      |                                            |                                              |   |        |       |   |        |       |   |        |       |   |       |      |   |        |       |   |       |      |   |       |      |   |       |      |   |       |      |   |       |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | d <sub>C</sub>                                 | : 0.000 m                                               |      |                                            |                                              |   |        |       |   |        |       |   |        |       |   |       |      |   |        |       |   |       |      |   |       |      |   |       |      |   |       |      |   |       |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | b <sub>F</sub>                                 | : 4.000 m                                               |      |                                            |                                              |   |        |       |   |        |       |   |        |       |   |       |      |   |        |       |   |       |      |   |       |      |   |       |      |   |       |      |   |       |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | d <sub>F</sub>                                 | : 1.600 m                                               |      |                                            |                                              |   |        |       |   |        |       |   |        |       |   |       |      |   |        |       |   |       |      |   |       |      |   |       |      |   |       |      |   |       |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | d <sub>H</sub>                                 | : 1.575 m                                               |      |                                            |                                              |   |        |       |   |        |       |   |        |       |   |       |      |   |        |       |   |       |      |   |       |      |   |       |      |   |       |      |   |       |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | d <sub>I</sub>                                 | : 1.575 m                                               |      |                                            |                                              |   |        |       |   |        |       |   |        |       |   |       |      |   |        |       |   |       |      |   |       |      |   |       |      |   |       |      |   |       |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | d <sub>J</sub>                                 | : 1.600 m                                               |      |                                            |                                              |   |        |       |   |        |       |   |        |       |   |       |      |   |        |       |   |       |      |   |       |      |   |       |      |   |       |      |   |       |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | $\Theta$                                       | : 0.0 °                                                 |      |                                            |                                              |   |        |       |   |        |       |   |        |       |   |       |      |   |        |       |   |       |      |   |       |      |   |       |      |   |       |      |   |       |      |
| <table><thead><tr><th>Zone</th><th>External pressure coefficient <math>c_{pe, 10}</math></th><th>External pressure <math>w_e</math> [kN/m<sup>2</sup>]</th></tr></thead><tbody><tr><td>A</td><td>-1.200</td><td>-0.61</td></tr><tr><td>B</td><td>-0.800</td><td>-0.41</td></tr><tr><td>C</td><td>-0.500</td><td>-0.25</td></tr><tr><td>D</td><td>0.800</td><td>0.34</td></tr><tr><td>E</td><td>-0.513</td><td>-0.22</td></tr><tr><td>F</td><td>0.700</td><td>0.35</td></tr><tr><td>G</td><td>0.700</td><td>0.35</td></tr><tr><td>H</td><td>0.608</td><td>0.31</td></tr><tr><td>I</td><td>0.000</td><td>0.00</td></tr><tr><td>J</td><td>0.000</td><td>0.00</td></tr></tbody></table> |                                                |                                                         | Zone | External pressure coefficient $c_{pe, 10}$ | External pressure $w_e$ [kN/m <sup>2</sup> ] | A | -1.200 | -0.61 | B | -0.800 | -0.41 | C | -0.500 | -0.25 | D | 0.800 | 0.34 | E | -0.513 | -0.22 | F | 0.700 | 0.35 | G | 0.700 | 0.35 | H | 0.608 | 0.31 | I | 0.000 | 0.00 | J | 0.000 | 0.00 |
| Zone                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | External pressure coefficient $c_{pe, 10}$     | External pressure $w_e$ [kN/m <sup>2</sup> ]            |      |                                            |                                              |   |        |       |   |        |       |   |        |       |   |       |      |   |        |       |   |       |      |   |       |      |   |       |      |   |       |      |   |       |      |
| A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | -1.200                                         | -0.61                                                   |      |                                            |                                              |   |        |       |   |        |       |   |        |       |   |       |      |   |        |       |   |       |      |   |       |      |   |       |      |   |       |      |   |       |      |
| B                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | -0.800                                         | -0.41                                                   |      |                                            |                                              |   |        |       |   |        |       |   |        |       |   |       |      |   |        |       |   |       |      |   |       |      |   |       |      |   |       |      |   |       |      |
| C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | -0.500                                         | -0.25                                                   |      |                                            |                                              |   |        |       |   |        |       |   |        |       |   |       |      |   |        |       |   |       |      |   |       |      |   |       |      |   |       |      |   |       |      |
| D                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 0.800                                          | 0.34                                                    |      |                                            |                                              |   |        |       |   |        |       |   |        |       |   |       |      |   |        |       |   |       |      |   |       |      |   |       |      |   |       |      |   |       |      |
| E                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | -0.513                                         | -0.22                                                   |      |                                            |                                              |   |        |       |   |        |       |   |        |       |   |       |      |   |        |       |   |       |      |   |       |      |   |       |      |   |       |      |   |       |      |
| F                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 0.700                                          | 0.35                                                    |      |                                            |                                              |   |        |       |   |        |       |   |        |       |   |       |      |   |        |       |   |       |      |   |       |      |   |       |      |   |       |      |   |       |      |
| G                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 0.700                                          | 0.35                                                    |      |                                            |                                              |   |        |       |   |        |       |   |        |       |   |       |      |   |        |       |   |       |      |   |       |      |   |       |      |   |       |      |   |       |      |
| H                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 0.608                                          | 0.31                                                    |      |                                            |                                              |   |        |       |   |        |       |   |        |       |   |       |      |   |        |       |   |       |      |   |       |      |   |       |      |   |       |      |   |       |      |
| I                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 0.000                                          | 0.00                                                    |      |                                            |                                              |   |        |       |   |        |       |   |        |       |   |       |      |   |        |       |   |       |      |   |       |      |   |       |      |   |       |      |   |       |      |
| J                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 0.000                                          | 0.00                                                    |      |                                            |                                              |   |        |       |   |        |       |   |        |       |   |       |      |   |        |       |   |       |      |   |       |      |   |       |      |   |       |      |   |       |      |
| Generated total loads                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | $\Sigma P_{Areas}$                             | : 75.863 kN                                             |      |                                            |                                              |   |        |       |   |        |       |   |        |       |   |       |      |   |        |       |   |       |      |   |       |      |   |       |      |   |       |      |   |       |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | $\Sigma P$                                     | : 44.869 kN                                             |      |                                            |                                              |   |        |       |   |        |       |   |        |       |   |       |      |   |        |       |   |       |      |   |       |      |   |       |      |   |       |      |   |       |      |
| Total moment to the origin                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | $\Sigma M_{Areas}$                             | : 797.031 kNm                                           |      |                                            |                                              |   |        |       |   |        |       |   |        |       |   |       |      |   |        |       |   |       |      |   |       |      |   |       |      |   |       |      |   |       |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | $\Sigma M$                                     | : 382.166 kNm                                           |      |                                            |                                              |   |        |       |   |        |       |   |        |       |   |       |      |   |        |       |   |       |      |   |       |      |   |       |      |   |       |      |   |       |      |
| 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | <b>From Area Loads on Openings</b>             |                                                         |      |                                            |                                              |   |        |       |   |        |       |   |        |       |   |       |      |   |        |       |   |       |      |   |       |      |   |       |      |   |       |      |   |       |      |
| Area load direction                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Perpendicular to the plane                     | : <input checked="" type="checkbox"/> z                 |      |                                            |                                              |   |        |       |   |        |       |   |        |       |   |       |      |   |        |       |   |       |      |   |       |      |   |       |      |   |       |      |   |       |      |
| Member load direction                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Direction of generated member loads:           | : <input checked="" type="checkbox"/> Global in X, Y, Z |      |                                            |                                              |   |        |       |   |        |       |   |        |       |   |       |      |   |        |       |   |       |      |   |       |      |   |       |      |   |       |      |   |       |      |
| Load distribution type:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | <input checked="" type="checkbox"/> Combined   |                                                         |      |                                            |                                              |   |        |       |   |        |       |   |        |       |   |       |      |   |        |       |   |       |      |   |       |      |   |       |      |   |       |      |   |       |      |
| Area load magnitude                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | <input checked="" type="checkbox"/> Constant   | : 0.35 kN/m <sup>2</sup>                                |      |                                            |                                              |   |        |       |   |        |       |   |        |       |   |       |      |   |        |       |   |       |      |   |       |      |   |       |      |   |       |      |   |       |      |
| Openings with area load                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Openings                                       | : 11                                                    |      |                                            |                                              |   |        |       |   |        |       |   |        |       |   |       |      |   |        |       |   |       |      |   |       |      |   |       |      |   |       |      |   |       |      |
| Generating total loads in direction                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | $\Sigma P_{Areas}$                             | X : 0.000 kN                                            |      |                                            |                                              |   |        |       |   |        |       |   |        |       |   |       |      |   |        |       |   |       |      |   |       |      |   |       |      |   |       |      |   |       |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                | Y : -0.443 kN                                           |      |                                            |                                              |   |        |       |   |        |       |   |        |       |   |       |      |   |        |       |   |       |      |   |       |      |   |       |      |   |       |      |   |       |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                | Z : 0.425 kN                                            |      |                                            |                                              |   |        |       |   |        |       |   |        |       |   |       |      |   |        |       |   |       |      |   |       |      |   |       |      |   |       |      |   |       |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | $\Sigma P_{Lines}$                             | X : 0.000 kN                                            |      |                                            |                                              |   |        |       |   |        |       |   |        |       |   |       |      |   |        |       |   |       |      |   |       |      |   |       |      |   |       |      |   |       |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                | Y : -0.443 kN                                           |      |                                            |                                              |   |        |       |   |        |       |   |        |       |   |       |      |   |        |       |   |       |      |   |       |      |   |       |      |   |       |      |   |       |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                | Z : 0.425 kN                                            |      |                                            |                                              |   |        |       |   |        |       |   |        |       |   |       |      |   |        |       |   |       |      |   |       |      |   |       |      |   |       |      |   |       |      |
| Total moment to the origin                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | $\Sigma M_{Areas}$                             | X : -0.174 kNm                                          |      |                                            |                                              |   |        |       |   |        |       |   |        |       |   |       |      |   |        |       |   |       |      |   |       |      |   |       |      |   |       |      |   |       |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                | Y : -5.824 kNm                                          |      |                                            |                                              |   |        |       |   |        |       |   |        |       |   |       |      |   |        |       |   |       |      |   |       |      |   |       |      |   |       |      |   |       |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                | Z : -6.066 kNm                                          |      |                                            |                                              |   |        |       |   |        |       |   |        |       |   |       |      |   |        |       |   |       |      |   |       |      |   |       |      |   |       |      |   |       |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | $\Sigma M_{Lines}$                             | X : -0.174 kNm                                          |      |                                            |                                              |   |        |       |   |        |       |   |        |       |   |       |      |   |        |       |   |       |      |   |       |      |   |       |      |   |       |      |   |       |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                | Y : -5.824 kNm                                          |      |                                            |                                              |   |        |       |   |        |       |   |        |       |   |       |      |   |        |       |   |       |      |   |       |      |   |       |      |   |       |      |   |       |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                | Z : -6.066 kNm                                          |      |                                            |                                              |   |        |       |   |        |       |   |        |       |   |       |      |   |        |       |   |       |      |   |       |      |   |       |      |   |       |      |   |       |      |

4.3 LINES - SUPPORT FORCES

| Line No. | LC/CO | Node No. | Location x [m] | Support Forces [kN/m] |        |       | Support Moments [kNm/m] |       |       |
|----------|-------|----------|----------------|-----------------------|--------|-------|-------------------------|-------|-------|
|          |       |          |                | $p_x$                 | $p_y$  | $p_z$ | $m_x$                   | $m_y$ | $m_z$ |
| 2        | LC1   | 1        | 0.000          | -0.47                 | -17.10 | 28.44 | 0.00                    | 0.00  | 0.00  |
|          |       |          | 0.216          | -0.03                 | 0.14   | 26.72 | 0.00                    | 0.00  | 0.00  |
|          |       |          | 0.431          | 0.01                  | -3.10  | 26.72 | 0.00                    | 0.00  | 0.00  |
|          |       |          | 0.647          | 0.03                  | 12.05  | 23.78 | 0.00                    | 0.00  | 0.00  |
|          | LC2   | 1        | 0.000          | -0.04                 | -0.67  | 1.14  | 0.00                    | 0.00  | 0.00  |
|          |       |          | 0.216          | 0.00                  | 0.08   | 0.95  | 0.00                    | 0.00  | 0.00  |
|          |       |          | 0.431          | 0.00                  | 0.01   | 0.74  | 0.00                    | 0.00  | 0.00  |
|          |       |          | 0.647          | 0.00                  | 0.22   | 0.37  | 0.00                    | 0.00  | 0.00  |
|          | LC3   | 1        | 0.000          | -0.03                 | -0.91  | 1.52  | 0.00                    | 0.00  | 0.00  |
|          |       |          | 0.216          | 0.00                  | 0.06   | 1.36  | 0.00                    | 0.00  | 0.00  |



Project: 2010-2

Model: 2010-2

Date: 29-4-2021

#### ■ 4.3 LINES - SUPPORT FORCES

| Line No. | LC/CO | Node No. | Location x [m] | Support Forces [kN/m] |                |                | Support Moments [kNm/m] |                |                |
|----------|-------|----------|----------------|-----------------------|----------------|----------------|-------------------------|----------------|----------------|
|          |       |          |                | p <sub>x</sub>        | p <sub>y</sub> | p <sub>z</sub> | m <sub>x</sub>          | m <sub>y</sub> | m <sub>z</sub> |
| 2        | LC3   | 1        | 0.431          | 0.00                  | -0.05          | 1.21           | 0.00                    | 0.00           | 0.00           |
|          |       | 15       | 0.647          | 0.00                  | 0.44           | 0.77           | 0.00                    | 0.00           | 0.00           |
|          | LC6   | 1        | 0.000          | -4.61                 | -4.77          | 7.77           | 0.00                    | 0.00           | 0.00           |
|          |       |          | 0.216          | 0.67                  | 0.33           | 1.99           | 0.00                    | 0.00           | 0.00           |
|          |       |          | 0.431          | 2.83                  | 0.36           | -1.46          | 0.00                    | 0.00           | 0.00           |
|          |       | 15       | 0.647          | 9.70                  | -4.55          | -7.44          | 0.00                    | 0.00           | 0.00           |
|          | LC7   | 1        | 0.000          | 2.70                  | -3.41          | 5.78           | 0.00                    | 0.00           | 0.00           |
|          |       |          | 0.216          | -0.43                 | 0.59           | 2.39           | 0.00                    | 0.00           | 0.00           |
|          |       |          | 0.431          | -1.73                 | 0.50           | -0.26          | 0.00                    | 0.00           | 0.00           |
|          |       | 15       | 0.647          | -5.86                 | -2.30          | -3.88          | 0.00                    | 0.00           | 0.00           |
|          | LC8   | 1        | 0.000          | 2.82                  | 37.81          | -64.72         | 0.00                    | 0.00           | 0.00           |
|          |       |          | 0.216          | -0.21                 | -8.92          | -18.73         | 0.00                    | 0.00           | 0.00           |
|          |       |          | 0.431          | -1.10                 | -9.30          | 19.72          | 0.00                    | 0.00           | 0.00           |
|          |       | 15       | 0.647          | -4.13                 | 38.71          | 66.62          | 0.00                    | 0.00           | 0.00           |
|          | LC9   | 1        | 0.000          | 2.24                  | -40.04         | 68.76          | 0.00                    | 0.00           | 0.00           |
|          |       |          | 0.216          | -0.12                 | 9.74           | 21.81          | 0.00                    | 0.00           | 0.00           |
|          |       |          | 0.431          | -0.87                 | 9.91           | -18.45         | 0.00                    | 0.00           | 0.00           |
|          |       | 15       | 0.647          | -3.62                 | -38.63         | -66.72         | 0.00                    | 0.00           | 0.00           |
| 6        | LC1   | 17       | 0.000          | -0.04                 | -14.39         | 27.71          | 0.00                    | 0.00           | 0.00           |
|          |       |          | 0.216          | 0.01                  | 3.28           | 29.80          | 0.00                    | 0.00           | 0.00           |
|          |       |          | 0.431          | 0.03                  | -0.24          | 29.20          | 0.00                    | 0.00           | 0.00           |
|          |       | 2        | 0.647          | -0.35                 | 17.74          | 29.63          | 0.00                    | 0.00           | 0.00           |
|          | LC2   | 17       | 0.000          | -0.01                 | -0.61          | 1.04           | 0.00                    | 0.00           | 0.00           |
|          |       |          | 0.216          | 0.00                  | 0.06           | 1.00           | 0.00                    | 0.00           | 0.00           |
|          |       |          | 0.431          | 0.01                  | -0.03          | 0.89           | 0.00                    | 0.00           | 0.00           |
|          |       | 2        | 0.647          | -0.01                 | 0.39           | 0.68           | 0.00                    | 0.00           | 0.00           |
|          | LC3   | 17       | 0.000          | 0.00                  | -0.66          | 1.14           | 0.00                    | 0.00           | 0.00           |
|          |       |          | 0.216          | 0.00                  | 0.08           | 1.47           | 0.00                    | 0.00           | 0.00           |
|          |       |          | 0.431          | 0.00                  | -0.05          | 1.53           | 0.00                    | 0.00           | 0.00           |
|          |       | 2        | 0.647          | -0.02                 | 0.92           | 1.54           | 0.00                    | 0.00           | 0.00           |
|          | LC6   | 17       | 0.000          | 9.79                  | -0.56          | 1.20           | 0.00                    | 0.00           | 0.00           |
|          |       |          | 0.216          | 2.84                  | 0.56           | 1.10           | 0.00                    | 0.00           | 0.00           |
|          |       |          | 0.431          | 0.61                  | 0.55           | 0.05           | 0.00                    | 0.00           | 0.00           |
|          |       | 2        | 0.647          | -4.85                 | -0.01          | -0.29          | 0.00                    | 0.00           | 0.00           |
|          | LC7   | 17       | 0.000          | -5.91                 | -2.23          | 3.90           | 0.00                    | 0.00           | 0.00           |
|          |       |          | 0.216          | -1.74                 | 0.58           | 1.84           | 0.00                    | 0.00           | 0.00           |
|          |       |          | 0.431          | -0.39                 | 0.45           | -0.10          | 0.00                    | 0.00           | 0.00           |
|          |       | 2        | 0.647          | 2.86                  | -1.25          | -2.17          | 0.00                    | 0.00           | 0.00           |
|          | LC8   | 17       | 0.000          | -3.54                 | 35.89          | -62.01         | 0.00                    | 0.00           | 0.00           |
|          |       |          | 0.216          | -0.86                 | -9.28          | -16.77         | 0.00                    | 0.00           | 0.00           |
|          |       |          | 0.431          | -0.09                 | -9.17          | 20.93          | 0.00                    | 0.00           | 0.00           |
|          |       | 2        | 0.647          | 2.33                  | 37.75          | 64.86          | 0.00                    | 0.00           | 0.00           |
|          | LC9   | 17       | 0.000          | -4.38                 | -40.36         | 69.61          | 0.00                    | 0.00           | 0.00           |
|          |       |          | 0.216          | -1.14                 | 9.99           | 20.41          | 0.00                    | 0.00           | 0.00           |
|          |       |          | 0.431          | -0.15                 | 9.60           | -20.29         | 0.00                    | 0.00           | 0.00           |
|          |       | 2        | 0.647          | 3.07                  | -39.84         | -68.28         | 0.00                    | 0.00           | 0.00           |
| 10       | LC1   | 5        | 0.000          | -1.77                 | -1.53          | 10.97          | 0.00                    | 0.00           | 0.00           |
|          |       |          | 0.199          | 0.10                  | 0.55           | 10.99          | 0.00                    | 0.00           | 0.00           |
|          |       |          | 0.399          | -0.05                 | 0.13           | 11.30          | 0.00                    | 0.00           | 0.00           |
|          |       |          | 0.598          | 0.01                  | -0.04          | 11.57          | 0.00                    | 0.00           | 0.00           |
|          |       |          | 0.797          | 0.00                  | -0.11          | 11.83          | 0.00                    | 0.00           | 0.00           |
|          |       |          | 0.997          | 0.00                  | -0.13          | 12.06          | 0.00                    | 0.00           | 0.00           |
|          |       |          | 1.196          | 0.00                  | -0.13          | 12.21          | 0.00                    | 0.00           | 0.00           |
|          |       |          | 1.395          | 0.00                  | -0.12          | 12.25          | 0.00                    | 0.00           | 0.00           |
|          |       |          | 1.595          | 0.00                  | -0.10          | 12.17          | 0.00                    | 0.00           | 0.00           |
|          |       |          | 1.794          | 0.00                  | -0.08          | 11.94          | 0.00                    | 0.00           | 0.00           |
|          |       |          | 1.993          | 0.00                  | -0.07          | 11.57          | 0.00                    | 0.00           | 0.00           |
|          |       |          | 2.193          | 0.00                  | -0.06          | 11.10          | 0.00                    | 0.00           | 0.00           |
|          |       |          | 2.392          | 0.00                  | -0.06          | 10.56          | 0.00                    | 0.00           | 0.00           |
|          |       |          | 2.591          | 0.00                  | -0.07          | 9.99           | 0.00                    | 0.00           | 0.00           |
|          |       |          | 2.791          | 0.00                  | -0.09          | 9.44           | 0.00                    | 0.00           | 0.00           |
|          |       |          | 2.990          | -0.01                 | -0.16          | 8.97           | 0.00                    | 0.00           | 0.00           |
|          | LC2   | 5        | 0.000          | -0.45                 | -0.37          | 2.77           | 0.00                    | 0.00           | 0.00           |
|          |       |          | 0.199          | 0.03                  | 0.16           | 2.78           | 0.00                    | 0.00           | 0.00           |
|          |       |          | 0.399          | -0.01                 | 0.05           | 2.88           | 0.00                    | 0.00           | 0.00           |
|          |       |          | 0.598          | 0.00                  | 0.00           | 2.98           | 0.00                    | 0.00           | 0.00           |
|          |       |          | 0.797          | 0.00                  | -0.01          | 3.07           | 0.00                    | 0.00           | 0.00           |
|          |       |          | 0.997          | 0.00                  | -0.02          | 3.15           | 0.00                    | 0.00           | 0.00           |
|          |       |          | 1.196          | 0.00                  | -0.01          | 3.21           | 0.00                    | 0.00           | 0.00           |
|          |       |          | 1.395          | 0.00                  | -0.01          | 3.24           | 0.00                    | 0.00           | 0.00           |
|          |       |          | 1.595          | 0.00                  | -0.01          | 3.24           | 0.00                    | 0.00           | 0.00           |
|          |       |          | 1.794          | 0.00                  | 0.00           | 3.20           | 0.00                    | 0.00           | 0.00           |
|          |       |          | 1.993          | 0.00                  | 0.00           | 3.13           | 0.00                    | 0.00           | 0.00           |
|          |       |          | 2.193          | 0.00                  | 0.01           | 3.02           | 0.00                    | 0.00           | 0.00           |
|          |       |          | 2.392          | 0.00                  | 0.01           | 2.89           | 0.00                    | 0.00           | 0.00           |
|          |       |          | 2.591          | 0.00                  | 0.01           | 2.75           | 0.00                    | 0.00           | 0.00           |
|          |       |          | 2.791          | 0.00                  | 0.00           | 2.60           | 0.00                    | 0.00           | 0.00           |
|          |       |          | 2.990          | 0.00                  | -0.01          | 2.45           | 0.00                    | 0.00           | 0.00           |
|          | LC3   | 5        | 0.000          | -0.06                 | -0.05          | 0.38           | 0.00                    | 0.00           | 0.00           |
|          |       |          | 0.199          | 0.00                  | 0.02           | 0.40           | 0.00                    | 0.00           | 0.00           |
|          |       |          | 0.399          | 0.00                  | 0.00           | 0.42           | 0.00                    | 0.00           | 0.00           |
|          |       |          | 0.598          | 0.00                  | 0.00           | 0.43           | 0.00                    | 0.00           | 0.00           |
|          |       |          | 0.797          | 0.00                  | -0.01          | 0.44           | 0.00                    | 0.00           | 0.00           |
|          |       |          | 0.997          | 0.00                  | -0.01          | 0.45           | 0.00                    | 0.00           | 0.00           |
|          |       |          | 1.196          | 0.00                  | -0.01          | 0.46           | 0.00                    | 0.00           | 0.00           |
|          |       |          | 1.395          | 0.00                  | 0.00           | 0.46           | 0.00                    | 0.00           | 0.00           |
|          |       |          | 1.595          | 0.00                  | 0.00           | 0.45           | 0.00                    | 0.00           | 0.00           |
|          |       |          | 1.794          | 0.00                  | 0.00           | 0.43           | 0.00                    | 0.00           | 0.00           |
|          |       |          | 1.993          | 0.00                  | 0.00           | 0.41           | 0.00                    | 0.00           | 0.00           |
|          |       |          | 2.193          | 0.00                  | 0.00           | 0.38           | 0.00                    | 0.00           | 0.00           |
|          |       |          | 2.392          | 0.00                  | 0.00           | 0.35           | 0.00                    | 0.00           | 0.00           |
|          |       |          | 2.591          | 0.00                  | 0.00           | 0.32           | 0.00                    | 0.00           | 0.00           |
|          |       |          | 2.791          | 0.00                  | 0.00           | 0.29           | 0.00                    | 0.00           | 0.00           |
|          |       |          | 2.990          | 0.00                  | -0.01          | 0.26           | 0.00                    | 0.00           | 0.00           |



Project: 2010-2

Model: 2010-2

Date: 29-4-2021

#### ■ 4.3 LINES - SUPPORT FORCES

| Line No. | LC/CO | Node No. | Location x [m] | Support Forces [kN/m] |                |                | Support Moments [kNm/m] |                |                |  |
|----------|-------|----------|----------------|-----------------------|----------------|----------------|-------------------------|----------------|----------------|--|
|          |       |          |                | p <sub>x</sub>        | p <sub>y</sub> | p <sub>z</sub> | m <sub>x</sub>          | m <sub>y</sub> | m <sub>z</sub> |  |
| 10       | LC6   | 5        | 0.000          | 0.28                  | -0.10          | -0.39          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.199          | -0.01                 | -0.38          | -0.25          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.399          | 0.00                  | -0.34          | -0.14          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.598          | 0.00                  | -0.33          | -0.07          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.797          | 0.00                  | -0.32          | -0.02          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.997          | 0.00                  | -0.32          | 0.02           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.196          | 0.00                  | -0.32          | 0.05           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.395          | 0.00                  | -0.31          | 0.07           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.595          | 0.00                  | -0.31          | 0.09           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.794          | 0.00                  | -0.31          | 0.09           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.993          | 0.00                  | -0.31          | 0.09           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 2.193          | 0.00                  | -0.30          | 0.07           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 2.392          | 0.00                  | -0.29          | 0.04           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 2.591          | 0.00                  | -0.29          | -0.01          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 2.791          | 0.00                  | -0.27          | -0.10          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 2.990          | 0.00                  | -0.29          | -0.23          | 0.00                    | 0.00           | 0.00           |  |
|          | LC7   | 5        | 0.000          | -0.37                 | -0.23          | 1.45           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.199          | 0.01                  | 0.16           | 0.95           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.399          | 0.00                  | 0.04           | 0.65           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.598          | 0.00                  | -0.01          | 0.46           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.797          | 0.00                  | -0.03          | 0.33           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.997          | 0.00                  | -0.04          | 0.25           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.196          | 0.00                  | -0.04          | 0.20           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.395          | 0.00                  | -0.05          | 0.17           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.595          | 0.00                  | -0.05          | 0.15           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.794          | 0.00                  | -0.05          | 0.13           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.993          | 0.00                  | -0.05          | 0.12           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 2.193          | 0.00                  | -0.05          | 0.11           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 2.392          | 0.00                  | -0.05          | 0.10           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 2.591          | 0.00                  | -0.05          | 0.10           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 2.791          | 0.00                  | -0.05          | 0.09           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 2.990          | 0.00                  | -0.05          | 0.08           | 0.00                    | 0.00           | 0.00           |  |
|          | LC8   | 5        | 0.000          | 2.18                  | 5.95           | -19.79         | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.199          | -0.14                 | 3.43           | -11.82         | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.399          | 0.05                  | 5.25           | -7.29          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.598          | -0.02                 | 5.88           | -4.36          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.797          | 0.00                  | 6.14           | -2.55          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.997          | 0.00                  | 6.26           | -1.48          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.196          | 0.00                  | 6.32           | -0.87          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.395          | 0.00                  | 6.35           | -0.54          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.595          | 0.00                  | 6.36           | -0.38          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.794          | 0.00                  | 6.35           | -0.29          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.993          | 0.00                  | 6.33           | -0.21          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 2.193          | 0.00                  | 6.27           | -0.03          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 2.392          | 0.00                  | 6.18           | 0.37           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 2.591          | 0.00                  | 6.03           | 1.12           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 2.791          | 0.00                  | 5.84           | 2.36           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 2.990          | 0.00                  | 6.13           | 4.62           | 0.00                    | 0.00           | 0.00           |  |
|          | LC9   | 5        | 0.000          | -1.91                 | -5.90          | 19.07          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.199          | 0.13                  | -3.67          | 11.46          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.399          | -0.05                 | -5.41          | 7.14           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.598          | 0.02                  | -6.00          | 4.35           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.797          | 0.00                  | -6.26          | 2.62           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.997          | 0.00                  | -6.38          | 1.60           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.196          | 0.00                  | -6.43          | 1.02           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.395          | 0.00                  | -6.46          | 0.71           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.595          | 0.00                  | -6.47          | 0.56           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.794          | 0.00                  | -6.46          | 0.48           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.993          | 0.00                  | -6.43          | 0.39           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 2.193          | 0.00                  | -6.38          | 0.21           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 2.392          | 0.00                  | -6.28          | -0.19          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 2.591          | 0.00                  | -6.13          | -0.96          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 2.791          | 0.00                  | -5.93          | -2.21          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 2.990          | 0.00                  | -6.22          | -4.50          | 0.00                    | 0.00           | 0.00           |  |
| 17       | LC1   | 7        | 0.000          | 0.02                  | -2.01          | 8.45           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.216          | 0.01                  | 0.59           | 8.85           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.432          | 0.00                  | 0.39           | 8.71           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.648          | 0.00                  | 0.23           | 8.31           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.864          | 0.00                  | 0.17           | 7.84           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.080          | 0.01                  | 0.30           | 7.46           | 0.00                    | 0.00           | 0.00           |  |
|          | LC2   | 7        | 0.000          | 0.01                  | -0.47          | 2.00           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.216          | 0.00                  | 0.14           | 2.09           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.432          | 0.00                  | 0.08           | 2.08           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.648          | 0.00                  | 0.04           | 2.03           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.864          | 0.00                  | 0.03           | 1.98           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.080          | 0.00                  | 0.07           | 1.95           | 0.00                    | 0.00           | 0.00           |  |
|          | LC3   | 7        | 0.000          | 0.00                  | -0.08          | 0.32           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.216          | 0.00                  | 0.02           | 0.33           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.432          | 0.00                  | 0.02           | 0.32           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.648          | 0.00                  | 0.01           | 0.29           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.864          | 0.00                  | 0.01           | 0.25           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.080          | 0.00                  | 0.01           | 0.22           | 0.00                    | 0.00           | 0.00           |  |
|          | LC6   | 7        | 0.000          | 0.00                  | 0.03           | 0.03           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.216          | 0.00                  | 0.04           | 0.13           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.432          | 0.00                  | 0.06           | 0.13           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.648          | 0.00                  | 0.06           | 0.12           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.864          | 0.00                  | 0.06           | 0.10           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.080          | 0.00                  | 0.06           | 0.08           | 0.00                    | 0.00           | 0.00           |  |
|          | LC7   | 7        | 0.000          | 0.00                  | 0.18           | -0.42          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.216          | 0.00                  | 0.01           | -0.18          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.432          | 0.00                  | 0.07           | -0.10          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.648          | 0.00                  | 0.09           | -0.08          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.864          | 0.00                  | 0.10           | -0.11          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.080          | 0.00                  | 0.08           | -0.16          | 0.00                    | 0.00           | 0.00           |  |



Project: 2010-2

Model: 2010-2

Date: 29-4-2021

#### ■ 4.3 LINES - SUPPORT FORCES

| Line No. | LC/CO | Node No. | Location x [m] | Support Forces [kN/m] |        |        | Support Moments [kNm/m] |       |       |  |
|----------|-------|----------|----------------|-----------------------|--------|--------|-------------------------|-------|-------|--|
|          |       |          |                | $p_x$                 | $p_y$  | $p_z$  | $m_x$                   | $m_y$ | $m_z$ |  |
| 17       | LC8   | 7        | 0.000          | 0.00                  | 10.77  | -26.41 | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.216          | 0.01                  | 0.07   | -15.36 | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.432          | 0.00                  | 2.53   | -9.61  | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.648          | 0.00                  | 3.38   | -5.83  | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.864          | 0.00                  | 3.74   | -3.42  | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 1.080          | 0.00                  | 4.09   | -1.71  | 0.00                    | 0.00  | 0.00  |  |
|          | LC9   | 7        | 0.000          | -0.01                 | -10.73 | 26.44  | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.216          | -0.01                 | -0.05  | 15.47  | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.432          | 0.00                  | -2.51  | 9.79   | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.648          | 0.00                  | -3.36  | 6.09   | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.864          | 0.00                  | -3.72  | 3.75   | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 1.080          | 0.00                  | -4.04  | 2.12   | 0.00                    | 0.00  | 0.00  |  |
| 21       | LC1   | 3        | 0.000          | 0.59                  | -10.67 | 17.32  | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.216          | 0.08                  | -0.84  | 17.28  | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.431          | 0.01                  | -2.78  | 19.54  | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.647          | 0.04                  | 9.09   | 17.27  | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.864          | 0.00                  | 0.00   | 0.00   | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 1.080          | 0.00                  | 0.00   | 0.00   | 0.00                    | 0.00  | 0.00  |  |
|          | LC2   | 3        | 0.000          | 0.23                  | -1.17  | 1.90   | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.216          | 0.04                  | -0.08  | 1.64   | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.431          | 0.01                  | -0.23  | 1.74   | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.647          | 0.02                  | 0.61   | 1.14   | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.864          | 0.00                  | 0.00   | 0.00   | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 1.080          | 0.00                  | 0.00   | 0.00   | 0.00                    | 0.00  | 0.00  |  |
|          | LC3   | 3        | 0.000          | 0.01                  | -0.66  | 1.07   | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.216          | 0.00                  | -0.03  | 1.01   | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.431          | 0.00                  | -0.12  | 1.07   | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.647          | 0.00                  | 0.43   | 0.78   | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.864          | 0.00                  | 0.00   | 0.00   | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 1.080          | 0.00                  | 0.00   | 0.00   | 0.00                    | 0.00  | 0.00  |  |
|          | LC6   | 3        | 0.000          | -0.86                 | -1.04  | 1.69   | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.216          | 0.24                  | 0.00   | 0.99   | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.431          | 0.75                  | -0.09  | 0.71   | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.647          | 2.21                  | -0.13  | -0.13  | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.864          | 0.00                  | 0.00   | 0.00   | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 1.080          | 0.00                  | 0.00   | 0.00   | 0.00                    | 0.00  | 0.00  |  |
|          | LC7   | 3        | 0.000          | 1.40                  | -1.58  | 2.43   | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.216          | -0.38                 | -0.14  | -0.05  | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.431          | -1.20                 | -0.07  | -1.07  | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.647          | -3.57                 | -2.20  | -3.50  | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.864          | 0.00                  | 0.00   | 0.00   | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 1.080          | 0.00                  | 0.00   | 0.00   | 0.00                    | 0.00  | 0.00  |  |
|          | LC8   | 3        | 0.000          | -0.77                 | 16.33  | -28.00 | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.216          | 0.29                  | -3.77  | -10.37 | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.431          | 0.68                  | -3.67  | 4.97   | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.647          | 1.61                  | 13.64  | 23.58  | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.864          | 0.00                  | 0.00   | 0.00   | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 1.080          | 0.00                  | 0.00   | 0.00   | 0.00                    | 0.00  | 0.00  |  |
|          | LC9   | 3        | 0.000          | -0.23                 | -17.30 | 29.69  | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.216          | 0.19                  | 3.84   | 12.85  | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.431          | 0.44                  | 3.47   | -2.06  | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.647          | 1.07                  | -11.73 | -20.33 | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.864          | 0.00                  | 0.00   | 0.00   | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 1.080          | 0.00                  | 0.00   | 0.00   | 0.00                    | 0.00  | 0.00  |  |
| 25       | LC1   | 18       | 0.000          | 0.04                  | -5.56  | 12.77  | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.162          | 0.01                  | 2.64   | 18.63  | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.324          | 0.01                  | 2.10   | 19.87  | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.485          | 0.09                  | -0.75  | 20.03  | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.647          | 0.54                  | 13.29  | 24.27  | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.864          | 0.00                  | 0.00   | 0.00   | 0.00                    | 0.00  | 0.00  |  |
|          | LC2   | 18       | 0.000          | 0.03                  | -0.13  | 0.41   | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.162          | 0.01                  | 0.19   | 1.37   | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.324          | 0.01                  | 0.25   | 1.62   | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.485          | 0.03                  | -0.05  | 1.74   | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.647          | 0.14                  | 1.34   | 2.41   | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.864          | 0.00                  | 0.00   | 0.00   | 0.00                    | 0.00  | 0.00  |  |
|          | LC3   | 18       | 0.000          | 0.00                  | -0.25  | 0.56   | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.162          | 0.00                  | 0.11   | 1.05   | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.324          | 0.00                  | 0.11   | 1.18   | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.485          | 0.00                  | -0.06  | 1.23   | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.647          | 0.02                  | 0.82   | 1.51   | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.864          | 0.00                  | 0.00   | 0.00   | 0.00                    | 0.00  | 0.00  |  |
|          | LC6   | 18       | 0.000          | 2.60                  | 1.40   | -2.41  | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.162          | 0.92                  | -0.12  | -0.55  | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.324          | 0.46                  | 0.15   | 0.65   | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.485          | 0.12                  | -0.22  | 1.81   | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.647          | -1.13                 | 2.00   | 3.57   | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.864          | 0.00                  | 0.00   | 0.00   | 0.00                    | 0.00  | 0.00  |  |
|          | LC7   | 18       | 0.000          | -4.18                 | 3.60   | -6.32  | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.162          | -1.48                 | -0.27  | -2.86  | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.324          | -0.74                 | 0.45   | -0.88  | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.485          | -0.19                 | -0.09  | 1.13   | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.647          | 1.81                  | 2.74   | 4.68   | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.864          | 0.00                  | 0.00   | 0.00   | 0.00                    | 0.00  | 0.00  |  |
|          | LC8   | 18       | 0.000          | 1.23                  | 14.82  | -26.36 | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.162          | 0.52                  | -2.77  | -9.29  | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.324          | 0.31                  | -0.54  | 5.11   | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.485          | 0.13                  | -3.38  | 18.98  | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.647          | -0.35                 | 19.28  | 34.90  | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.864          | 0.00                  | 0.00   | 0.00   | 0.00                    | 0.00  | 0.00  |  |
|          | LC9   | 18       | 0.000          | 1.87                  | -15.89 | 28.40  | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.162          | 0.79                  | 2.91   | 11.52  | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.324          | 0.48                  | 0.50   | -2.74  | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.485          | 0.18                  | 3.14   | -16.62 | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.647          | -1.05                 | -18.15 | -32.72 | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.864          | 0.00                  | 0.00   | 0.00   | 0.00                    | 0.00  | 0.00  |  |
| 33       | LC1   | 20       | 0.000          | -12.71                | 0.00   | 24.72  | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.194          | 3.42                  | 0.00   | 24.75  | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.387          | 1.82                  | 0.00   | 23.80  | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.581          | 0.84                  | 0.00   | 21.76  | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.775          | 0.37                  | 0.00   | 19.90  | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.968          | 0.12                  | 0.00   | 18.43  | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 1.162          | -0.12                 | 0.00   | 17.48  | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 1.355          | -0.43                 | 0.00   | 17.25  | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 1.549          | -0.90                 | 0.00   | 17.84  | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 1.743          | -1.67                 | 0.00   | 18.93  | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 1.936          | -2.79                 | 0.00   | 19.19  | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 2.130          | 9.30                  | 0.00   | 18.48  | 0.00                    | 0.00  | 0.00  |  |
|          | LC2   | 20       | 0.000          | -2.67                 | 0.00   | 5.02   | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.194          | 0.66                  | 0.00   | 5.47   | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.387          | 0.41                  | 0.00   | 5.35   | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.581          | 0.22                  | 0.00   | 4.88   | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.775          | 0.11                  | 0.00   | 4.42   | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.968          | 0.05                  | 0.00   | 4.06   | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 1.162          | -0.01                 | 0.00   | 3.84   | 0.00                    | 0.00  | 0.00  |  |



Project: 2010-2

Model: 2010-2

Date: 29-4-2021

#### ■ 4.3 LINES - SUPPORT FORCES

| Line No. | LC/CO | Node No. | Location x [m] | Support Forces [kN/m] |       |       | Support Moments [kNm/m] |       |       |  |
|----------|-------|----------|----------------|-----------------------|-------|-------|-------------------------|-------|-------|--|
|          |       |          |                | $p_x$                 | $p_y$ | $p_z$ | $m_x$                   | $m_y$ | $m_z$ |  |
| 33       | LC2   | 20       | 1.355          | -0.08                 | 0.00  | 3.79  | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 1.549          | -0.17                 | 0.00  | 3.92  | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 1.743          | -0.32                 | 0.00  | 4.12  | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 1.936          | -0.48                 | 0.00  | 4.07  | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 2.130          | 1.89                  | 0.00  | 3.57  | 0.00                    | 0.00  | 0.00  |  |
|          | LC3   | 20       | 0.000          | -0.49                 | 0.00  | 0.93  | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.194          | 0.12                  | 0.00  | 1.01  | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.387          | 0.07                  | 0.00  | 1.01  | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.581          | 0.03                  | 0.00  | 0.95  | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.775          | 0.02                  | 0.00  | 0.88  | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.968          | 0.01                  | 0.00  | 0.82  | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 1.162          | 0.00                  | 0.00  | 0.77  | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 1.355          | -0.01                 | 0.00  | 0.74  | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 1.549          | -0.03                 | 0.00  | 0.74  | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 1.743          | -0.06                 | 0.00  | 0.76  | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 1.936          | -0.09                 | 0.00  | 0.74  | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 2.130          | 0.34                  | 0.00  | 0.64  | 0.00                    | 0.00  | 0.00  |  |
|          | LC6   | 20       | 0.000          | 1.84                  | -0.31 | -3.21 | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.194          | -0.21                 | -0.35 | -2.07 | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.387          | 0.13                  | -0.34 | -1.38 | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.581          | 0.28                  | -0.34 | -0.83 | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.775          | 0.34                  | -0.34 | -0.44 | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.968          | 0.36                  | -0.34 | -0.14 | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 1.162          | 0.36                  | -0.34 | 0.14  | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 1.355          | 0.34                  | -0.34 | 0.43  | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 1.549          | 0.28                  | -0.34 | 0.82  | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 1.743          | 0.14                  | -0.34 | 1.35  | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 1.936          | -0.21                 | -0.35 | 2.03  | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 2.130          | 1.82                  | -0.31 | 3.17  | 0.00                    | 0.00  | 0.00  |  |
|          | LC7   | 20       | 0.000          | -1.27                 | -0.31 | 2.21  | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.194          | 0.14                  | -0.35 | 1.40  | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.387          | -0.11                 | -0.34 | 0.94  | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.581          | -0.21                 | -0.34 | 0.59  | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.775          | -0.24                 | -0.34 | 0.33  | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.968          | -0.26                 | -0.34 | 0.13  | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 1.162          | -0.25                 | -0.34 | -0.06 | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 1.355          | -0.24                 | -0.34 | -0.27 | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 1.549          | -0.20                 | -0.34 | -0.55 | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 1.743          | -0.10                 | -0.34 | -0.93 | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 1.936          | 0.15                  | -0.35 | -1.42 | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 2.130          | -1.28                 | -0.31 | -2.24 | 0.00                    | 0.00  | 0.00  |  |
|          | LC8   | 20       | 0.000          | -3.24                 | 2.13  | 5.64  | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.194          | 0.39                  | 1.15  | 3.53  | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.387          | -0.22                 | 0.85  | 2.15  | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.581          | -0.48                 | 0.72  | 1.03  | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.775          | -0.59                 | 0.65  | 0.21  | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.968          | -0.63                 | 0.62  | -0.41 | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 1.162          | -0.64                 | 0.62  | -0.94 | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 1.355          | -0.60                 | 0.65  | -1.49 | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 1.549          | -0.48                 | 0.72  | -2.19 | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 1.743          | -0.19                 | 0.85  | -3.17 | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 1.936          | 0.47                  | 1.15  | -4.38 | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 2.130          | -3.61                 | 2.09  | -6.35 | 0.00                    | 0.00  | 0.00  |  |
|          | LC9   | 20       | 0.000          | 4.04                  | -1.40 | -6.97 | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.194          | -0.39                 | -0.75 | -3.89 | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.387          | 0.42                  | -0.55 | -2.05 | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.581          | 0.75                  | -0.47 | -0.66 | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.775          | 0.88                  | -0.42 | 0.32  | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.968          | 0.92                  | -0.40 | 1.07  | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 1.162          | 0.91                  | -0.40 | 1.74  | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 1.355          | 0.85                  | -0.42 | 2.50  | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 1.549          | 0.67                  | -0.47 | 3.53  | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 1.743          | 0.24                  | -0.55 | 4.96  | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 1.936          | -0.72                 | -0.74 | 6.69  | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 2.130          | 5.37                  | -1.36 | 9.45  | 0.00                    | 0.00  | 0.00  |  |
| 37       | LC1   | 22       | 0.000          | -8.80                 | -0.01 | 17.38 | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.194          | 2.60                  | 0.00  | 17.74 | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.387          | 1.49                  | 0.00  | 17.44 | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.581          | 0.77                  | 0.00  | 16.39 | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.775          | 0.35                  | 0.00  | 15.74 | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.968          | 0.07                  | 0.00  | 15.78 | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 1.162          | -0.19                 | 0.00  | 16.57 | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 1.355          | -0.52                 | 0.00  | 18.12 | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 1.549          | -1.01                 | 0.00  | 20.41 | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 1.743          | -2.01                 | 0.00  | 23.10 | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 1.936          | -3.49                 | 0.00  | 24.63 | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 2.130          | 12.48                 | 0.01  | 24.59 | 0.00                    | 0.00  | 0.00  |  |
|          | LC2   | 22       | 0.000          | -1.97                 | 0.00  | 3.65  | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.194          | 0.45                  | 0.00  | 3.95  | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.387          | 0.24                  | 0.00  | 3.97  | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.581          | 0.10                  | 0.00  | 3.75  | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.775          | 0.02                  | 0.00  | 3.56  | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.968          | -0.04                 | 0.00  | 3.50  | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 1.162          | -0.09                 | 0.00  | 3.58  | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 1.355          | -0.18                 | 0.00  | 3.85  | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 1.549          | -0.30                 | 0.00  | 4.35  | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 1.743          | -0.51                 | 0.00  | 5.00  | 0.00                    | 0.00  | 0.00  |  |
|          | LC3   | 22       | 1.936          | -0.70                 | 0.00  | 5.31  | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 2.130          | 2.50                  | 0.00  | 4.78  | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.000          | -0.24                 | 0.00  | 0.45  | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.194          | 0.07                  | 0.00  | 0.57  | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.387          | 0.05                  | 0.00  | 0.61  | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.581          | 0.04                  | 0.00  | 0.60  | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.775          | 0.02                  | 0.00  | 0.60  | 0.00                    | 0.00  | 0.00  |  |



Project: 2010-2

Model: 2010-2

Date: 29-4-2021

#### ■ 4.3 LINES - SUPPORT FORCES

| Line No. | LC/CO | Node No. | Location x [m] | Support Forces [kN/m] |                |                | Support Moments [kNm/m] |                |                |      |      |  |
|----------|-------|----------|----------------|-----------------------|----------------|----------------|-------------------------|----------------|----------------|------|------|--|
|          |       |          |                | p <sub>x</sub>        | p <sub>y</sub> | p <sub>z</sub> | m <sub>x</sub>          | m <sub>y</sub> | m <sub>z</sub> |      |      |  |
| 37       | LC3   | 22       | 0.968          | 0.01                  | 0.00           | 0.63           | 0.00                    | 0.00           | 0.00           |      |      |  |
|          |       |          | 1.162          | 0.00                  | 0.00           | 0.69           | 0.00                    | 0.00           | 0.00           |      |      |  |
|          |       |          | 1.355          | -0.01                 | 0.00           | 0.78           | 0.00                    | 0.00           | 0.00           |      |      |  |
|          |       |          | 1.549          | -0.03                 | 0.00           | 0.88           | 0.00                    | 0.00           | 0.00           |      |      |  |
|          |       |          | 1.743          | -0.06                 | 0.00           | 0.98           | 0.00                    | 0.00           | 0.00           |      |      |  |
|          |       |          | 1.936          | -0.12                 | 0.00           | 1.01           | 0.00                    | 0.00           | 0.00           |      |      |  |
|          |       | 23       | 2.130          | 0.51                  | 0.00           | 0.97           | 0.00                    | 0.00           | 0.00           |      |      |  |
|          |       |          | LC6            | 22                    | 0.000          | 1.98           | -0.32                   | -3.43          | 0.00           | 0.00 | 0.00 |  |
|          |       |          |                |                       | 0.194          | -0.23          | -0.35                   | -2.20          | 0.00           | 0.00 | 0.00 |  |
|          |       |          |                |                       | 0.387          | 0.15           | -0.34                   | -1.47          | 0.00           | 0.00 | 0.00 |  |
|          |       |          |                |                       | 0.581          | 0.31           | -0.34                   | -0.90          | 0.00           | 0.00 | 0.00 |  |
|          |       |          |                |                       | 0.775          | 0.37           | -0.34                   | -0.49          | 0.00           | 0.00 | 0.00 |  |
|          | 0.968 | 0.39     |                |                       | -0.34          | -0.18          | 0.00                    | 0.00           | 0.00           |      |      |  |
|          | 23    | 1.162    |                | 0.39                  | -0.34          | 0.11           | 0.00                    | 0.00           | 0.00           |      |      |  |
|          |       | 1.355    |                | 0.37                  | -0.34          | 0.43           | 0.00                    | 0.00           | 0.00           |      |      |  |
|          |       | 1.549    |                | 0.31                  | -0.34          | 0.84           | 0.00                    | 0.00           | 0.00           |      |      |  |
|          |       | 1.743    |                | 0.16                  | -0.34          | 1.40           | 0.00                    | 0.00           | 0.00           |      |      |  |
|          |       | 1.936    |                | -0.21                 | -0.35          | 2.14           | 0.00                    | 0.00           | 0.00           |      |      |  |
|          |       | 2.130    |                | 1.92                  | -0.31          | 3.38           | 0.00                    | 0.00           | 0.00           |      |      |  |
|          | LC7   | 22       | 0.000          | -1.41                 | -0.29          | 2.45           | 0.00                    | 0.00           | 0.00           |      |      |  |
|          |       |          | 0.194          | 0.16                  | -0.42          | 1.53           | 0.00                    | 0.00           | 0.00           |      |      |  |
|          |       |          | 0.387          | -0.11                 | -0.45          | 0.99           | 0.00                    | 0.00           | 0.00           |      |      |  |
|          |       |          | 0.581          | -0.23                 | -0.49          | 0.56           | 0.00                    | 0.00           | 0.00           |      |      |  |
|          |       |          | 0.775          | -0.27                 | -0.50          | 0.26           | 0.00                    | 0.00           | 0.00           |      |      |  |
|          |       |          | 0.968          | -0.28                 | -0.51          | 0.02           | 0.00                    | 0.00           | 0.00           |      |      |  |
|          |       | 23       | 1.162          | -0.28                 | -0.52          | -0.21          | 0.00                    | 0.00           | 0.00           |      |      |  |
|          |       |          | 1.355          | -0.26                 | -0.53          | -0.46          | 0.00                    | 0.00           | 0.00           |      |      |  |
|          |       |          | 1.549          | -0.21                 | -0.54          | -0.79          | 0.00                    | 0.00           | 0.00           |      |      |  |
|          |       |          | 1.743          | -0.09                 | -0.55          | -1.26          | 0.00                    | 0.00           | 0.00           |      |      |  |
|          |       |          | 1.936          | 0.19                  | -0.57          | -1.83          | 0.00                    | 0.00           | 0.00           |      |      |  |
|          |       |          | 2.130          | -1.54                 | -0.55          | -2.72          | 0.00                    | 0.00           | 0.00           |      |      |  |
|          | LC8   | 22       | 0.000          | -2.17                 | 2.11           | 3.75           | 0.00                    | 0.00           | 0.00           |      |      |  |
|          |       |          | 0.194          | 0.21                  | 1.15           | 2.23           | 0.00                    | 0.00           | 0.00           |      |      |  |
|          |       |          | 0.387          | -0.23                 | 0.85           | 1.40           | 0.00                    | 0.00           | 0.00           |      |      |  |
|          |       |          | 0.581          | -0.40                 | 0.72           | 0.80           | 0.00                    | 0.00           | 0.00           |      |      |  |
|          |       |          | 0.775          | -0.47                 | 0.65           | 0.39           | 0.00                    | 0.00           | 0.00           |      |      |  |
|          |       |          | 0.968          | -0.49                 | 0.62           | 0.08           | 0.00                    | 0.00           | 0.00           |      |      |  |
|          |       | 23       | 1.162          | -0.49                 | 0.62           | -0.19          | 0.00                    | 0.00           | 0.00           |      |      |  |
|          |       |          | 1.355          | -0.47                 | 0.65           | -0.47          | 0.00                    | 0.00           | 0.00           |      |      |  |
|          |       |          | 1.549          | -0.42                 | 0.72           | -0.84          | 0.00                    | 0.00           | 0.00           |      |      |  |
|          |       |          | 1.743          | -0.25                 | 0.85           | -1.38          | 0.00                    | 0.00           | 0.00           |      |      |  |
|          |       |          | 1.936          | 0.17                  | 1.15           | -2.15          | 0.00                    | 0.00           | 0.00           |      |      |  |
|          |       |          | 2.130          | -2.09                 | 2.11           | -3.65          | 0.00                    | 0.00           | 0.00           |      |      |  |
|          | LC9   | 22       | 0.000          | 4.04                  | -1.37          | -6.93          | 0.00                    | 0.00           | 0.00           |      |      |  |
|          |       |          | 0.194          | -0.38                 | -0.74          | -3.90          | 0.00                    | 0.00           | 0.00           |      |      |  |
|          |       |          | 0.387          | 0.45                  | -0.55          | -2.19          | 0.00                    | 0.00           | 0.00           |      |      |  |
|          |       |          | 0.581          | 0.78                  | -0.47          | -0.94          | 0.00                    | 0.00           | 0.00           |      |      |  |
|          |       |          | 0.775          | 0.89                  | -0.42          | -0.05          | 0.00                    | 0.00           | 0.00           |      |      |  |
| 0.968    |       |          | 0.92           | -0.40                 | 0.67           | 0.00           | 0.00                    | 0.00           |                |      |      |  |
| 23       |       | 1.162    | 0.91           | -0.40                 | 1.38           | 0.00           | 0.00                    | 0.00           |                |      |      |  |
|          |       | 1.355    | 0.84           | -0.42                 | 2.18           | 0.00           | 0.00                    | 0.00           |                |      |      |  |
|          |       | 1.549    | 0.69           | -0.47                 | 3.22           | 0.00           | 0.00                    | 0.00           |                |      |      |  |
|          |       | 1.743    | 0.29           | -0.55                 | 4.61           | 0.00           | 0.00                    | 0.00           |                |      |      |  |
|          |       | 1.936    | -0.63          | -0.75                 | 6.31           | 0.00           | 0.00                    | 0.00           |                |      |      |  |
|          |       | 2.130    | 5.11           | -1.38                 | 9.09           | 0.00           | 0.00                    | 0.00           |                |      |      |  |
| 41       | LC1   | 24       | 0.000          | -10.72                | 0.00           | 21.25          | 0.00                    | 0.00           | 0.00           |      |      |  |
|          |       |          | 0.199          | 3.98                  | 0.00           | 24.77          | 0.00                    | 0.00           | 0.00           |      |      |  |
|          |       |          | 0.397          | 3.10                  | 0.00           | 24.49          | 0.00                    | 0.00           | 0.00           |      |      |  |
|          |       |          | 0.596          | 2.27                  | 0.00           | 22.09          | 0.00                    | 0.00           | 0.00           |      |      |  |
|          |       |          | 0.794          | 1.81                  | 0.00           | 19.56          | 0.00                    | 0.00           | 0.00           |      |      |  |
|          |       |          | 0.993          | 1.56                  | 0.00           | 17.38          | 0.00                    | 0.00           | 0.00           |      |      |  |
|          |       | 3        | 1.191          | 1.41                  | 0.00           | 15.57          | 0.00                    | 0.00           | 0.00           |      |      |  |
|          |       |          | 1.390          | 1.32                  | 0.00           | 14.06          | 0.00                    | 0.00           | 0.00           |      |      |  |
|          |       |          | 1.589          | 1.27                  | 0.00           | 12.76          | 0.00                    | 0.00           | 0.00           |      |      |  |
|          |       |          | 1.787          | 1.23                  | 0.00           | 11.60          | 0.00                    | 0.00           | 0.00           |      |      |  |
|          |       |          | 1.986          | 1.19                  | -0.01          | 10.55          | 0.00                    | 0.00           | 0.00           |      |      |  |
|          |       |          | 2.184          | 1.12                  | -0.01          | 9.67           | 0.00                    | 0.00           | 0.00           |      |      |  |
|          |       | 24       | 2.383          | 0.89                  | -0.02          | 9.16           | 0.00                    | 0.00           | 0.00           |      |      |  |
|          |       |          | 2.581          | 0.10                  | -0.05          | 9.36           | 0.00                    | 0.00           | 0.00           |      |      |  |
|          |       |          | 2.780          | 2.44                  | -0.10          | 11.88          | 0.00                    | 0.00           | 0.00           |      |      |  |
|          |       |          | LC2            | 24                    | 0.000          | -4.66          | 0.00                    | 8.79           | 0.00           | 0.00 | 0.00 |  |
|          |       |          |                |                       | 0.199          | 1.50           | 0.00                    | 10.76          | 0.00           | 0.00 | 0.00 |  |
|          |       |          |                |                       | 0.397          | 1.22           | 0.00                    | 10.70          | 0.00           | 0.00 | 0.00 |  |
|          | 0.596 | 0.89     |                |                       | 0.00           | 9.60           | 0.00                    | 0.00           | 0.00           |      |      |  |
|          | 0.794 | 0.69     |                |                       | 0.00           | 8.38           | 0.00                    | 0.00           | 0.00           |      |      |  |
|          | 0.993 | 0.58     |                |                       | 0.00           | 7.30           | 0.00                    | 0.00           | 0.00           |      |      |  |
|          | 3     | 1.191    |                | 0.52                  | 0.00           | 6.37           | 0.00                    | 0.00           | 0.00           |      |      |  |
|          |       | 1.390    |                | 0.49                  | 0.00           | 5.57           | 0.00                    | 0.00           | 0.00           |      |      |  |
|          |       | 1.589    |                | 0.47                  | 0.00           | 4.83           | 0.00                    | 0.00           | 0.00           |      |      |  |
|          |       | 1.787    |                | 0.46                  | 0.00           | 4.12           | 0.00                    | 0.00           | 0.00           |      |      |  |
|          |       | 1.986    |                | 0.46                  | 0.00           | 3.42           | 0.00                    | 0.00           | 0.00           |      |      |  |
|          |       | 2.184    |                | 0.45                  | 0.00           | 2.74           | 0.00                    | 0.00           | 0.00           |      |      |  |
|          | LC3   | 24       | 2.383          | 0.40                  | 0.00           | 2.15           | 0.00                    | 0.00           | 0.00           |      |      |  |
|          |       |          | 2.581          | 0.16                  | -0.01          | 1.86           | 0.00                    | 0.00           | 0.00           |      |      |  |
|          |       |          | 2.780          | 0.40                  | -0.01          | 2.56           | 0.00                    | 0.00           | 0.00           |      |      |  |
|          |       |          | 0.000          | -0.02                 | 0.00           | 0.07           | 0.00                    | 0.00           | 0.00           |      |      |  |
|          |       |          | 0.199          | 0.04                  | 0.00           | 0.24           | 0.00                    | 0.00           | 0.00           |      |      |  |
|          |       |          | 0.397          | 0.06                  | 0.00           | 0.30           | 0.00                    | 0.00           | 0.00           |      |      |  |
|          |       | 3        | 0.596          | 0.06                  | 0.00           | 0.31           | 0.00                    | 0.00           | 0.00           |      |      |  |
|          |       |          | 0.794          | 0.06                  | 0.00           | 0.30           | 0.00                    | 0.00           | 0.00           |      |      |  |
|          |       |          | 0.993          | 0.05                  | 0.00           | 0.28           | 0.00                    | 0.00           | 0.00           |      |      |  |



Project: 2010-2

Model: 2010-2

Date: 29-4-2021

#### ■ 4.3 LINES - SUPPORT FORCES

| Line No. | LC/CO | Node No. | Location x [m] | Support Forces [kN/m] |                |                | Support Moments [kNm/m] |                |                |  |
|----------|-------|----------|----------------|-----------------------|----------------|----------------|-------------------------|----------------|----------------|--|
|          |       |          |                | p <sub>x</sub>        | p <sub>y</sub> | p <sub>z</sub> | m <sub>x</sub>          | m <sub>y</sub> | m <sub>z</sub> |  |
| 41       | LC3   | 24       | 1.787          | 0.05                  | 0.00           | 0.26           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.986          | 0.05                  | 0.00           | 0.27           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 2.184          | 0.04                  | 0.00           | 0.30           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 2.383          | 0.03                  | 0.00           | 0.34           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 2.581          | -0.01                 | 0.00           | 0.42           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 2.780          | 0.15                  | -0.01          | 0.57           | 0.00                    | 0.00           | 0.00           |  |
|          |       | 3        | 0.000          | 2.57                  | -0.35          | -4.40          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.199          | -0.25                 | -0.37          | -2.75          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.397          | 0.26                  | -0.36          | -1.89          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.596          | 0.46                  | -0.36          | -1.23          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.794          | 0.54                  | -0.35          | -0.79          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.993          | 0.58                  | -0.35          | -0.50          | 0.00                    | 0.00           | 0.00           |  |
|          | LC6   | 24       | 1.191          | 0.60                  | -0.34          | -0.29          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.390          | 0.60                  | -0.33          | -0.12          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.589          | 0.60                  | -0.32          | 0.04           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.787          | 0.60                  | -0.30          | 0.22           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.986          | 0.58                  | -0.28          | 0.47           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 2.184          | 0.53                  | -0.24          | 0.84           | 0.00                    | 0.00           | 0.00           |  |
|          |       | 3        | 2.383          | 0.39                  | -0.20          | 1.44           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 2.581          | -0.01                 | -0.11          | 2.39           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 2.780          | 1.49                  | 0.19           | 4.27           | 0.00                    | 0.00           | 0.00           |  |
|          |       | LC7      | 0.000          | -2.86                 | -0.50          | 4.84           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.199          | 0.22                  | -0.60          | 2.74           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.397          | -0.38                 | -0.60          | 1.69           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.596          | -0.61                 | -0.60          | 0.95           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.794          | -0.70                 | -0.61          | 0.48           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.993          | -0.73                 | -0.62          | 0.17           | 0.00                    | 0.00           | 0.00           |  |
|          | LC8   | 24       | 1.191          | -0.75                 | -0.62          | -0.04          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.390          | -0.76                 | -0.64          | -0.21          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.589          | -0.75                 | -0.66          | -0.38          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.787          | -0.74                 | -0.65          | -0.58          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.986          | -0.72                 | -0.61          | -0.87          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 2.184          | -0.65                 | -0.55          | -1.33          | 0.00                    | 0.00           | 0.00           |  |
|          |       | 3        | 2.383          | -0.48                 | -0.45          | -2.06          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 2.581          | 0.02                  | -0.26          | -3.19          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 2.780          | -1.87                 | 0.38           | -5.44          | 0.00                    | 0.00           | 0.00           |  |
|          |       | LC9      | 0.000          | 0.47                  | 2.42           | -0.65          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.199          | 0.16                  | 1.27           | 0.38           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.397          | 0.35                  | 0.92           | 0.66           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.596          | 0.39                  | 0.76           | 0.72           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.794          | 0.39                  | 0.66           | 0.68           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.993          | 0.39                  | 0.59           | 0.60           | 0.00                    | 0.00           | 0.00           |  |
| 46       | LC1   | 124      | 1.191          | 0.40                  | 0.53           | 0.48           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.390          | 0.41                  | 0.49           | 0.33           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.589          | 0.42                  | 0.45           | 0.13           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.787          | 0.45                  | 0.41           | -0.15          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.986          | 0.48                  | 0.37           | -0.53          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 2.184          | 0.52                  | 0.31           | -1.03          | 0.00                    | 0.00           | 0.00           |  |
|          |       | 3        | 2.383          | 0.56                  | 0.23           | -1.61          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 2.581          | 0.47                  | 0.08           | -2.08          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 2.780          | -0.01                 | -0.43          | -1.55          | 0.00                    | 0.00           | 0.00           |  |
|          |       | LC2      | 0.000          | 4.72                  | -1.58          | -8.07          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.199          | -0.48                 | -0.83          | -4.91          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.397          | 0.47                  | -0.60          | -3.18          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.596          | 0.85                  | -0.49          | -1.88          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.794          | 1.00                  | -0.42          | -1.00          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.993          | 1.06                  | -0.38          | -0.39          | 0.00                    | 0.00           | 0.00           |  |
|          | LC3   | 124      | 1.191          | 1.09                  | -0.34          | 0.09           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.390          | 1.09                  | -0.31          | 0.53           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.589          | 1.08                  | -0.29          | 1.02           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.787          | 1.05                  | -0.26          | 1.65           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.986          | 0.98                  | -0.23          | 2.53           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 2.184          | 0.84                  | -0.20          | 3.83           | 0.00                    | 0.00           | 0.00           |  |
|          |       | 8        | 2.383          | 0.49                  | -0.14          | 5.74           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 2.581          | -0.37                 | -0.03          | 8.41           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 2.780          | 3.63                  | 0.32           | 12.53          | 0.00                    | 0.00           | 0.00           |  |
|          |       | LC4      | 0.000          | -4.65                 | 0.01           | 8.10           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.195          | 0.97                  | 0.00           | 9.12           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.391          | 0.38                  | -0.01          | 10.04          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.586          | 0.06                  | -0.01          | 10.67          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.782          | -0.11                 | -0.01          | 11.36          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.977          | -0.23                 | -0.01          | 12.20          | 0.00                    | 0.00           | 0.00           |  |
|          | LC5   | 124      | 1.173          | -0.36                 | -0.01          | 13.22          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.368          | -0.54                 | -0.01          | 14.44          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.564          | -0.83                 | -0.01          | 15.77          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.759          | -1.36                 | 0.00           | 16.91          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.955          | -2.11                 | 0.02           | 16.83          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 2.150          | 8.60                  | 0.07           | 14.89          | 0.00                    | 0.00           | 0.00           |  |
|          |       | 8        | 0.000          | -0.99                 | 0.00           | 1.73           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.195          | 0.22                  | 0.00           | 2.01           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.391          | 0.10                  | 0.00           | 2.24           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.586          | 0.03                  | 0.00           | 2.39           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.782          | 0.00                  | 0.00           | 2.54           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.977          | -0.03                 | 0.00           | 2.72           | 0.00                    | 0.00           | 0.00           |  |
|          | LC6   | 124      | 1.173          | -0.06                 | 0.00           | 2.94           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.368          | -0.10                 | 0.00           | 3.21           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.564          | -0.17                 | 0.00           | 3.51           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.759          | -0.29                 | 0.00           | 3.77           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.955          | -0.47                 | 0.00           | 3.78           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 2.150          | 1.97                  | 0.02           | 3.40           | 0.00                    | 0.00           | 0.00           |  |
|          |       | 8        | 0.000          | -0.14                 | 0.00           | 0.25           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.195          | 0.02                  | 0.00           | 0.28           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.391          | 0.00                  | 0.00           | 0.32           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.586          | -0.01                 | 0.00           | 0.36           | 0.00                    | 0.00           | 0.00           |  |



Project: 2010-2

Model: 2010-2

Date: 29-4-2021

#### ■ 4.3 LINES - SUPPORT FORCES

| Line No. | LC/CO | Node No. | Location x [m] | Support Forces [kN/m] |                |                | Support Moments [kNm/m] |                |                |  |
|----------|-------|----------|----------------|-----------------------|----------------|----------------|-------------------------|----------------|----------------|--|
|          |       |          |                | p <sub>x</sub>        | p <sub>y</sub> | p <sub>z</sub> | m <sub>x</sub>          | m <sub>y</sub> | m <sub>z</sub> |  |
| 46       | LC3   | 124      | 0.782          | -0.01                 | 0.00           | 0.41           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.977          | -0.02                 | 0.00           | 0.47           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.173          | -0.02                 | 0.00           | 0.54           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.368          | -0.03                 | 0.00           | 0.62           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.564          | -0.05                 | 0.00           | 0.71           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.759          | -0.07                 | 0.00           | 0.79           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.955          | -0.10                 | 0.00           | 0.80           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 2.150          | 0.41                  | 0.00           | 0.71           | 0.00                    | 0.00           | 0.00           |  |
|          |       | 8        | 0.000          | 0.41                  | 0.00           | -0.63          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.195          | -0.01                 | 0.00           | -0.27          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.391          | 0.09                  | 0.00           | -0.10          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.586          | 0.12                  | 0.00           | 0.00           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.782          | 0.13                  | 0.00           | 0.07           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.977          | 0.13                  | 0.00           | 0.12           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.173          | 0.13                  | 0.00           | 0.18           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.368          | 0.12                  | 0.00           | 0.24           | 0.00                    | 0.00           | 0.00           |  |
|          | LC6   | 124      | 1.564          | 0.10                  | 0.00           | 0.33           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.759          | 0.06                  | 0.00           | 0.45           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.955          | -0.06                 | 0.00           | 0.62           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 2.150          | 0.60                  | 0.00           | 0.96           | 0.00                    | 0.00           | 0.00           |  |
|          |       | 8        | 0.000          | -0.96                 | 0.00           | 1.51           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.195          | 0.06                  | 0.00           | 0.86           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.391          | -0.14                 | 0.00           | 0.54           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.586          | -0.21                 | 0.00           | 0.34           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.782          | -0.23                 | 0.00           | 0.20           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.977          | -0.24                 | 0.00           | 0.09           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.173          | -0.24                 | 0.00           | -0.01          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.368          | -0.23                 | 0.00           | -0.13          | 0.00                    | 0.00           | 0.00           |  |
|          | LC7   | 124      | 1.564          | -0.20                 | 0.00           | -0.28          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.759          | -0.13                 | 0.00           | -0.52          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.955          | 0.07                  | 0.00           | -0.87          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 2.150          | -0.98                 | 0.00           | -1.53          | 0.00                    | 0.00           | 0.00           |  |
|          |       | 8        | 0.000          | 1.61                  | 0.01           | -2.47          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.195          | -0.02                 | 0.00           | -1.10          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.391          | 0.37                  | 0.00           | -0.53          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.586          | 0.48                  | 0.00           | -0.25          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.782          | 0.52                  | 0.00           | -0.14          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.977          | 0.54                  | 0.00           | -0.11          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.173          | 0.54                  | 0.00           | -0.11          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.368          | 0.53                  | 0.00           | -0.09          | 0.00                    | 0.00           | 0.00           |  |
|          | LC8   | 124      | 1.564          | 0.49                  | 0.00           | 0.01           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.759          | 0.36                  | -0.01          | 0.30           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.955          | -0.04                 | -0.03          | 0.94           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 2.150          | 1.57                  | -0.12          | 2.42           | 0.00                    | 0.00           | 0.00           |  |
|          |       | 8        | 0.000          | -0.71                 | -0.01          | 1.05           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.195          | -0.06                 | 0.00           | 0.29           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.391          | -0.27                 | 0.00           | 0.10           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.586          | -0.32                 | 0.00           | 0.11           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.782          | -0.34                 | 0.00           | 0.23           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.977          | -0.35                 | 0.00           | 0.41           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.173          | -0.36                 | 0.01           | 0.63           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.368          | -0.37                 | 0.01           | 0.87           | 0.00                    | 0.00           | 0.00           |  |
|          | LC9   | 124      | 1.564          | -0.38                 | 0.00           | 1.08           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.759          | -0.35                 | 0.01           | 1.16           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.955          | -0.17                 | 0.03           | 0.90           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 2.150          | -0.13                 | 0.12           | -0.06          | 0.00                    | 0.00           | 0.00           |  |
|          |       | 8        | 0.000          | 0.24                  | 0.00           | 0.39           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.180          | -0.06                 | 0.00           | 0.66           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.360          | -0.06                 | 0.00           | 0.87           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.540          | -0.04                 | 0.00           | 1.01           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.720          | -0.03                 | 0.00           | 1.11           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.900          | -0.02                 | 0.00           | 1.22           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.080          | -0.01                 | 0.00           | 1.33           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.260          | 0.01                  | 0.00           | 1.46           | 0.00                    | 0.00           | 0.00           |  |
|          | LC1   | 38       | 1.440          | 0.05                  | 0.00           | 1.62           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.620          | 0.10                  | 0.00           | 1.80           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.800          | 0.21                  | 0.00           | 1.99           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.980          | -1.00                 | 0.00           | 2.06           | 0.00                    | 0.00           | 0.00           |  |
|          |       | 245      | 0.000          | 0.10                  | 0.00           | 0.14           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.180          | -0.01                 | 0.00           | 0.08           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.360          | 0.01                  | 0.00           | 0.06           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.540          | 0.02                  | 0.00           | 0.03           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.720          | 0.02                  | 0.00           | 0.02           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.900          | 0.02                  | 0.00           | 0.01           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.080          | 0.02                  | 0.00           | 0.00           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.260          | 0.02                  | 0.00           | -0.01          | 0.00                    | 0.00           | 0.00           |  |
|          | LC2   | 38       | 1.440          | 0.02                  | 0.00           | -0.03          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.620          | 0.02                  | 0.00           | -0.05          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.800          | 0.00                  | 0.00           | -0.08          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.980          | 0.09                  | 0.00           | -0.16          | 0.00                    | 0.00           | 0.00           |  |
|          |       | 245      | 0.000          | -0.04                 | 0.00           | -0.06          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.180          | 0.01                  | 0.00           | -0.04          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.360          | 0.00                  | 0.00           | -0.03          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.540          | 0.00                  | 0.00           | -0.03          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.720          | -0.01                 | 0.00           | -0.02          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.900          | -0.01                 | 0.00           | -0.02          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.080          | -0.01                 | 0.00           | -0.01          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.260          | 0.00                  | 0.00           | -0.01          | 0.00                    | 0.00           | 0.00           |  |
|          | LC3   | 38       | 1.440          | 0.00                  | 0.00           | 0.00           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.620          | 0.00                  | 0.00           | 0.01           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.800          | 0.00                  | 0.00           | 0.03           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.980          | -0.03                 | 0.00           | 0.05           | 0.00                    | 0.00           | 0.00           |  |
|          |       | 245      | 0.000          | 0.23                  | 0.00           | 0.35           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.180          | -0.02                 | 0.00           | 0.22           | 0.00                    | 0.00           | 0.00           |  |



Project: 2010-2

Model: 2010-2

Date: 29-4-2021

#### ■ 4.3 LINES - SUPPORT FORCES

| Line No. | LC/CO | No.   | x [m] | Support Forces [kN/m] |                |                | Support Moments [kNm/m] |                |                |      |
|----------|-------|-------|-------|-----------------------|----------------|----------------|-------------------------|----------------|----------------|------|
|          |       |       |       | p <sub>x</sub>        | p <sub>y</sub> | p <sub>z</sub> | m <sub>x</sub>          | m <sub>y</sub> | m <sub>z</sub> |      |
| 52       | LC6   | 38    | 0.360 | 0.02                  | 0.00           | 0.16           | 0.00                    | 0.00           | 0.00           |      |
|          |       |       | 0.540 | 0.04                  | 0.00           | 0.11           | 0.00                    | 0.00           | 0.00           |      |
|          |       |       | 0.720 | 0.05                  | 0.00           | 0.08           | 0.00                    | 0.00           | 0.00           |      |
|          |       |       | 0.900 | 0.05                  | 0.00           | 0.05           | 0.00                    | 0.00           | 0.00           |      |
|          |       |       | 1.080 | 0.05                  | 0.00           | 0.03           | 0.00                    | 0.00           | 0.00           |      |
|          |       |       | 1.260 | 0.05                  | 0.00           | 0.01           | 0.00                    | 0.00           | 0.00           |      |
|          |       |       | 1.440 | 0.05                  | 0.00           | -0.03          | 0.00                    | 0.00           | 0.00           |      |
|          |       |       | 1.620 | 0.04                  | 0.00           | -0.08          | 0.00                    | 0.00           | 0.00           |      |
|          |       |       | 1.800 | 0.00                  | 0.00           | -0.17          | 0.00                    | 0.00           | 0.00           |      |
|          |       |       | 1.980 | 0.18                  | 0.00           | -0.33          | 0.00                    | 0.00           | 0.00           |      |
|          |       | 245   | 1.980 | 0.00                  | 0.00           | 0.00           | 0.00                    | 0.00           | 0.00           |      |
|          |       | LC7   | 38    | 0.000                 | -0.31          | 0.00           | -0.47                   | 0.00           | 0.00           | 0.00 |
|          | 0.180 |       |       | 0.03                  | 0.00           | -0.29          | 0.00                    | 0.00           | 0.00           |      |
|          | 0.360 |       |       | -0.03                 | 0.00           | -0.21          | 0.00                    | 0.00           | 0.00           |      |
|          | 0.540 |       |       | -0.06                 | 0.00           | -0.14          | 0.00                    | 0.00           | 0.00           |      |
|          | 0.720 |       |       | -0.07                 | 0.00           | -0.10          | 0.00                    | 0.00           | 0.00           |      |
|          | 0.900 |       |       | -0.07                 | 0.00           | -0.06          | 0.00                    | 0.00           | 0.00           |      |
|          | 1.080 |       |       | -0.07                 | 0.00           | -0.03          | 0.00                    | 0.00           | 0.00           |      |
|          | 1.260 |       |       | -0.07                 | 0.00           | 0.00           | 0.00                    | 0.00           | 0.00           |      |
|          | 1.440 |       |       | -0.07                 | 0.00           | 0.05           | 0.00                    | 0.00           | 0.00           |      |
|          | 1.620 |       |       | -0.05                 | 0.00           | 0.11           | 0.00                    | 0.00           | 0.00           |      |
|          | 1.800 |       | 0.00  | 0.00                  | 0.22           | 0.00           | 0.00                    | 0.00           |                |      |
|          | 245   |       | 1.980 | -0.25                 | 0.00           | 0.46           | 0.00                    | 0.00           | 0.00           |      |
|          | LC8   | 38    | 0.000 | 1.02                  | 0.00           | 1.53           | 0.00                    | 0.00           | 0.00           |      |
|          |       |       | 0.180 | -0.10                 | 0.00           | 0.97           | 0.00                    | 0.00           | 0.00           |      |
|          |       |       | 0.360 | 0.09                  | 0.00           | 0.70           | 0.00                    | 0.00           | 0.00           |      |
|          |       |       | 0.540 | 0.19                  | 0.00           | 0.48           | 0.00                    | 0.00           | 0.00           |      |
|          |       |       | 0.720 | 0.23                  | 0.00           | 0.34           | 0.00                    | 0.00           | 0.00           |      |
|          |       |       | 0.900 | 0.23                  | 0.00           | 0.23           | 0.00                    | 0.00           | 0.00           |      |
|          |       |       | 1.080 | 0.23                  | 0.00           | 0.13           | 0.00                    | 0.00           | 0.00           |      |
|          |       |       | 1.260 | 0.22                  | 0.00           | 0.01           | 0.00                    | 0.00           | 0.00           |      |
|          |       |       | 1.440 | 0.20                  | 0.00           | -0.15          | 0.00                    | 0.00           | 0.00           |      |
|          |       |       | 1.620 | 0.16                  | 0.00           | -0.38          | 0.00                    | 0.00           | 0.00           |      |
|          |       | 1.800 | 0.00  | 0.00                  | -0.76          | 0.00           | 0.00                    | 0.00           |                |      |
|          |       | 245   | 1.980 | 0.82                  | 0.00           | -1.51          | 0.00                    | 0.00           | 0.00           |      |
|          | LC9   | 38    | 0.000 | -1.27                 | 0.00           | -1.90          | 0.00                    | 0.00           | 0.00           |      |
|          |       |       | 0.180 | 0.13                  | 0.00           | -1.23          | 0.00                    | 0.00           | 0.00           |      |
|          |       |       | 0.360 | -0.10                 | 0.00           | -0.90          | 0.00                    | 0.00           | 0.00           |      |
|          |       |       | 0.540 | -0.23                 | 0.00           | -0.63          | 0.00                    | 0.00           | 0.00           |      |
|          |       |       | 0.720 | -0.27                 | 0.00           | -0.46          | 0.00                    | 0.00           | 0.00           |      |
|          |       |       | 0.900 | -0.28                 | 0.00           | -0.32          | 0.00                    | 0.00           | 0.00           |      |
|          |       |       | 1.080 | -0.27                 | 0.00           | -0.20          | 0.00                    | 0.00           | 0.00           |      |
|          |       |       | 1.260 | -0.26                 | 0.00           | -0.04          | 0.00                    | 0.00           | 0.00           |      |
|          |       |       | 1.440 | -0.23                 | 0.00           | 0.17           | 0.00                    | 0.00           | 0.00           |      |
|          |       |       | 1.620 | -0.18                 | 0.00           | 0.47           | 0.00                    | 0.00           | 0.00           |      |
|          |       | 1.800 | 0.02  | 0.00                  | 0.96           | 0.00           | 0.00                    | 0.00           |                |      |
|          |       | 245   | 1.980 | -1.01                 | 0.00           | 1.86           | 0.00                    | 0.00           | 0.00           |      |
| 53       | LC1   | 33    | 0.000 | 0.01                  | 0.30           | 7.46           | 0.00                    | 0.00           | 0.00           |      |
|          |       |       | 0.191 | 0.00                  | 0.10           | 7.07           | 0.00                    | 0.00           | 0.00           |      |
|          |       |       | 0.382 | 0.00                  | 0.07           | 6.63           | 0.00                    | 0.00           | 0.00           |      |
|          |       |       | 0.573 | 0.00                  | 0.07           | 6.29           | 0.00                    | 0.00           | 0.00           |      |
|          |       |       | 0.764 | 0.00                  | 0.06           | 6.01           | 0.00                    | 0.00           | 0.00           |      |
|          |       |       | 0.955 | 0.00                  | 0.06           | 5.76           | 0.00                    | 0.00           | 0.00           |      |
|          |       |       | 1.146 | 0.00                  | 0.04           | 5.57           | 0.00                    | 0.00           | 0.00           |      |
|          |       |       | 1.337 | 0.00                  | 0.01           | 5.48           | 0.00                    | 0.00           | 0.00           |      |
|          |       |       | 1.528 | 0.00                  | -0.04          | 5.55           | 0.00                    | 0.00           | 0.00           |      |
|          |       |       | 1.719 | 0.00                  | -0.12          | 5.80           | 0.00                    | 0.00           | 0.00           |      |
|          |       | 8     | 1.910 | 0.01                  | -0.09          | 6.20           | 0.00                    | 0.00           | 0.00           |      |
|          |       | LC2   | 33    | 0.000                 | 0.00           | 0.07           | 1.95                    | 0.00           | 0.00           | 0.00 |
|          | 0.191 |       |       | 0.00                  | 0.02           | 1.90           | 0.00                    | 0.00           | 0.00           |      |
|          | 0.382 |       |       | 0.00                  | 0.01           | 1.81           | 0.00                    | 0.00           | 0.00           |      |
|          | 0.573 |       |       | 0.00                  | 0.02           | 1.74           | 0.00                    | 0.00           | 0.00           |      |
|          | 0.764 |       |       | 0.00                  | 0.02           | 1.65           | 0.00                    | 0.00           | 0.00           |      |
|          | 0.955 |       |       | 0.00                  | 0.02           | 1.56           | 0.00                    | 0.00           | 0.00           |      |
|          | 1.146 |       |       | 0.00                  | 0.02           | 1.47           | 0.00                    | 0.00           | 0.00           |      |
|          | 1.337 |       |       | 0.00                  | 0.02           | 1.38           | 0.00                    | 0.00           | 0.00           |      |
|          | 1.528 |       |       | 0.00                  | 0.01           | 1.32           | 0.00                    | 0.00           | 0.00           |      |
|          | 1.719 |       |       | 0.00                  | -0.01          | 1.30           | 0.00                    | 0.00           | 0.00           |      |
|          | 8     |       | 1.910 | 0.00                  | -0.01          | 1.30           | 0.00                    | 0.00           | 0.00           |      |
|          | LC3   |       | 33    | 0.000                 | 0.00           | 0.01           | 0.22                    | 0.00           | 0.00           | 0.00 |
|          |       | 0.191 |       | 0.00                  | 0.01           | 0.19           | 0.00                    | 0.00           | 0.00           |      |
|          |       | 0.382 |       | 0.00                  | 0.00           | 0.17           | 0.00                    | 0.00           | 0.00           |      |
|          |       | 0.573 |       | 0.00                  | 0.00           | 0.15           | 0.00                    | 0.00           | 0.00           |      |
|          |       | 0.764 |       | 0.00                  | 0.00           | 0.14           | 0.00                    | 0.00           | 0.00           |      |
|          |       | 0.955 |       | 0.00                  | 0.00           | 0.13           | 0.00                    | 0.00           | 0.00           |      |
|          |       | 1.146 |       | 0.00                  | 0.00           | 0.13           | 0.00                    | 0.00           | 0.00           |      |
|          |       | 1.337 |       | 0.00                  | 0.00           | 0.13           | 0.00                    | 0.00           | 0.00           |      |
|          |       | 1.528 |       | 0.00                  | -0.01          | 0.15           | 0.00                    | 0.00           | 0.00           |      |
|          |       | 1.719 |       | 0.00                  | -0.01          | 0.18           | 0.00                    | 0.00           | 0.00           |      |
|          |       | 8     | 1.910 | 0.00                  | -0.01          | 0.22           | 0.00                    | 0.00           | 0.00           |      |
|          |       | LC6   | 33    | 0.000                 | 0.00           | 0.06           | 0.08                    | 0.00           | 0.00           | 0.00 |
|          | 0.191 |       |       | 0.00                  | 0.06           | 0.03           | 0.00                    | 0.00           | 0.00           |      |
|          | 0.382 |       |       | 0.00                  | 0.06           | -0.01          | 0.00                    | 0.00           | 0.00           |      |
|          | 0.573 |       |       | 0.00                  | 0.05           | -0.04          | 0.00                    | 0.00           | 0.00           |      |
|          | 0.764 |       |       | 0.00                  | 0.05           | -0.06          | 0.00                    | 0.00           | 0.00           |      |
|          | 0.955 |       |       | 0.00                  | 0.05           | -0.07          | 0.00                    | 0.00           | 0.00           |      |
|          | 1.146 |       |       | 0.00                  | 0.05           | -0.07          | 0.00                    | 0.00           | 0.00           |      |
|          | 1.337 |       |       | 0.00                  | 0.05           | -0.06          | 0.00                    | 0.00           | 0.00           |      |
|          | 1.528 |       |       | 0.00                  | 0.04           | -0.03          | 0.00                    | 0.00           | 0.00           |      |
|          | 1.719 |       |       | 0.00                  | 0.03           | 0.03           | 0.00                    | 0.00           | 0.00           |      |
|          | 8     |       | 1.910 | 0.00                  | 0.04           | 0.10           | 0.00                    | 0.00           | 0.00           |      |
|          | LC7   |       | 33    | 0.000                 | 0.00           | 0.08           | -0.16                   | 0.00           | 0.00           | 0.00 |
|          |       | 0.191 |       | 0.00                  | 0.08           | -0.18          | 0.00                    | 0.00           | 0.00           |      |
|          |       | 0.382 |       | 0.00                  | 0.08           | -0.19          | 0.00                    | 0.00           | 0.00           |      |
| 0.573    |       | 0.00  |       | 0.08                  | -0.20          | 0.00           | 0.00                    | 0.00           |                |      |



Project: 2010-2

Model: 2010-2

Date: 29-4-2021

#### ■ 4.3 LINES - SUPPORT FORCES

| Line No. | LC/CO | Node No. | Location x [m] | Support Forces [kN/m] |                |                | Support Moments [kNm/m] |                |                |  |
|----------|-------|----------|----------------|-----------------------|----------------|----------------|-------------------------|----------------|----------------|--|
|          |       |          |                | p <sub>x</sub>        | p <sub>y</sub> | p <sub>z</sub> | m <sub>x</sub>          | m <sub>y</sub> | m <sub>z</sub> |  |
| 53       | LC7   | 33       | 0.764          | 0.00                  | 0.08           | -0.20          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.955          | 0.00                  | 0.08           | -0.21          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.146          | 0.00                  | 0.08           | -0.20          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.337          | 0.00                  | 0.08           | -0.19          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.528          | 0.00                  | 0.07           | -0.16          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.719          | 0.00                  | 0.06           | -0.11          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.910          | 0.00                  | 0.07           | -0.01          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          |                |                       |                |                |                         |                |                |  |
|          | LC8   | 33       | 0.000          | 0.00                  | 4.09           | -1.71          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.191          | 0.00                  | 4.01           | -0.59          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.382          | 0.00                  | 4.05           | -0.02          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.573          | 0.00                  | 4.08           | 0.31           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.764          | 0.00                  | 4.10           | 0.49           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.955          | 0.00                  | 4.10           | 0.61           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.146          | 0.00                  | 4.08           | 0.75           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.337          | 0.00                  | 4.03           | 1.00           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.528          | 0.00                  | 3.94           | 1.45           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.719          | 0.00                  | 3.83           | 2.18           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.910          | 0.00                  | 3.96           | 3.50           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          |                |                       |                |                |                         |                |                |  |
|          | LC9   | 33       | 0.000          | 0.00                  | -4.04          | 2.12           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.191          | 0.00                  | -3.97          | 1.02           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.382          | 0.00                  | -4.01          | 0.45           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.573          | 0.00                  | -4.05          | 0.11           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.764          | 0.00                  | -4.06          | -0.07          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.955          | 0.00                  | -4.06          | -0.19          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.146          | 0.00                  | -4.04          | -0.33          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.337          | 0.00                  | -3.99          | -0.58          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.528          | 0.00                  | -3.90          | -1.04          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.719          | 0.00                  | -3.79          | -1.78          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.910          | 0.00                  | -3.92          | -3.15          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          |                |                       |                |                |                         |                |                |  |
| 59       | LC1   | 6        | 0.000          | -0.01                 | -0.16          | 8.97           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.188          | 0.00                  | -0.22          | 8.64           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.376          | 0.00                  | -0.36          | 8.44           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.564          | 0.00                  | -0.62          | 8.34           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.752          | 0.00                  | -1.09          | 8.06           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.940          | -0.01                 | 3.69           | 8.23           | 0.00                    | 0.00           | 0.00           |  |
|          | LC2   | 6        | 0.000          | 0.00                  | -0.01          | 2.45           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.188          | 0.00                  | -0.03          | 2.34           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.376          | 0.00                  | -0.06          | 2.25           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.564          | 0.00                  | -0.11          | 2.16           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.752          | 0.00                  | -0.22          | 2.01           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.940          | 0.00                  | 0.91           | 1.78           | 0.00                    | 0.00           | 0.00           |  |
|          | LC3   | 6        | 0.000          | 0.00                  | -0.01          | 0.26           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.188          | 0.00                  | -0.01          | 0.24           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.376          | 0.00                  | -0.01          | 0.23           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.564          | 0.00                  | -0.01          | 0.21           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.752          | 0.00                  | -0.02          | 0.19           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.940          | 0.00                  | 0.08           | 0.16           | 0.00                    | 0.00           | 0.00           |  |
|          | LC6   | 6        | 0.000          | 0.00                  | -0.29          | -0.23          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.188          | 0.00                  | -0.25          | -0.38          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.376          | 0.00                  | -0.22          | -0.58          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.564          | 0.00                  | -0.13          | -0.88          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.752          | 0.00                  | 0.11           | -1.30          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.940          | -0.01                 | -1.21          | -2.06          | 0.00                    | 0.00           | 0.00           |  |
|          | LC7   | 6        | 0.000          | 0.00                  | -0.05          | 0.08           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.188          | 0.00                  | -0.04          | 0.03           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.376          | 0.00                  | -0.04          | -0.02          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.564          | 0.00                  | -0.02          | -0.09          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.752          | 0.01                  | 0.02           | -0.19          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.940          | 0.01                  | -0.20          | -0.34          | 0.00                    | 0.00           | 0.00           |  |
|          | LC8   | 6        | 0.000          | 0.00                  | 6.13           | 4.62           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.188          | 0.00                  | 5.20           | 7.98           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.376          | 0.00                  | 4.45           | 12.36          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.564          | -0.01                 | 2.69           | 18.75          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.752          | -0.01                 | -2.55          | 27.83          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.940          | -0.01                 | 25.86          | 43.91          | 0.00                    | 0.00           | 0.00           |  |
|          | LC9   | 6        | 0.000          | 0.00                  | -6.22          | -4.50          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.188          | 0.00                  | -5.30          | -7.88          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.376          | 0.01                  | -4.54          | -12.28         | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.564          | 0.01                  | -2.75          | -18.72         | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.752          | 0.01                  | 2.55           | -27.93         | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.940          | 0.00                  | -26.12         | -44.26         | 0.00                    | 0.00           | 0.00           |  |
| 62       | LC1   | 8        | 0.000          | 0.01                  | -0.09          | 6.20           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.188          | 0.00                  | -0.10          | 6.37           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.376          | 0.00                  | -0.25          | 6.56           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.564          | 0.00                  | -0.47          | 6.77           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.752          | 0.00                  | -0.84          | 6.63           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.940          | 0.00                  | 3.44           | 5.98           | 0.00                    | 0.00           | 0.00           |  |
|          | LC2   | 8        | 0.000          | 0.00                  | -0.01          | 1.30           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.188          | 0.00                  | 0.00           | 1.25           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.376          | 0.00                  | -0.03          | 1.22           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.564          | 0.00                  | -0.07          | 1.21           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.752          | 0.00                  | -0.14          | 1.15           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.940          | 0.00                  | 0.60           | 1.04           | 0.00                    | 0.00           | 0.00           |  |
|          | LC3   | 8        | 0.000          | 0.00                  | -0.01          | 0.22           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.188          | 0.00                  | -0.01          | 0.24           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.376          | 0.00                  | -0.02          | 0.27           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.564          | 0.00                  | -0.03          | 0.29           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.752          | 0.00                  | -0.04          | 0.30           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.940          | 0.00                  | 0.15           | 0.27           | 0.00                    | 0.00           | 0.00           |  |
|          | LC6   | 8        | 0.000          | 0.00                  | 0.04           | 0.10           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.188          | 0.00                  | 0.03           | 0.18           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.376          | 0.00                  | 0.02           | 0.26           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.564          | 0.00                  | 0.00           | 0.35           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.752          | 0.00                  | -0.06          | 0.44           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          |                |                       |                |                |                         |                |                |  |



Project: 2010-2

Model: 2010-2

Date: 29-4-2021

#### ■ 4.3 LINES - SUPPORT FORCES

| Line No. | LC/CO | Node No. | Location x [m] | Support Forces [kN/m] |        |        | Support Moments [kNm/m] |       |       |
|----------|-------|----------|----------------|-----------------------|--------|--------|-------------------------|-------|-------|
|          |       |          |                | $p_x$                 | $p_y$  | $p_z$  | $m_x$                   | $m_y$ | $m_z$ |
| 62       | LC6   | 12       | 0.940          | 0.00                  | 0.33   | 0.55   | 0.00                    | 0.00  | 0.00  |
|          |       |          | 0.000          | 0.00                  | 0.07   | -0.01  | 0.00                    | 0.00  | 0.00  |
|          |       |          | 0.188          | 0.00                  | 0.03   | 0.14   | 0.00                    | 0.00  | 0.00  |
|          |       |          | 0.376          | 0.00                  | 0.02   | 0.31   | 0.00                    | 0.00  | 0.00  |
|          |       |          | 0.564          | 0.00                  | -0.01  | 0.49   | 0.00                    | 0.00  | 0.00  |
|          |       |          | 0.752          | 0.00                  | -0.09  | 0.66   | 0.00                    | 0.00  | 0.00  |
|          | LC8   | 8        | 0.940          | 0.00                  | 0.51   | 0.84   | 0.00                    | 0.00  | 0.00  |
|          |       |          | 0.000          | 0.00                  | 3.96   | 3.50   | 0.00                    | 0.00  | 0.00  |
|          |       |          | 0.188          | 0.00                  | 3.44   | 5.45   | 0.00                    | 0.00  | 0.00  |
|          |       |          | 0.376          | 0.00                  | 2.93   | 8.14   | 0.00                    | 0.00  | 0.00  |
|          |       |          | 0.564          | 0.00                  | 1.70   | 12.18  | 0.00                    | 0.00  | 0.00  |
|          |       |          | 0.752          | 0.00                  | -1.88  | 17.90  | 0.00                    | 0.00  | 0.00  |
|          | LC9   | 12       | 0.940          | 0.00                  | 17.63  | 28.22  | 0.00                    | 0.00  | 0.00  |
|          |       |          | 0.000          | 0.00                  | -3.92  | -3.15  | 0.00                    | 0.00  | 0.00  |
|          |       |          | 0.188          | 0.00                  | -3.38  | -5.19  | 0.00                    | 0.00  | 0.00  |
|          |       |          | 0.376          | 0.00                  | -2.87  | -7.98  | 0.00                    | 0.00  | 0.00  |
|          |       |          | 0.564          | -0.01                 | -1.65  | -12.09 | 0.00                    | 0.00  | 0.00  |
|          |       |          | 0.752          | -0.01                 | 1.89   | -17.83 | 0.00                    | 0.00  | 0.00  |
|          | LC7   | 12       | 0.940          | 0.01                  | -17.53 | -28.06 | 0.00                    | 0.00  | 0.00  |
|          |       |          | 0.000          | -3.04                 | 0.14   | 5.46   | 0.00                    | 0.00  | 0.00  |
|          |       |          | 0.196          | 0.83                  | 0.04   | 7.06   | 0.00                    | 0.00  | 0.00  |
|          |       |          | 0.393          | 0.56                  | 0.00   | 8.06   | 0.00                    | 0.00  | 0.00  |
|          |       |          | 0.589          | 0.37                  | 0.00   | 8.60   | 0.00                    | 0.00  | 0.00  |
|          |       |          | 0.786          | 0.29                  | 0.00   | 8.98   | 0.00                    | 0.00  | 0.00  |
| 63       | LC1   | 6        | 0.982          | 0.25                  | 0.00   | 9.27   | 0.00                    | 0.00  | 0.00  |
|          |       |          | 1.179          | 0.22                  | 0.00   | 9.49   | 0.00                    | 0.00  | 0.00  |
|          |       |          | 1.375          | 0.20                  | 0.00   | 9.68   | 0.00                    | 0.00  | 0.00  |
|          |       |          | 1.571          | 0.17                  | 0.00   | 9.85   | 0.00                    | 0.00  | 0.00  |
|          |       |          | 1.768          | 0.13                  | 0.00   | 10.01  | 0.00                    | 0.00  | 0.00  |
|          |       |          | 1.964          | 0.06                  | 0.00   | 10.17  | 0.00                    | 0.00  | 0.00  |
|          |       |          | 2.161          | -0.11                 | 0.00   | 10.33  | 0.00                    | 0.00  | 0.00  |
|          |       |          | 2.357          | -0.49                 | 0.00   | 10.47  | 0.00                    | 0.00  | 0.00  |
|          |       |          | 2.554          | -1.20                 | 0.00   | 10.24  | 0.00                    | 0.00  | 0.00  |
|          |       |          | 2.750          | 5.67                  | 0.00   | 9.73   | 0.00                    | 0.00  | 0.00  |
|          | LC2   | 6        | 0.000          | -0.69                 | 0.04   | 1.25   | 0.00                    | 0.00  | 0.00  |
|          |       |          | 0.196          | 0.20                  | 0.01   | 1.68   | 0.00                    | 0.00  | 0.00  |
|          |       |          | 0.393          | 0.15                  | 0.00   | 1.93   | 0.00                    | 0.00  | 0.00  |
|          |       |          | 0.589          | 0.11                  | 0.00   | 2.06   | 0.00                    | 0.00  | 0.00  |
|          |       |          | 0.786          | 0.09                  | 0.00   | 2.16   | 0.00                    | 0.00  | 0.00  |
|          |       |          | 0.982          | 0.08                  | 0.00   | 2.23   | 0.00                    | 0.00  | 0.00  |
|          |       |          | 1.179          | 0.07                  | 0.00   | 2.29   | 0.00                    | 0.00  | 0.00  |
|          |       |          | 1.375          | 0.07                  | 0.00   | 2.33   | 0.00                    | 0.00  | 0.00  |
|          |       |          | 1.571          | 0.06                  | 0.00   | 2.36   | 0.00                    | 0.00  | 0.00  |
|          |       |          | 1.768          | 0.06                  | 0.00   | 2.38   | 0.00                    | 0.00  | 0.00  |
|          |       |          | 1.964          | 0.04                  | 0.00   | 2.40   | 0.00                    | 0.00  | 0.00  |
|          |       |          | 2.161          | 0.00                  | 0.00   | 2.42   | 0.00                    | 0.00  | 0.00  |
|          |       |          | 2.357          | -0.09                 | 0.00   | 2.45   | 0.00                    | 0.00  | 0.00  |
|          |       |          | 2.554          | -0.27                 | 0.00   | 2.40   | 0.00                    | 0.00  | 0.00  |
|          |       |          | 2.750          | 1.37                  | 0.00   | 2.33   | 0.00                    | 0.00  | 0.00  |
|          | LC3   | 6        | 0.000          | -0.02                 | 0.01   | 0.05   | 0.00                    | 0.00  | 0.00  |
|          |       |          | 0.196          | 0.01                  | 0.00   | 0.10   | 0.00                    | 0.00  | 0.00  |
|          |       |          | 0.393          | 0.02                  | 0.00   | 0.13   | 0.00                    | 0.00  | 0.00  |
|          |       |          | 0.589          | 0.01                  | 0.00   | 0.16   | 0.00                    | 0.00  | 0.00  |
|          |       |          | 0.786          | 0.01                  | 0.00   | 0.18   | 0.00                    | 0.00  | 0.00  |
|          |       |          | 0.982          | 0.01                  | 0.00   | 0.20   | 0.00                    | 0.00  | 0.00  |
|          |       |          | 1.179          | 0.01                  | 0.00   | 0.22   | 0.00                    | 0.00  | 0.00  |
|          |       |          | 1.375          | 0.01                  | 0.00   | 0.24   | 0.00                    | 0.00  | 0.00  |
|          |       |          | 1.571          | 0.01                  | 0.00   | 0.26   | 0.00                    | 0.00  | 0.00  |
|          |       |          | 1.768          | 0.01                  | 0.00   | 0.28   | 0.00                    | 0.00  | 0.00  |
|          |       |          | 1.964          | 0.01                  | 0.00   | 0.30   | 0.00                    | 0.00  | 0.00  |
|          |       |          | 2.161          | 0.00                  | 0.00   | 0.31   | 0.00                    | 0.00  | 0.00  |
|          |       |          | 2.357          | -0.01                 | 0.00   | 0.33   | 0.00                    | 0.00  | 0.00  |
|          |       |          | 2.554          | -0.04                 | 0.00   | 0.33   | 0.00                    | 0.00  | 0.00  |
|          |       |          | 2.750          | 0.20                  | 0.00   | 0.34   | 0.00                    | 0.00  | 0.00  |
|          | LC6   | 6        | 0.000          | 0.65                  | 0.01   | -1.02  | 0.00                    | 0.00  | 0.00  |
|          |       |          | 0.196          | -0.06                 | 0.00   | -0.63  | 0.00                    | 0.00  | 0.00  |
|          |       |          | 0.393          | 0.07                  | 0.00   | -0.41  | 0.00                    | 0.00  | 0.00  |
|          |       |          | 0.589          | 0.12                  | 0.00   | -0.26  | 0.00                    | 0.00  | 0.00  |
|          |       |          | 0.786          | 0.14                  | 0.00   | -0.15  | 0.00                    | 0.00  | 0.00  |
|          |       |          | 0.982          | 0.14                  | 0.00   | -0.08  | 0.00                    | 0.00  | 0.00  |
|          |       |          | 1.179          | 0.15                  | 0.00   | -0.02  | 0.00                    | 0.00  | 0.00  |
|          |       |          | 1.375          | 0.15                  | 0.00   | 0.02   | 0.00                    | 0.00  | 0.00  |
|          |       |          | 1.571          | 0.15                  | 0.00   | 0.06   | 0.00                    | 0.00  | 0.00  |
|          |       |          | 1.768          | 0.15                  | 0.00   | 0.10   | 0.00                    | 0.00  | 0.00  |
|          |       |          | 1.964          | 0.14                  | 0.00   | 0.15   | 0.00                    | 0.00  | 0.00  |
|          |       |          | 2.161          | 0.13                  | 0.00   | 0.23   | 0.00                    | 0.00  | 0.00  |
|          |       |          | 2.357          | 0.09                  | 0.00   | 0.34   | 0.00                    | 0.00  | 0.00  |
|          |       |          | 2.554          | -0.03                 | 0.00   | 0.52   | 0.00                    | 0.00  | 0.00  |
|          |       |          | 2.750          | 0.58                  | 0.00   | 0.91   | 0.00                    | 0.00  | 0.00  |
|          | LC7   | 6        | 0.000          | -0.89                 | 0.00   | 1.41   | 0.00                    | 0.00  | 0.00  |
|          |       |          | 0.196          | 0.07                  | 0.00   | 0.87   | 0.00                    | 0.00  | 0.00  |
|          |       |          | 0.393          | -0.11                 | 0.00   | 0.59   | 0.00                    | 0.00  | 0.00  |
|          |       |          | 0.589          | -0.17                 | 0.00   | 0.40   | 0.00                    | 0.00  | 0.00  |
|          |       |          | 0.786          | -0.20                 | 0.00   | 0.28   | 0.00                    | 0.00  | 0.00  |
|          |       |          | 0.982          | -0.21                 | 0.00   | 0.21   | 0.00                    | 0.00  | 0.00  |
|          |       |          | 1.179          | -0.22                 | 0.00   | 0.16   | 0.00                    | 0.00  | 0.00  |
|          |       |          | 1.375          | -0.22                 | 0.00   | 0.13   | 0.00                    | 0.00  | 0.00  |
|          |       |          | 1.571          | -0.22                 | 0.00   | 0.10   | 0.00                    | 0.00  | 0.00  |
|          |       |          | 1.768          | -0.22                 | 0.00   | 0.07   | 0.00                    | 0.00  | 0.00  |
|          |       |          | 1.964          | -0.21                 | 0.00   | 0.02   | 0.00                    | 0.00  | 0.00  |
|          |       |          | 2.161          | -0.20                 | 0.00   | -0.06  | 0.00                    | 0.00  | 0.00  |
|          |       |          | 2.357          | -0.15                 | 0.00   | -0.19  | 0.00                    | 0.00  | 0.00  |
|          |       |          | 2.554          | 0.00                  | 0.00   | -0.44  | 0.00                    | 0.00  | 0.00  |
|          |       |          | 2.750          | -0.66                 | 0.00   | -1.00  | 0.00                    | 0.00  | 0.00  |



Project: 2010-2

Model: 2010-2

Date: 29-4-2021

#### ■ 4.3 LINES - SUPPORT FORCES

| Line No. | LC/CO | Node No. | Location x [m] | Support Forces [kN/m] |                |                | Support Moments [kNm/m] |                |                |  |
|----------|-------|----------|----------------|-----------------------|----------------|----------------|-------------------------|----------------|----------------|--|
|          |       |          |                | p <sub>x</sub>        | p <sub>y</sub> | p <sub>z</sub> | m <sub>x</sub>          | m <sub>y</sub> | m <sub>z</sub> |  |
| 63       | LC8   | 6        | 0.000          | 1.48                  | -0.20          | -2.29          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.196          | -0.05                 | -0.06          | -1.20          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.393          | 0.27                  | -0.01          | -0.69          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.589          | 0.37                  | 0.00           | -0.35          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.786          | 0.41                  | 0.00           | -0.12          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.982          | 0.42                  | 0.00           | 0.04           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.179          | 0.43                  | 0.00           | 0.16           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.375          | 0.43                  | 0.00           | 0.26           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.571          | 0.43                  | 0.00           | 0.36           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.768          | 0.42                  | 0.00           | 0.47           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.964          | 0.41                  | 0.00           | 0.60           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 2.161          | 0.37                  | 0.00           | 0.79           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 2.357          | 0.25                  | 0.00           | 1.09           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 2.554          | -0.09                 | 0.00           | 1.56           | 0.00                    | 0.00           | 0.00           |  |
|          |       | 124      | 2.750          | 1.67                  | 0.00           | 2.62           | 0.00                    | 0.00           | 0.00           |  |
|          | LC9   | 6        | 0.000          | -1.03                 | 0.20           | 1.60           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.196          | 0.04                  | 0.06           | 0.88           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.393          | -0.17                 | 0.01           | 0.54           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.589          | -0.24                 | 0.00           | 0.29           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.786          | -0.27                 | 0.00           | 0.11           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.982          | -0.28                 | 0.00           | -0.02          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.179          | -0.28                 | 0.00           | -0.13          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.375          | -0.28                 | 0.00           | -0.23          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.571          | -0.28                 | 0.00           | -0.32          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.768          | -0.28                 | 0.00           | -0.42          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.964          | -0.26                 | 0.00           | -0.55          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 2.161          | -0.23                 | 0.00           | -0.71          | 0.00                    | 0.00           | 0.00           |  |
| 65       | LC1   | 35       | 0.000          | -7.27                 | 0.00           | 13.79          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.209          | 2.21                  | 0.00           | 15.90          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.418          | 1.41                  | 0.00           | 16.76          | 0.00                    | 0.00           | 0.00           |  |
|          |       | 72       | 0.627          | -0.67                 | 0.00           | 15.83          | 0.00                    | 0.00           | 0.00           |  |
|          | LC2   | 35       | 0.000          | -1.68                 | 0.00           | 2.96           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.209          | 0.46                  | 0.00           | 3.68           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.418          | 0.28                  | 0.00           | 3.93           | 0.00                    | 0.00           | 0.00           |  |
|          |       | 72       | 0.627          | -0.19                 | 0.00           | 3.75           | 0.00                    | 0.00           | 0.00           |  |
|          | LC3   | 35       | 0.000          | -0.22                 | 0.00           | 0.39           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.209          | 0.08                  | 0.00           | 0.56           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.418          | 0.07                  | 0.00           | 0.61           | 0.00                    | 0.00           | 0.00           |  |
|          |       | 72       | 0.627          | 0.00                  | 0.00           | 0.58           | 0.00                    | 0.00           | 0.00           |  |
|          | LC6   | 35       | 0.000          | 1.44                  | 0.00           | -2.26          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.209          | -0.20                 | 0.00           | -1.14          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.418          | 0.06                  | 0.00           | -0.33          | 0.00                    | 0.00           | 0.00           |  |
|          |       | 72       | 0.627          | 0.07                  | 0.00           | 0.47           | 0.00                    | 0.00           | 0.00           |  |
|          | LC7   | 35       | 0.000          | -1.28                 | 0.00           | 2.03           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.209          | 0.20                  | 0.00           | 1.18           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.418          | -0.03                 | 0.00           | 0.54           | 0.00                    | 0.00           | 0.00           |  |
|          |       | 72       | 0.627          | -0.07                 | 0.00           | -0.12          | 0.00                    | 0.00           | 0.00           |  |
|          | LC8   | 35       | 0.000          | -0.93                 | 0.00           | 1.39           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.209          | 0.16                  | -0.03          | 0.29           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.418          | 0.06                  | -0.04          | -0.74          | 0.00                    | 0.00           | 0.00           |  |
|          |       | 72       | 0.627          | 0.04                  | -0.04          | -1.68          | 0.00                    | 0.00           | 0.00           |  |
|          | LC9   | 35       | 0.000          | 2.26                  | 0.00           | -3.44          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.209          | -0.32                 | 0.03           | -1.18          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.418          | 0.03                  | 0.04           | 0.66           | 0.00                    | 0.00           | 0.00           |  |
|          |       | 72       | 0.627          | 0.03                  | 0.04           | 2.37           | 0.00                    | 0.00           | 0.00           |  |
| 66       | LC1   | 2        | 0.000          | -8.34                 | 0.03           | 31.41          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.162          | 0.83                  | 0.03           | 23.27          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.324          | -0.82                 | 0.01           | 16.61          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.485          | -0.89                 | 0.01           | 9.91           | 0.00                    | 0.00           | 0.00           |  |
|          | LC2   | 2        | 0.000          | 0.03                  | 0.03           | 2.49           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.162          | -1.27                 | -0.02          | 3.84           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.324          | 0.18                  | 0.00           | 1.87           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.485          | -0.01                 | 0.00           | 0.20           | 0.00                    | 0.00           | 0.00           |  |
|          | LC3   | 2        | 0.000          | 0.30                  | 0.00           | -1.43          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.162          | -1.87                 | 0.02           | -3.31          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.324          | -0.54                 | 0.00           | 1.98           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.485          | 0.06                  | 0.00           | 1.41           | 0.00                    | 0.00           | 0.00           |  |
|          | LC6   | 2        | 0.000          | -0.04                 | 0.00           | 0.93           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.162          | 0.00                  | 0.00           | 0.42           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.324          | -0.16                 | 0.00           | -0.21          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.485          | 6.01                  | -2.66          | -14.95         | 0.00                    | 0.00           | 0.00           |  |
|          | LC7   | 2        | 0.000          | -0.84                 | -0.03          | -6.83          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.162          | 0.31                  | 0.56           | -0.66          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.324          | -1.09                 | 1.15           | 5.41           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.485          | 7.63                  | 3.68           | 13.49          | 0.00                    | 0.00           | 0.00           |  |
|          | LC8   | 2        | 0.000          | -4.23                 | -0.09          | 10.43          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.162          | 0.61                  | 0.11           | 4.25           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.324          | -0.15                 | 0.18           | -0.59          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.485          | 0.97                  | 0.24           | -5.31          | 0.00                    | 0.00           | 0.00           |  |
| 70       | LC1   | 26       | 0.000          | -6.35                 | 0.39           | -11.32         | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.162          | -4.71                 | -1.43          | 16.56          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.324          | 1.15                  | -0.07          | 12.25          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.485          | 0.12                  | 0.40           | 8.15           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.647          | 0.10                  | 0.91           | 4.23           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.810          | -0.26                 | 2.53           | 0.10           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.973          | 0.00                  | 4.90           | 11.33          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.136          | -0.15                 | 0.36           | 0.09           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.299          | -1.16                 | -0.81          | -7.00          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.462          | 1.59                  | -2.09          | -14.11         | 0.00                    | 0.00           | 0.00           |  |



Project: 2010-2

Model: 2010-2

Date: 29-4-2021

#### ■ 4.3 LINES - SUPPORT FORCES

| Line No. | LC/CO | Node No. | Location x [m] | Support Forces [kN/m] |       |       | Support Moments [kNm/m] |       |       |  |
|----------|-------|----------|----------------|-----------------------|-------|-------|-------------------------|-------|-------|--|
|          |       |          |                | $p_x$                 | $p_y$ | $p_z$ | $m_x$                   | $m_y$ | $m_z$ |  |
| 70       | LC1   | 26       | 0.199          | 3.87                  | -0.05 | 34.22 | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.397          | -0.16                 | -0.05 | 30.32 | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.596          | -2.14                 | -0.05 | 26.05 | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.794          | -2.13                 | -0.04 | 20.02 | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.993          | 4.02                  | -0.07 | 9.09  | 0.00                    | 0.00  | 0.00  |  |
|          | LC2   | 26       | 0.000          | -4.48                 | 0.00  | 7.90  | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.199          | 0.53                  | -0.01 | 5.99  | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.397          | -0.29                 | -0.01 | 5.08  | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.596          | -0.61                 | -0.01 | 4.20  | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.794          | -0.41                 | -0.01 | 2.91  | 0.00                    | 0.00  | 0.00  |  |
|          | LC3   | 26       | 0.993          | -0.13                 | -0.01 | 0.23  | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.000          | -1.26                 | 0.00  | 2.25  | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.199          | 0.19                  | 0.00  | 1.91  | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.397          | -0.01                 | 0.00  | 1.70  | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.596          | -0.11                 | 0.00  | 1.45  | 0.00                    | 0.00  | 0.00  |  |
|          | LC6   | 26       | 0.794          | -0.11                 | 0.00  | 1.08  | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.993          | 0.19                  | -0.01 | 0.45  | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.000          | 4.82                  | 1.77  | -8.42 | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.199          | -0.82                 | 0.88  | -5.35 | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.397          | -0.07                 | 0.71  | -2.75 | 0.00                    | 0.00  | 0.00  |  |
|          | LC7   | 26       | 0.596          | 0.04                  | 0.66  | -0.11 | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.794          | -0.49                 | 0.57  | 2.56  | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.993          | 3.41                  | -0.26 | 5.78  | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.000          | -4.28                 | 0.70  | 7.39  | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.199          | 0.63                  | 0.43  | 4.10  | 0.00                    | 0.00  | 0.00  |  |
|          | LC8   | 26       | 0.397          | -0.10                 | 0.38  | 1.60  | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.596          | -0.15                 | 0.37  | -0.81 | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.794          | 0.47                  | 0.34  | -3.23 | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.993          | -3.77                 | 0.07  | -6.41 | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.000          | -1.85                 | 2.41  | 3.34  | 0.00                    | 0.00  | 0.00  |  |
|          | LC9   | 26       | 0.199          | 0.49                  | 1.07  | 2.64  | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.397          | 0.29                  | 0.71  | 1.58  | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.596          | 0.22                  | 0.55  | 0.38  | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.794          | 0.31                  | 0.35  | -0.78 | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.993          | -0.96                 | -0.60 | -1.67 | 0.00                    | 0.00  | 0.00  |  |
| 74       | LC1   | 28       | 0.000          | -21.38                | -0.01 | 40.59 | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.186          | 4.20                  | 0.00  | 35.08 | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.372          | 0.97                  | 0.00  | 31.14 | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.558          | -0.70                 | 0.00  | 27.25 | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.744          | -1.51                 | 0.00  | 24.54 | 0.00                    | 0.00  | 0.00  |  |
|          | LC2   | 28       | 0.930          | -1.98                 | 0.00  | 22.99 | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 1.116          | -2.34                 | 0.00  | 22.35 | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 1.302          | -2.71                 | 0.00  | 22.23 | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 1.488          | -3.10                 | 0.00  | 21.83 | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 1.674          | -2.99                 | 0.00  | 19.20 | 0.00                    | 0.00  | 0.00  |  |
|          | LC3   | 28       | 1.860          | 5.26                  | 0.01  | 12.17 | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.000          | -5.68                 | 0.00  | 10.58 | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.186          | 1.04                  | 0.00  | 9.76  | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.372          | 0.29                  | 0.00  | 8.91  | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.558          | -0.13                 | 0.00  | 7.91  | 0.00                    | 0.00  | 0.00  |  |
|          | LC6   | 28       | 0.744          | -0.35                 | 0.00  | 7.14  | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.930          | -0.48                 | 0.00  | 6.67  | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 1.116          | -0.57                 | 0.00  | 6.42  | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 1.302          | -0.67                 | 0.00  | 6.29  | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 1.488          | -0.75                 | 0.00  | 6.05  | 0.00                    | 0.00  | 0.00  |  |
|          | LC7   | 28       | 1.674          | -0.64                 | 0.00  | 5.13  | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 1.860          | 1.31                  | 0.00  | 2.83  | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.000          | -0.89                 | 0.00  | 1.64  | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.186          | 0.14                  | 0.00  | 1.39  | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.372          | 0.01                  | 0.00  | 1.21  | 0.00                    | 0.00  | 0.00  |  |
|          | LC8   | 28       | 0.558          | -0.06                 | 0.00  | 1.05  | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.744          | -0.09                 | 0.00  | 0.94  | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.930          | -0.11                 | 0.00  | 0.88  | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 1.116          | -0.13                 | 0.00  | 0.85  | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 1.302          | -0.13                 | 0.00  | 0.83  | 0.00                    | 0.00  | 0.00  |  |
|          | LC9   | 28       | 1.488          | -0.14                 | 0.00  | 0.78  | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 1.674          | -0.09                 | 0.00  | 0.61  | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 1.860          | 0.05                  | 0.00  | 0.17  | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.000          | 1.43                  | 0.41  | -2.55 | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.186          | -0.18                 | 0.39  | -1.69 | 0.00                    | 0.00  | 0.00  |  |
|          | LC10  | 28       | 0.372          | 0.08                  | 0.37  | -1.14 | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.558          | 0.19                  | 0.36  | -0.69 | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.744          | 0.24                  | 0.35  | -0.35 | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.930          | 0.25                  | 0.34  | -0.06 | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 1.116          | 0.24                  | 0.34  | 0.23  | 0.00                    | 0.00  | 0.00  |  |
|          | LC11  | 28       | 1.302          | 0.20                  | 0.34  | 0.56  | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 1.488          | 0.09                  | 0.34  | 1.00  | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 1.674          | -0.17                 | 0.34  | 1.56  | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 1.860          | 1.38                  | 0.29  | 2.43  | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.000          | -2.53                 | 0.31  | 4.49  | 0.00                    | 0.00  | 0.00  |  |
|          | LC12  | 28       | 0.186          | 0.29                  | 0.35  | 2.84  | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.372          | -0.18                 | 0.34  | 1.81  | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.558          | -0.38                 | 0.34  | 1.02  | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.744          | -0.46                 | 0.34  | 0.42  | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.930          | -0.48                 | 0.34  | -0.09 | 0.00                    | 0.00  | 0.00  |  |
|          | LC13  | 28       | 1.116          | -0.46                 | 0.34  | -0.59 | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 1.302          | -0.38                 | 0.34  | -1.19 | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 1.488          | -0.18                 | 0.34  | -1.99 | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.000          | -0.18                 | 0.34  | -1.99 | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.186          | 0.29                  | 0.35  | 2.84  | 0.00                    | 0.00  | 0.00  |  |



Project: 2010-2

Model: 2010-2

Date: 29-4-2021

#### ■ 4.3 LINES - SUPPORT FORCES

| Line No. | LC/CO | Node No. | Location x [m] | Support Forces [kN/m] |                |                | Support Moments [kNm/m] |                |                |  |
|----------|-------|----------|----------------|-----------------------|----------------|----------------|-------------------------|----------------|----------------|--|
|          |       |          |                | p <sub>x</sub>        | p <sub>y</sub> | p <sub>z</sub> | m <sub>x</sub>          | m <sub>y</sub> | m <sub>z</sub> |  |
| 74       | LC7   | 28       | 1.674          | 0.32                  | 0.35           | -3.00          | 0.00                    | 0.00           | 0.00           |  |
|          |       | 29       | 1.860          | -2.63                 | 0.32           | -4.62          | 0.00                    | 0.00           | 0.00           |  |
|          | LC8   | 28       | 0.000          | 5.86                  | 1.39           | -10.45         | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.186          | -0.72                 | 0.76           | -6.84          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.372          | 0.34                  | 0.57           | -4.49          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.558          | 0.80                  | 0.50           | -2.60          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.744          | 0.97                  | 0.46           | -1.13          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.930          | 1.01                  | 0.45           | 0.13           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.116          | 0.97                  | 0.46           | 1.40           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.302          | 0.79                  | 0.50           | 2.90           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.488          | 0.32                  | 0.57           | 4.84           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.674          | -0.81                 | 0.75           | 7.19           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.860          | 6.10                  | 1.31           | 10.76          | 0.00                    | 0.00           | 0.00           |  |
|          | LC9   | 28       | 0.000          | -8.82                 | -2.11          | 15.78          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.186          | 1.13                  | -1.17          | 10.76          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.372          | -0.43                 | -0.89          | 7.47           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.558          | -1.12                 | -0.77          | 4.79           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.744          | -1.39                 | -0.71          | 2.74           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.930          | -1.46                 | -0.69          | 1.01           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.116          | -1.42                 | -0.71          | -0.69          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.302          | -1.20                 | -0.77          | -2.67          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.488          | -0.59                 | -0.88          | -5.26          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.674          | 0.94                  | -1.16          | -8.55          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.860          | -7.87                 | -2.02          | -13.78         | 0.00                    | 0.00           | 0.00           |  |
| 29       |       |          |                |                       |                |                |                         |                |                |  |
| 77       | LC1   | 30       | 0.000          | -7.52                 | 0.02           | 15.70          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.199          | 3.23                  | 0.00           | 19.53          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.399          | 2.81                  | 0.00           | 19.78          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.598          | 2.19                  | 0.00           | 18.29          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.797          | 1.79                  | 0.00           | 16.80          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.996          | 1.55                  | 0.00           | 15.72          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.196          | 1.44                  | 0.00           | 14.98          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.395          | 1.38                  | 0.00           | 14.38          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.594          | 1.33                  | 0.00           | 13.86          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.794          | 1.22                  | 0.00           | 13.53          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.993          | 1.01                  | 0.00           | 13.59          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 2.192          | 0.60                  | 0.00           | 14.24          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 2.391          | -0.32                 | 0.00           | 15.58          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 2.591          | -2.23                 | 0.00           | 17.12          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 2.790          | 11.01                 | -0.02          | 20.75          | 0.00                    | 0.00           | 0.00           |  |
|          | LC2   | 30       | 0.000          | -0.71                 | 0.00           | 1.60           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.199          | 0.53                  | 0.00           | 3.29           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.399          | 0.68                  | 0.00           | 3.64           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.598          | 0.64                  | 0.00           | 3.41           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.797          | 0.59                  | 0.00           | 3.06           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.996          | 0.55                  | 0.00           | 2.73           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.196          | 0.52                  | 0.00           | 2.46           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.395          | 0.51                  | 0.00           | 2.25           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.594          | 0.49                  | 0.00           | 2.07           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.794          | 0.47                  | 0.00           | 1.96           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.993          | 0.44                  | 0.00           | 1.93           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 2.192          | 0.37                  | 0.00           | 2.03           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 2.391          | 0.19                  | 0.00           | 2.30           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 2.591          | -0.21                 | 0.00           | 2.72           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 2.790          | 2.17                  | 0.00           | 3.80           | 0.00                    | 0.00           | 0.00           |  |
|          | LC3   | 30       | 0.000          | -0.36                 | 0.00           | 0.70           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.199          | 0.13                  | 0.00           | 0.93           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.399          | 0.11                  | 0.00           | 0.96           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.598          | 0.08                  | 0.00           | 0.91           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.797          | 0.07                  | 0.00           | 0.86           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.996          | 0.05                  | 0.00           | 0.83           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.196          | 0.05                  | 0.00           | 0.81           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.395          | 0.05                  | 0.00           | 0.79           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.594          | 0.05                  | 0.00           | 0.77           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.794          | 0.05                  | 0.00           | 0.74           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.993          | 0.04                  | 0.00           | 0.73           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 2.192          | 0.02                  | 0.00           | 0.73           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 2.391          | -0.01                 | 0.00           | 0.76           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 2.591          | -0.08                 | 0.00           | 0.77           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 2.790          | 0.44                  | 0.00           | 0.80           | 0.00                    | 0.00           | 0.00           |  |
|          | LC6   | 30       | 0.000          | 1.34                  | 0.06           | -2.31          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.199          | -0.13                 | 0.27           | -1.45          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.399          | 0.13                  | 0.31           | -0.99          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.598          | 0.24                  | 0.34           | -0.66          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.797          | 0.28                  | 0.35           | -0.43          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.996          | 0.30                  | 0.36           | -0.27          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.196          | 0.30                  | 0.37           | -0.14          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.395          | 0.30                  | 0.37           | -0.02          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.594          | 0.30                  | 0.36           | 0.10           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.794          | 0.30                  | 0.35           | 0.22           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.993          | 0.28                  | 0.34           | 0.38           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 2.192          | 0.24                  | 0.33           | 0.61           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 2.391          | 0.13                  | 0.32           | 0.96           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 2.591          | -0.13                 | 0.34           | 1.43           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 2.790          | 1.33                  | 0.58           | 2.30           | 0.00                    | 0.00           | 0.00           |  |
|          | LC7   | 30       | 0.000          | -2.18                 | 0.05           | 3.79           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.199          | 0.23                  | 0.27           | 2.43           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.399          | -0.18                 | 0.31           | 1.68           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.598          | -0.36                 | 0.33           | 1.09           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.797          | -0.43                 | 0.35           | 0.69           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.996          | -0.46                 | 0.37           | 0.40           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.196          | -0.47                 | 0.37           | 0.18           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.395          | -0.47                 | 0.37           | -0.03          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.594          | -0.47                 | 0.37           | -0.23          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.794          | -0.46                 | 0.35           | -0.44          | 0.00                    | 0.00           | 0.00           |  |



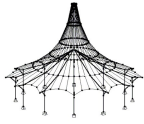
Project: 2010-2

Model: 2010-2

Date: 29-4-2021

#### ■ 4.3 LINES - SUPPORT FORCES

| Line No. | LC/CO | Node No. | Location x [m] | Support Forces [kN/m] |                |                | Support Moments [kNm/m] |                |                |  |
|----------|-------|----------|----------------|-----------------------|----------------|----------------|-------------------------|----------------|----------------|--|
|          |       |          |                | p <sub>x</sub>        | p <sub>y</sub> | p <sub>z</sub> | m <sub>x</sub>          | m <sub>y</sub> | m <sub>z</sub> |  |
| 77       | LC7   | 30       | 1.993          | -0.43                 | 0.34           | -0.71          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 2.192          | -0.36                 | 0.33           | -1.10          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 2.391          | -0.18                 | 0.31           | -1.67          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 2.591          | 0.23                  | 0.34           | -2.42          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 2.790          | -2.18                 | 0.60           | -3.77          | 0.00                    | 0.00           | 0.00           |  |
|          | LC8   | 30       | 0.000          | 5.01                  | 1.15           | -8.59          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.199          | -0.41                 | 0.66           | -4.88          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.399          | 0.61                  | 0.50           | -2.91          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.598          | 1.02                  | 0.44           | -1.50          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.797          | 1.18                  | 0.40           | -0.56          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.996          | 1.24                  | 0.38           | 0.11           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.196          | 1.26                  | 0.37           | 0.62           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.395          | 1.27                  | 0.37           | 1.05           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.594          | 1.27                  | 0.36           | 1.44           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.794          | 1.24                  | 0.37           | 1.87           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.993          | 1.17                  | 0.39           | 2.44           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 2.192          | 0.98                  | 0.43           | 3.34           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 2.391          | 0.50                  | 0.51           | 4.73           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 2.591          | -0.61                 | 0.75           | 6.59           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 2.790          | 5.82                  | 1.82           | 10.09          | 0.00                    | 0.00           | 0.00           |  |
|          | LC9   | 30       | 0.000          | -5.08                 | -1.74          | 8.79           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.199          | 0.50                  | -1.01          | 5.48           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.399          | -0.48                 | -0.77          | 3.67           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.598          | -0.90                 | -0.68          | 2.31           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.797          | -1.06                 | -0.63          | 1.39           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.996          | -1.13                 | -0.60          | 0.77           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.196          | -1.15                 | -0.58          | 0.29           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.395          | -1.17                 | -0.57          | -0.11          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.594          | -1.17                 | -0.57          | -0.48          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.794          | -1.15                 | -0.57          | -0.88          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.993          | -1.09                 | -0.60          | -1.40          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 2.192          | -0.93                 | -0.66          | -2.19          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 2.391          | -0.52                 | -0.78          | -3.44          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 2.591          | 0.46                  | -1.16          | -5.17          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 2.790          | -4.93                 | -2.80          | -8.49          | 0.00                    | 0.00           | 0.00           |  |
| 81       | LC1   | 32       | 0.000          | -4.53                 | -0.01          | 9.66           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.197          | 1.74                  | 0.00           | 10.16          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.394          | 1.08                  | 0.00           | 10.55          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.592          | 0.67                  | 0.00           | 10.64          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.789          | 0.47                  | 0.00           | 10.91          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.986          | 0.40                  | 0.00           | 11.34          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.183          | 0.38                  | 0.00           | 11.79          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.380          | 0.39                  | 0.00           | 12.17          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.578          | 0.39                  | 0.00           | 12.46          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.775          | 0.38                  | 0.00           | 12.73          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.972          | 0.37                  | 0.00           | 13.01          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 2.169          | 0.36                  | 0.00           | 13.32          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 2.366          | 0.36                  | 0.00           | 13.68          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 2.564          | 0.35                  | 0.00           | 14.09          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 2.761          | 0.34                  | 0.00           | 14.54          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 2.958          | 0.33                  | 0.00           | 15.02          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 3.155          | 0.34                  | 0.00           | 15.49          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 3.352          | 0.37                  | 0.00           | 15.83          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 3.549          | 0.43                  | 0.00           | 15.92          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 3.747          | 0.49                  | 0.00           | 15.66          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 3.944          | 0.53                  | 0.00           | 15.13          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 4.141          | 0.54                  | 0.00           | 14.45          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 4.338          | 0.53                  | 0.00           | 13.72          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 4.535          | 0.53                  | 0.00           | 13.00          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 4.733          | 0.52                  | 0.00           | 12.29          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 4.930          | 0.52                  | 0.00           | 11.57          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 5.127          | 0.52                  | 0.00           | 10.84          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 5.324          | 0.51                  | 0.01           | 10.11          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 5.521          | 0.45                  | 0.01           | 9.45           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 5.719          | 0.26                  | 0.02           | 8.98           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 5.916          | -0.25                 | 0.03           | 8.89           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 6.113          | 1.92                  | 0.08           | 9.83           | 0.00                    | 0.00           | 0.00           |  |
|          | LC2   | 32       | 0.000          | -0.11                 | 0.00           | 0.22           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.197          | 0.02                  | 0.00           | 0.33           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.394          | 0.01                  | 0.00           | 0.47           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.592          | 0.00                  | 0.00           | 0.63           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.789          | -0.02                 | 0.00           | 0.83           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.986          | -0.04                 | 0.00           | 1.14           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.183          | -0.06                 | 0.00           | 1.56           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.380          | -0.07                 | 0.00           | 2.08           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.578          | -0.07                 | 0.00           | 2.64           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.775          | -0.06                 | 0.00           | 3.19           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.972          | -0.05                 | 0.00           | 3.70           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 2.169          | -0.04                 | 0.00           | 4.17           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 2.366          | -0.03                 | 0.00           | 4.61           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 2.564          | -0.02                 | 0.00           | 5.04           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 2.761          | -0.02                 | 0.00           | 5.45           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 2.958          | -0.02                 | 0.00           | 5.87           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 3.155          | -0.02                 | 0.00           | 6.25           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 3.352          | 0.01                  | 0.00           | 6.55           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 3.549          | 0.05                  | 0.00           | 6.66           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 3.747          | 0.10                  | 0.00           | 6.55           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 3.944          | 0.12                  | 0.00           | 6.26           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 4.141          | 0.13                  | 0.00           | 5.86           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 4.338          | 0.13                  | 0.00           | 5.43           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 4.535          | 0.13                  | 0.00           | 4.99           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 4.733          | 0.14                  | 0.00           | 4.54           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 4.930          | 0.15                  | 0.00           | 4.07           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 5.127          | 0.16                  | 0.00           | 3.55           | 0.00                    | 0.00           | 0.00           |  |



Project: 2010-2

Model: 2010-2

Date: 29-4-2021

#### ■ 4.3 LINES - SUPPORT FORCES

| Line No. | LC/CO | Node No. | Location x [m] | Support Forces [kN/m] |                |                | Support Moments [kNm/m] |                |                |  |
|----------|-------|----------|----------------|-----------------------|----------------|----------------|-------------------------|----------------|----------------|--|
|          |       |          |                | p <sub>x</sub>        | p <sub>y</sub> | p <sub>z</sub> | m <sub>x</sub>          | m <sub>y</sub> | m <sub>z</sub> |  |
| 81       | LC2   | 32       | 5.324          | 0.17                  | 0.00           | 3.00           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 5.521          | 0.17                  | 0.00           | 2.41           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 5.719          | 0.14                  | 0.00           | 1.86           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 5.916          | 0.03                  | 0.00           | 1.47           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 6.113          | 0.16                  | 0.01           | 1.53           | 0.00                    | 0.00           | 0.00           |  |
|          | LC3   | 32       | 0.000          | -0.16                 | 0.00           | 0.33           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.197          | 0.06                  | 0.00           | 0.50           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.394          | 0.05                  | 0.00           | 0.58           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.592          | 0.04                  | 0.00           | 0.63           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.789          | 0.04                  | 0.00           | 0.66           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.986          | 0.04                  | 0.00           | 0.69           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.183          | 0.04                  | 0.00           | 0.68           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.380          | 0.04                  | 0.00           | 0.65           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.578          | 0.04                  | 0.00           | 0.60           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.775          | 0.04                  | 0.00           | 0.55           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.972          | 0.04                  | 0.00           | 0.50           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 2.169          | 0.04                  | 0.00           | 0.47           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 2.366          | 0.04                  | 0.00           | 0.44           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 2.564          | 0.04                  | 0.00           | 0.41           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 2.761          | 0.04                  | 0.00           | 0.40           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 2.958          | 0.04                  | 0.00           | 0.38           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 3.155          | 0.04                  | 0.00           | 0.37           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 3.352          | 0.04                  | 0.00           | 0.36           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 3.549          | 0.04                  | 0.00           | 0.35           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 3.747          | 0.03                  | 0.00           | 0.34           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 3.944          | 0.03                  | 0.00           | 0.34           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 4.141          | 0.03                  | 0.00           | 0.33           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 4.338          | 0.03                  | 0.00           | 0.32           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 4.535          | 0.03                  | 0.00           | 0.32           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 4.733          | 0.03                  | 0.00           | 0.32           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 4.930          | 0.03                  | 0.00           | 0.32           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 5.127          | 0.03                  | 0.00           | 0.32           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 5.324          | 0.03                  | 0.00           | 0.33           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 5.521          | 0.02                  | 0.00           | 0.35           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 5.719          | 0.01                  | 0.00           | 0.39           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 5.916          | -0.02                 | 0.00           | 0.44           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 6.113          | 0.13                  | 0.00           | 0.54           | 0.00                    | 0.00           | 0.00           |  |
|          | LC6   | 32       | 0.000          | 1.63                  | 0.45           | -2.80          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.197          | -0.14                 | 0.33           | -1.76          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.394          | 0.17                  | 0.32           | -1.22          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.592          | 0.30                  | 0.33           | -0.81          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.789          | 0.35                  | 0.35           | -0.54          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.986          | 0.37                  | 0.36           | -0.36          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.183          | 0.39                  | 0.36           | -0.23          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.380          | 0.40                  | 0.36           | -0.15          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.578          | 0.41                  | 0.36           | -0.11          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.775          | 0.41                  | 0.35           | -0.09          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.972          | 0.42                  | 0.34           | -0.08          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 2.169          | 0.42                  | 0.34           | -0.08          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 2.366          | 0.42                  | 0.33           | -0.09          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 2.564          | 0.42                  | 0.33           | -0.10          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 2.761          | 0.43                  | 0.33           | -0.11          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 2.958          | 0.43                  | 0.33           | -0.12          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 3.155          | 0.43                  | 0.33           | -0.12          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 3.352          | 0.43                  | 0.33           | -0.13          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 3.549          | 0.43                  | 0.34           | -0.13          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 3.747          | 0.43                  | 0.34           | -0.13          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 3.944          | 0.43                  | 0.35           | -0.12          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 4.141          | 0.43                  | 0.35           | -0.10          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 4.338          | 0.42                  | 0.35           | -0.07          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 4.535          | 0.42                  | 0.34           | -0.04          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 4.733          | 0.42                  | 0.34           | 0.01           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 4.930          | 0.41                  | 0.32           | 0.09           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 5.127          | 0.40                  | 0.30           | 0.20           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 5.324          | 0.38                  | 0.28           | 0.37           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 5.521          | 0.34                  | 0.24           | 0.64           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 5.719          | 0.23                  | 0.20           | 1.07           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 5.916          | -0.06                 | 0.11           | 1.73           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 6.113          | 1.09                  | -0.20          | 2.98           | 0.00                    | 0.00           | 0.00           |  |
|          | LC7   | 32       | 0.000          | -2.49                 | 0.67           | 4.27           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.197          | 0.20                  | 0.53           | 2.57           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.394          | -0.29                 | 0.52           | 1.72           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.592          | -0.49                 | 0.53           | 1.09           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.789          | -0.57                 | 0.55           | 0.68           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.986          | -0.60                 | 0.56           | 0.39           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.183          | -0.62                 | 0.57           | 0.20           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.380          | -0.64                 | 0.57           | 0.06           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.578          | -0.65                 | 0.57           | -0.03          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.775          | -0.66                 | 0.56           | -0.08          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.972          | -0.66                 | 0.55           | -0.12          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 2.169          | -0.67                 | 0.54           | -0.14          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 2.366          | -0.67                 | 0.53           | -0.15          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 2.564          | -0.68                 | 0.53           | -0.16          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 2.761          | -0.68                 | 0.53           | -0.16          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 2.958          | -0.68                 | 0.53           | -0.16          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 3.155          | -0.68                 | 0.54           | -0.16          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 3.352          | -0.69                 | 0.55           | -0.16          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 3.549          | -0.69                 | 0.56           | -0.16          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 3.747          | -0.69                 | 0.57           | -0.16          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 3.944          | -0.69                 | 0.58           | -0.17          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 4.141          | -0.69                 | 0.60           | -0.19          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 4.338          | -0.69                 | 0.61           | -0.21          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 4.535          | -0.68                 | 0.62           | -0.25          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 4.733          | -0.68                 | 0.63           | -0.30          | 0.00                    | 0.00           | 0.00           |  |



Project: 2010-2

Model: 2010-2

Date: 29-4-2021

#### ■ 4.3 LINES - SUPPORT FORCES

| Line No. | LC/CO | Node No. | Location x [m] | Support Forces [kN/m] |                |                | Support Moments [kNm/m] |                |                |  |
|----------|-------|----------|----------------|-----------------------|----------------|----------------|-------------------------|----------------|----------------|--|
|          |       |          |                | p <sub>x</sub>        | p <sub>y</sub> | p <sub>z</sub> | m <sub>x</sub>          | m <sub>y</sub> | m <sub>z</sub> |  |
| 81       | LC7   | 32       | 4.930          | -0.67                 | 0.66           | -0.39          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 5.127          | -0.65                 | 0.65           | -0.53          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 5.324          | -0.63                 | 0.61           | -0.75          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 5.521          | -0.56                 | 0.55           | -1.12          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 5.719          | -0.40                 | 0.45           | -1.72          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 5.916          | 0.04                  | 0.26           | -2.65          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 6.113          | -1.67                 | -0.39          | -4.52          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          |                |                       |                |                |                         |                |                |  |
|          |       |          |                |                       |                |                |                         |                |                |  |
|          |       |          |                |                       |                |                |                         |                |                |  |
|          | LC8   | 32       | 0.000          | 3.87                  | 1.74           | -6.61          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.197          | -0.32                 | 0.78           | -3.81          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.394          | 0.44                  | 0.54           | -2.25          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.592          | 0.75                  | 0.47           | -1.04          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.789          | 0.87                  | 0.42           | -0.17          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.986          | 0.94                  | 0.39           | 0.44           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.183          | 0.99                  | 0.37           | 0.82           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.380          | 1.03                  | 0.35           | 0.99           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.578          | 1.05                  | 0.33           | 1.02           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.775          | 1.06                  | 0.31           | 0.95           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.972          | 1.07                  | 0.30           | 0.86           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 2.169          | 1.07                  | 0.29           | 0.75           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 2.366          | 1.07                  | 0.28           | 0.66           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 2.564          | 1.07                  | 0.28           | 0.57           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 2.761          | 1.07                  | 0.28           | 0.49           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 2.958          | 1.07                  | 0.28           | 0.43           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 3.155          | 1.07                  | 0.29           | 0.37           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 3.352          | 1.06                  | 0.30           | 0.33           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 3.549          | 1.06                  | 0.31           | 0.31           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 3.747          | 1.05                  | 0.31           | 0.30           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 3.944          | 1.05                  | 0.32           | 0.32           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 4.141          | 1.04                  | 0.32           | 0.37           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 4.338          | 1.03                  | 0.32           | 0.45           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 4.535          | 1.01                  | 0.32           | 0.58           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 4.733          | 0.99                  | 0.31           | 0.79           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 4.930          | 0.97                  | 0.30           | 1.11           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 5.127          | 0.93                  | 0.28           | 1.60           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 5.324          | 0.86                  | 0.25           | 2.34           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 5.521          | 0.72                  | 0.21           | 3.45           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 5.719          | 0.41                  | 0.15           | 5.10           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 5.916          | -0.36                 | 0.03           | 7.35           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 6.113          | 3.34                  | -0.33          | 10.82          | 0.00                    | 0.00           | 0.00           |  |
|          | LC9   | 32       | 0.000          | -1.28                 | -2.68          | 2.25           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.197          | 0.23                  | -1.19          | 1.74           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.394          | 0.05                  | -0.84          | 1.22           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.592          | -0.05                 | -0.72          | 0.66           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.789          | -0.09                 | -0.65          | 0.18           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.986          | -0.13                 | -0.61          | -0.20          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.183          | -0.16                 | -0.58          | -0.45          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.380          | -0.19                 | -0.55          | -0.54          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.578          | -0.20                 | -0.52          | -0.51          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.775          | -0.21                 | -0.49          | -0.42          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.972          | -0.20                 | -0.47          | -0.29          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 2.169          | -0.20                 | -0.45          | -0.17          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 2.366          | -0.19                 | -0.44          | -0.06          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 2.564          | -0.19                 | -0.43          | 0.04           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 2.761          | -0.18                 | -0.43          | 0.12           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 2.958          | -0.18                 | -0.44          | 0.19           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 3.155          | -0.17                 | -0.45          | 0.24           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 3.352          | -0.16                 | -0.46          | 0.28           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 3.549          | -0.16                 | -0.47          | 0.31           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 3.747          | -0.15                 | -0.48          | 0.33           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 3.944          | -0.14                 | -0.49          | 0.33           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 4.141          | -0.13                 | -0.50          | 0.31           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 4.338          | -0.12                 | -0.50          | 0.27           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 4.535          | -0.10                 | -0.50          | 0.19           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 4.733          | -0.09                 | -0.48          | 0.06           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 4.930          | -0.07                 | -0.47          | -0.13          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 5.127          | -0.04                 | -0.44          | -0.41          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 5.324          | 0.00                  | -0.40          | -0.83          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 5.521          | 0.06                  | -0.34          | -1.42          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 5.719          | 0.17                  | -0.25          | -2.21          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 5.916          | 0.34                  | -0.09          | -3.14          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 6.113          | -0.97                 | 0.44           | -3.88          | 0.00                    | 0.00           | 0.00           |  |
| 82       | LC1   | 72       | 0.000          | 0.02                  | -6.80          | 11.77          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.180          | 0.01                  | 1.38           | 11.47          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.360          | 0.00                  | 0.43           | 10.97          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.540          | 0.00                  | -0.03          | 10.22          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.720          | 0.00                  | -0.27          | 9.41           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.900          | -0.01                 | -0.29          | 8.28           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.080          | -0.02                 | 1.08           | 6.57           | 0.00                    | 0.00           | 0.00           |  |
|          | LC2   | 72       | 0.000          | 0.00                  | -1.38          | 2.40           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.180          | 0.00                  | 0.29           | 2.42           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.360          | 0.00                  | 0.11           | 2.35           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.540          | 0.00                  | 0.01           | 2.23           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.720          | 0.00                  | -0.04          | 2.10           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.900          | 0.00                  | -0.07          | 1.91           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.080          | 0.00                  | 0.31           | 1.63           | 0.00                    | 0.00           | 0.00           |  |
|          | LC3   | 72       | 0.000          | 0.00                  | -0.31          | 0.54           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.180          | 0.00                  | 0.06           | 0.49           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.360          | 0.00                  | 0.01           | 0.45           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.540          | 0.00                  | -0.01          | 0.40           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.720          | 0.00                  | -0.02          | 0.34           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.900          | 0.00                  | -0.01          | 0.27           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.080          | 0.00                  | 0.01           | 0.17           | 0.00                    | 0.00           | 0.00           |  |
|          | LC6   | 72       | 0.000          | -0.03                 | -0.64          | 1.04           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.180          | -0.01                 | 0.10           | 0.66           | 0.00                    | 0.00           | 0.00           |  |



Project: 2010-2

Model: 2010-2

Date: 29-4-2021

#### ■ 4.3 LINES - SUPPORT FORCES

| Line No. | LC/CO | Node No. | Location x [m] | Support Forces [kN/m] |        |        | Support Moments [kNm/m] |       |       |  |
|----------|-------|----------|----------------|-----------------------|--------|--------|-------------------------|-------|-------|--|
|          |       |          |                | $p_x$                 | $p_y$  | $p_z$  | $m_x$                   | $m_y$ | $m_z$ |  |
| 82       | LC6   | 72       | 0.360          | 0.00                  | -0.01  | 0.33   | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.540          | 0.00                  | -0.04  | 0.03   | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.720          | 0.00                  | -0.03  | -0.29  | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.900          | 0.00                  | 0.06   | -0.66  | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 1.080          | 0.00                  | -0.42  | -1.11  | 0.00                    | 0.00  | 0.00  |  |
|          | LC7   | 72       | 0.000          | 0.03                  | -0.46  | 0.76   | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.180          | 0.01                  | 0.06   | 0.49   | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.360          | 0.00                  | -0.03  | 0.30   | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.540          | 0.00                  | -0.06  | 0.15   | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.720          | 0.00                  | -0.05  | -0.01  | 0.00                    | 0.00  | 0.00  |  |
|          | LC8   | 72       | 0.900          | 0.00                  | -0.01  | -0.19  | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 1.080          | 0.00                  | -0.22  | -0.48  | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.000          | 0.02                  | 15.45  | -25.00 | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.180          | 0.00                  | -2.10  | -15.01 | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.360          | 0.00                  | 0.70   | -7.12  | 0.00                    | 0.00  | 0.00  |  |
|          | LC9   | 72       | 0.540          | 0.00                  | 1.46   | 0.07   | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.720          | 0.00                  | 1.13   | 7.35   | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.900          | 0.00                  | -0.93  | 15.83  | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 1.080          | 0.01                  | 10.37  | 26.93  | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.000          | -0.05                 | -14.91 | 24.15  | 0.00                    | 0.00  | 0.00  |  |
| 87       | LC1   | 5        | 0.180          | -0.01                 | 2.06   | 14.62  | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.360          | -0.01                 | -0.64  | 7.06   | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.540          | 0.00                  | -1.38  | 0.15   | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.720          | 0.00                  | -1.06  | -6.86  | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.900          | 0.00                  | 0.91   | -15.04 | 0.00                    | 0.00  | 0.00  |  |
|          | LC2   | 5        | 1.080          | -0.01                 | -9.91  | -25.69 | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.000          | -1.77                 | -1.53  | 10.97  | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.199          | 0.23                  | 0.07   | 10.37  | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.398          | -0.31                 | -0.05  | 10.39  | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.597          | -0.66                 | 0.01   | 10.77  | 0.00                    | 0.00  | 0.00  |  |
|          | LC3   | 5        | 0.796          | -1.03                 | 0.00   | 11.61  | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.995          | -1.53                 | 0.00   | 12.67  | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 1.194          | -2.02                 | 0.00   | 12.94  | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 1.393          | 6.20                  | 0.00   | 11.98  | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.000          | -0.45                 | -0.37  | 2.77   | 0.00                    | 0.00  | 0.00  |  |
|          | LC4   | 5        | 0.199          | 0.04                  | 0.02   | 2.66   | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.398          | -0.10                 | -0.01  | 2.71   | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.597          | -0.19                 | 0.00   | 2.85   | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.796          | -0.28                 | 0.00   | 3.10   | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.995          | -0.39                 | 0.00   | 3.37   | 0.00                    | 0.00  | 0.00  |  |
|          | LC5   | 5        | 1.194          | -0.49                 | 0.00   | 3.37   | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 1.393          | 1.56                  | 0.00   | 2.77   | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.000          | -0.06                 | -0.05  | 0.38   | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.199          | 0.01                  | 0.00   | 0.35   | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.398          | 0.00                  | 0.00   | 0.34   | 0.00                    | 0.00  | 0.00  |  |
|          | LC6   | 5        | 0.597          | -0.02                 | 0.00   | 0.35   | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.796          | -0.03                 | 0.00   | 0.38   | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.995          | -0.05                 | 0.00   | 0.41   | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 1.194          | -0.06                 | 0.00   | 0.42   | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 1.393          | 0.20                  | 0.00   | 0.36   | 0.00                    | 0.00  | 0.00  |  |
|          | LC7   | 5        | 0.000          | 0.28                  | -0.10  | -0.39  | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.199          | 0.34                  | 0.00   | -0.07  | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.398          | 0.38                  | 0.00   | 0.19   | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.597          | 0.37                  | 0.00   | 0.45   | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.796          | 0.32                  | 0.00   | 0.77   | 0.00                    | 0.00  | 0.00  |  |
|          | LC8   | 5        | 0.995          | 0.19                  | 0.00   | 1.22   | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 1.194          | -0.20                 | 0.00   | 1.85   | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 1.393          | 1.88                  | 0.00   | 3.00   | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.000          | -0.37                 | -0.23  | 1.45   | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.199          | -0.09                 | 0.01   | 0.85   | 0.00                    | 0.00  | 0.00  |  |
|          | LC9   | 5        | 0.398          | -0.21                 | 0.00   | 0.44   | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.597          | -0.24                 | 0.00   | 0.11   | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.796          | -0.22                 | 0.00   | -0.23  | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.995          | -0.13                 | 0.00   | -0.63  | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 1.194          | 0.13                  | 0.00   | -1.15  | 0.00                    | 0.00  | 0.00  |  |
| 97       | LC1   | 37       | 1.393          | -1.28                 | 0.00   | -2.03  | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.000          | 2.18                  | 5.95   | -19.79 | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.199          | -3.98                 | -0.15  | -12.65 | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.398          | -2.19                 | 0.04   | -8.66  | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.597          | -1.59                 | -0.03  | -6.10  | 0.00                    | 0.00  | 0.00  |  |
|          | LC2   | 37       | 0.796          | -1.27                 | -0.01  | -4.58  | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.995          | -0.92                 | -0.01  | -3.88  | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 1.194          | 0.05                  | -0.01  | -4.02  | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 1.393          | -4.01                 | 0.01   | -6.36  | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.000          | -1.91                 | -5.90  | 19.07  | 0.00                    | 0.00  | 0.00  |  |
|          | LC3   | 37       | 0.199          | 4.18                  | 0.14   | 12.34  | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.398          | 2.46                  | -0.04  | 8.64   | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.597          | 1.87                  | 0.03   | 6.35   | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.796          | 1.51                  | 0.01   | 5.14   | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.995          | 1.04                  | 0.01   | 4.88   | 0.00                    | 0.00  | 0.00  |  |
|          | LC4   | 37       | 1.194          | -0.23                 | 0.01   | 5.58   | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 1.393          | 5.56                  | -0.01  | 8.84   | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.000          | -4.56                 | 0.03   | 8.59   | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.198          | 0.62                  | 0.00   | 10.26  | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.397          | -0.62                 | -0.04  | 11.22  | 0.00                    | 0.00  | 0.00  |  |
|          | LC5   | 37       | 0.595          | 7.75                  | -0.33  | 12.21  | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.000          | -0.96                 | 0.01   | 1.60   | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.198          | 0.09                  | 0.00   | 2.53   | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.397          | -0.19                 | -0.01  | 2.94   | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.595          | 2.15                  | -0.08  | 3.38   | 0.00                    | 0.00  | 0.00  |  |
|          | LC6   | 37       | 0.000          | -0.11                 | 0.00   | 0.18   | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.198          | 0.00                  | 0.00   | 0.27   | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.397          | -0.03                 | 0.00   | 0.33   | 0.00                    | 0.00  | 0.00  |  |
|          |       |          | 0.595          | 0.23                  | -0.01  | 0.37   | 0.00                    | 0.00  | 0.00  |  |



Project: 2010-2

Model: 2010-2

Date: 29-4-2021

#### ■ 4.3 LINES - SUPPORT FORCES

| Line No. | LC/CO | Node No. | Location x [m] | Support Forces [kN/m] |                |                | Support Moments [kNm/m] |                |                |  |
|----------|-------|----------|----------------|-----------------------|----------------|----------------|-------------------------|----------------|----------------|--|
|          |       |          |                | p <sub>x</sub>        | p <sub>y</sub> | p <sub>z</sub> | m <sub>x</sub>          | m <sub>y</sub> | m <sub>z</sub> |  |
| 97       | LC6   | 37       | 0.000          | 0.98                  | 0.00           | -1.58          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.198          | -0.30                 | 0.00           | -0.44          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.397          | -0.30                 | 0.00           | 0.65           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.595          | 1.08                  | 0.00           | 1.73           | 0.00                    | 0.00           | 0.00           |  |
|          | LC7   | 37       | 0.000          | -0.86                 | 0.00           | 1.40           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.198          | 0.26                  | 0.00           | 0.47           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.397          | 0.25                  | 0.00           | -0.43          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.595          | -0.83                 | 0.01           | -1.33          | 0.00                    | 0.00           | 0.00           |  |
|          | LC8   | 37       | 0.000          | 0.45                  | -0.01          | -0.62          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.198          | 0.35                  | 0.01           | -1.26          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.397          | 0.67                  | -0.01          | -2.35          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.595          | -1.76                 | 0.44           | -3.00          | 0.00                    | 0.00           | 0.00           |  |
|          | LC9   | 37       | 0.000          | 0.51                  | 0.02           | -0.93          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.198          | -0.66                 | -0.02          | 0.96           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.397          | -0.99                 | 0.01           | 3.20           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.595          | 3.00                  | -0.45          | 5.00           | 0.00                    | 0.00           | 0.00           |  |
| 102      | LC1   | 75       | 0.000          | -3.80                 | 0.20           | 6.69           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.198          | 1.00                  | 0.03           | 8.21           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.396          | 0.70                  | 0.01           | 8.82           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.594          | 0.46                  | -0.01          | 8.81           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.792          | 0.33                  | 0.00           | 8.67           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.990          | 0.24                  | 0.00           | 8.52           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.188          | 0.15                  | 0.00           | 8.41           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.386          | -0.01                 | 0.00           | 8.37           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.584          | -0.32                 | 0.00           | 8.35           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.782          | -0.89                 | 0.01           | 8.07           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.980          | 4.50                  | 0.08           | 7.68           | 0.00                    | 0.00           | 0.00           |  |
|          | LC2   | 75       | 0.000          | -0.91                 | 0.05           | 1.60           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.198          | 0.23                  | 0.01           | 1.97           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.396          | 0.15                  | 0.00           | 2.15           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.594          | 0.10                  | 0.00           | 2.20           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.792          | 0.06                  | 0.00           | 2.21           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.990          | 0.04                  | 0.00           | 2.22           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.188          | 0.02                  | 0.00           | 2.23           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.386          | -0.02                 | 0.00           | 2.25           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.584          | -0.10                 | 0.00           | 2.26           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.782          | -0.25                 | 0.00           | 2.19           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.980          | 1.21                  | 0.02           | 2.07           | 0.00                    | 0.00           | 0.00           |  |
|          | LC3   | 75       | 0.000          | -0.11                 | 0.01           | 0.20           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.198          | 0.03                  | 0.00           | 0.26           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.396          | 0.03                  | 0.00           | 0.29           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.594          | 0.02                  | 0.00           | 0.29           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.792          | 0.02                  | 0.00           | 0.28           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.990          | 0.02                  | 0.00           | 0.27           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.188          | 0.01                  | 0.00           | 0.26           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.386          | 0.01                  | 0.00           | 0.26           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.584          | 0.00                  | 0.00           | 0.26           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.782          | -0.03                 | 0.00           | 0.26           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.980          | 0.16                  | 0.00           | 0.27           | 0.00                    | 0.00           | 0.00           |  |
|          | LC6   | 75       | 0.000          | 0.91                  | -0.01          | -1.44          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.198          | -0.10                 | 0.00           | -0.90          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.396          | 0.07                  | 0.00           | -0.56          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.594          | 0.14                  | 0.00           | -0.30          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.792          | 0.17                  | 0.00           | -0.11          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.990          | 0.17                  | 0.00           | 0.05           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.188          | 0.17                  | 0.00           | 0.20           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.386          | 0.14                  | 0.00           | 0.39           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.584          | 0.08                  | 0.00           | 0.63           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.782          | -0.10                 | 0.00           | 0.93           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.980          | 0.91                  | 0.01           | 1.45           | 0.00                    | 0.00           | 0.00           |  |
|          | LC7   | 75       | 0.000          | -1.02                 | 0.00           | 1.62           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.198          | 0.10                  | 0.00           | 1.04           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.396          | -0.09                 | 0.00           | 0.70           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.594          | -0.16                 | 0.00           | 0.43           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.792          | -0.19                 | 0.00           | 0.23           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.990          | -0.20                 | 0.00           | 0.06           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.188          | -0.19                 | 0.00           | -0.12          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.386          | -0.17                 | 0.00           | -0.33          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.584          | -0.09                 | 0.00           | -0.60          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.782          | 0.10                  | 0.00           | -0.96          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.980          | -0.99                 | 0.00           | -1.57          | 0.00                    | 0.00           | 0.00           |  |
|          | LC8   | 75       | 0.000          | -1.16                 | 0.20           | 2.08           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.198          | 0.53                  | -0.06          | 2.08           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.396          | 0.37                  | 0.00           | 1.64           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.594          | 0.25                  | -0.03          | 1.21           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.792          | 0.19                  | 0.00           | 0.88           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.990          | 0.15                  | 0.00           | 0.65           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.188          | 0.14                  | 0.00           | 0.50           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.386          | 0.12                  | 0.00           | 0.39           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.584          | 0.10                  | -0.01          | 0.33           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.782          | 0.03                  | -0.05          | 0.30           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.980          | 0.32                  | -0.17          | 0.49           | 0.00                    | 0.00           | 0.00           |  |
|          | LC9   | 75       | 0.000          | 2.33                  | -0.19          | -3.93          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.198          | -0.62                 | 0.06           | -3.13          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.396          | -0.22                 | 0.00           | -2.25          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.594          | -0.02                 | 0.02           | -1.50          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.792          | 0.07                  | 0.00           | -0.93          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.990          | 0.11                  | 0.00           | -0.49          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.188          | 0.12                  | 0.00           | -0.12          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.386          | 0.09                  | 0.00           | 0.25           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.584          | 0.01                  | 0.01           | 0.67           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.782          | -0.18                 | 0.04           | 1.15           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.980          | 1.08                  | 0.17           | 1.74           | 0.00                    | 0.00           | 0.00           |  |
| 138      | LC1   | 72       | 0.000          | -0.67                 | 0.00           | 15.83          | 0.00                    | 0.00           | 0.00           |  |



Project: 2010-2

Model: 2010-2

Date: 29-4-2021

#### ■ 4.3 LINES - SUPPORT FORCES

| Line No. | LC/CO | Node No. | Location x [m] | Support Forces [kN/m] |                |                | Support Moments [kNm/m] |                |                |  |
|----------|-------|----------|----------------|-----------------------|----------------|----------------|-------------------------|----------------|----------------|--|
|          |       |          |                | p <sub>x</sub>        | p <sub>y</sub> | p <sub>z</sub> | m <sub>x</sub>          | m <sub>y</sub> | m <sub>z</sub> |  |
| 138      | LC1   | 72       | 0.243          | -1.38                 | 0.00           | 14.78          | 0.00                    | 0.00           | 0.00           |  |
|          |       | 36       | 0.485          | 9.58                  | 0.00           | 16.08          | 0.00                    | 0.00           | 0.00           |  |
|          | LC2   | 72       | 0.000          | -0.19                 | 0.00           | 3.75           | 0.00                    | 0.00           | 0.00           |  |
|          |       | 36       | 0.243          | -0.32                 | 0.00           | 3.49           | 0.00                    | 0.00           | 0.00           |  |
|          | LC3   | 72       | 0.485          | 2.19                  | 0.00           | 3.48           | 0.00                    | 0.00           | 0.00           |  |
|          |       | 36       | 0.000          | 0.00                  | 0.00           | 0.58           | 0.00                    | 0.00           | 0.00           |  |
|          | LC6   | 72       | 0.243          | -0.04                 | 0.00           | 0.53           | 0.00                    | 0.00           | 0.00           |  |
|          |       | 36       | 0.485          | 0.37                  | 0.00           | 0.58           | 0.00                    | 0.00           | 0.00           |  |
|          | LC7   | 72       | 0.000          | 0.07                  | 0.00           | 0.47           | 0.00                    | 0.00           | 0.00           |  |
|          |       | 36       | 0.243          | -0.22                 | 0.00           | 1.24           | 0.00                    | 0.00           | 0.00           |  |
|          | LC8   | 72       | 0.485          | 1.48                  | 0.00           | 2.31           | 0.00                    | 0.00           | 0.00           |  |
|          |       | 36       | 0.000          | -0.07                 | 0.00           | -0.12          | 0.00                    | 0.00           | 0.00           |  |
|          | LC9   | 72       | 0.243          | 0.17                  | 0.00           | -0.80          | 0.00                    | 0.00           | 0.00           |  |
|          |       | 36       | 0.485          | -1.08                 | 0.00           | -1.68          | 0.00                    | 0.00           | 0.00           |  |
|          | LC10  | 72       | 0.000          | 0.04                  | -0.04          | -1.68          | 0.00                    | 0.00           | 0.00           |  |
|          |       | 36       | 0.243          | 0.19                  | -0.05          | -1.99          | 0.00                    | 0.00           | 0.00           |  |
|          | LC11  | 72       | 0.485          | -1.70                 | -0.04          | -2.67          | 0.00                    | 0.00           | 0.00           |  |
|          |       | 36       | 0.000          | 0.03                  | 0.04           | 2.37           | 0.00                    | 0.00           | 0.00           |  |
| 351      | LC1   | 233      | 0.243          | -0.44                 | 0.05           | 3.47           | 0.00                    | 0.00           | 0.00           |  |
|          |       | 36       | 0.485          | 3.34                  | 0.04           | 5.24           | 0.00                    | 0.00           | 0.00           |  |
|          | LC2   | 233      | 0.000          | -19.69                | -0.01          | 36.20          | 0.00                    | 0.00           | 0.00           |  |
|          |       | 36       | 0.200          | 5.09                  | 0.00           | 38.42          | 0.00                    | 0.00           | 0.00           |  |
|          | LC3   | 233      | 0.399          | 3.56                  | 0.00           | 34.76          | 0.00                    | 0.00           | 0.00           |  |
|          |       | 36       | 0.599          | 2.02                  | 0.00           | 28.17          | 0.00                    | 0.00           | 0.00           |  |
|          | LC4   | 233      | 0.798          | 1.03                  | 0.00           | 22.37          | 0.00                    | 0.00           | 0.00           |  |
|          |       | 36       | 0.998          | 0.44                  | 0.00           | 18.17          | 0.00                    | 0.00           | 0.00           |  |
|          | LC5   | 233      | 1.197          | 0.09                  | 0.00           | 15.40          | 0.00                    | 0.00           | 0.00           |  |
|          |       | 36       | 1.397          | -0.13                 | 0.00           | 13.69          | 0.00                    | 0.00           | 0.00           |  |
|          | LC6   | 233      | 1.597          | -0.27                 | 0.00           | 12.70          | 0.00                    | 0.00           | 0.00           |  |
|          |       | 36       | 1.796          | -0.37                 | 0.00           | 12.18          | 0.00                    | 0.00           | 0.00           |  |
|          | LC7   | 233      | 1.996          | -0.44                 | 0.00           | 11.96          | 0.00                    | 0.00           | 0.00           |  |
|          |       | 36       | 2.195          | -0.50                 | 0.00           | 11.93          | 0.00                    | 0.00           | 0.00           |  |
|          | LC8   | 233      | 2.395          | -0.56                 | 0.00           | 12.01          | 0.00                    | 0.00           | 0.00           |  |
|          |       | 36       | 2.594          | -0.61                 | 0.00           | 12.19          | 0.00                    | 0.00           | 0.00           |  |
|          | LC9   | 233      | 2.794          | -0.66                 | 0.00           | 12.44          | 0.00                    | 0.00           | 0.00           |  |
|          |       | 36       | 2.993          | -0.71                 | 0.00           | 12.80          | 0.00                    | 0.00           | 0.00           |  |
|          | LC10  | 233      | 3.193          | -0.78                 | 0.00           | 13.27          | 0.00                    | 0.00           | 0.00           |  |
|          |       | 36       | 3.393          | -0.86                 | 0.00           | 13.92          | 0.00                    | 0.00           | 0.00           |  |
|          | LC11  | 233      | 3.592          | -0.99                 | 0.00           | 14.81          | 0.00                    | 0.00           | 0.00           |  |
|          |       | 36       | 3.792          | -1.20                 | 0.00           | 16.02          | 0.00                    | 0.00           | 0.00           |  |
|          | LC12  | 233      | 3.991          | -1.58                 | 0.00           | 17.56          | 0.00                    | 0.00           | 0.00           |  |
|          |       | 36       | 4.191          | -2.23                 | 0.00           | 19.10          | 0.00                    | 0.00           | 0.00           |  |
|          | LC13  | 233      | 4.390          | -2.97                 | 0.00           | 19.16          | 0.00                    | 0.00           | 0.00           |  |
|          |       | 36       | 4.590          | 8.34                  | 0.01           | 16.91          | 0.00                    | 0.00           | 0.00           |  |
|          | LC14  | 233      | 0.000          | -4.53                 | -0.01          | 8.32           | 0.00                    | 0.00           | 0.00           |  |
|          |       | 36       | 0.200          | 1.13                  | 0.00           | 8.83           | 0.00                    | 0.00           | 0.00           |  |
|          | LC15  | 233      | 0.399          | 0.76                  | 0.00           | 8.13           | 0.00                    | 0.00           | 0.00           |  |
|          |       | 36       | 0.599          | 0.41                  | 0.00           | 6.78           | 0.00                    | 0.00           | 0.00           |  |
|          | LC16  | 233      | 0.798          | 0.19                  | 0.00           | 5.62           | 0.00                    | 0.00           | 0.00           |  |
|          |       | 36       | 0.998          | 0.06                  | 0.00           | 4.79           | 0.00                    | 0.00           | 0.00           |  |
|          | LC17  | 233      | 1.197          | -0.02                 | 0.00           | 4.26           | 0.00                    | 0.00           | 0.00           |  |
|          |       | 36       | 1.397          | -0.06                 | 0.00           | 3.95           | 0.00                    | 0.00           | 0.00           |  |
|          | LC18  | 233      | 1.597          | -0.09                 | 0.00           | 3.77           | 0.00                    | 0.00           | 0.00           |  |
|          |       | 36       | 1.796          | -0.11                 | 0.00           | 3.69           | 0.00                    | 0.00           | 0.00           |  |
|          | LC19  | 233      | 1.996          | -0.13                 | 0.00           | 3.66           | 0.00                    | 0.00           | 0.00           |  |
|          |       | 36       | 2.195          | -0.14                 | 0.00           | 3.66           | 0.00                    | 0.00           | 0.00           |  |
|          | LC20  | 233      | 2.395          | -0.15                 | 0.00           | 3.69           | 0.00                    | 0.00           | 0.00           |  |
|          |       | 36       | 2.594          | -0.16                 | 0.00           | 3.73           | 0.00                    | 0.00           | 0.00           |  |
|          | LC21  | 233      | 2.794          | -0.17                 | 0.00           | 3.79           | 0.00                    | 0.00           | 0.00           |  |
|          |       | 36       | 2.993          | -0.19                 | 0.00           | 3.88           | 0.00                    | 0.00           | 0.00           |  |
|          | LC22  | 233      | 3.193          | -0.20                 | 0.00           | 3.99           | 0.00                    | 0.00           | 0.00           |  |
|          |       | 36       | 3.393          | -0.23                 | 0.00           | 4.16           | 0.00                    | 0.00           | 0.00           |  |
|          | LC23  | 233      | 3.592          | -0.26                 | 0.00           | 4.39           | 0.00                    | 0.00           | 0.00           |  |
|          |       | 36       | 3.792          | -0.32                 | 0.00           | 4.72           | 0.00                    | 0.00           | 0.00           |  |
|          | LC24  | 233      | 3.991          | -0.42                 | 0.00           | 5.14           | 0.00                    | 0.00           | 0.00           |  |
|          |       | 36       | 4.191          | -0.59                 | 0.00           | 5.52           | 0.00                    | 0.00           | 0.00           |  |
|          | LC25  | 233      | 4.390          | -0.70                 | 0.00           | 5.39           | 0.00                    | 0.00           | 0.00           |  |
|          |       | 36       | 4.590          | 2.23                  | 0.00           | 4.29           | 0.00                    | 0.00           | 0.00           |  |
|          | LC26  | 233      | 0.000          | -1.05                 | 0.00           | 1.92           | 0.00                    | 0.00           | 0.00           |  |
|          |       | 36       | 0.200          | 0.28                  | 0.00           | 2.03           | 0.00                    | 0.00           | 0.00           |  |
|          | LC27  | 233      | 0.399          | 0.20                  | 0.00           | 1.79           | 0.00                    | 0.00           | 0.00           |  |
|          |       | 36       | 0.599          | 0.12                  | 0.00           | 1.39           | 0.00                    | 0.00           | 0.00           |  |
|          | LC28  | 233      | 0.798          | 0.06                  | 0.00           | 1.03           | 0.00                    | 0.00           | 0.00           |  |
|          |       | 36       | 0.998          | 0.03                  | 0.00           | 0.77           | 0.00                    | 0.00           | 0.00           |  |
|          | LC29  | 233      | 1.197          | 0.01                  | 0.00           | 0.60           | 0.00                    | 0.00           | 0.00           |  |
|          |       | 36       | 1.397          | 0.00                  | 0.00           | 0.49           | 0.00                    | 0.00           | 0.00           |  |
|          | LC30  | 233      | 1.597          | -0.01                 | 0.00           | 0.43           | 0.00                    | 0.00           | 0.00           |  |
|          |       | 36       | 1.796          | -0.02                 | 0.00           | 0.40           | 0.00                    | 0.00           | 0.00           |  |
|          | LC31  | 233      | 1.996          | -0.02                 | 0.00           | 0.38           | 0.00                    | 0.00           | 0.00           |  |
|          |       | 36       | 2.195          | -0.02                 | 0.00           | 0.38           | 0.00                    | 0.00           | 0.00           |  |
|          | LC32  | 233      | 2.395          | -0.03                 | 0.00           | 0.38           | 0.00                    | 0.00           | 0.00           |  |
|          |       | 36       | 2.594          | -0.03                 | 0.00           | 0.39           | 0.00                    | 0.00           | 0.00           |  |
|          | LC33  | 233      | 2.794          | -0.03                 | 0.00           | 0.41           | 0.00                    | 0.00           | 0.00           |  |
|          |       | 36       | 2.993          | -0.03                 | 0.00           | 0.42           | 0.00                    | 0.00           | 0.00           |  |
|          | LC34  | 233      | 3.193          | -0.04                 | 0.00           | 0.45           | 0.00                    | 0.00           | 0.00           |  |
|          |       | 36       | 3.393          | -0.04                 | 0.00           | 0.47           | 0.00                    | 0.00           | 0.00           |  |
|          | LC35  | 233      | 3.592          | -0.04                 | 0.00           | 0.50           | 0.00                    | 0.00           | 0.00           |  |
|          |       | 36       | 3.792          | -0.05                 | 0.00           | 0.55           | 0.00                    | 0.00           | 0.00           |  |
|          | LC36  | 233      | 3.991          | -0.06                 | 0.00           | 0.59           | 0.00                    | 0.00           | 0.00           |  |
|          |       | 36       | 4.191          | -0.07                 | 0.00           | 0.62           | 0.00                    | 0.00           | 0.00           |  |
|          | LC37  | 233      | 4.390          | -0.08                 | 0.00           | 0.59           | 0.00                    | 0.00           | 0.00           |  |
|          |       | 36       | 4.590          | 0.21                  | 0.00           | 0.42           | 0.00                    | 0.00           | 0.00           |  |
|          | LC38  | 233      | 0.000          | 1.35                  | -0.55          | -2.21          | 0.00                    | 0.00           | 0.00           |  |
|          |       | 36       | 0.200          | 0.06                  | -0.61          | -0.84          | 0.00                    | 0.00           | 0.00           |  |



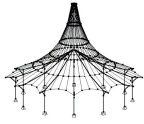
Project: 2010-2

Model: 2010-2

Date: 29-4-2021

#### ■ 4.3 LINES - SUPPORT FORCES

| Line No. | LC/CO | Node No. | Location x [m] | Support Forces [kN/m] |                |                | Support Moments [kNm/m] |                |                |  |
|----------|-------|----------|----------------|-----------------------|----------------|----------------|-------------------------|----------------|----------------|--|
|          |       |          |                | p <sub>x</sub>        | p <sub>y</sub> | p <sub>z</sub> | m <sub>x</sub>          | m <sub>y</sub> | m <sub>z</sub> |  |
| 351      | LC6   | 233      | 0.399          | 0.39                  | -0.62          | -0.37          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.599          | 0.49                  | -0.60          | -0.16          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.798          | 0.52                  | -0.58          | -0.08          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.998          | 0.53                  | -0.57          | -0.05          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.197          | 0.53                  | -0.56          | -0.05          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.397          | 0.53                  | -0.55          | -0.05          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.597          | 0.53                  | -0.54          | -0.06          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.796          | 0.53                  | -0.53          | -0.06          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.996          | 0.53                  | -0.52          | -0.07          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 2.195          | 0.52                  | -0.51          | -0.07          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 2.395          | 0.52                  | -0.49          | -0.08          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 2.594          | 0.52                  | -0.48          | -0.07          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 2.794          | 0.51                  | -0.45          | -0.06          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 2.993          | 0.51                  | -0.41          | -0.03          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 3.193          | 0.50                  | -0.39          | 0.02           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 3.393          | 0.49                  | -0.37          | 0.09           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 3.592          | 0.48                  | -0.36          | 0.21           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 3.792          | 0.45                  | -0.35          | 0.41           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 3.991          | 0.39                  | -0.34          | 0.71           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 4.191          | 0.24                  | -0.34          | 1.19           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 4.390          | -0.14                 | -0.33          | 1.86           | 0.00                    | 0.00           | 0.00           |  |
|          |       | 19       | 4.590          | 1.86                  | -0.25          | 3.19           | 0.00                    | 0.00           | 0.00           |  |
|          | LC7   | 233      | 0.000          | -0.88                 | -0.37          | 1.48           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.200          | 0.04                  | -0.38          | 0.92           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.399          | -0.11                 | -0.38          | 0.64           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.599          | -0.18                 | -0.37          | 0.41           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.798          | -0.20                 | -0.36          | 0.24           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.998          | -0.22                 | -0.35          | 0.12           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.197          | -0.22                 | -0.35          | 0.04           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.397          | -0.23                 | -0.34          | -0.01          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.597          | -0.23                 | -0.34          | -0.05          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.796          | -0.23                 | -0.34          | -0.08          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.996          | -0.23                 | -0.34          | -0.09          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 2.195          | -0.23                 | -0.33          | -0.11          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 2.395          | -0.23                 | -0.33          | -0.12          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 2.594          | -0.23                 | -0.33          | -0.13          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 2.794          | -0.23                 | -0.33          | -0.15          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 2.993          | -0.22                 | -0.34          | -0.17          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 3.193          | -0.22                 | -0.34          | -0.20          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 3.393          | -0.21                 | -0.34          | -0.24          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 3.592          | -0.21                 | -0.34          | -0.30          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 3.792          | -0.19                 | -0.34          | -0.41          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 3.991          | -0.16                 | -0.34          | -0.56          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 4.191          | -0.08                 | -0.34          | -0.80          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 4.390          | 0.09                  | -0.35          | -1.10          | 0.00                    | 0.00           | 0.00           |  |
|          |       | 19       | 4.590          | -0.96                 | -0.30          | -1.66          | 0.00                    | 0.00           | 0.00           |  |
|          | LC8   | 233      | 0.000          | -4.21                 | 0.57           | 7.09           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.200          | 0.13                  | 0.57           | 3.77           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.399          | -0.78                 | 0.56           | 2.41           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.599          | -1.11                 | 0.54           | 1.58           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.798          | -1.23                 | 0.52           | 1.15           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.998          | -1.28                 | 0.51           | 0.93           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.197          | -1.30                 | 0.49           | 0.82           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.397          | -1.31                 | 0.48           | 0.77           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.597          | -1.32                 | 0.47           | 0.76           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.796          | -1.33                 | 0.46           | 0.77           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.996          | -1.33                 | 0.45           | 0.79           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 2.195          | -1.33                 | 0.45           | 0.81           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 2.395          | -1.33                 | 0.45           | 0.83           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 2.594          | -1.32                 | 0.45           | 0.83           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 2.794          | -1.31                 | 0.46           | 0.81           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 2.993          | -1.30                 | 0.47           | 0.75           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 3.193          | -1.29                 | 0.49           | 0.65           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 3.393          | -1.27                 | 0.52           | 0.47           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 3.592          | -1.23                 | 0.56           | 0.17           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 3.792          | -1.17                 | 0.63           | -0.31          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 3.991          | -1.02                 | 0.73           | -1.08          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 4.191          | -0.65                 | 0.89           | -2.32          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 4.390          | 0.29                  | 1.22           | -4.10          | 0.00                    | 0.00           | 0.00           |  |
|          |       | 19       | 4.590          | -4.49                 | 2.31           | -7.65          | 0.00                    | 0.00           | 0.00           |  |
|          | LC9   | 233      | 0.000          | 2.90                  | -0.42          | -4.84          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.200          | -0.05                 | -0.38          | -2.17          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.399          | 0.65                  | -0.36          | -1.12          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.599          | 0.89                  | -0.35          | -0.59          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.798          | 0.97                  | -0.33          | -0.37          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.998          | 1.00                  | -0.32          | -0.28          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.197          | 1.01                  | -0.32          | -0.24          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.397          | 1.02                  | -0.31          | -0.23          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.597          | 1.03                  | -0.30          | -0.22          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.796          | 1.03                  | -0.30          | -0.22          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.996          | 1.03                  | -0.29          | -0.22          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 2.195          | 1.03                  | -0.29          | -0.21          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 2.395          | 1.03                  | -0.29          | -0.19          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 2.594          | 1.03                  | -0.29          | -0.16          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 2.794          | 1.02                  | -0.29          | -0.11          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 2.993          | 1.01                  | -0.30          | -0.02          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 3.193          | 1.00                  | -0.31          | 0.12           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 3.393          | 0.98                  | -0.33          | 0.34           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 3.592          | 0.94                  | -0.36          | 0.68           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 3.792          | 0.87                  | -0.41          | 1.20           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 3.991          | 0.72                  | -0.47          | 1.99           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 4.191          | 0.37                  | -0.57          | 3.16           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 4.390          | -0.42                 | -0.79          | 4.68           | 0.00                    | 0.00           | 0.00           |  |
|          |       | 19       | 4.590          | 4.25                  | -1.49          | 7.37           | 0.00                    | 0.00           | 0.00           |  |



Project: 2010-2

Model: 2010-2

Date: 29-4-2021

#### ■ 4.3 LINES - SUPPORT FORCES

| Line No. | LC/CO | Node No. | Location x [m] | Support Forces [kN/m] |                |                | Support Moments [kNm/m] |                |                |  |
|----------|-------|----------|----------------|-----------------------|----------------|----------------|-------------------------|----------------|----------------|--|
|          |       |          |                | p <sub>x</sub>        | p <sub>y</sub> | p <sub>z</sub> | m <sub>x</sub>          | m <sub>y</sub> | m <sub>z</sub> |  |
| 353      | LC1   | 1        | 0.000          | -3.92                 | 0.01           | 16.51          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.194          | 0.44                  | -0.02          | 13.42          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.389          | -0.34                 | -0.01          | 11.41          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.583          | -0.67                 | 0.00           | 9.81           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.778          | -0.82                 | 0.00           | 8.65           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.972          | -0.91                 | 0.01           | 7.85           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.167          | -0.97                 | 0.02           | 7.34           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.361          | -1.02                 | 0.03           | 7.09           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.556          | -1.07                 | 0.03           | 7.09           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.750          | -1.13                 | 0.04           | 7.32           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.944          | -1.19                 | 0.04           | 7.81           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 2.139          | -1.25                 | 0.04           | 8.57           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 2.333          | -1.34                 | 0.04           | 9.63           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 2.528          | -1.45                 | 0.04           | 10.98          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 2.722          | -1.60                 | 0.03           | 12.58          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 2.917          | -1.83                 | 0.03           | 14.28          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 3.111          | -2.20                 | 0.02           | 15.58          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 3.306          | -2.29                 | 0.02           | 15.12          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 3.500          | 5.39                  | 0.03           | 10.86          | 0.00                    | 0.00           | 0.00           |  |
|          | LC2   | 1        | 0.000          | -0.59                 | 0.02           | 1.88           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.194          | -0.03                 | 0.00           | 1.11           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.389          | -0.18                 | 0.00           | 0.76           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.583          | -0.23                 | 0.00           | 0.54           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.778          | -0.25                 | 0.00           | 0.42           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.972          | -0.26                 | 0.00           | 0.35           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.167          | -0.27                 | 0.00           | 0.33           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.361          | -0.27                 | 0.01           | 0.35           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.556          | -0.28                 | 0.01           | 0.41           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.750          | -0.29                 | 0.01           | 0.51           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.944          | -0.30                 | 0.01           | 0.66           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 2.139          | -0.31                 | 0.01           | 0.86           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 2.333          | -0.33                 | 0.01           | 1.12           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 2.528          | -0.35                 | 0.01           | 1.44           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 2.722          | -0.38                 | 0.01           | 1.81           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 2.917          | -0.41                 | 0.00           | 2.18           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 3.111          | -0.46                 | 0.00           | 2.48           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 3.306          | -0.42                 | 0.00           | 2.42           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 3.500          | 0.72                  | 0.00           | 1.53           | 0.00                    | 0.00           | 0.00           |  |
|          | LC3   | 1        | 0.000          | -0.24                 | 0.00           | 0.96           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.194          | 0.02                  | 0.00           | 0.76           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.389          | -0.03                 | 0.00           | 0.63           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.583          | -0.05                 | 0.00           | 0.54           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.778          | -0.05                 | 0.00           | 0.47           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.972          | -0.06                 | 0.00           | 0.42           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.167          | -0.06                 | 0.00           | 0.38           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.361          | -0.07                 | 0.00           | 0.37           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.556          | -0.07                 | 0.00           | 0.36           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.750          | -0.07                 | 0.00           | 0.37           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.944          | -0.07                 | 0.00           | 0.40           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 2.139          | -0.08                 | 0.00           | 0.44           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 2.333          | -0.08                 | 0.00           | 0.49           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 2.528          | -0.09                 | 0.00           | 0.56           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 2.722          | -0.10                 | 0.00           | 0.65           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 2.917          | -0.11                 | 0.00           | 0.74           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 3.111          | -0.13                 | 0.00           | 0.81           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 3.306          | -0.12                 | 0.00           | 0.78           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 3.500          | 0.25                  | 0.00           | 0.52           | 0.00                    | 0.00           | 0.00           |  |
|          | LC6   | 1        | 0.000          | 2.35                  | 1.19           | -5.95          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.194          | -0.18                 | -0.17          | -3.52          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.389          | 0.51                  | -0.47          | -2.34          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.583          | 0.77                  | -0.61          | -1.65          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.778          | 0.87                  | -0.71          | -1.27          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.972          | 0.91                  | -0.78          | -1.05          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.167          | 0.93                  | -0.82          | -0.92          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.361          | 0.94                  | -0.82          | -0.82          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.556          | 0.94                  | -0.82          | -0.72          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.750          | 0.94                  | -0.82          | -0.61          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.944          | 0.94                  | -0.81          | -0.48          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 2.139          | 0.93                  | -0.79          | -0.32          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 2.333          | 0.91                  | -0.77          | -0.12          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 2.528          | 0.89                  | -0.75          | 0.14           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 2.722          | 0.86                  | -0.73          | 0.49           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 2.917          | 0.77                  | -0.71          | 1.00           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 3.111          | 0.52                  | -0.69          | 1.78           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 3.306          | -0.14                 | -0.64          | 2.92           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 3.500          | 3.17                  | -0.14          | 5.37           | 0.00                    | 0.00           | 0.00           |  |
|          | LC7   | 1        | 0.000          | -1.75                 | 0.38           | 4.85           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.194          | 0.22                  | -0.10          | 3.01           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.389          | -0.27                 | -0.23          | 1.94           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.583          | -0.46                 | -0.29          | 1.22           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.778          | -0.54                 | -0.33          | 0.75           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.972          | -0.58                 | -0.35          | 0.43           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.167          | -0.60                 | -0.37          | 0.20           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.361          | -0.61                 | -0.38          | 0.04           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.556          | -0.62                 | -0.38          | -0.10          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.750          | -0.62                 | -0.38          | -0.20          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.944          | -0.62                 | -0.38          | -0.30          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 2.139          | -0.62                 | -0.38          | -0.39          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 2.333          | -0.61                 | -0.38          | -0.49          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 2.528          | -0.60                 | -0.38          | -0.62          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 2.722          | -0.57                 | -0.38          | -0.80          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 2.917          | -0.50                 | -0.38          | -1.10          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 3.111          | -0.33                 | -0.39          | -1.59          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 3.306          | 0.13                  | -0.39          | -2.31          | 0.00                    | 0.00           | 0.00           |  |



Project: 2010-2

Model: 2010-2

Date: 29-4-2021

#### ■ 4.3 LINES - SUPPORT FORCES

| Line No. | LC/CO | Node No. | Location x [m] | Support Forces [kN/m] |                |                | Support Moments [kNm/m] |                |                |  |
|----------|-------|----------|----------------|-----------------------|----------------|----------------|-------------------------|----------------|----------------|--|
|          |       |          |                | p <sub>x</sub>        | p <sub>y</sub> | p <sub>z</sub> | m <sub>x</sub>          | m <sub>y</sub> | m <sub>z</sub> |  |
| 353      | LC7   | 233      | 3.500          | -2.27                 | -0.23          | -3.89          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.000          | -1.04                 | -1.31          | -0.72          | 0.00                    | 0.00           | 0.00           |  |
|          | LC8   | 1        | 0.194          | -0.86                 | -0.08          | -2.72          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.389          | -1.26                 | 0.25           | -2.48          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.583          | -1.29                 | 0.39           | -1.83          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.778          | -1.26                 | 0.50           | -1.13          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.972          | -1.23                 | 0.57           | -0.51          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.167          | -1.20                 | 0.63           | -0.02          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.361          | -1.18                 | 0.67           | 0.34           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.556          | -1.16                 | 0.70           | 0.59           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.750          | -1.14                 | 0.71           | 0.73           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.944          | -1.12                 | 0.71           | 0.79           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 2.139          | -1.10                 | 0.71           | 0.78           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 2.333          | -1.08                 | 0.69           | 0.69           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 2.528          | -1.06                 | 0.68           | 0.53           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 2.722          | -1.03                 | 0.66           | 0.28           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 2.917          | -0.96                 | 0.65           | -0.12          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 3.111          | -0.75                 | 0.63           | -0.79          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 3.306          | -0.08                 | 0.60           | -1.92          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 3.500          | -2.89                 | 0.22           | -4.76          | 0.00                    | 0.00           | 0.00           |  |
|          | 233   |          |                |                       |                |                |                         |                |                |  |
|          |       |          |                |                       |                |                |                         |                |                |  |
|          | LC9   | 1        | 0.000          | -3.07                 | 0.57           | 12.17          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.194          | 1.10                  | 0.04           | 9.81           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.389          | 0.39                  | -0.16          | 7.38           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.583          | 0.04                  | -0.26          | 5.39           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.778          | -0.13                 | -0.32          | 3.89           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.972          | -0.22                 | -0.34          | 2.77           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.167          | -0.27                 | -0.35          | 1.94           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.361          | -0.31                 | -0.35          | 1.32           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.556          | -0.33                 | -0.35          | 0.84           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.750          | -0.35                 | -0.35          | 0.48           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.944          | -0.36                 | -0.35          | 0.20           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 2.139          | -0.37                 | -0.35          | -0.02          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 2.333          | -0.37                 | -0.35          | -0.20          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 2.528          | -0.36                 | -0.35          | -0.38          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 2.722          | -0.34                 | -0.36          | -0.59          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 2.917          | -0.28                 | -0.36          | -0.88          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 3.111          | -0.12                 | -0.37          | -1.34          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 3.306          | 0.22                  | -0.38          | -1.99          | 0.00                    | 0.00           | 0.00           |  |
|          | 233   |          | 3.500          | -1.75                 | -0.33          | -3.06          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          |                |                       |                |                |                         |                |                |  |
| 354      | LC1   | 235      | 0.000          | 0.00                  | -10.71         | 20.76          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.222          | 0.00                  | 3.14           | 22.64          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.443          | 0.00                  | 1.89           | 23.14          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.665          | 0.00                  | 0.31           | 23.05          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.887          | 0.00                  | -1.45          | 24.12          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.108          | 0.00                  | -3.29          | 24.85          | 0.00                    | 0.00           | 0.00           |  |
|          | 237   |          | 1.330          | 0.00                  | 13.53          | 25.50          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          |                |                       |                |                |                         |                |                |  |
|          | LC2   | 235      | 0.000          | 0.00                  | -1.69          | 3.13           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.222          | 0.00                  | 0.39           | 3.66           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.443          | 0.00                  | 0.23           | 3.90           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.665          | 0.00                  | 0.01           | 3.95           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.887          | 0.00                  | -0.23          | 4.05           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.108          | 0.00                  | -0.44          | 3.97           | 0.00                    | 0.00           | 0.00           |  |
|          | 237   |          | 1.330          | 0.00                  | 1.98           | 3.62           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          |                |                       |                |                |                         |                |                |  |
|          | LC3   | 235      | 0.000          | 0.00                  | -0.48          | 0.89           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.222          | 0.00                  | 0.14           | 1.07           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.443          | 0.00                  | 0.10           | 1.08           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.665          | 0.00                  | 0.03           | 1.05           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.887          | 0.00                  | -0.05          | 1.09           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.108          | 0.00                  | -0.12          | 1.10           | 0.00                    | 0.00           | 0.00           |  |
|          | 237   |          | 1.330          | 0.00                  | 0.60           | 1.08           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          |                |                       |                |                |                         |                |                |  |
|          | LC6   | 235      | 0.000          | 1.06                  | 0.37           | -0.61          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.222          | 0.69                  | -0.02          | -0.16          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.443          | 0.57                  | 0.06           | 0.12           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.665          | 0.54                  | 0.07           | 0.36           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.887          | 0.57                  | 0.01           | 0.63           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.108          | 0.69                  | -0.11          | 0.91           | 0.00                    | 0.00           | 0.00           |  |
|          | 237   |          | 1.330          | 1.06                  | 0.75           | 1.30           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          |                |                       |                |                |                         |                |                |  |
|          | LC7   | 235      | 0.000          | -1.70                 | 0.37           | -0.60          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.222          | -1.11                 | 0.01           | -0.09          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.443          | -0.91                 | 0.10           | 0.16           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.665          | -0.87                 | 0.11           | 0.36           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.887          | -0.91                 | 0.05           | 0.58           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.108          | -1.11                 | -0.08          | 0.83           | 0.00                    | 0.00           | 0.00           |  |
|          | 237   |          | 1.330          | -1.70                 | 0.74           | 1.27           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          |                |                       |                |                |                         |                |                |  |
|          | LC8   | 235      | 0.000          | 0.91                  | 16.65          | -28.21         | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.222          | 0.86                  | -1.79          | -15.17         | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.443          | 0.80                  | 1.22           | -6.86          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.665          | 0.74                  | 2.17           | 0.87           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.887          | 0.68                  | 1.10           | 8.64           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.108          | 0.64                  | -1.99          | 16.97          | 0.00                    | 0.00           | 0.00           |  |
|          | 237   |          | 1.330          | 0.41                  | 17.52          | 29.84          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          |                |                       |                |                |                         |                |                |  |
|          | LC9   | 235      | 0.000          | 0.41                  | -16.71         | 28.37          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.222          | 0.63                  | 1.82           | 15.63          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.443          | 0.68                  | -1.18          | 7.53           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.665          | 0.74                  | -2.18          | 0.02           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.887          | 0.79                  | -1.19          | -7.50          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.108          | 0.86                  | 1.81           | -15.60         | 0.00                    | 0.00           | 0.00           |  |
|          | 237   |          | 1.330          | 0.91                  | -16.69         | -28.34         | 0.00                    | 0.00           | 0.00           |  |
|          |       |          |                |                       |                |                |                         |                |                |  |
| 359      | LC1   | 239      | 0.000          | -27.83                | 0.00           | 49.79          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.217          | 6.54                  | -0.03          | 50.01          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.433          | 3.56                  | -0.02          | 42.69          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.650          | -0.11                 | -0.02          | 30.76          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.867          | 12.16                 | -0.07          | 22.79          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.000          | -6.90                 | 0.00           | 12.24          | 0.00                    | 0.00           | 0.00           |  |



Project: 2010-2

Model: 2010-2

Date: 29-4-2021

#### ■ 4.3 LINES - SUPPORT FORCES

| Line No. | LC/CO | Node No. | Location x [m] | Support Forces [kN/m] |                |                | Support Moments [kNm/m] |                |                |  |
|----------|-------|----------|----------------|-----------------------|----------------|----------------|-------------------------|----------------|----------------|--|
|          |       |          |                | p <sub>x</sub>        | p <sub>y</sub> | p <sub>z</sub> | m <sub>x</sub>          | m <sub>y</sub> | m <sub>z</sub> |  |
| 359      | LC2   | 239      | 0.217          | 1.44                  | 0.00           | 11.85          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.433          | 0.67                  | 0.00           | 10.10          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.650          | 0.01                  | 0.00           | 7.17           | 0.00                    | 0.00           | 0.00           |  |
|          |       | 27       | 0.867          | 2.39                  | -0.02          | 4.38           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.000          | -1.43                 | 0.00           | 2.57           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.217          | 0.39                  | 0.00           | 2.59           | 0.00                    | 0.00           | 0.00           |  |
|          | LC3   | 239      | 0.433          | 0.27                  | 0.00           | 2.07           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.650          | 0.09                  | 0.00           | 1.32           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.867          | 0.48                  | 0.00           | 0.85           | 0.00                    | 0.00           | 0.00           |  |
|          | LC6   | 239      | 0.000          | 1.96                  | 0.37           | -3.17          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.217          | -0.13                 | 0.53           | -0.69          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.433          | 0.07                  | 0.57           | 0.98           | 0.00                    | 0.00           | 0.00           |  |
|          |       | 27       | 0.650          | -0.35                 | 0.56           | 2.60           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.867          | 2.96                  | 0.39           | 5.02           | 0.00                    | 0.00           | 0.00           |  |
|          | LC7   | 239      | 0.000          | -2.64                 | 0.27           | 4.41           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.217          | 0.39                  | 0.33           | 1.92           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.433          | 0.17                  | 0.35           | -0.20          | 0.00                    | 0.00           | 0.00           |  |
|          |       | 27       | 0.650          | 0.50                  | 0.35           | -2.36          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.867          | -2.93                 | 0.27           | -4.98          | 0.00                    | 0.00           | 0.00           |  |
|          | LC8   | 239      | 0.000          | 1.01                  | -0.33          | -1.72          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.217          | -0.38                 | 0.38           | -0.01          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.433          | -0.40                 | 0.61           | 1.81           | 0.00                    | 0.00           | 0.00           |  |
|          |       | 27       | 0.650          | -0.66                 | 0.90           | 3.45           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.867          | 2.73                  | 1.77           | 4.80           | 0.00                    | 0.00           | 0.00           |  |
|          | LC9   | 239      | 0.000          | -5.77                 | 0.62           | 9.67           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.217          | 0.97                  | -0.57          | 3.88           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.433          | 0.50                  | -0.95          | -1.14          | 0.00                    | 0.00           | 0.00           |  |
|          |       | 27       | 0.650          | 1.28                  | -1.39          | -6.16          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.867          | -7.02                 | -2.70          | -12.02         | 0.00                    | 0.00           | 0.00           |  |
| 361      | LC1   | 241      | 0.000          | -5.57                 | 0.00           | 8.72           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.223          | 0.56                  | 0.00           | 10.73          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.447          | -0.55                 | 0.00           | 11.15          | 0.00                    | 0.00           | 0.00           |  |
|          |       | 13       | 0.670          | 7.16                  | 0.00           | 11.03          | 0.00                    | 0.00           | 0.00           |  |
|          | LC2   | 241      | 0.000          | -1.62                 | 0.00           | 2.54           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.223          | 0.14                  | 0.00           | 3.28           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.447          | -0.21                 | 0.00           | 3.53           | 0.00                    | 0.00           | 0.00           |  |
|          |       | 13       | 0.670          | 2.34                  | 0.00           | 3.62           | 0.00                    | 0.00           | 0.00           |  |
|          | LC3   | 241      | 0.000          | -0.17                 | 0.00           | 0.27           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.223          | 0.02                  | 0.00           | 0.33           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.447          | -0.01                 | 0.00           | 0.34           | 0.00                    | 0.00           | 0.00           |  |
|          |       | 13       | 0.670          | 0.22                  | 0.00           | 0.34           | 0.00                    | 0.00           | 0.00           |  |
|          | LC6   | 241      | 0.000          | 0.46                  | 0.00           | -0.75          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.223          | -0.18                 | 0.00           | -0.22          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.447          | -0.19                 | 0.00           | 0.34           | 0.00                    | 0.00           | 0.00           |  |
|          |       | 13       | 0.670          | 0.53                  | 0.00           | 0.86           | 0.00                    | 0.00           | 0.00           |  |
|          | LC7   | 241      | 0.000          | -0.81                 | 0.00           | 1.30           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.223          | 0.30                  | 0.00           | 0.51           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.447          | 0.29                  | 0.00           | -0.36          | 0.00                    | 0.00           | 0.00           |  |
|          |       | 13       | 0.670          | -0.72                 | 0.00           | -1.17          | 0.00                    | 0.00           | 0.00           |  |
|          | LC8   | 241      | 0.000          | 1.97                  | 0.01           | -3.19          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.223          | -0.78                 | 0.00           | -0.97          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.447          | -0.80                 | 0.00           | 1.38           | 0.00                    | 0.00           | 0.00           |  |
|          |       | 13       | 0.670          | 2.21                  | -0.01          | 3.56           | 0.00                    | 0.00           | 0.00           |  |
|          | LC9   | 241      | 0.000          | -2.23                 | -0.01          | 3.61           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.223          | 0.85                  | 0.00           | 1.28           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.447          | 0.84                  | 0.00           | -1.24          | 0.00                    | 0.00           | 0.00           |  |
|          |       | 13       | 0.670          | -2.21                 | 0.01           | -3.57          | 0.00                    | 0.00           | 0.00           |  |
| 365      | LC1   | 243      | 0.000          | -7.83                 | 0.00           | 12.24          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.223          | 0.93                  | 0.00           | 13.42          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.447          | -0.40                 | 0.00           | 12.91          | 0.00                    | 0.00           | 0.00           |  |
|          |       | 9        | 0.670          | 7.49                  | 0.00           | 11.52          | 0.00                    | 0.00           | 0.00           |  |
|          | LC2   | 243      | 0.000          | -2.30                 | 0.00           | 3.60           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.223          | 0.28                  | 0.00           | 4.09           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.447          | -0.13                 | 0.00           | 4.01           | 0.00                    | 0.00           | 0.00           |  |
|          |       | 9        | 0.670          | 2.41                  | 0.00           | 3.71           | 0.00                    | 0.00           | 0.00           |  |
|          | LC3   | 243      | 0.000          | -0.27                 | 0.00           | 0.42           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.223          | 0.03                  | 0.00           | 0.44           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.447          | -0.01                 | 0.00           | 0.42           | 0.00                    | 0.00           | 0.00           |  |
|          |       | 9        | 0.670          | 0.24                  | 0.00           | 0.37           | 0.00                    | 0.00           | 0.00           |  |
|          | LC6   | 243      | 0.000          | 0.72                  | 0.00           | -1.17          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.223          | -0.29                 | 0.00           | -0.34          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.447          | -0.30                 | 0.00           | 0.54           | 0.00                    | 0.00           | 0.00           |  |
|          |       | 9        | 0.670          | 0.84                  | 0.00           | 1.35           | 0.00                    | 0.00           | 0.00           |  |
|          | LC7   | 243      | 0.000          | -0.61                 | 0.00           | 0.99           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.223          | 0.22                  | 0.00           | 0.41           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.447          | 0.21                  | 0.00           | -0.22          | 0.00                    | 0.00           | 0.00           |  |
|          |       | 9        | 0.670          | -0.50                 | 0.00           | -0.81          | 0.00                    | 0.00           | 0.00           |  |
|          | LC8   | 243      | 0.000          | -1.02                 | 0.01           | 1.65           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.223          | 0.40                  | 0.00           | 0.57           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.447          | 0.40                  | 0.00           | -0.60          | 0.00                    | 0.00           | 0.00           |  |
|          |       | 9        | 0.670          | -1.03                 | -0.01          | -1.68          | 0.00                    | 0.00           | 0.00           |  |
|          | LC9   | 243      | 0.000          | 1.29                  | -0.01          | -2.10          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.223          | -0.53                 | 0.00           | -0.58          | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.447          | -0.56                 | 0.00           | 1.04           | 0.00                    | 0.00           | 0.00           |  |
|          |       | 9        | 0.670          | 1.56                  | 0.01           | 2.51           | 0.00                    | 0.00           | 0.00           |  |
| 368      | LC1   | 245      | 0.000          | 2.11                  | 0.04           | 4.29           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.216          | 0.40                  | -0.02          | 3.71           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.432          | 1.09                  | -0.03          | 5.24           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.648          | 1.51                  | -0.03          | 7.25           | 0.00                    | 0.00           | 0.00           |  |
|          |       | 258      | 0.864          | 1.71                  | -0.05          | 8.51           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 1.080          | -4.21                 | -0.08          | 8.18           | 0.00                    | 0.00           | 0.00           |  |
|          | LC2   | 245      | 0.000          | 0.24                  | 0.01           | 0.42           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.216          | 0.02                  | 0.00           | 0.19           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          | 0.432          | 0.08                  | -0.01          | 0.15           | 0.00                    | 0.00           | 0.00           |  |
|          |       |          |                |                       |                |                |                         |                |                |  |



Project: 2010-2

Model: 2010-2

Date: 29-4-2021

### ■ 4.3 LINES - SUPPORT FORCES

| Line No. | LC/CO   | Node No. | Location x [m] | Support Forces [kN/m] |                |                | Support Moments [kNm/m] |                |                |  |
|----------|---------|----------|----------------|-----------------------|----------------|----------------|-------------------------|----------------|----------------|--|
|          |         |          |                | p <sub>x</sub>        | p <sub>y</sub> | p <sub>z</sub> | m <sub>x</sub>          | m <sub>y</sub> | m <sub>z</sub> |  |
| 368      | LC2     | 245      | 0.648          | 0.09                  | -0.01          | 0.16           | 0.00                    | 0.00           | 0.00           |  |
|          |         |          | 0.864          | 0.04                  | -0.01          | 0.11           | 0.00                    | 0.00           | 0.00           |  |
|          |         |          | 1.080          | 0.09                  | -0.02          | -0.12          | 0.00                    | 0.00           | 0.00           |  |
|          | LC3     | 245      | 0.000          | 0.08                  | 0.00           | 0.17           | 0.00                    | 0.00           | 0.00           |  |
|          |         |          | 0.216          | 0.04                  | 0.00           | 0.13           | 0.00                    | 0.00           | 0.00           |  |
|          |         |          | 0.432          | 0.09                  | 0.00           | 0.25           | 0.00                    | 0.00           | 0.00           |  |
|          |         |          | 0.648          | 0.11                  | 0.00           | 0.42           | 0.00                    | 0.00           | 0.00           |  |
|          |         |          | 0.864          | 0.11                  | 0.00           | 0.52           | 0.00                    | 0.00           | 0.00           |  |
|          |         |          | 1.080          | -0.25                 | 0.00           | 0.43           | 0.00                    | 0.00           | 0.00           |  |
|          | LC6     | 245      | 0.000          | 0.31                  | 0.00           | 0.52           | 0.00                    | 0.00           | 0.00           |  |
|          |         |          | 0.216          | -0.07                 | 0.00           | 0.26           | 0.00                    | 0.00           | 0.00           |  |
|          |         |          | 0.432          | -0.04                 | 0.00           | -0.03          | 0.00                    | 0.00           | 0.00           |  |
|          |         |          | 0.648          | -0.06                 | 0.00           | -0.31          | 0.00                    | 0.00           | 0.00           |  |
|          |         |          | 0.864          | -0.12                 | 0.00           | -0.58          | 0.00                    | 0.00           | 0.00           |  |
|          |         |          | 1.080          | 0.49                  | -0.01          | -0.78          | 0.00                    | 0.00           | 0.00           |  |
|          | LC7     | 245      | 0.000          | -0.56                 | 0.00           | -0.99          | 0.00                    | 0.00           | 0.00           |  |
|          |         |          | 0.216          | 0.06                  | 0.00           | -0.54          | 0.00                    | 0.00           | 0.00           |  |
|          |         |          | 0.432          | -0.04                 | 0.00           | -0.24          | 0.00                    | 0.00           | 0.00           |  |
|          |         |          | 0.648          | -0.03                 | 0.00           | 0.01           | 0.00                    | 0.00           | 0.00           |  |
|          |         |          | 0.864          | 0.06                  | 0.00           | 0.30           | 0.00                    | 0.00           | 0.00           |  |
|          |         |          | 1.080          | -0.47                 | -0.01          | 0.72           | 0.00                    | 0.00           | 0.00           |  |
|          | LC8     | 245      | 0.000          | 1.34                  | 0.01           | 2.27           | 0.00                    | 0.00           | 0.00           |  |
|          |         |          | 0.216          | -0.28                 | 0.00           | 1.03           | 0.00                    | 0.00           | 0.00           |  |
|          |         |          | 0.432          | -0.13                 | -0.01          | -0.21          | 0.00                    | 0.00           | 0.00           |  |
|          |         |          | 0.648          | -0.23                 | -0.01          | -1.44          | 0.00                    | 0.00           | 0.00           |  |
|          |         |          | 0.864          | -0.51                 | -0.02          | -2.59          | 0.00                    | 0.00           | 0.00           |  |
|          |         |          | 1.080          | 2.21                  | 0.03           | -3.55          | 0.00                    | 0.00           | 0.00           |  |
|          | LC9     | 245      | 0.000          | -1.11                 | -0.02          | -1.75          | 0.00                    | 0.00           | 0.00           |  |
|          |         |          | 0.216          | 0.49                  | 0.00           | -0.56          | 0.00                    | 0.00           | 0.00           |  |
|          |         |          | 0.432          | 0.52                  | 0.01           | 1.34           | 0.00                    | 0.00           | 0.00           |  |
|          |         |          | 0.648          | 0.73                  | 0.01           | 3.39           | 0.00                    | 0.00           | 0.00           |  |
|          |         |          | 0.864          | 1.02                  | 0.03           | 5.09           | 0.00                    | 0.00           | 0.00           |  |
|          |         |          | 1.080          | -3.50                 | -0.01          | 5.74           | 0.00                    | 0.00           | 0.00           |  |
|          | Σ Supp. | LC1      |                | 0.00                  | 0.00           | 790.06         |                         |                |                |  |
|          | Σ Loads | LC1      |                | 0.00                  | 0.00           | 790.06         |                         |                |                |  |
|          | Σ Supp. | LC2      |                | 0.00                  | 0.00           | 175.14         |                         |                |                |  |
|          | Σ Loads | LC2      |                | 0.00                  | 0.00           | 175.14         |                         |                |                |  |
|          | Σ Supp. | LC3      |                | 0.00                  | 0.00           | 31.45          |                         |                |                |  |
|          | Σ Loads | LC3      |                | 0.00                  | 0.00           | 31.45          |                         |                |                |  |
|          | Σ Supp. | LC6      |                | 19.78                 | -3.11          | 0.00           |                         |                |                |  |
|          | Σ Loads | LC6      |                | 19.78                 | -3.11          | 0.00           |                         |                |                |  |
|          | Σ Supp. | LC7      |                | -19.83                | -0.60          | 0.00           |                         |                |                |  |
|          | Σ Loads | LC7      |                | -19.83                | -0.60          | 0.00           |                         |                |                |  |
|          | Σ Supp. | LC8      |                | 1.94                  | 71.90          | 20.96          |                         |                |                |  |
|          | Σ Loads | LC8      |                | 1.94                  | 71.90          | 20.96          |                         |                |                |  |
|          | Σ Supp. | LC9      |                | 1.93                  | -72.30         | 21.37          |                         |                |                |  |
|          | Σ Loads | LC9      |                | 1.93                  | -72.30         | 21.37          |                         |                |                |  |



## Bijlage 4 – Statische hoofdberekening onderbouw

**Project:** Nieuwbouw woning a/d Hamersveldseweg 82/84  
te Leusden

**Betreft:** Statische hoofdberekening  
Omgevingsvergunning

**Projectnr:** 820.306

**Opdrachtgever:** Solid Timber  
Ketjapweg 18  
3541 RH Utrecht

constructeur  
projectleider  
datum

:  
:  
:  
: 26-04-2021

## Inhoudsopgave

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## Algemeen

### Algemene voorwaarden van Ingenieursbureau Hartman Constructies

#### Algemene voorwaarden van Ingenieursbureau Hartman Constructies

##### Artikel 1 Algemeen

In de Algemene Voorwaarden wordt verstaan onder:

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

##### Artikel 2 Toepasselijkheid

2.1 Deze Algemene Voorwaarden zijn van toepassing op alle aanbiedingen en overeenkomsten tussen het adviesbureau en opdrachtgever zulks met uitsluiting van eventuele algemene voorwaarden van opdrachtgever. Wijzigingen in deze voorwaarden dienen door beide partijen uitdrukkelijk en schriftelijk te zijn bevestigd.

2.2 De regeling van de verhouding tussen opdrachtgever en adviserend ingenieursbureau DNR 2011 zijn naast deze Algemene Voorwaarden van toepassing op alle onze aanbiedingen en met ons gesloten overeenkomsten.

2.3 De DNR 2011 is gedeponeerd op 5 oktober 2004 ter griffie van de Rechtbank te Amsterdam onder nummer 139/2004. De opdrachtgever is op de hoogte van de inhoud van de DNR 2011 die op de website [www.hartmanconstructies.nl](http://www.hartmanconstructies.nl) is in te zien.

2.4 In geval van strijdigheid tussen deze Algemene Voorwaarden en de DNR 2011 prevaleren deze Algemene Voorwaarden.

2.5 Alle door de opdrachtgever gestelde voorwaarden, welke met de Algemene Voorwaarden van het adviesbureau en de DNR 2011 in strijd zijn, zijn op aanbiedingen van en overeenkomsten met het adviesbureau niet van toepassing.

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

##### Artikel 3 Vrijwaring door opdrachtgever.

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

##### Artikel 4 Aansprakelijkheid van het adviesbureau.

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

4.2 Voor het overige geldt ten aanzien van de aansprakelijkheid art. 13 van de DNR 2011

##### Artikel 5 Onderbreking opdracht.

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

##### Artikel 6 Betaling

6.1 Betaling door de opdrachtgever dient, zonder aftrek, korting of schuldverrekening, te geschieden binnen de overeengekomen termijn, doch in geen geval later dan dertig dagen na factuurdatum. Betaling dient te geschieden door middel van storting ten gunste van een door het adviesbureau aan te wijzen bankrekening.

6.2 Indien de opdrachtgever niet binnen de onder lid 6.1 genoemde termijn heeft betaald, is het adviesbureau gerechtigd, nadat de opdrachtgever ten minste een maal is aangemaand te betalen, zonder nadere ingebrekestelling en onverminderd de overige rechten van het adviesbureau, vanaf de vervaldag de opdrachtgever de wettelijke rente verhoogd met 2 % in rekening te brengen tot op de datum van algehele voldoening.

6.3 Alle in redelijkheid gemaakte gerechtelijke en buitengerechtelijke (incasso-)kosten, die het adviesbureau maakt als gevolg van de niet-nakoming door de opdrachtgever van diens betalingsverplichtingen, komen ten laste van de opdrachtgever.

6.4 Indien de financiële positie of het betalingsgedrag van de opdrachtgever naar het oordeel van het adviesbureau daartoe aanleiding geeft, is het adviesbureau gerechtigd van opdrachtgever te verlangen, dat deze onverwijld (aanvullende) zekerheid stelt in een door het adviesbureau te bepalen vorm. Indien de opdrachtgever nalaat de verlangde zekerheid te stellen, is het adviesbureau gerechtigd, onverminderd de overige rechten, de verdere uitvoering van de overeenkomst onmiddellijk op te schorten en is al hetgeen de opdrachtgever aan het adviesbureau uit welke hoofde dan ook verschuldigd direct opeisbaar.

##### Artikel 7 Interpretaties en gebruik van rapportages.

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

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

##### Artikel 8 Toepasselijk recht.

8.1 Op alle overeenkomsten tussen de opdrachtgever en het adviesbureau is Nederlands recht van toepassing. Verschillen van mening tussen de opdrachtgever en het adviesbureau zullen zoveel mogelijk langs minnelijke weg worden opgelost. Indien een verschil van mening niet langs minnelijke weg is opgelost, wordt geacht een geschil te bestaan.

8.2 Alle geschillen, daaronder begrepen die welke door slechts één der partijen als zodanig worden beschouwd, welke tussen de opdrachtgever en het adviesbureau mochten ontstaan in verband met de opdracht of enige overeenkomst die daarvan een uitvloeisel is, zullen met uitsluiting van de gewone rechter uitsluitend en in hoogste instantie worden beslecht door arbitrage overeenkomstig het Reglement van de Commissie van Geschillen, vastgesteld door het Hoofdbestuur van het Koninklijk Instituut van Ingenieurs, zoals dat reglement ter griffie van de Arrondissementsrechtbank te 's-Gravenhage zal zijn gedeponeerd op de dag waarop het geschil aanhangig wordt gemaakt.

8.3 Een overeenkomstig lid 2 van dit artikel en het aldaar genoemde Reglement benoemd scheidsrecht oordeelt als goede man(nen) naar billijkheid.

8.4 Waar in dit artikel wordt gesproken van de opdrachtgever respectievelijk het adviesbureau worden rechtverkrijgenden van de opdrachtgever respectievelijk het adviesbureau daaronder begrepen.

### **Algemeen van toepassing zijn de voorschriften:**

---

|            |                                          |             |
|------------|------------------------------------------|-------------|
| Eurocode 0 | Grondslagen van het constructief ontwerp | NEN-EN 1990 |
| Eurocode 1 | Belastingen op constructies              | NEN-EN 1991 |
| Eurocode 2 | Betonconstructies                        | NEN-EN 1992 |
| Eurocode 3 | Staalconstructies                        | NEN-EN 1993 |
| Eurocode 4 | Staal-betonconstructies                  | NEN-EN 1994 |
| Eurocode 5 | Houtconstructies                         | NEN-EN 1995 |
| Eurocode 6 | Constructies van metselwerk              | NEN-EN 1996 |
| Eurocode 7 | Geotechnisch ontwerp                     | NEN-EN 1997 |
| Eurocode 9 | Aluminiumconstructies                    | NEN-EN 1999 |

### **Door de bouwpartners te controleren aannames in de berekening:**

---

Alle in deze berekening genoemde uitgangspunten en aannames dienen door de opdrachtgever / aannemer te worden gecontroleerd en indien akkoord gevonden, te worden toegepast.

Bij afwijkingen dient Ingenieursbureau Hartman Constructies te worden ingelicht.

Het betreft hierbij met name: (indien van toepassing)

- Vloertypes
- Overspanningsrichtingen vloeren / daken
- Vloerbelastingen
- Materiaalkeuzes, materiaalsterktes en –kwaliteiten
- Grondwaterstanden
- Bodemgesteldheid
- Overspanningslengtes van vloeren, balken en lateien
- Bestaande fundering

### **Leverancier gebonden onderdelen:**

---

Deze berekening dient als uitgangspunt voor de berekening van prefab onderdelen en voor detailberekeningen.

De detailberekeningen zijn geen onderdeel van deze berekening en zijn voor rekening van de leverancier. Onderdelen welke leverancier gebonden zijn, worden door de leverancier berekend en getekend en indien noodzakelijk aan de constructeur voor afstemming cq goedkeuring overhandigd. Tekeningen en berekeningen in 2-voud/digitaal ter controle indienen, definitieve stukken in 3-voud.

Het betreft hier o.a. de volgende elementen:

Bouwput: Voorzieningen van de bouwput voor rekening van de aannemer.

Bemaling: Voorzieningen van de bemaling voor rekening van de aannemer.

Wapeningsperc.: De opgave van de wapeningspercentage betreffen een inschatting ten tijde van het voorontwerp.

De definitieve wapeningspercentages zijn afhankelijk van ontwikkelingen.

De opgegeven wapeningspercentages impliceren schattingen waaraan geen rechten verbonden kunnen worden. De opgegeven percentages zijn excl.:

- Hulpijzer
- Knipverlies
- Voegnetten
- Raveelwapening
- Aansluitingen.

Prefab beton:

Werkzaamheden voor de prefab onderdelen dienen te worden uitgevoerd conform de onderstaande categorieën volgens het KOMO-atteest:

- categorie 1: niet van toepassing.
- categorie 2: heipalen
- categorie 3: trappen, bordessen, galerijen, balkons
- categorie 4: systeemvloeren
- categorie 5: balken, kolommen, wanden
- categorie 6: niet van toepassing.
- categorie 7: niet van toepassing.

Staalconstructie:

Definitieve details, detailberekeningen, werkplaatstekeningen, hulpstaal, valbeveiliging, (vloer)ravelingen, opleggingen, sparingen, (boor)anker- en boutverbindingen, tijdelijke voorzieningen voor montage en uitvoering, stalen trappen en bordessen, lateien en geveldragers zijn uit te voeren door de aannemer.

Staalconstructies en verankeringen in vochtig milieu corrosie werend behandelen, met een referentieperiode van 50 jaar.

Indien dak of vloerliggers worden voorzien van een zeeg moet deze zeeg parabool-vormig worden uitgevoerd. De in de berekening genoemde zege zijn exclusief eventueel afschot.

Brandwerendheid van de staalconstructie d.m.v. bouwkundige voorzieningen (indien noodzakelijk)

Minimale opleglengte latei/stalen balk is gelijk aan de profielhoogte (tenzij anders aangegeven).

Staalprofielen voorzien van de nodige ankers, strippen, haarspelden, schotjes e.d. voor verankering.

|                                     |                                                                                                   |
|-------------------------------------|---------------------------------------------------------------------------------------------------|
| Staalkwaliteit walsprofielen:       | S235 (tenzij anders aangegeven)                                                                   |
| Staalkwaliteit buis/kokerprofielen: | S275 (tenzij anders aangegeven)                                                                   |
| Boutkwaliteit:                      | 8.8                                                                                               |
| Ankerkwaliteit:                     | 4.6 (gerolde draad)                                                                               |
| Lasdikte:                           | 0,5 * lijfdikte; 0,7 * flensdikte; min. a=4mm                                                     |
| Gatafstanden verbindingen:          | $e_1 = 3,0 \cdot d_0$ $e_2 = 1,5 \cdot d_0$<br>$\rho_1 = 3,75 \cdot d_0$ $\rho_2 = 3,0 \cdot d_0$ |

Metselwerk:

Metselwerkconstructies conform Eurocode 6 (NEN-EN 1996)

Kwaliteit metselwerk: PM20 / CS12 (tenzij anders aangegeven)  
 mortelkwaliteit M10 / lijmortel M12,5 (tenzij anders aangegeven)

Er dient altijd oplegvilt te worden toegepast. Bij geperforeerde stenen dient dit waterwerend oplegvilt te zijn. (tenzij anders aangegeven)

Verwerking van metselwerk volgens voorschriften van de fabrikant.

Dilataties in buitenmetselwerk en dragende binnenwanden conform opgave K.N.B. en verwerkingsvoorschriften fabrikant en ter controle aan Ingenieursbureau Hartman Constructies.

Dragende penanten/hoeken dienen in verband vermetseld te worden.

Houtconstructies:

uitvoeren in kwaliteit C18; de gebinten in C24 (tenzij anders aangegeven)

Brandwerendheid van de gebinten d.m.v. coating (o.g.), de overige houtconstructie d.m.v. bouwkundige voorzieningen (indien noodzakelijk)

Brand:

De brandwerendheidseis is conform bestek / bouwbesluit. Wij adviseren om het bouwplan altijd voor te leggen aan de brandweer.

## Controlerichtlijn Ingenieursbureau Hartman Constructies

---

Ingenieursbureau Hartman Constructies controleert en beoordeeld alleen de constructieve aspecten.

Dit houdt in:

1. Controle of de door Ingenieursbureau Hartman Constructies verstrekte constructieve uitgangspunten correct gehanteerd worden.
2. Globale controle van de toegepaste berekeningswijze en op toepassing van de juiste voorschriften.
3. Steekproefsgewijze controle van de belastingaannamen en van de verwerking van de berekeningsresultaten op tekening.
4. Beoordeling van de onderlinge aansluiting en samenhang van constructies op kritische punten.
5. De juiste werking van de toegepaste computerprogrammatuur is niet getoetst.
6. De maatvoering is niet gecontroleerd.

Goedkeuring door Ingenieursbureau Hartman Constructies ontslaat de producent niet van verantwoordelijkheid voor de door of namens hem gemaakte tekeningen en berekeningen.  
(e.e.a. conform DNR2011)

## Toegepaste software:

---

|                            |                      |
|----------------------------|----------------------|
| Technosoft liggers         | versie: 6.60b        |
| Technosoft raamwerken      | versie: 6.60c        |
| Technosoft balkenrooster   | versie: 6.60b        |
| Technosoft verbindingen    | versie: 6.60b        |
| AxisVM                     | versie: 11.5g        |
| Diverse spreadsheets [Qeq] | versie: diverse data |

## Constructieoverzichten

---

De positienummers (POS nr) in de berekening zijn terug te vinden in de constructiebijlagen.  
NB. Niet alle positienummers worden berekend, enkele afmetingen zijn praktisch gekozen of zijn niet maatgevend.

## Gegunde opdracht

---

De opdracht van de statische berekening loopt tot aanvraag omgevingsvergunning. Detail berekeningen behoren niet tot onze opdracht en worden door derden aangeleverd of middels een aanvullende opdracht door ons gemaakt.

In de uitvoeringsfase zullen wij tekeningen en berekeningen van derden op constructieve uitgangspunten controleren (zie hiervoor 'Controlerichtlijn Ingenieursbureau Hartman Constructies')

Wij hebben geen uitvoeringscontrole op de bouw.

## Wijzigingen

---

|                         |
|-------------------------|
| <b>Wijziging a d.d.</b> |
|-------------------------|

-

|                         |
|-------------------------|
| <b>Wijziging b d.d.</b> |
|-------------------------|

-

## Gebouwfunctie

|                                     |                                                                                                                                                                                                                                           |                                |                         |           |
|-------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|-------------------------|-----------|
|                                     |                                                                                                                                                                                                                                           | ontwerplevens-<br>gevolgklasse | gebruiks-<br>duurklasse | categorie |
| soort gebouwfunctie                 | : <b>vrijstaande woning</b>                                                                                                                                                                                                               | CC1                            | 3                       | A         |
| toegepaste norm                     | : eurocode nieuwbouw: NEN-EN 1990:2002                                                                                                                                                                                                    |                                |                         |           |
| ontwerplevensduurklasse             | : <b>3</b>                                                                                                                                                                                                                                |                                |                         |           |
| ontwerplevensduur                   | : 50 jaar                                                                                                                                                                                                                                 |                                |                         |           |
| toepassing                          | : gebouwen en andere gewone constructie                                                                                                                                                                                                   |                                |                         |           |
| correctiefactor levensduur $\psi_t$ | : $\{ 1 + (1 - \psi_1) / 9 * \ln(t / t_0) \}$<br>(alleen vloerbelastingen, niet voor wind-, sneeuw-, thermische belasting)<br>vlg. NEN-EN 1990:2002 1.5.3.14 moet de karakteristieke vloerbelasting vermenigvuldigd worden met $\psi_t$ ) |                                |                         |           |
| gevolgklasse                        | : CC1 (Consequence Class was: veiligheidsklasse)                                                                                                                                                                                          |                                |                         |           |
| omschrijving                        | : geringe gevolgen t.a.v. verlies van mensenlevens                                                                                                                                                                                        |                                |                         |           |
| voorbeelden                         | : landbouwbedrijfsgebouw, tuinbouwkas, eengezinswoning, industriegebouw tot 2 verdiepingen                                                                                                                                                |                                |                         |           |
| betrouwbaarheidsklasse              | : RC1 (Reliability Class = betrouwbaarheidsklasse)                                                                                                                                                                                        |                                |                         |           |
| K <sub>FI</sub> factor              | : 0,9                                                                                                                                                                                                                                     |                                |                         |           |
| betrouwbaarheidsfactor $\beta$      | : 3,3                                                                                                                                                                                                                                     |                                |                         |           |
| correctiefactor $\xi$               | : 0,89                                                                                                                                                                                                                                    |                                |                         |           |

|                                                       |                   |                               |      |      |      |      |      |      |
|-------------------------------------------------------|-------------------|-------------------------------|------|------|------|------|------|------|
|                                                       | gebruikscategorie | $\psi$ -waarden voor gebouwen |      |      |      |      |      |      |
|                                                       |                   | A                             | B    | C    | D    | E    | F    | G    |
| $\psi_0$ gelijktijdige waarde van de ver. belasting   | :                 | 0,4                           | 0,5  | 0,4  | 0,4  | 1    | 0,7  | 0,7  |
| $\psi_1$ frequente waarde van de ver. belasting       | :                 | 0,5                           | 0,5  | 0,7  | 0,7  | 0,9  | 0,7  | 0,5  |
| $\psi_2$ quasi-blijvende waarde van de ver. belasting | :                 | 0,3                           | 0,3  | 0,6  | 0,6  | 0,8  | 0,6  | 0,3  |
| $\psi_t$ correctiefactor voor levensduur $F_t/F_0$    | :                 | 1,00                          | 1,00 | 1,00 | 1,00 | 1,00 | 1,00 | 1,00 |

| belastingfactoren Y                            | blijvend            |                     | overheersend<br>veranderlijk | gelijktijdig optredende var. bel.         |                      |
|------------------------------------------------|---------------------|---------------------|------------------------------|-------------------------------------------|----------------------|
|                                                | ongunstig           | gunstig             |                              | ongunstig                                 | gunstig              |
|                                                | G <sub>kj;sup</sub> | G <sub>kj;inf</sub> | Q <sub>k,1</sub>             | Q <sub>k,i;sup</sub>                      | Q <sub>k,i;sup</sub> |
| tabel A1.2(B) (STR/GEO) (groep B) verg. 6.10.a | 1,35                | 0,9                 | -                            | 1,5 * $\psi_0$ met $\psi_0 = \text{var.}$ | 0                    |
| tabel A1.2(B) (STR/GEO) (groep B) verg. 6.10.b | 1,2 (1,35* $\xi$ )  | 0,9                 | 1,5                          | 1,5 * $\psi_0$ met $\psi_0 = \text{var.}$ | 0                    |

(voor waarden  $\psi_0$  zie gewichtsberekening)

|                    |                                  |                                  |                              |
|--------------------|----------------------------------|----------------------------------|------------------------------|
| Belastingfactoren: | formule 6.10a                    | formule 6.10b                    | formule 6.10a en b (gunstig) |
|                    | $K_{FI} Y_{G,j} = 1,22$          | $K_{FI} \xi Y_{G,j} = 1,08$      | $Y_{G,j} = 0,9$              |
|                    | $K_{FI} Y_{G,j} = 1,35 * \psi_0$ | $K_{FI} Y_{Q,1} = 1,35$          |                              |
|                    | $K_{FI} Y_{G,j} = 1,35 * \psi_0$ | $K_{FI} Y_{Q,i} = 1,35 * \psi_0$ |                              |

## Stabiliteit bouwwerk

\* De stabiliteit wordt verzorgd door de CLT-vloeren en wanden Deze wanden worden doorgezet tot in de fundatie.

## Aangehouden belastingen

### ALGEMEEN AANGEHOUDEN BELASTINGEN volgens NEN-EN 1990

tabel A1.2(B), verg. 6.10a :  $K_{ft} * Y_{Gj} * G_{k,j} + K_{ft} * Y_{Q,1} * \psi_{0,1} * Q_{k1} + K_{ft} * Y_{Q,i} * \psi_{0,i} * Q_{ki}$

tabel A1.2(B), verg. 6.10b :  $\xi * K_{ft} * Y_{Gj} * G_{k,j} + K_{ft} * Y_{Q,1} * \psi_t * Q_{k1} + K_{ft} * Y_{Q,i} * \psi_{0,i} * Q_{ki}$

#### begane grondvloer / funderingsplaat

##### permanent

|                     |                      |        |   |                        |   |                              |
|---------------------|----------------------|--------|---|------------------------|---|------------------------------|
| type                | : betonvloer op zand |        |   | =                      | - | kN/m <sup>2</sup>            |
|                     | : dikte vloer        | 180 mm | * | 25                     | = | 4,50 kN/m <sup>2</sup>       |
|                     | : -                  |        |   |                        | = | - kN/m <sup>2</sup>          |
| afwerking           | : cementdekvloer     | 100 mm | * | 20                     | = | 2,00 kN/m <sup>2</sup>       |
| <b>veranderlijk</b> |                      |        |   | <b>G<sub>k,1</sub></b> | = | <b>6,50 kN/m<sup>2</sup></b> |

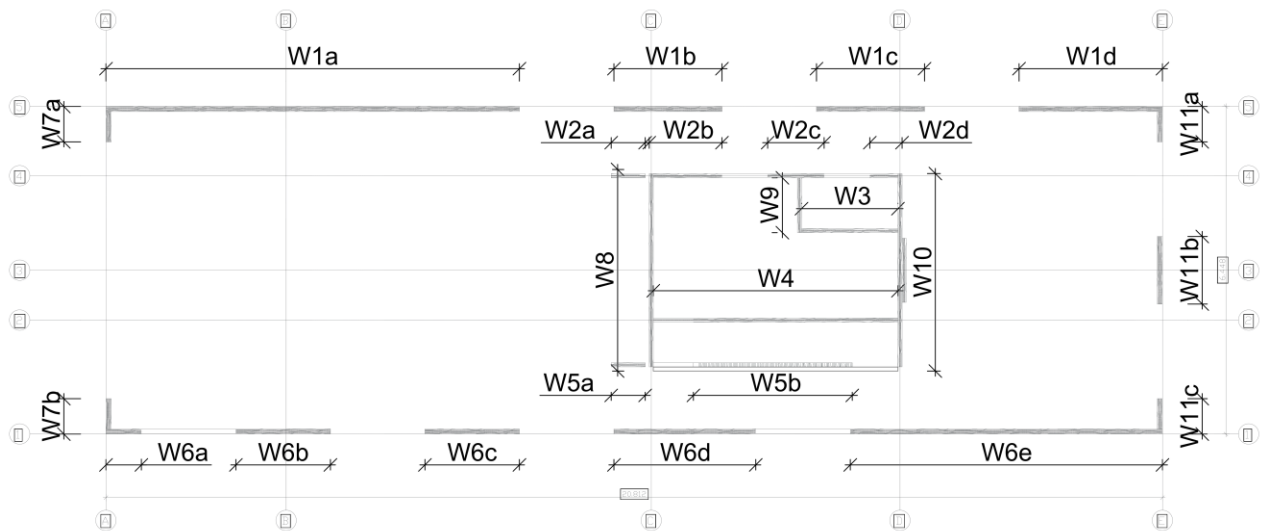
A2: Kamer in een woonhuis

|                     |                          |                     |       |                        |   |                              |
|---------------------|--------------------------|---------------------|-------|------------------------|---|------------------------------|
| opgelegde belasting | :                        | ( $\psi_t = 1,00$ ) | *     | 1,75                   | = | 1,75 kN/m <sup>2</sup>       |
|                     | : scheidingswanden (1,2) |                     | 0,0 * |                        | = | 1,20 kN/m <sup>2</sup>       |
|                     |                          |                     |       | <b>Q<sub>k,1</sub></b> | = | <b>2,95 kN/m<sup>2</sup></b> |
|                     |                          | ( $\psi_0 = 0,4$ )  |       | Q <sub>k,i</sub>       | = | 1,18 ,,                      |

Bovenbouw volgens constructieberekening Solid Timber te Utrecht

Projectnr. 2010-2, d.d. 22-04-2021

## Lijn- en puntlasten op de funderingsplaat | Solid Timber d.d. 22-04-2021



| Gewichtsberekening DO |                                                          |                           |                        |        |                                                          |         |         |         |                                          |                 |                                   |               |
|-----------------------|----------------------------------------------------------|---------------------------|------------------------|--------|----------------------------------------------------------|---------|---------|---------|------------------------------------------|-----------------|-----------------------------------|---------------|
| Project               |                                                          | Woonhuis - Hamerveldseweg |                        |        |                                                          |         |         |         |                                          |                 |                                   |               |
| Datum                 |                                                          | 22-4-2021                 |                        |        |                                                          |         |         |         |                                          |                 |                                   |               |
| Wand / kolom          | Karakteristieke verticaallasten [kN/m / kN] <sup>1</sup> |                           |                        |        | Karakteristieke puntlasten stabiliteit [kN] <sup>4</sup> |         |         |         | Rekenwaarde verticaallasten <sup>2</sup> |                 | Karakteristieke horizontaallasten |               |
|                       | Permanent                                                | Opgelegde vloerbelasting  | Opgelegde dakbelasting | Sneeuw | Wind X+                                                  | Wind X- | Wind Y+ | Wind Y- | Max [kN/m / kN]                          | BC <sup>3</sup> | Max [kN/m]                        | Wind-richting |
| W1a                   | 15                                                       | 4                         | 0                      | 1      |                                                          |         |         |         | 20                                       | 3               | 1                                 | X             |
| W1b                   | 21                                                       | 5                         | 0                      | 1      |                                                          |         |         |         | 28                                       | 3               | 1                                 | X             |
| W1c                   | 19                                                       | 5                         | 0                      | 1      |                                                          |         |         |         | 26                                       | 3               | 1                                 | X             |
| W1d                   | 16                                                       | 6                         | 0                      | 1      |                                                          |         |         |         | 25                                       | 3               | 1                                 | X             |
| W2a                   | 13                                                       | 4                         | 0                      | 1      |                                                          |         |         |         | 20                                       | 3               | 1                                 | X             |
| W2b                   | 12                                                       | 3                         | 0                      | 1      |                                                          |         |         |         | 24                                       | 13              | 1                                 | X             |
| W2c                   | 16                                                       | 4                         | 0                      | 1      |                                                          |         |         |         | 22                                       | 13              | 1                                 | X             |
| W2d                   | 11                                                       | 3                         | 0                      | 1      |                                                          |         |         |         | 16                                       | 3               | 1                                 | X             |
| W3                    | 9                                                        | 3                         | 0                      | 1      |                                                          |         |         |         | 13                                       | 3               | 1                                 | X             |
| W4                    | 11                                                       | 3                         | 0                      | 1      |                                                          |         |         |         | 15                                       | 3               | 1                                 | X             |
| W5a                   | 11                                                       | 4                         | 0                      | 1      |                                                          |         |         |         | 17                                       | 3               | 1                                 | X             |
| W5b                   | 5                                                        | 2                         | 0                      | 1      |                                                          |         |         |         | 4                                        | 3               | 1                                 | X             |
| W6a                   | 17                                                       | 1                         | 0                      | 1      |                                                          |         |         |         | 30                                       | 12              | 2                                 | X             |
| W6b                   | 34                                                       | 7                         | 0                      | 2      |                                                          |         |         |         | 45                                       | 3               | 1                                 | X             |
| W6c                   | 26                                                       | 8                         | 0                      | 1      |                                                          |         |         |         | 37                                       | 3               | 1                                 | X             |
| W6d                   | 17                                                       | 3                         | 0                      | 1      |                                                          |         |         |         | 22                                       | 3               | 1                                 | X             |
| W6e                   | 13                                                       | 4                         | 0                      | 1      |                                                          |         |         |         | 19                                       | 3               | 1                                 | X             |
| W7a                   | 27                                                       | 1                         | 0                      | 2      |                                                          |         |         |         | 33                                       | 2               | 7                                 | Y             |
| W7b                   | 30                                                       | 1                         | 0                      | 2      |                                                          |         |         |         | 37                                       | 2               | 7                                 | Y             |
| W8                    | 11                                                       | 3                         | 0                      | 1      |                                                          |         |         |         | 16                                       | 3               | 6                                 | Y             |
| W9                    | 10                                                       | 3                         | 0                      | 1      |                                                          |         |         |         | 14                                       | 3               | 3                                 | Y             |
| W10                   | 7                                                        | 2                         | 0                      | 1      |                                                          |         |         |         | 10                                       | 3               | 4                                 | Y             |
| W11a                  | 19                                                       | 2                         | 0                      | 1      |                                                          |         |         |         | 27                                       | 13              | 3                                 | Y             |
| W11b                  | 24                                                       | 4                         | 0                      | 2      |                                                          |         |         |         | 31                                       | 3               | 3                                 | Y             |
| W11c                  | 20                                                       | 2                         | 0                      | 2      |                                                          |         |         |         | 28                                       | 12              | 3                                 | Y             |

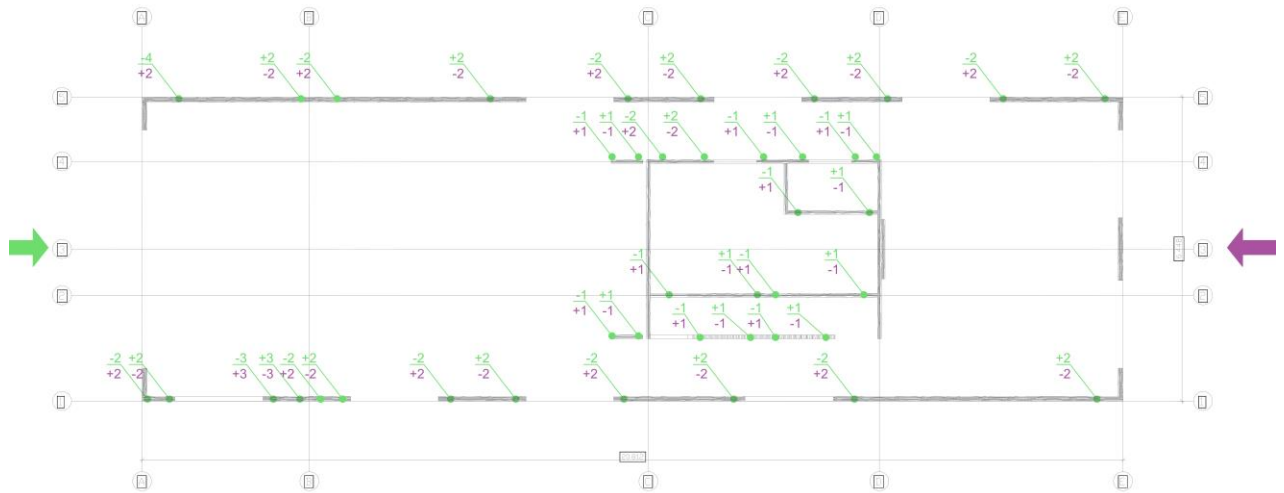
<sup>1</sup>) Verticaallasten kN/m voor wanden W en kN voor kolommen K

<sup>2</sup>) Rekenwaarde bepaald volgens vgl. 6.10a/b in NEN-EN 1990.

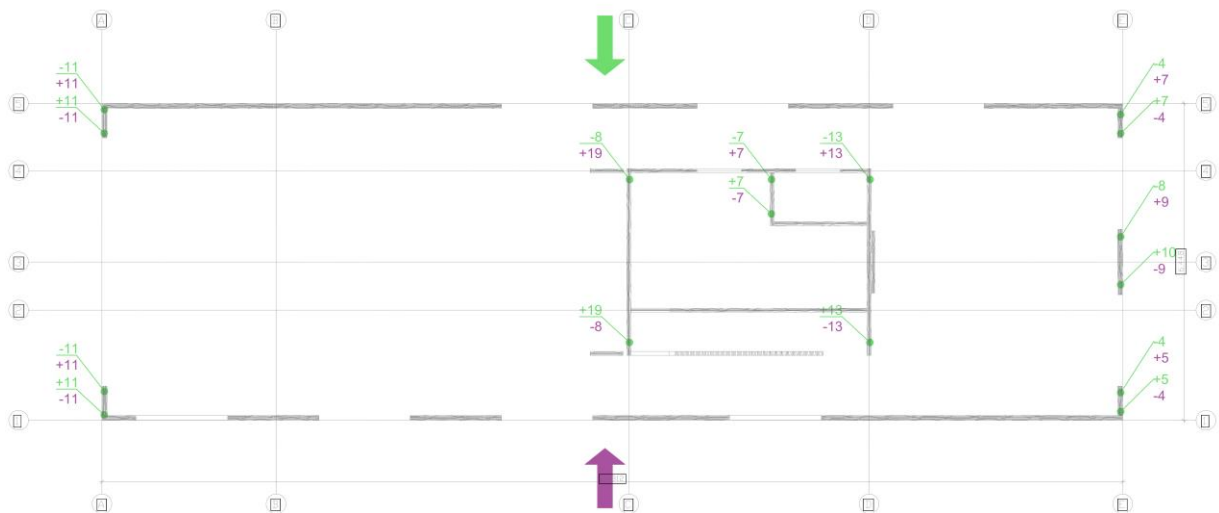
<sup>3</sup>) Bijbehorende belastingcombinatie volgens "Algemene gegevens & aandachtspunten"

<sup>4</sup>) - = verticale liftkracht, + = verticale drukkracht

**Stabiliserende puntlasten op de funderingsplaat | Solid Timber d.d. 22-04-2021**



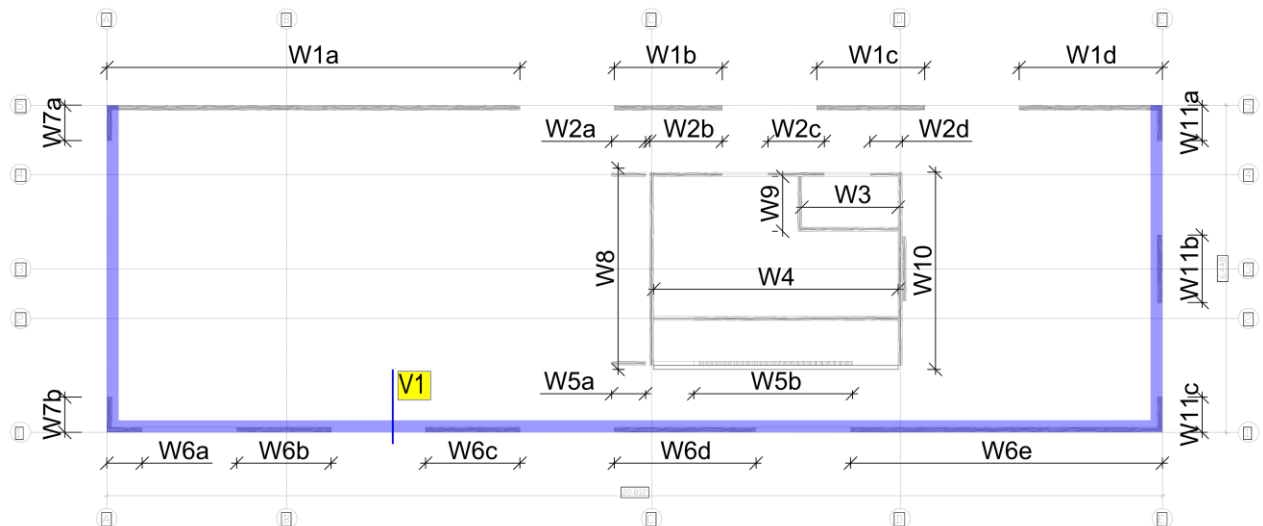
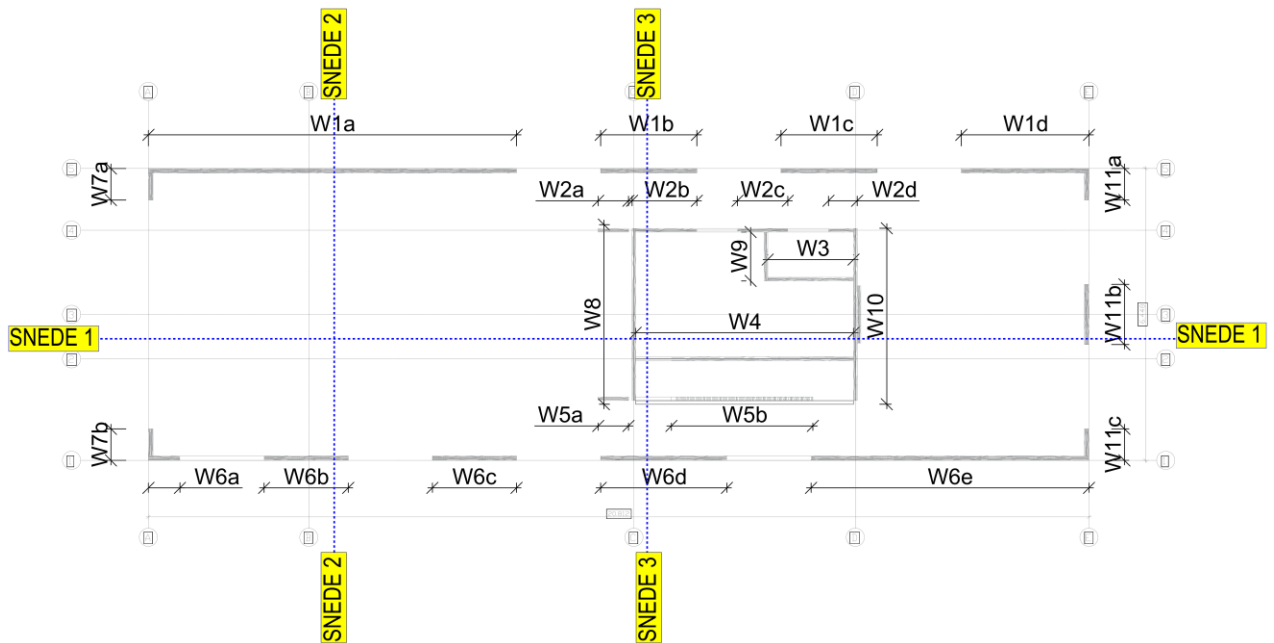
Stabiliserende puntlasten wanden - wind X  
LC5 / LC6



## Begane grondvloer / Funderingsplaat

De positienummers (POS nr) in de berekening zijn terug te vinden in de constructiebijlagen.

NB. Niet alle positienummers worden berekend, enkele afmetingen zijn praktisch gekozen of zijn niet maatgevend.



**Begane grondvloer / funderingsplaat snede 1 | d= 180mm, wap. conform tekening F-01**

---

|                         |           |                                                                                          |
|-------------------------|-----------|------------------------------------------------------------------------------------------|
| Permanente belasting:   | Afwerking | : $q_g = 2 \text{ kN/m}^2 * 1.0 \text{ m} = 2 \text{ kN/m}$                              |
|                         | W8        | : $P_g = 11 \text{ kN/m} * 1.0 \text{ m} = 11 \text{ kN}$                                |
|                         | W10       | : $P_g = 7 \text{ kN/m} * 1.0 \text{ m} = 7 \text{ kN}$                                  |
|                         | W11b      | : $P_g = 24 \text{ kN/m} * 1.0 \text{ m} = 24 \text{ kN}$                                |
| Veranderlijke belasting | Opgelegd  | : $q_q = (1.75 \text{ kN/m}^2 + 1.2 \text{ kN/m}^2) * 1.0 \text{ m} = 2.95 \text{ kN/m}$ |
|                         | W8        | : $P_q = (3 \text{ kN/m} + 1 \text{ kN/m}) * 1.0 \text{ m} = 4 \text{ kN}$               |
|                         | W10       | : $P_q = (2 \text{ kN/m} + 1 \text{ kN/m}) * 1.0 \text{ m} = 3 \text{ kN}$               |
|                         | W11b      | : $P_q = (4 \text{ kN/m} + 2 \text{ kN/m}) * 1.0 \text{ m} = 6 \text{ kN}$               |

Project.....: 820.306  
Onderdeel.....: Begane grondvloer / funderingsplaat | snede 1  
Constructeur.:                      k  
Dimensies.....: kN/m/rad  
Datum.....: 24/11/2020  
Bestand.....: N:\10. GRIPWERKEN\Werken  
                  2020\820306\Berekening\tijd\TS\Begane grondvloer,  
                  funderingsplaat, snede 1.dlw

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

Fysisch lineair : Er is gerekend met de e-modulus uit de materiaaltabel.  
Fys.NLE.kort : Er is gerekend met een gecorrigeerde e-modulus (korte duur).  
Deze e-mod. is berekend mbv de krachten uit de fysisch lineair berekening.

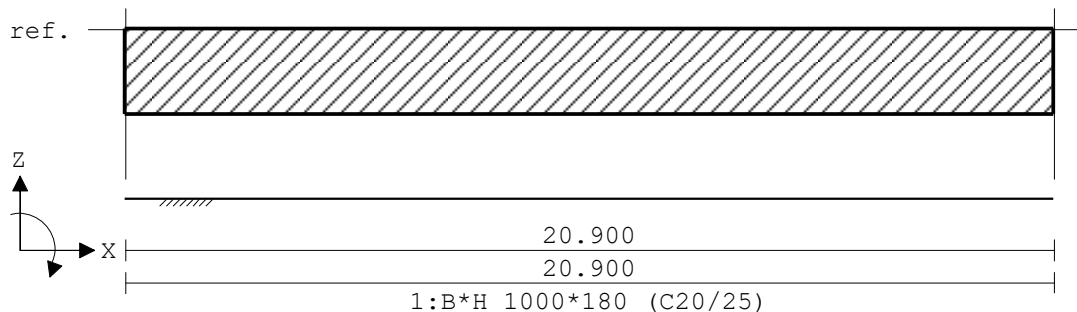
### Toegepaste normen volgens Eurocode met Nederlandse NB

|             |                          |                |             |
|-------------|--------------------------|----------------|-------------|
| Belastingen | NEN-EN 1990:2002         | C2:2010        | NB:2011(nl) |
|             | NEN-EN 1991-1-1:2002     | C1:2009        | NB:2011(nl) |
| Beton       | NEN-EN 1992-1-1:2011(nl) | C2/A1:2015(nl) | NB:2016(nl) |



### GEOMETRIE

Ligger:1



Project.....: 820.306

Onderdeel.....: Begane grondvloer / funderingsplaat | snede 1

#### VELDLENGTEN

Ligger:1

| Veld | Vanaf | Tot    | Lengte |
|------|-------|--------|--------|
| 1    | 0.000 | 20.900 | 20.900 |

#### MATERIALEN

| Mt | Omschrijving | E-modulus[N/mm <sup>2</sup> ] | S.G. | Pois. | Uitz. coëff |
|----|--------------|-------------------------------|------|-------|-------------|
| 1  | C20/25       | 7480                          | 25.0 | 0.20  | 1.0000e-05  |

#### MATERIALEN vervolg

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

#### PROFIELEN [mm]

| Prof. | Omschrijving | Materiaal | Oppervlak  | Traagheid  | Vormf. |
|-------|--------------|-----------|------------|------------|--------|
| 1     | B*H 1000*180 | 1:C20/25  | 1.8000e+05 | 4.8600e+08 | 0.00   |

#### PROFIELEN vervolg [mm]

| Prof. | Staaftype | Breedte | Hoogte | e    | Type | b1 | h1 | b2 | h2 |
|-------|-----------|---------|--------|------|------|----|----|----|----|
| 1     | 0:Normaal | 1000    | 180    | 90.0 | 0:RH |    |    |    |    |

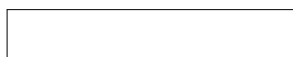
#### DOORSNEDEN

Ligger:1

| sector | Vanaf | Tot    | Lengte | Profiel begin  | z-begin | Profiel eind   | z-eind |
|--------|-------|--------|--------|----------------|---------|----------------|--------|
| 1      | 0.000 | 20.900 | 20.900 | 1:B*H 1000*180 | 0.000   | 1:B*H 1000*180 | 0.000  |
| sector | Vanaf | Tot    | Lengte | Eindcode       | Bedding | Br.[mm]        |        |
| 1      | 0.000 | 20.900 | 20.900 | 1:Vast         | 7500    | 1000           |        |

#### PROFIELVORMEN [mm]

1 B\*H 1000\*180



#### BELASTINGGEVALLEN

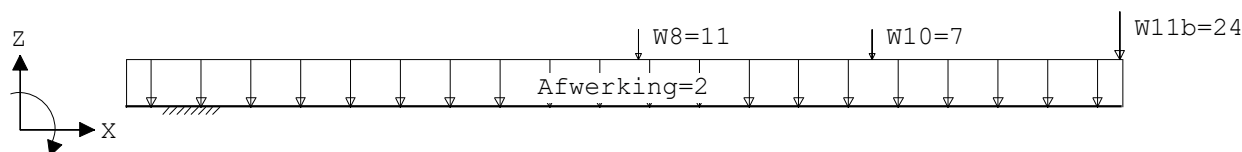
| B.G. | Omschrijving | Belast/onbelast     | $\Psi_0$ | $\Psi_1$ | $\Psi_2$ | e.g.  |
|------|--------------|---------------------|----------|----------|----------|-------|
| 1    | Permanent    | 2:Permanent EN1991  |          |          |          | -1.00 |
| 2    | Veranderlijk | 1:Schaakbord EN1991 | 0.40     | 0.50     | 0.30     | 0.00  |

#### BELASTINGGEVALLEN

| B.G. | Omschrijving | Type                          |
|------|--------------|-------------------------------|
| 1    | Permanent    | 1 Permanente belasting        |
| 2    | Veranderlijk | 2 Ver. bel. pers. ed. (p_rep) |

#### VELDBELASTINGEN

Ligger:1 B.G:1 Permanent



Project.....: 820.306

Onderdeel.....: Begane grondvloer / funderingsplaat | snede 1

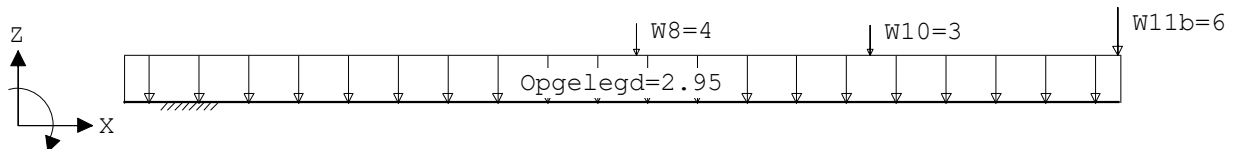
#### VELDBELASTINGEN

Ligger:1 B.G:1 Permanent

| Last Ref. | Type       | Omschrijving | q1/p/m                              | q2     | psi | Afstand | Lengte |
|-----------|------------|--------------|-------------------------------------|--------|-----|---------|--------|
| 1         | 1:q-last   | Afwerking    | -2.000                              | -2.000 |     | 0.000   | 20.900 |
| 2         | 8:Puntlast | W8           | -11.000                             |        |     | 10.750  |        |
| 3         | 8:Puntlast | W10          | -7.000                              |        |     | 15.650  |        |
| 4         | 8:Puntlast | W11b         | -24.000                             |        |     | 20.850  |        |
|           |            |              |                                     |        |     |         |        |
|           | 0.00       | :            | (absoluut) grootste som reacties    |        |     |         |        |
|           | -177.85    | :            | (absoluut) grootste som belastingen |        |     |         |        |

#### VELDBELASTINGEN

Ligger:1 B.G:2 Veranderlijk



#### VELDBELASTINGEN

Ligger:1 B.G:2 Veranderlijk

| Last Ref. | Type       | Omschrijving | q1/p/m | q2     | psi | Afstand | Lengte |
|-----------|------------|--------------|--------|--------|-----|---------|--------|
| 1         | 1:q-last   | Opgelegd     | -2.950 | -2.950 |     | 0.000   | 0.000  |
| 2         | 8:Puntlast | W8           | -4.000 |        |     | 10.750  |        |
| 3         | 8:Puntlast | W10          | -3.000 |        |     | 15.650  |        |
| 4         | 8:Puntlast | W11b         | -6.000 |        |     | 20.850  |        |

#### BELASTINGCOMBINATIES

| BC | Type  | BG | Gen. | Factor | BG | Gen. | Factor | BG | Gen. | Factor | BG | Gen. | Factor |
|----|-------|----|------|--------|----|------|--------|----|------|--------|----|------|--------|
| 1  | Fund. | 1  | Perm | 1.22   |    |      |        |    |      |        |    |      |        |
| 2  | Fund. | 1  | Perm | 1.22   | 2  | psi0 | 1.35   |    |      |        |    |      |        |
| 3  | Fund. | 1  | Perm | 1.08   | 2  | Extr | 1.35   |    |      |        |    |      |        |
| 4  | Fund. | 1  | Perm | 1.08   |    |      |        |    |      |        |    |      |        |
| 5  | Fund. | 1  | Perm | 0.90   |    |      |        |    |      |        |    |      |        |
| 6  | Fund. | 1  | Perm | 0.90   | 2  | psi0 | 1.35   |    |      |        |    |      |        |
| 7  | Fund. | 1  | Perm | 0.90   | 2  | Extr | 1.35   |    |      |        |    |      |        |
| 8  | Kar.  | 1  | Perm | 1.00   | 2  | Extr | 1.00   |    |      |        |    |      |        |
| 9  | Kar.  | 1  | Perm | 1.00   |    |      |        |    |      |        |    |      |        |
| 10 | Freq. | 1  | Perm | 1.00   |    |      |        |    |      |        |    |      |        |
| 11 | Freq. | 1  | Perm | 1.00   | 2  | psi1 | 1.00   |    |      |        |    |      |        |
| 12 | Quas. | 1  | Perm | 1.00   |    |      |        |    |      |        |    |      |        |
| 13 | Quas. | 1  | Perm | 1.00   | 2  | psi2 | 1.00   |    |      |        |    |      |        |
| 14 | Blij. | 1  | Perm | 1.00   |    |      |        |    |      |        |    |      |        |

#### GUNSTIGE WERKING PERMANENTE BELASTINGEN

| BC Velden met gunstige werking |                            |
|--------------------------------|----------------------------|
| 1                              | Geen                       |
| 2                              | Geen                       |
| 3                              | Geen                       |
| 4                              | Geen                       |
| 5                              | Alle velden de factor:0.90 |
| 6                              | Alle velden de factor:0.90 |

Project.....: 820.306

Onderdeel.....: Begane grondvloer / funderingsplaat | snede 1

### GUNSTIGE WERKING PERMANENTE BELASTINGEN

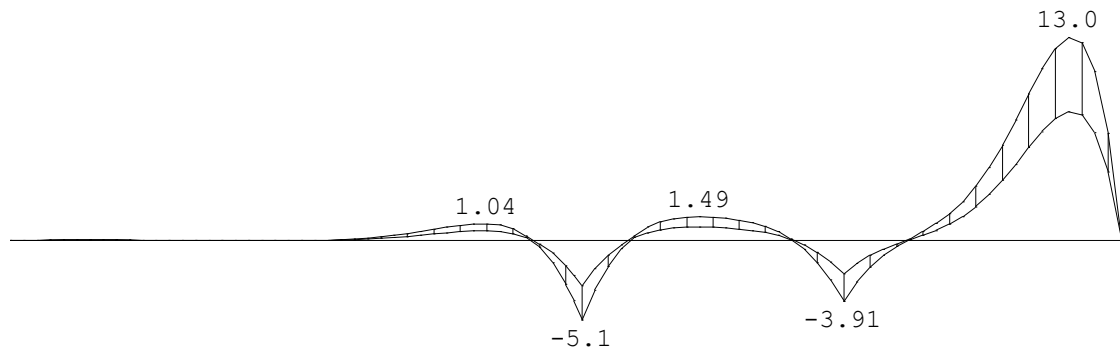
BC Velden met gunstige werking

7 Alle velden de factor:0.90

### OMHULLENDE VAN DE FUNDAMENTELE COMBINATIES

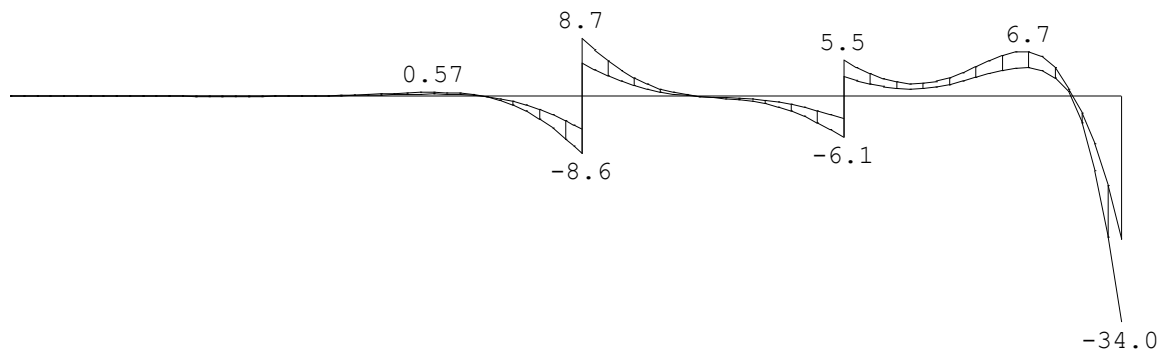
**MOMENTEN** Fysisch lineair

Ligger:1 Fundamentele combinatie



**DWARSKRACHTEN** Fysisch lineair

Ligger:1 Fundamentele combinatie



**TUSSENpunTEN** Fysisch lineair

Ligger:1 Fundamentele combinatie

| Veld | Pos.  | Grondspan. [kN/m2] |        | Dwarskr |       | Moment |       |
|------|-------|--------------------|--------|---------|-------|--------|-------|
|      |       | min.               | max.   | min.    | max.  | min.   | max.  |
| 1    | 0.000 | 5.848              | 10.999 | 0.00    | 0.00  | 0.00   | 0.00  |
| 1    | 0.498 | 5.849              | 11.001 | 0.00    | 0.00  | 0.00   | 0.00  |
| 1    | 0.995 | 5.850              | 11.003 | 0.00    | 0.00  | 0.00   | 0.00  |
| 1    | 1.368 | 5.851              | 11.005 | 0.00    | 0.00  | 0.00   | 0.00  |
| 1    | 1.742 | 5.853              | 11.007 | -0.00   | -0.00 | 0.00   | 0.00  |
| 1    | 2.239 | 5.854              | 11.010 | -0.00   | -0.00 | 0.00   | 0.00  |
| 1    | 2.737 | 5.856              | 11.014 | -0.01   | -0.00 | -0.00  | -0.00 |
| 1    | 3.235 | 5.858              | 11.016 | -0.01   | -0.01 | -0.01  | -0.00 |
| 1    | 3.732 | 5.857              | 11.014 | -0.02   | -0.01 | -0.02  | -0.01 |
| 1    | 4.230 | 5.850              | 11.003 | -0.02   | -0.01 | -0.03  | -0.02 |
| 1    | 4.727 | 5.836              | 10.978 | -0.02   | -0.01 | -0.04  | -0.02 |

Project.....: 820.306

Onderdeel.....: Begane grondvloer / funderingsplaat | snede 1

**TUSSENpunten** Fysisch lineair

Ligger:1 Fundamentele combinatie

| Veld | Pos.   | Grondspan. [kN/m <sup>2</sup> ] |        | Dwarskr |        | Moment |       |
|------|--------|---------------------------------|--------|---------|--------|--------|-------|
|      |        | min.                            | max.   | min.    | max.   | min.   | max.  |
| 1    | 5.225  | 5.810                           | 10.933 | 0.00    | 0.00   | -0.05  | -0.03 |
| 1    | 5.225  | 5.810                           | 10.933 | 0.00    | 0.00   | -0.05  | -0.03 |
| 1    | 5.681  | 5.775                           | 10.871 | 0.03    | 0.05   | -0.03  | -0.02 |
| 1    | 6.137  | 5.732                           | 10.796 | 0.07    | 0.13   | 0.00   | 0.01  |
| 1    | 6.593  | 5.691                           | 10.726 | 0.14    | 0.24   | 0.05   | 0.09  |
| 1    | 7.050  | 5.673                           | 10.694 | 0.21    | 0.37   | 0.13   | 0.23  |
| 1    | 7.506  | 5.711                           | 10.760 | 0.29    | 0.50   | 0.24   | 0.43  |
| 1    | 7.962  | 5.851                           | 11.005 | 0.33    | 0.57   | 0.39   | 0.67  |
| 1    | 8.460  | 6.198                           | 11.610 | 0.25    | 0.44   | 0.54   | 0.94  |
| 1    | 8.957  | 6.815                           | 12.688 | -0.11   | -0.06  | 0.60   | 1.04  |
| 1    | 9.455  | 7.727                           | 14.279 | -1.33   | -0.76  | 0.41   | 0.71  |
| 1    | 9.952  | 8.828                           | 16.200 | -3.43   | -1.97  | -0.43  | -0.25 |
| 1    | 10.450 | 9.773                           | 17.847 | -6.46   | -3.70  | -2.86  | -1.64 |
| 1    | 10.450 | 9.773                           | 17.847 | -6.46   | -3.70  | -2.86  | -1.64 |
| 1    | 10.750 | 9.984                           | 18.213 | -8.59   | -4.92  | -5.11  | -2.93 |
| 1    | 10.750 | 9.984                           | 18.213 | 4.98    | 8.69   | -5.11  | -2.93 |
| 1    | 11.193 | 9.487                           | 17.343 | 3.23    | 5.65   | -1.98  | -1.13 |
| 1    | 11.636 | 8.539                           | 15.685 | 1.83    | 3.20   | -0.13  | 0.03  |
| 1    | 12.080 | 7.563                           | 13.981 | 0.86    | 1.51   | 0.55   | 0.96  |
| 1    | 12.523 | 6.793                           | 12.637 | 0.28    | 0.50   | 0.79   | 1.39  |
| 1    | 12.966 | 6.330                           | 11.836 | -0.04   | -0.03  | 0.84   | 1.49  |
| 1    | 13.418 | 6.219                           | 11.660 | -0.34   | -0.21  | 0.78   | 1.40  |
| 1    | 13.869 | 6.430                           | 12.059 | -0.71   | -0.41  | 0.64   | 1.16  |
| 1    | 14.321 | 6.903                           | 12.932 | -1.37   | -0.77  | 0.38   | 0.71  |
| 1    | 14.772 | 7.528                           | 14.087 | -2.50   | -1.39  | -0.18  | -0.07 |
| 1    | 15.224 | 8.107                           | 15.167 | -4.14   | -2.28  | -1.62  | -0.91 |
| 1    | 15.675 | 8.308                           | 15.575 | -6.15   | -3.36  | -3.91  | -2.17 |
| 1    | 15.675 | 8.308                           | 15.575 | 2.94    | 5.46   | -3.91  | -2.17 |
| 1    | 16.090 | 7.821                           | 14.741 | 2.01    | 3.72   | -2.05  | -1.16 |
| 1    | 16.504 | 6.944                           | 13.220 | 1.36    | 2.47   | -0.79  | -0.48 |
| 1    | 16.919 | 5.889                           | 11.402 | 1.10    | 1.89   | 0.02   | 0.09  |
| 1    | 17.367 | 4.761                           | 9.481  | 1.36    | 2.17   | 0.56   | 0.97  |
| 1    | 17.815 | 3.877                           | 7.983  | 2.06    | 3.22   | 1.31   | 2.16  |
| 1    | 18.263 | 3.548                           | 7.397  | 3.05    | 4.75   | 2.45   | 3.93  |
| 1    | 18.710 | 4.227                           | 8.430  | 3.98    | 6.21   | 4.03   | 6.39  |
| 1    | 19.158 | 6.532                           | 12.046 | 4.29    | 6.72   | 5.91   | 9.34  |
| 1    | 19.532 | 10.439                          | 18.200 | 3.29    | 5.15   | 7.36   | 11.60 |
| 1    | 19.905 | 16.220                          | 27.308 | 0.69    | 1.07   | 8.22   | 12.96 |
| 1    | 20.402 | 27.687                          | 45.377 | -11.28  | -7.15  | 6.85   | 10.79 |
| 1    | 20.900 | 42.422                          | 68.594 | -34.02  | -21.60 | 0.00   | 0.00  |

Project.....: 820.306

Onderdeel.....: Begane grondvloer / funderingsplaat | snede 1

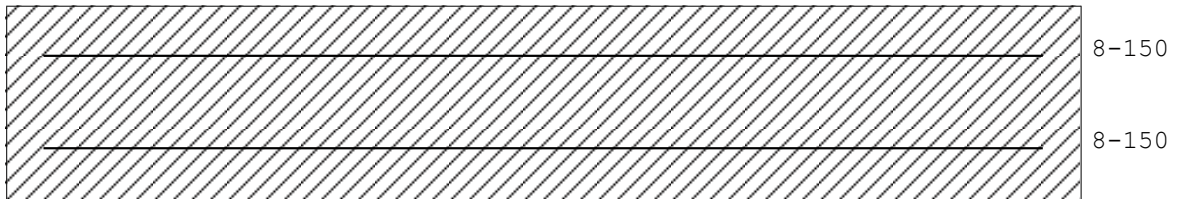
**PROFIELGEGEVENS Vloer** [N] [mm] t.b.v. profiel:1 B\*H 1000\*180

**Algemeen**

Materiaal : C20/25  
Oppervlak : 1.800000e+05 Traagheid : 4.8600e+08  
Staaftype : 0:normaal Vormfactor : 0.00

**Doorsnede**

breedte : 1000 hoogte : 180 zwaartepunt tov onderkant : 90  
Referentie : Boven



Fictieve dikte : 152.5  
Gedrongen inwendige hefboomsarm : Automatisch berekend  
Breedte lastvlak  $a_b$  6.1(10) : 0  
Betonkwaliteit element : C20/25 Kruipcoëf. : 3.010  
Treksterkte  $f_{ct,eff}$  art. 7.1(2) :  $f_{ctm,fl}$  ( 3.14 N/mm<sup>2</sup>)  
Soort spanningsrekdiagram : Parabolisch - rechthoekig diagram  
Doorbuiging volgens art.7.3.4(3) : Ja  
Langeduur scheurmoment begrensd : Ja  
Staalkwaliteit hoofdwapening : 500  $\epsilon_{uk}$  : 2.50  
Soort spanningsrekdiagram : Bi-lineair diagram met klimmende tak  
Geprefabriceerd element : Nee

**Betondekking**

|                                 |   |               |               |
|---------------------------------|---|---------------|---------------|
|                                 |   | Boven         | Onder         |
| Milieu                          | : | XC2           | XC3           |
| Gestort tegen bestaand beton    | : | Nee           | Nee           |
| Element met plaatgeometrie      | : | Ja            | Ja            |
| Specifieke kwaliteitsbeheersing | : | Nee           | Nee           |
| Oneffen beton oppervlak         | : | Nee           | Nee           |
| Ondergrond                      | : | Glad / N.v.t. | Glad / N.v.t. |
| Constructieklasse               | : | S3            | S3            |
| Grootste korrel                 | : | 31.5          |               |

|                                            |   |           |           |
|--------------------------------------------|---|-----------|-----------|
| Hoofdwapening                              | : | 1ste laag | 1ste laag |
| Nominale dekking                           | : | 25        | 25        |
| Toegepaste dekking                         | : | 35        | 35        |
| Gelijkwaardige diameter                    | : | 8         | 8         |
| $C_{min,b}$ $C_{min,dur}$ $\Delta C_{dur}$ | : | 8 20 0    | 8 20 0    |
| $C_{min}$ $\Delta C_{dev}$ $C_{nom}$       | : | 20 5 25   | 20 5 25   |

Project.....: 820.306

Onderdeel.....: Begane grondvloer / funderingsplaat | snede 1

**Betondekking** Boven Onder

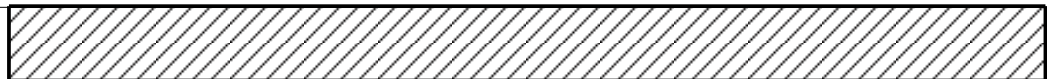
|                                            |   |          |          |
|--------------------------------------------|---|----------|----------|
| Beugel / Verdeelwapening                   | : | 2de laag | 2de laag |
| Nominale dekking                           | : | 25       | 25       |
| Toegepaste dekking                         | : | 43       | 43       |
| Gelijkwaardige diameter                    | : | 6        | 6        |
| $C_{min,b}$ $C_{min,dur}$ $\Delta C_{dur}$ | : | 6 20 0   | 6 20 0   |
| $C_{min}$ $\Delta C_{dev}$ $C_{nom}$       | : | 20 5 25  | 20 5 25  |

|                                |   |             |             |
|--------------------------------|---|-------------|-------------|
| <b>Wapening</b>                |   | Boven       | Onder       |
| Basiswapening                  | : | 8-150       | 8-150       |
| Hoofdwapening laag             | : | 1           | 1           |
| Automatisch verhogen basiswap. | : | Nee         | Nee         |
| Art. 7.3.2 minimum wapening    | : | Ja          | Ja          |
| Bijlegdiameters                | : | 8;10;12     | 8;10;12     |
| Diameter nuttige hoogte        | : | 8.0         | 8.0         |
| Diameter verdeelwapening       | : | 6.0         | 6.0         |
| Min.tussenruimte               | : | 50          | 50          |
| Aanhechting                    | : | Automatisch | Automatisch |

**Hoofdwapening** Fysisch lineair Ligger:1 Fundamentele combinatie

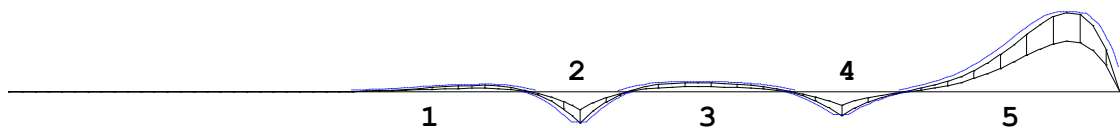
8-150 a

ref.



8-150 b

**MEd dekkingslijn** Fysisch lineair Ligger:1 Fundamentele combinatie



Project.....: 820.306

Onderdeel.....: Begane grondvloer / funderingsplaat | snede 1

### Hoofdwapening

Ligger:1

| Geb. | Pos.<br>[mm] | $M_{Ed}$<br>[kNm] | $M_{Rd}$<br>[kNm] | z B/O<br>[mm] | $A_b$<br>[mm <sup>2</sup> ] | $A_a$<br>[mm <sup>2</sup> ] | Basiswapening<br>+Bijlegwapening | Opm. |
|------|--------------|-------------------|-------------------|---------------|-----------------------------|-----------------------------|----------------------------------|------|
| 5    | 19905        | 12.96             | 23.11             | 84 Bov        | 261*                        | 336                         | 8-150                            |      |
| 1,54 |              |                   |                   |               |                             |                             |                                  |      |
| 2    | 10750        | -5.11             | -23.11            | 84 Ond        | 160*                        | 336                         | 8-150                            | 54   |

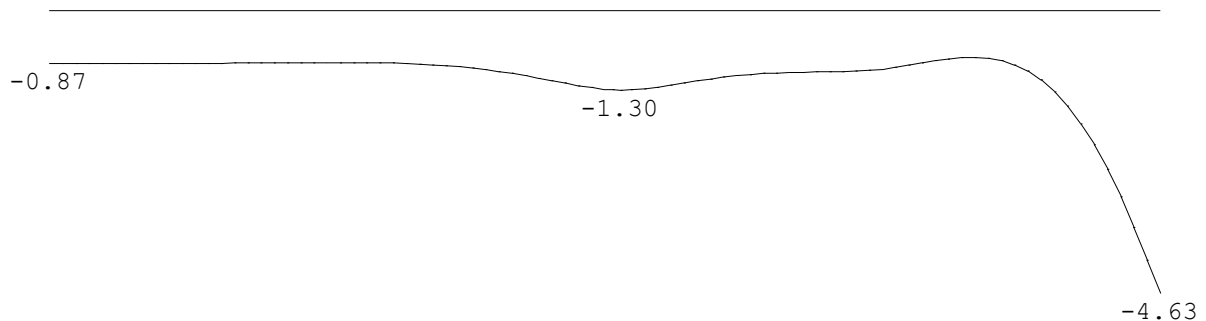
Opmerkingen

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

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

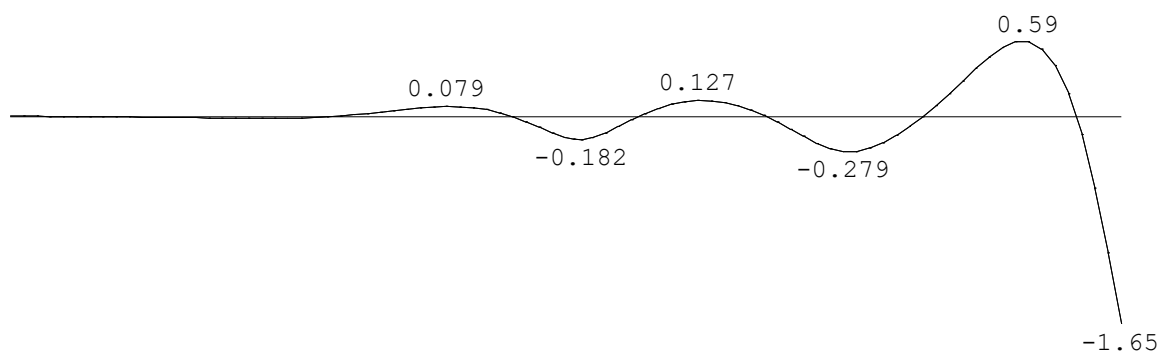
### DOORBUIGINGEN w1 [mm]

Ligger:1 Blijvende combinatie



### DOORBUIGINGEN w2 [mm]

Ligger:1 Quasi-blijvende combinatie

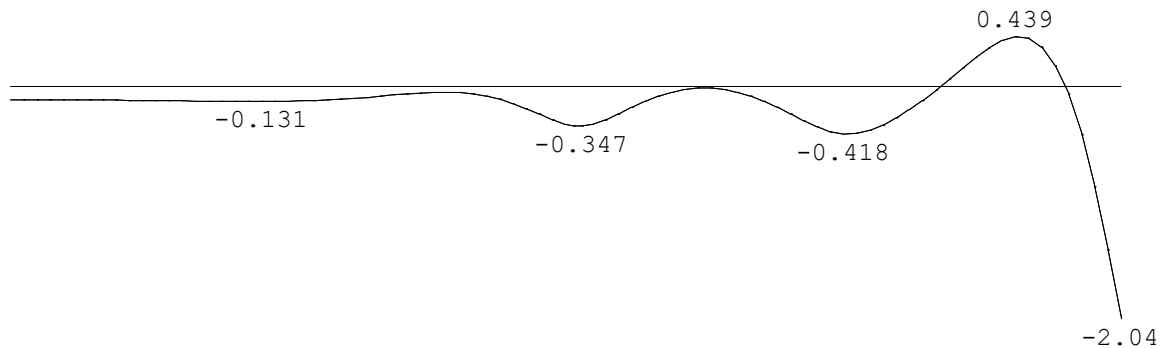


Project.....: 820.306

Onderdeel.....: Begane grondvloer / funderingsplaat | snede 1

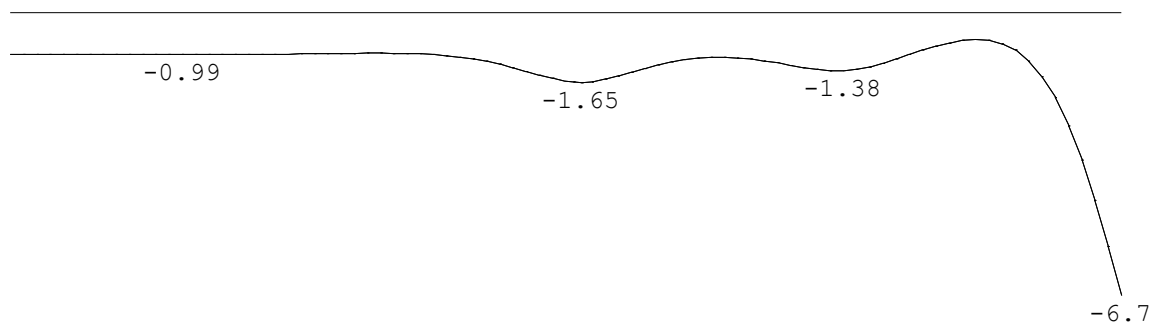
**DOORBUIGINGEN  $W_{bij}$**  [mm]

Ligger:1 Quasi-blijvende combinatie



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

Ligger:1 Quasi-blijvende combinatie



**DOORBUIGINGEN**

Quasi-blijvende combinatie

| Veld | Zijde | positie | $l_{rep}$ | $W_1$ | $W_2$ | $W_{bij}$    | $W_{tot}$ | $W_c$ | $W_{max}$    |
|------|-------|---------|-----------|-------|-------|--------------|-----------|-------|--------------|
|      |       | [m]     | [mm]      | [mm]  | [mm]  | [mm] [lrep/] | [mm]      | [mm]  | [mm] [lrep/] |
| 1    | Neg.  | /       | 41800     | -3.8  | -1.6  | -1.9 21676   | -5.7      |       | -5.7 7345    |
| 1    | Pos.  | 18.910  | 20900     | 2.9   | 2.1   | 2.3 9092     | 5.2       |       | 5.2 3983     |

**Begane grondvloer / funderingsplaat snede 2 | d= 180mm, wap. conform tekening F-01**

---

|                         |           |                                                                                          |
|-------------------------|-----------|------------------------------------------------------------------------------------------|
| Permanente belasting:   | Afwerking | : $q_g = 2 \text{ kN/m}^2 * 1.0 \text{ m} = 2 \text{ kN/m}$                              |
|                         | W6b       | : $P_g = 34 \text{ kN/m} * 1.0 \text{ m} = 34 \text{ kN}$                                |
|                         | W1a       | : $P_g = 15 \text{ kN/m} * 1.0 \text{ m} = 15 \text{ kN}$                                |
| Veranderlijke belasting | Opgelegd  | : $q_q = (1.75 \text{ kN/m}^2 + 1.2 \text{ kN/m}^2) * 1.0 \text{ m} = 2.95 \text{ kN/m}$ |
|                         | W6b       | : $P_q = (7 \text{ kN/m} + 2 \text{ kN/m}) * 1.0 \text{ m} = 9 \text{ kN}$               |
|                         | W1a       | : $P_q = (4 \text{ kN/m} + 1 \text{ kN/m}) * 1.0 \text{ m} = 5 \text{ kN}$               |

Project.....: 820.306  
Onderdeel.....: Begane grondvloer / funderingsplaat | snede 2  
Constructeur.:   
Dimensies.....: kN/m/rad  
Datum.....: 24/11/2020  
Bestand.....: N:\10. GRIPWERKEN\Werken  
2020\820306\Berekening\tijd\TS\Begane grondvloer,  
funderingsplaat, snede 2.dlw

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

Fysisch lineair : Er is gerekend met de e-modulus uit de materiaaltabel.  
Fys.NLE.kort : Er is gerekend met een gecorrigeerde e-modulus (korte duur).  
Deze e-mod. is berekend mbv de krachten uit de fysisch lineair berekening.

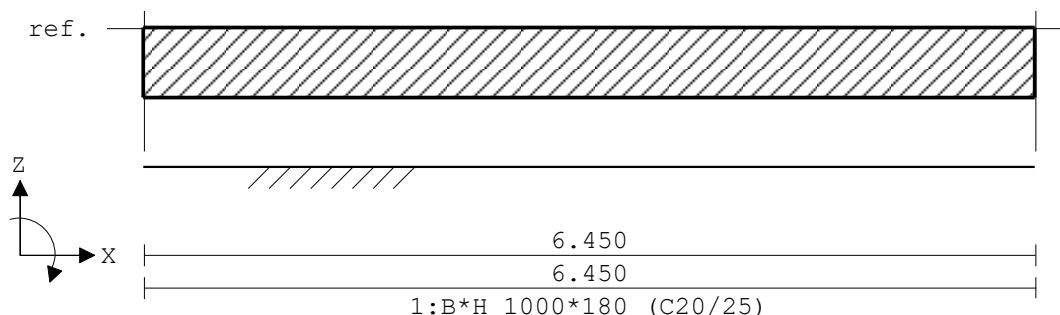
#### Toegepaste normen volgens Eurocode met Nederlandse NB

|             |                          |                |             |
|-------------|--------------------------|----------------|-------------|
| Belastingen | NEN-EN 1990:2002         | C2:2010        | NB:2011(nl) |
|             | NEN-EN 1991-1-1:2002     | C1:2009        | NB:2011(nl) |
| Beton       | NEN-EN 1992-1-1:2011(nl) | C2/A1:2015(nl) | NB:2016(nl) |



#### GEOMETRIE

Ligger:1



Project.....: 820.306

Onderdeel.....: Begane grondvloer / funderingsplaat | snede 2

#### VELDLENGTEN

Ligger:1

| Veld | Vanaf | Tot   | Lengte |
|------|-------|-------|--------|
| 1    | 0.000 | 6.450 | 6.450  |

#### MATERIALEN

| Mt | Omschrijving | E-modulus[N/mm <sup>2</sup> ] | S.G. | Pois. | Uitz. coëff |
|----|--------------|-------------------------------|------|-------|-------------|
| 1  | C20/25       | 7480                          | 25.0 | 0.20  | 1.0000e-05  |

#### MATERIALEN vervolg

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

#### PROFIELEN [mm]

| Prof. | Omschrijving | Materiaal | Oppervlak  | Traagheid  | Vormf. |
|-------|--------------|-----------|------------|------------|--------|
| 1     | B*H 1000*180 | 1:C20/25  | 1.8000e+05 | 4.8600e+08 | 0.00   |

#### PROFIELEN vervolg [mm]

| Prof. | Staaftype | Breedte | Hoogte | e    | Type | b1 | h1 | b2 | h2 |
|-------|-----------|---------|--------|------|------|----|----|----|----|
| 1     | 0:Normaal | 1000    | 180    | 90.0 | 0:RH |    |    |    |    |

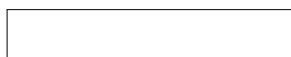
#### DOORSNEDEN

Ligger:1

| sector | Vanaf | Tot   | Lengte | Profiel begin  | z-begin | Profiel eind   | z-eind |
|--------|-------|-------|--------|----------------|---------|----------------|--------|
| 1      | 0.000 | 6.450 | 6.450  | 1:B*H 1000*180 | 0.000   | 1:B*H 1000*180 | 0.000  |
| sector | Vanaf | Tot   | Lengte | Eindcode       | Bedding | Br.[mm]        |        |
| 1      | 0.000 | 6.450 | 6.450  | 1:Vast         | 7500    | 1000           |        |

#### PROFIELVORMEN [mm]

1 B\*H 1000\*180



#### BELASTINGGEVALLEN

| B.G. | Omschrijving | Belast/onbelast     | $\Psi_0$ | $\Psi_1$ | $\Psi_2$ | e.g.  |
|------|--------------|---------------------|----------|----------|----------|-------|
| 1    | Permanent    | 2:Permanent EN1991  |          |          |          | -1.00 |
| 2    | Veranderlijk | 1:Schaakbord EN1991 | 0.40     | 0.50     | 0.30     | 0.00  |

#### BELASTINGGEVALLEN

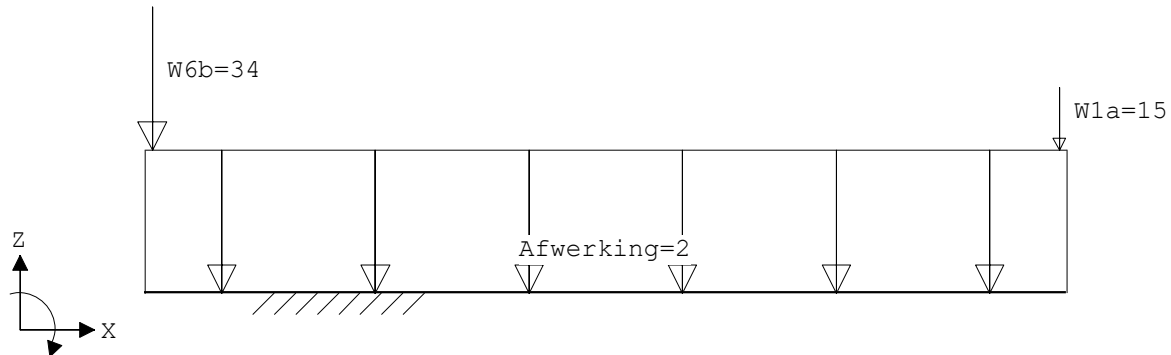
| B.G. | Omschrijving | Type                          |
|------|--------------|-------------------------------|
| 1    | Permanent    | 1 Permanente belasting        |
| 2    | Veranderlijk | 2 Ver. bel. pers. ed. (p_rep) |

Project.....: 820.306

Onderdeel.....: Begane grondvloer / funderingsplaat | snede 2

### VELDBELASTINGEN

Ligger:1 B.G:1 Permanent



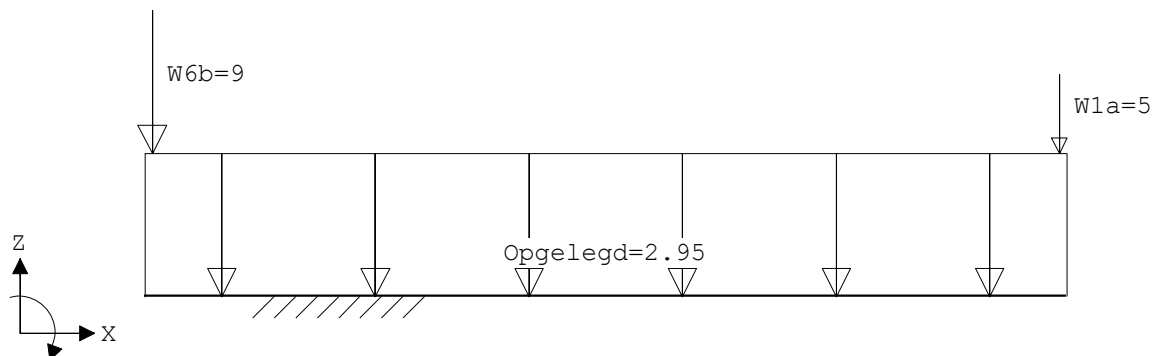
### VELDBELASTINGEN

Ligger:1 B.G:1 Permanent

| Last Ref.                                    | Type       | Omschrijving | q1/p/m  | q2 psi | Afstand | Lengte |
|----------------------------------------------|------------|--------------|---------|--------|---------|--------|
| 1                                            | 1:q-last   | Afwerking    | -2.000  | -2.000 | 0.000   | 6.450  |
| 2                                            | 8:Puntlast | W6b          | -34.000 |        | 0.050   |        |
| 3                                            | 8:Puntlast | W1a          | -15.000 |        | 6.400   |        |
| 0.00 : (absoluut) grootste som reacties      |            |              |         |        |         |        |
| -90.92 : (absoluut) grootste som belastingen |            |              |         |        |         |        |

### VELDBELASTINGEN

Ligger:1 B.G:2 Veranderlijk



### VELDBELASTINGEN

Ligger:1 B.G:2 Veranderlijk

| Last Ref. | Type       | Omschrijving | q1/p/m | q2 psi | Afstand | Lengte |
|-----------|------------|--------------|--------|--------|---------|--------|
| 1         | 1:q-last   | Opgelegd     | -2.950 | -2.950 | 0.000   | 0.000  |
| 2         | 8:Puntlast | W6b          | -9.000 |        | 0.050   |        |
| 3         | 8:Puntlast | W1a          | -5.000 |        | 6.400   |        |

Project.....: 820.306

Onderdeel.....: Begane grondvloer / funderingsplaat | snede 2

### BELASTINGCOMBINATIES

| BC | Type  | BG | Gen. | Factor | BG | Gen. | Factor | BG | Gen. | Factor | BG | Gen. | Factor |
|----|-------|----|------|--------|----|------|--------|----|------|--------|----|------|--------|
| 1  | Fund. | 1  | Perm | 1.22   |    |      |        |    |      |        |    |      |        |
| 2  | Fund. | 1  | Perm | 1.22   | 2  | psi0 | 1.35   |    |      |        |    |      |        |
| 3  | Fund. | 1  | Perm | 1.08   | 2  | Extr | 1.35   |    |      |        |    |      |        |
| 4  | Fund. | 1  | Perm | 0.90   |    |      |        |    |      |        |    |      |        |
| 5  | Fund. | 1  | Perm | 0.90   | 2  | psi0 | 1.35   |    |      |        |    |      |        |
| 6  | Fund. | 1  | Perm | 0.90   | 2  | Extr | 1.35   |    |      |        |    |      |        |
| 7  | Kar.  | 1  | Perm | 1.00   | 2  | Extr | 1.00   |    |      |        |    |      |        |
| 8  | Freq. | 1  | Perm | 1.00   |    |      |        |    |      |        |    |      |        |
| 9  | Freq. | 1  | Perm | 1.00   | 2  | psi1 | 1.00   |    |      |        |    |      |        |
| 10 | Quas. | 1  | Perm | 1.00   |    |      |        |    |      |        |    |      |        |
| 11 | Quas. | 1  | Perm | 1.00   | 2  | psi2 | 1.00   |    |      |        |    |      |        |
| 12 | Blij. | 1  | Perm | 1.00   |    |      |        |    |      |        |    |      |        |

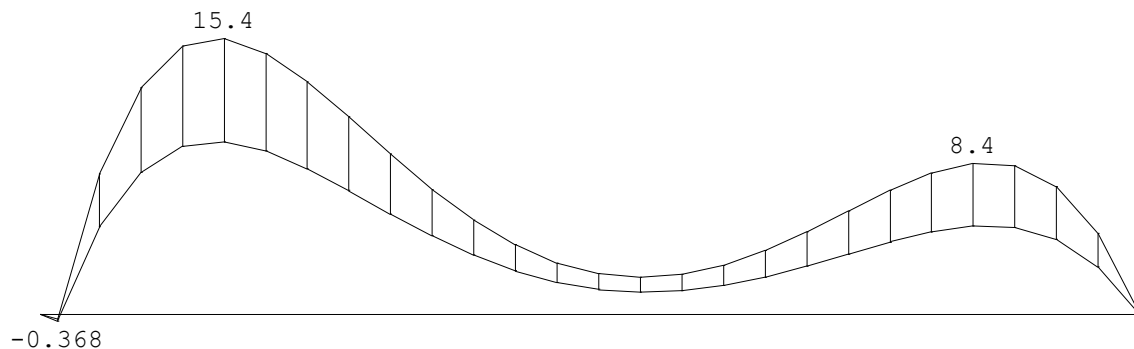
### GUNSTIGE WERKING PERMANENTE BELASTINGEN

| BC | Velden met gunstige werking |
|----|-----------------------------|
| 1  | Geen                        |
| 2  | Geen                        |
| 3  | Geen                        |
| 4  | Alle velden de factor:0.90  |
| 5  | Alle velden de factor:0.90  |
| 6  | Alle velden de factor:0.90  |

### OMHULLENDE VAN DE FUNDAMENTELE COMBINATIES

**MOMENTEN** Fysisch lineair

Ligger:1 Fundamentele combinatie

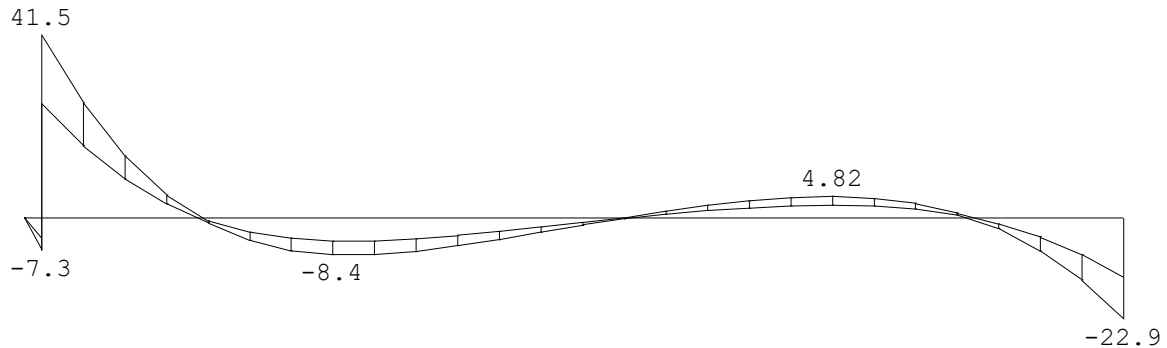


Project.....: 820.306

Onderdeel....: Begane grondvloer / funderingsplaat | snede 2

**DWARSKRACHTEN** Fysisch lineair

Ligger:1 Fundamentele combinatie



**TUSSENpunTEN** Fysisch lineair

Ligger:1 Fundamentele combinatie

| Veld | Pos.  | Grondspan. [kN/m <sup>2</sup> ] |        | Dwarskr |        | Moment |       |
|------|-------|---------------------------------|--------|---------|--------|--------|-------|
|      |       | min.                            | max.   | min.    | max.   | min.   | max.  |
| 1    | 0.000 | 53.608                          | 87.303 | 0.00    | 0.00   | 0.00   | 0.00  |
| 1    | 0.100 | 49.901                          | 81.381 | -7.33   | -4.59  | -0.37  | -0.23 |
| 1    | 0.100 | 49.901                          | 81.381 | 26.01   | 41.54  | -0.37  | -0.23 |
| 1    | 0.588 | 32.578                          | 53.702 | 8.82    | 14.07  | 7.93   | 12.66 |
| 1    | 1.077 | 18.894                          | 31.834 | -1.15   | -0.71  | 9.63   | 15.38 |
| 1    | 1.443 | 11.812                          | 20.508 | -6.35   | -3.97  | 8.63   | 13.77 |
| 1    | 1.810 | 6.846                           | 12.559 | -8.43   | -5.27  | 6.91   | 11.01 |
| 1    | 2.237 | 3.640                           | 7.410  | -7.80   | -4.89  | 4.69   | 7.47  |
| 1    | 2.664 | 2.140                           | 4.980  | -5.66   | -3.57  | 2.86   | 4.57  |
| 1    | 3.092 | 1.717                           | 4.270  | -2.89   | -1.87  | 1.69   | 2.72  |
| 1    | 3.519 | 1.951                           | 4.619  | -0.18   | -0.02  | 1.24   | 2.06  |
| 1    | 3.926 | 2.666                           | 5.769  | 1.31    | 2.33   | 1.51   | 2.58  |
| 1    | 4.333 | 3.897                           | 7.801  | 2.38    | 4.08   | 2.28   | 3.91  |
| 1    | 4.740 | 5.870                           | 11.101 | 2.84    | 4.82   | 3.36   | 5.75  |
| 1    | 5.107 | 8.713                           | 15.898 | 2.29    | 3.87   | 4.33   | 7.38  |
| 1    | 5.473 | 12.617                          | 22.506 | 0.64    | 1.07   | 4.94   | 8.42  |
| 1    | 5.962 | 19.999                          | 35.026 | -7.45   | -4.37  | 4.18   | 7.11  |
| 1    | 6.450 | 29.299                          | 50.808 | -22.95  | -13.50 | 0.00   | 0.00  |

**PROFIELGEGEVENS Vloer**

[N] [mm]

t.b.v. profiel:1 B\*H 1000\*180

**Algemeen**

Materiaal : C20/25  
Oppervlak : 1.800000e+05  
Staaftype : 0:normaal

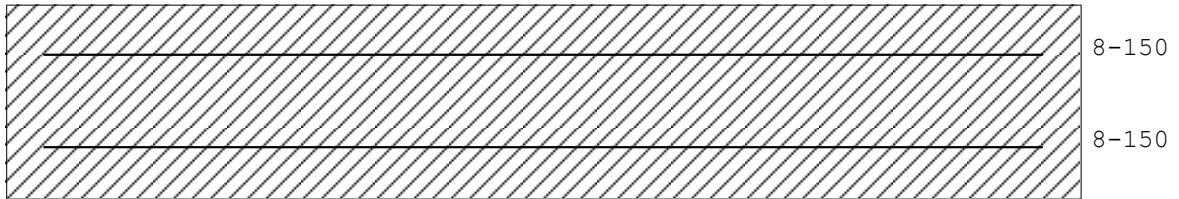
Traagheid : 4.8600e+08  
Vormfactor : 0.00

Project.....: 820.306

Onderdeel....: Begane grondvloer / funderingsplaat | snede 2

#### Doorsnede

breedte : 1000 hoogte : 180 zwaartepunt tov onderkant : 90  
Referentie : Boven



Fictieve dikte : 152.5  
Gedrongen inwendige hefboomsarm : Automatisch berekend  
Breedte lastvlak  $a_b$  6.1(10) : 0  
Betonkwaliteit element : C20/25 Kruipcoëf. : 3.010  
Treksterkte  $f_{ct,eff}$  art. 7.1(2) :  $f_{ctm,fl}$  ( 3.14 N/mm<sup>2</sup>)  
Soort spanningsrekdiagram : Parabolisch - rechthoekig diagram  
Doorbuiging volgens art.7.3.4(3) : Ja  
Langeduur scheurmoment begrensd : Ja  
Staalkwaliteit hoofdwapening : 500  $\epsilon_{uk}$  : 2.50  
Soort spanningsrekdiagram : Bi-lineair diagram met klimmende tak  
Geprefabriceerd element : Nee

#### Betondekking

|                                 |   |               |               |
|---------------------------------|---|---------------|---------------|
|                                 |   | Boven         | Onder         |
| Milieu                          | : | XC2           | XC3           |
| Gestort tegen bestaand beton    | : | Nee           | Nee           |
| Element met plaatgeometrie      | : | Ja            | Ja            |
| Specifieke kwaliteitsbeheersing | : | Nee           | Nee           |
| Oneffen beton oppervlak         | : | Nee           | Nee           |
| Ondergrond                      | : | Glad / N.v.t. | Glad / N.v.t. |
| Constructieklasse               | : | S3            | S3            |
| Grootste korrel                 | : | 31.5          |               |

|                                            |   |           |           |
|--------------------------------------------|---|-----------|-----------|
| Hoofdwapening                              | : | 1ste laag | 1ste laag |
| Nominale dekking                           | : | 25        | 25        |
| Toegepaste dekking                         | : | 35        | 35        |
| Gelijkwaardige diameter                    | : | 8         | 8         |
| $C_{min,b}$ $C_{min,dur}$ $\Delta C_{dur}$ | : | 8 20 0    | 8 20 0    |
| $C_{min}$ $\Delta C_{dev}$ $C_{nom}$       | : | 20 5 25   | 20 5 25   |
| Beugel / Verdeelwapening                   | : | 2de laag  | 2de laag  |
| Nominale dekking                           | : | 25        | 25        |
| Toegepaste dekking                         | : | 43        | 43        |
| Gelijkwaardige diameter                    | : | 6         | 6         |
| $C_{min,b}$ $C_{min,dur}$ $\Delta C_{dur}$ | : | 6 20 0    | 6 20 0    |
| $C_{min}$ $\Delta C_{dev}$ $C_{nom}$       | : | 20 5 25   | 20 5 25   |

Project.....: 820.306

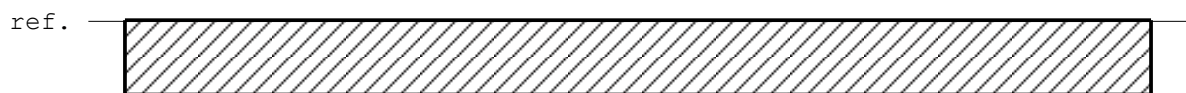
Onderdeel....: Begane grondvloer / funderingsplaat | snede 2

| Wapening                       |   | Boven       | Onder       |
|--------------------------------|---|-------------|-------------|
| Basiswapening                  | : | 8-150       | 8-150       |
| Hoofdwapening laag             | : | 1           | 1           |
| Automatisch verhogen basiswap. | : | Nee         | Nee         |
| Art. 7.3.2 minimum wapening    | : | Ja          | Ja          |
| Bijlegdiameters                | : | 8;10;12     | 8;10;12     |
| Diameter nuttige hoogte        | : | 8.0         | 8.0         |
| Diameter verdeelwapening       | : | 6.0         | 6.0         |
| Min.tussenruimte               | : | 50          | 50          |
| Aanhechting                    | : | Automatisch | Automatisch |

**Hoofdwapening** Fysisch lineair

Ligger:1 Fundamentele combinatie

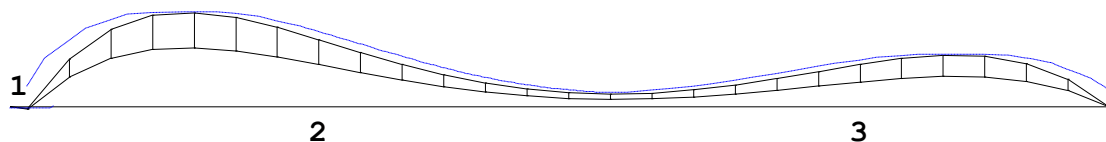
8-150 a



8-150 b

**MEd dekkingslijn** Fysisch lineair

Ligger:1 Fundamentele combinatie



**Hoofdwapening**

Ligger:1

| Geb. | Pos.<br>[mm] | $M_{Ed}$<br>[kNm] | $M_{Rd}$<br>[kNm] | z B/O<br>[mm] | $A_b$<br>[mm <sup>2</sup> ] | $A_a$<br>[mm <sup>2</sup> ] | Basiswapening<br>+Bijlegwapening | Opm. |
|------|--------------|-------------------|-------------------|---------------|-----------------------------|-----------------------------|----------------------------------|------|
| 1    | 100          | -0.37             | -23.11            | 84 Ond        | 160*                        | 336                         | 8-150                            | 54   |
| 2    | 1077         | 15.38             | 23.11             | 84 Bov        | 276*                        | 336                         | 8-150                            | 1    |

Opmerkingen

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

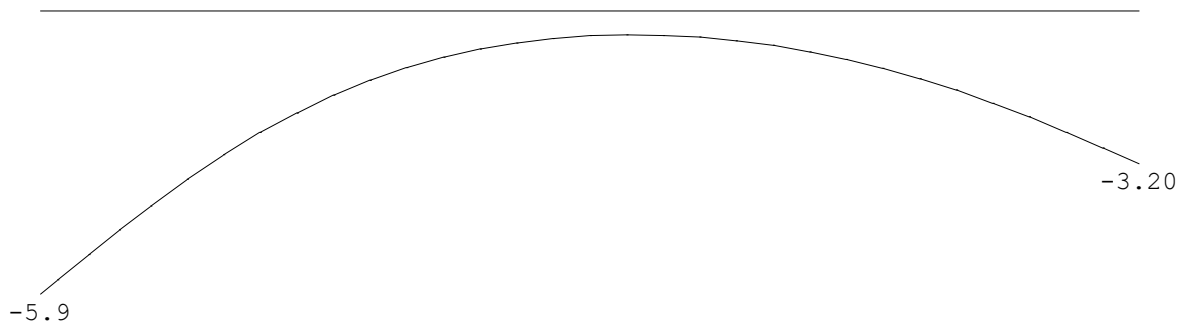
[54] \* = Eisen met betrekking tot minimum wapening ten behoeve van gecontroleerde scheurvorming zijn toegepast volgens art. 7.3.2.

Project.....: 820.306

Onderdeel.....: Begane grondvloer / funderingsplaat | snede 2

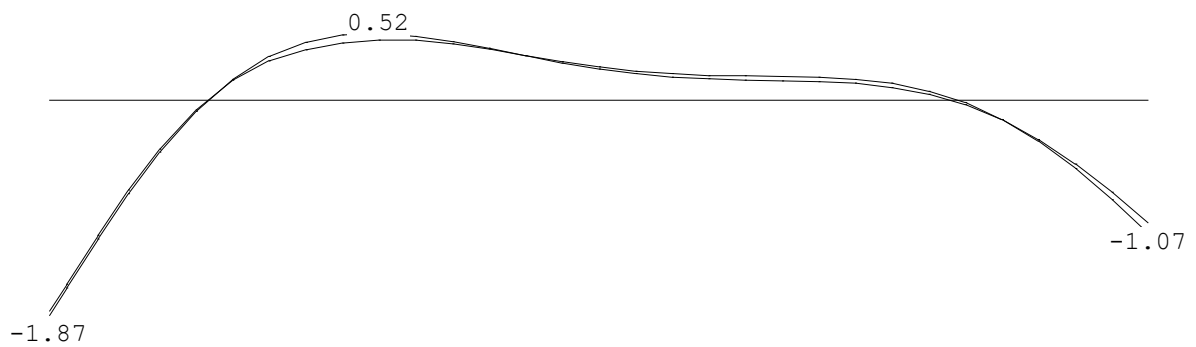
**DOORBUIGINGEN w1** [mm]

Ligger:1 Blijvende combinatie



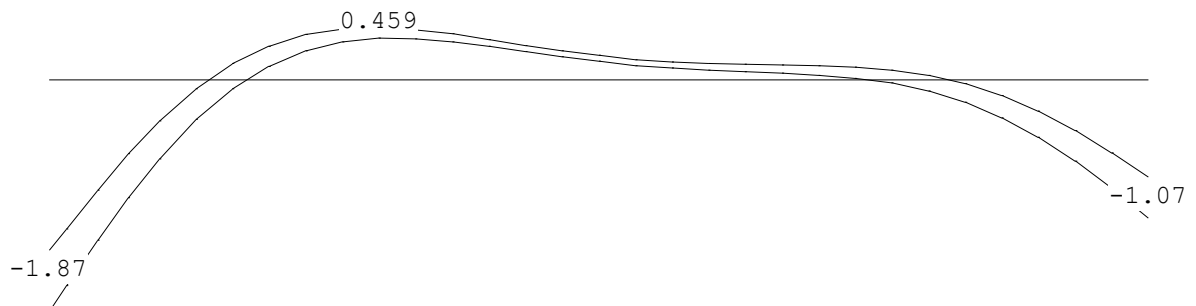
**DOORBUIGINGEN w2** [mm]

Ligger:1 Quasi-blijvende combinatie



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

Ligger:1 Quasi-blijvende combinatie

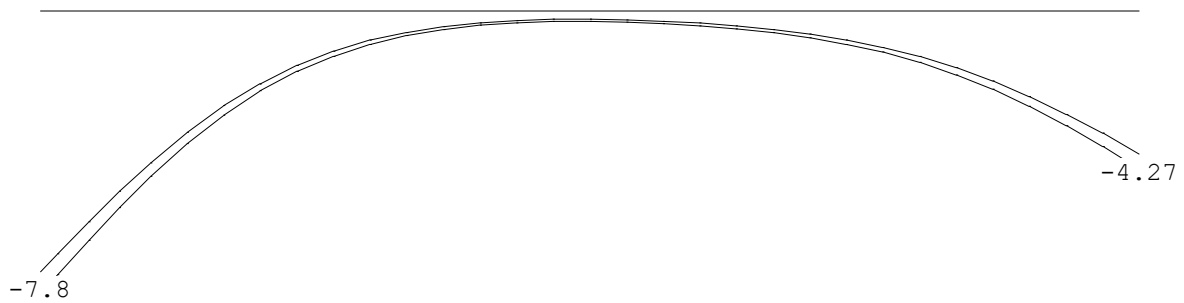


Project.....: 820.306

Onderdeel.....: Begane grondvloer / funderingsplaat | snede 2

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

Ligger:1 Quasi-blijvende combinatie



**DOORBUIGINGEN**

Quasi-blijvende combinatie

| Veld | Zijde | positie | $l_{rep}$ | $w_1$ | $w_2$ | -- $w_{bij}$ -- |         | $w_{tot}$ | $w_c$ | -- $w_{max}$ -- |         |
|------|-------|---------|-----------|-------|-------|-----------------|---------|-----------|-------|-----------------|---------|
|      |       | [m]     | [mm]      | [mm]  | [mm]  | [mm]            | [lrep/] | [mm]      | [mm]  | [mm]            | [lrep/] |
| 1    | Pos.  | 1.935   | 6450      | 3.7   | 2.2   | 2.7             | 2396    | 6.4       |       | 6.4             | 1015    |

**Begane grondvloer / funderingsplaat snede 3 | d= 180mm, wap. conform tekening F-01**

---

|                         |           |                                                                                          |
|-------------------------|-----------|------------------------------------------------------------------------------------------|
| Permanente belasting:   | Afwerking | : $q_g = 2 \text{ kN/m}^2 * 1.0 \text{ m} = 2 \text{ kN/m}$                              |
|                         | W6d       | : $P_g = 17 \text{ kN/m} * 1.0 \text{ m} = 17 \text{ kN}$                                |
|                         | W5a       | : $P_g = 11 \text{ kN/m} * 1.0 \text{ m} = 11 \text{ kN}$                                |
|                         | W8        | : $q_g = 11 \text{ kN/m}$                                                                |
|                         | W4        | : $P_g = 11 \text{ kN/m} * 1.0 \text{ m} = 11 \text{ kN}$                                |
|                         | W2a       | : $P_g = 13 \text{ kN/m} * 1.0 \text{ m} = 13 \text{ kN}$                                |
|                         | W1b       | : $P_g = 21 \text{ kN/m} * 1.0 \text{ m} = 21 \text{ kN}$                                |
| Veranderlijke belasting | Opgelegd  | : $q_q = (1.75 \text{ kN/m}^2 + 1.2 \text{ kN/m}^2) * 1.0 \text{ m} = 2.95 \text{ kN/m}$ |
|                         | W6d       | : $P_q = (3 \text{ kN/m} + 1 \text{ kN/m}) * 1.0 \text{ m} = 4 \text{ kN}$               |
|                         | W5a       | : $P_q = (4 \text{ kN/m} + 1 \text{ kN/m}) * 1.0 \text{ m} = 5 \text{ kN}$               |
|                         | W8        | : $q_q = (3 \text{ kN/m} + 1 \text{ kN/m}) = 4 \text{ kN/m}$                             |
|                         | W4        | : $P_q = (3 \text{ kN/m} + 1 \text{ kN/m}) * 1.0 \text{ m} = 4 \text{ kN}$               |
|                         | W2a       | : $P_q = (4 \text{ kN/m} + 1 \text{ kN/m}) * 1.0 \text{ m} = 5 \text{ kN}$               |
|                         | W1b       | : $P_q = (5 \text{ kN/m} + 1 \text{ kN/m}) * 1.0 \text{ m} = 6 \text{ kN}$               |
| Windbelasting           | W8        | : $P_q = +19 \text{ kN} / -8 \text{ kN}$                                                 |
|                         |           | : $P_q = +19 \text{ kN} / -8 \text{ kN}$                                                 |

Project.....: 820.306  
Onderdeel.....: Begane grondvloer / funderingsplaat | snede 3  
Constructeur.:   
Dimensies.....: kN/m/rad  
Datum.....: 24/11/2020  
Bestand.....: N:\10. GRIPWERKEN\Werken  
2020\820306\Berekening\tijd\TS\Begane grondvloer,  
funderingsplaat, snede 3.dlw

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

Fysisch lineair : Er is gerekend met de e-modulus uit de materiaaltabel.  
Fys.NLE.kort : Er is gerekend met een gecorrigeerde e-modulus (korte duur).  
Deze e-mod. is berekend mbv de krachten uit de fysisch lineair berekening.

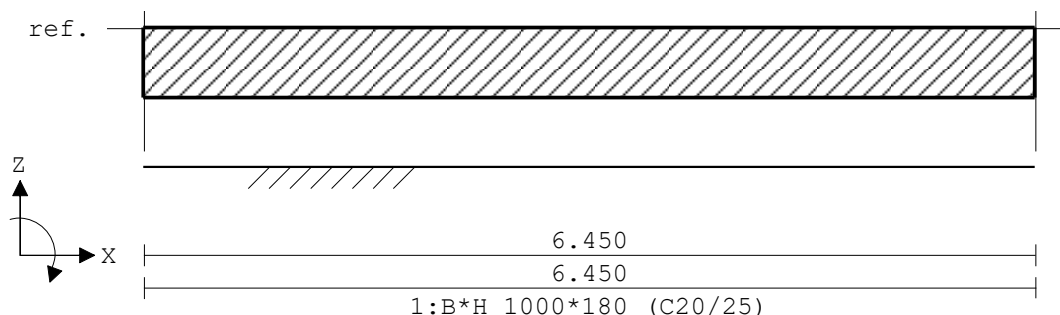
#### Toegepaste normen volgens Eurocode met Nederlandse NB

|             |                          |                |             |
|-------------|--------------------------|----------------|-------------|
| Belastingen | NEN-EN 1990:2002         | C2:2010        | NB:2011(nl) |
|             | NEN-EN 1991-1-1:2002     | C1:2009        | NB:2011(nl) |
| Beton       | NEN-EN 1992-1-1:2011(nl) | C2/A1:2015(nl) | NB:2016(nl) |



#### GEOMETRIE

Ligger:1



Project.....: 820.306

Onderdeel.....: Begane grondvloer / funderingsplaat | snede 3

#### VELDLENGTEN

Ligger:1

| Veld | Vanaf | Tot   | Lengte |
|------|-------|-------|--------|
| 1    | 0.000 | 6.450 | 6.450  |

#### MATERIALEN

| Mt | Omschrijving | E-modulus[N/mm <sup>2</sup> ] | S.G. | Pois. | Uitz. coëff |
|----|--------------|-------------------------------|------|-------|-------------|
| 1  | C20/25       | 7480                          | 25.0 | 0.20  | 1.0000e-05  |

#### MATERIALEN vervolg

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

#### PROFIELEN [mm]

| Prof. | Omschrijving | Materiaal | Oppervlak  | Traagheid  | Vormf. |
|-------|--------------|-----------|------------|------------|--------|
| 1     | B*H 1000*180 | 1:C20/25  | 1.8000e+05 | 4.8600e+08 | 0.00   |

#### PROFIELEN vervolg [mm]

| Prof. | Staaftype | Breedte | Hoogte | e    | Type | b1 | h1 | b2 | h2 |
|-------|-----------|---------|--------|------|------|----|----|----|----|
| 1     | 0:Normaal | 1000    | 180    | 90.0 | 0:RH |    |    |    |    |

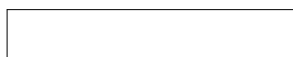
#### DOORSNEDEN

Ligger:1

| sector | Vanaf | Tot   | Lengte | Profiel begin  | z-begin | Profiel eind   | z-eind |
|--------|-------|-------|--------|----------------|---------|----------------|--------|
| 1      | 0.000 | 6.450 | 6.450  | 1:B*H 1000*180 | 0.000   | 1:B*H 1000*180 | 0.000  |
| sector | Vanaf | Tot   | Lengte | Eindcode       | Bedding | Br.[mm]        |        |
| 1      | 0.000 | 6.450 | 6.450  | 1:Vast         | 7500    | 1000           |        |

#### PROFIELVORMEN [mm]

1 B\*H 1000\*180



#### BELASTINGGEVALLEN

| B.G. | Omschrijving    | Belast/onbelast     | $\Psi_0$ | $\Psi_1$ | $\Psi_2$ | e.g.  |
|------|-----------------|---------------------|----------|----------|----------|-------|
| 1    | Permanent       | 2:Permanent EN1991  |          |          |          | -1.00 |
| 2    | Veranderlijk    | 1:Schaakbord EN1991 | 0.40     | 0.50     | 0.30     | 0.00  |
| 3    | Wind van links  | 1:Schaakbord EN1991 | 0.00     | 0.20     | 0.00     | 0.00  |
| 4    | Wind van rechts | 1:Schaakbord EN1991 | 0.00     | 0.20     | 0.00     | 0.00  |

#### BELASTINGGEVALLEN

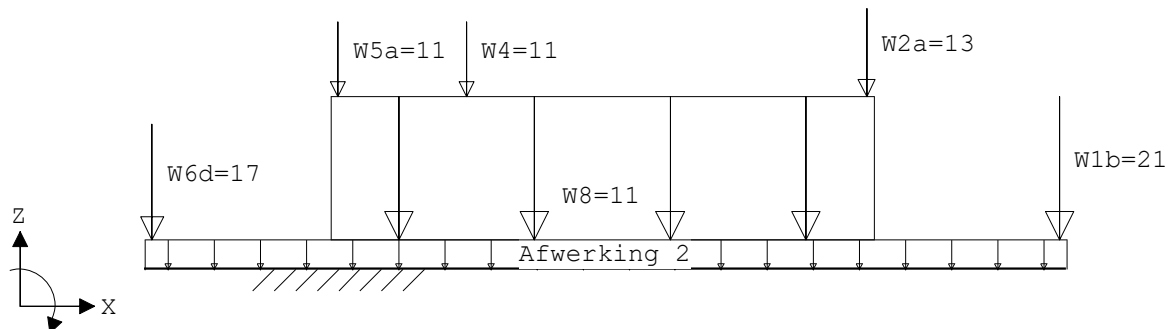
| B.G. | Omschrijving    | Type                           |
|------|-----------------|--------------------------------|
| 1    | Permanent       | 1 Permanente belasting         |
| 2    | Veranderlijk    | 2 Ver. bel. pers. ed. (p_rep)  |
| 3    | Wind van links  | 7 Wind van links onderdruk A   |
|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

Project.....: 820.306

Onderdeel.....: Begane grondvloer / funderingsplaat | snede 3

### VELDBELASTINGEN

Ligger:1 B.G:1 Permanent



### VELDBELASTINGEN

Ligger:1 B.G:1 Permanent

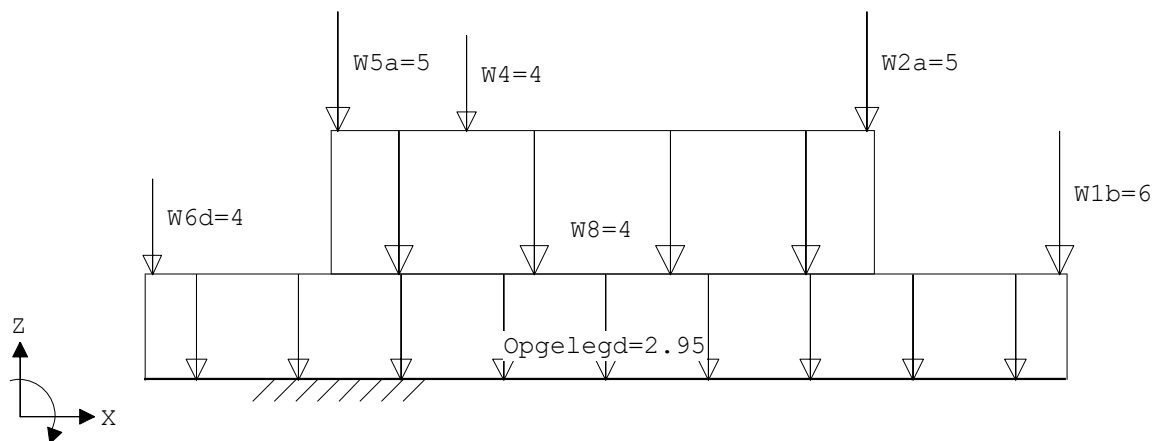
| Last Ref. | Type       | Omschrijving | q1/p/m  | q2      | psi | Afstand | Lengte |
|-----------|------------|--------------|---------|---------|-----|---------|--------|
| 1         | 1:q-last   | Afwerking    | -2.000  | -2.000  |     | 0.000   | 6.450  |
| 2         | 8:Puntlast | W6d          | -17.000 |         |     | 0.050   |        |
| 3         | 8:Puntlast | W5a          | -11.000 |         |     | 1.350   |        |
| 4         | 1:q-last   | W8           | -11.000 | -11.000 |     | 1.300   | 3.800  |
| 5         | 8:Puntlast | W4           | -11.000 |         |     | 2.250   |        |
| 6         | 8:Puntlast | W2a          | -13.000 |         |     | 5.050   |        |
| 7         | 8:Puntlast | W1b          | -21.000 |         |     | 6.400   |        |

0.00 : (absoluut) grootste som reacties

-156.72 : (absoluut) grootste som belastingen

### VELDBELASTINGEN

Ligger:1 B.G:2 Veranderlijk



Project.....: 820.306

Onderdeel.....: Begane grondvloer / funderingsplaat | snede 3

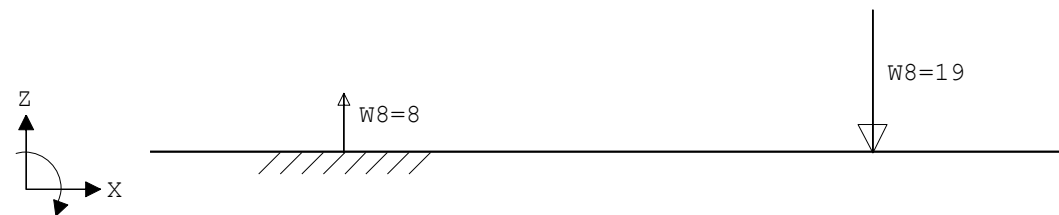
#### VELDBELASTINGEN

Ligger:1 B.G:2 Veranderlijk

| Last Ref. | Type       | Omschrijving | q1/p/m | q2     | psi | Afstand | Lengte |
|-----------|------------|--------------|--------|--------|-----|---------|--------|
| 1         | 1:q-last   | Opgelegd     | -2.950 | -2.950 |     | 0.000   | 0.000  |
| 2         | 8:Puntlast | W6d          | -4.000 |        |     | 0.050   |        |
| 3         | 8:Puntlast | W5a          | -5.000 |        |     | 1.350   |        |
| 4         | 1:q-last   | W8           | -4.000 | -4.000 |     | 1.300   | 3.800  |
| 5         | 8:Puntlast | W4           | -4.000 |        |     | 2.250   |        |
| 6         | 8:Puntlast | W2a          | -5.000 |        |     | 5.050   |        |
| 7         | 8:Puntlast | W1b          | -6.000 |        |     | 6.400   |        |

#### VELDBELASTINGEN

Ligger:1 B.G:3 Wind van links



#### VELDBELASTINGEN

Ligger:1 B.G:3 Wind van links

| Last Ref. | Type       | Omschrijving | q1/p/m  | q2 | psi | Afstand | Lengte |
|-----------|------------|--------------|---------|----|-----|---------|--------|
| 1         | 8:Puntlast | W8           | 8.000   |    |     | 1.350   |        |
| 2         | 8:Puntlast | W8           | -19.000 |    |     | 5.050   |        |

#### VELDBELASTINGEN

Ligger:1 B.G:4 Wind van rechts



#### VELDBELASTINGEN

Ligger:1 B.G:4 Wind van rechts

| Last Ref. | Type       | Omschrijving | q1/p/m  | q2 | psi | Afstand | Lengte |
|-----------|------------|--------------|---------|----|-----|---------|--------|
| 1         | 8:Puntlast | W8           | -19.000 |    |     | 1.350   |        |
| 2         | 8:Puntlast | W8           | 8.000   |    |     | 5.050   |        |

#### BELASTINGCOMBINATIES

| BC | Type  | BG | Gen. | Factor | BG | Gen. | Factor | BG | Gen. | Factor | BG | Gen. | Factor |
|----|-------|----|------|--------|----|------|--------|----|------|--------|----|------|--------|
| 1  | Fund. | 1  | Perm | 1.22   |    |      |        |    |      |        |    |      |        |
| 2  | Fund. | 1  | Perm | 1.22   | 2  | psi0 | 1.35   |    |      |        |    |      |        |
| 3  | Fund. | 1  | Perm | 1.08   | 2  | Extr | 1.35   |    |      |        |    |      |        |
| 4  | Fund. | 1  | Perm | 1.08   | 3  | Extr | 1.35   |    |      |        |    |      |        |
| 5  | Fund. | 1  | Perm | 1.08   | 3  | Extr | 1.35   | 2  | psi0 | 1.35   |    |      |        |
| 6  | Fund. | 1  | Perm | 1.08   | 4  | Extr | 1.35   |    |      |        |    |      |        |
| 7  | Fund. | 1  | Perm | 1.08   | 4  | Extr | 1.35   | 2  | psi0 | 1.35   |    |      |        |
| 8  | Fund. | 1  | Perm | 0.90   |    |      |        |    |      |        |    |      |        |

Project.....: 820.306

Onderdeel.....: Begane grondvloer / funderingsplaat | snede 3

### BELASTINGCOMBINATIES

| BC | Type  | BG | Gen. | Factor | BG | Gen. | Factor | BG | Gen. | Factor | BG | Gen. | Factor |
|----|-------|----|------|--------|----|------|--------|----|------|--------|----|------|--------|
| 9  | Fund. | 1  | Perm | 0.90   | 2  | psi0 | 1.35   |    |      |        |    |      |        |
| 10 | Fund. | 1  | Perm | 0.90   | 2  | Extr | 1.35   |    |      |        |    |      |        |
| 11 | Fund. | 1  | Perm | 0.90   | 3  | Extr | 1.35   |    |      |        |    |      |        |
| 12 | Fund. | 1  | Perm | 0.90   | 3  | Extr | 1.35   | 2  | psi0 | 1.35   |    |      |        |
| 13 | Fund. | 1  | Perm | 0.90   | 4  | Extr | 1.35   |    |      |        |    |      |        |
| 14 | Fund. | 1  | Perm | 0.90   | 4  | Extr | 1.35   | 2  | psi0 | 1.35   |    |      |        |
| 15 | Kar.  | 1  | Perm | 1.00   | 2  | Extr | 1.00   |    |      |        |    |      |        |
| 16 | Kar.  | 1  | Perm | 1.00   | 3  | Extr | 1.00   |    |      |        |    |      |        |
| 17 | Kar.  | 1  | Perm | 1.00   | 3  | Extr | 1.00   | 2  | psi0 | 1.00   |    |      |        |
| 18 | Kar.  | 1  | Perm | 1.00   | 4  | Extr | 1.00   |    |      |        |    |      |        |
| 19 | Kar.  | 1  | Perm | 1.00   | 4  | Extr | 1.00   | 2  | psi0 | 1.00   |    |      |        |
| 20 | Freq. | 1  | Perm | 1.00   |    |      |        |    |      |        |    |      |        |
| 21 | Freq. | 1  | Perm | 1.00   | 2  | psi1 | 1.00   |    |      |        |    |      |        |
| 22 | Freq. | 1  | Perm | 1.00   | 3  | psi1 | 1.00   |    |      |        |    |      |        |
| 23 | Freq. | 1  | Perm | 1.00   | 3  | psi1 | 1.00   | 2  | psi2 | 1.00   |    |      |        |
| 24 | Freq. | 1  | Perm | 1.00   | 4  | psi1 | 1.00   |    |      |        |    |      |        |
| 25 | Freq. | 1  | Perm | 1.00   | 4  | psi1 | 1.00   | 2  | psi2 | 1.00   |    |      |        |
| 26 | Quas. | 1  | Perm | 1.00   |    |      |        |    |      |        |    |      |        |
| 27 | Quas. | 1  | Perm | 1.00   | 2  | psi2 | 1.00   |    |      |        |    |      |        |
| 28 | Blij. | 1  | Perm | 1.00   |    |      |        |    |      |        |    |      |        |

### GUNSTIGE WERKING PERMANENTE BELASTINGEN

| BC | Velden met gunstige werking |
|----|-----------------------------|
| 1  | Geen                        |
| 2  | Geen                        |
| 3  | Geen                        |
| 4  | Geen                        |
| 5  | Geen                        |
| 6  | Geen                        |
| 7  | Geen                        |
| 8  | Alle velden de factor:0.90  |
| 9  | Alle velden de factor:0.90  |
| 10 | Alle velden de factor:0.90  |
| 11 | Alle velden de factor:0.90  |
| 12 | Alle velden de factor:0.90  |
| 13 | Alle velden de factor:0.90  |
| 14 | Alle velden de factor:0.90  |

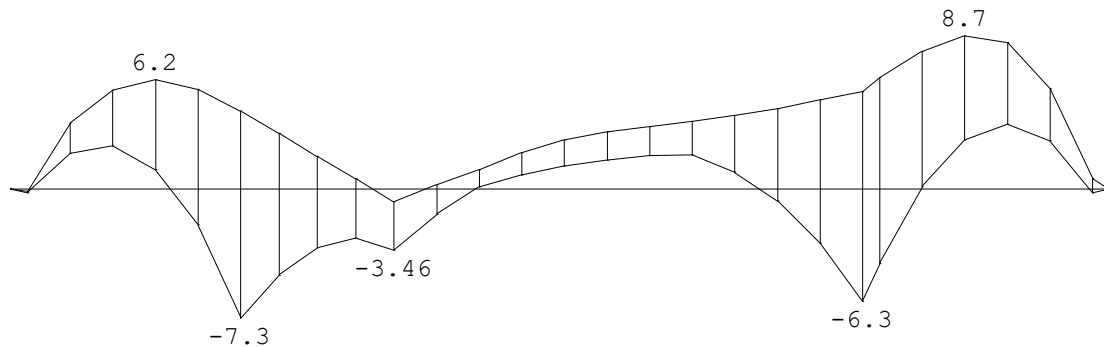
Project.....: 820.306

Onderdeel.....: Begane grondvloer / funderingsplaat | snede 3

## OMHULLENDE VAN DE FUNDAMENTELE COMBINATIES

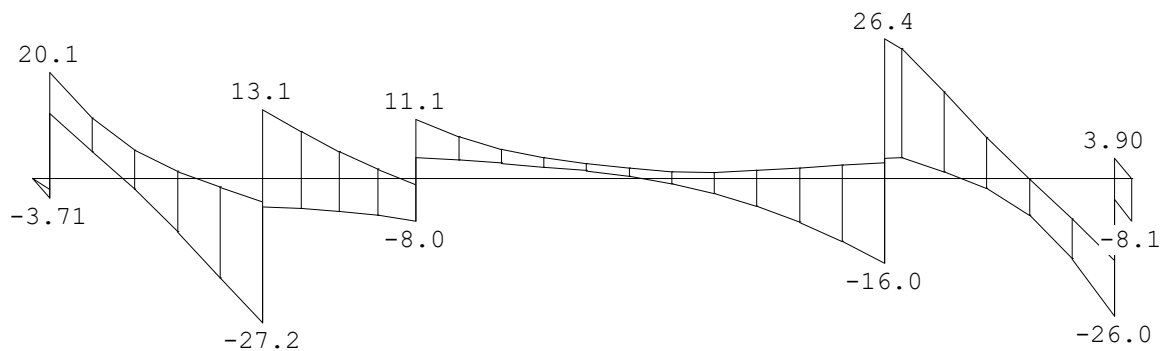
**MOMENTEN** Fysisch lineair

Ligger:1 Fundamentele combinatie



**DWARSKRACHTEN** Fysisch lineair

Ligger:1 Fundamentele combinatie



**TUSSENpunTEN** Fysisch lineair

Ligger:1 Fundamentele combinatie

| Veld | Pos.  | Grondspan. [kN/m2] |        | Dwarskr |       | Moment |       |
|------|-------|--------------------|--------|---------|-------|--------|-------|
|      |       | min.               | max.   | min.    | max.  | min.   | max.  |
| 1    | 0.000 | 26.812             | 48.161 | 0.00    | 0.00  | 0.00   | 0.00  |
| 1    | 0.100 | 25.664             | 47.023 | -3.75   | -2.04 | -0.19  | -0.10 |
| 1    | 0.100 | 25.664             | 47.023 | 12.36   | 20.10 | -0.19  | -0.10 |
| 1    | 0.600 | 20.368             | 43.873 | -1.94   | 5.37  | 2.44   | 5.59  |
| 1    | 0.850 | 18.426             | 43.491 | -10.06  | 1.36  | 1.07   | 6.18  |
| 1    | 1.100 | 17.125             | 43.371 | -18.76  | -1.61 | -2.04  | 5.65  |
| 1    | 1.350 | 16.461             | 43.049 | -27.21  | -4.33 | -7.30  | 4.40  |
| 1    | 1.350 | 16.461             | 43.049 | -5.29   | 13.08 | -7.30  | 4.40  |
| 1    | 1.688 | 16.422             | 41.432 | -5.92   | 6.97  | -4.07  | 2.51  |
| 1    | 2.025 | 16.896             | 38.960 | -6.92   | 1.78  | -2.75  | 0.60  |
| 1    | 2.250 | 17.338             | 37.100 | -8.00   | -1.12 | -3.46  | -0.70 |
| 1    | 2.250 | 17.338             | 37.100 | 3.98    | 11.13 | -3.46  | -0.70 |
| 1    | 2.688 | 18.152             | 35.059 | 3.08    | 6.08  | -0.25  | 0.89  |
| 1    | 3.125 | 18.168             | 32.945 | 1.85    | 3.47  | 1.05   | 2.43  |
| 1    | 3.562 | 16.704             | 31.494 | 0.05    | 1.81  | 1.70   | 3.31  |

Project.....: 820.306

Onderdeel.....: Begane grondvloer / funderingsplaat | snede 3

**TUSSENpunten** Fysisch lineair

Ligger:1 Fundamentele combinatie

| Veld | Pos.  | Grondspan. [kN/m <sup>2</sup> ] |        | Dwarskr |        | Moment |      |
|------|-------|---------------------------------|--------|---------|--------|--------|------|
|      |       | min.                            | max.   | min.    | max.   | min.   | max. |
| 1    | 4.000 | 14.596                          | 31.661 | -2.83   | 1.19   | 1.94   | 3.85 |
| 1    | 4.500 | 13.715                          | 36.033 | -8.23   | 2.03   | -0.67  | 4.56 |
| 1    | 5.000 | 14.817                          | 40.314 | -15.98  | 2.93   | -6.33  | 5.53 |
| 1    | 5.000 | 14.817                          | 40.314 | 3.83    | 26.41  | -6.33  | 5.53 |
| 1    | 5.100 | 15.328                          | 40.936 | 3.92    | 24.63  | -4.18  | 6.32 |
| 1    | 5.600 | 19.678                          | 43.857 | -1.78   | 7.77   | 2.79   | 8.66 |
| 1    | 5.850 | 23.018                          | 46.037 | -6.85   | -0.09  | 3.67   | 8.27 |
| 1    | 6.350 | 31.403                          | 57.465 | -26.01  | -15.57 | -0.20  | 0.60 |
| 1    | 6.350 | 31.403                          | 57.465 | -3.90   | 3.90   | -0.20  | 0.60 |
| 1    | 6.450 | 33.186                          | 59.961 | -8.10   | 0.00   | 0.00   | 0.00 |

**PROFIELGEGEVENS Vloer**

[N] [mm]

t.b.v. profiel:1 B\*H 1000\*180

**Algemeen**

Materiaal : C20/25

Oppervlak : 1.800000e+05

Staaftype : 0:normaal

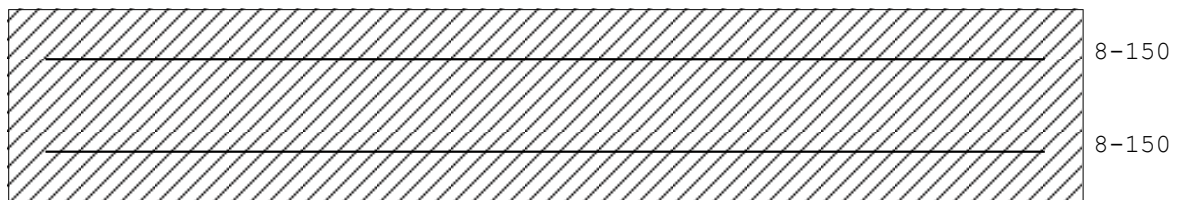
Traagheid : 4.8600e+08

Vormfactor : 0.00

**Doorsnede**

breedte : 1000 hoogte : 180 zwaartepunt tov onderkant : 90

Referentie : Boven



Fictieve dikte : 152.5

Gedrongen inwendige hefboomsarm : Automatisch berekend

Breedte lastvlak  $a_b$  6.1(10) : 0

Betonkwaliteit element : C20/25 Kruipcoëf. : 3.010

Treksterkte  $f_{ct,eff}$  art. 7.1(2) :  $f_{ctm,fl}$  ( 3.14 N/mm<sup>2</sup>)

Soort spanningsrekdiagram : Parabolisch - rechthoekig diagram

Doorbuiging volgens art.7.3.4(3) : Ja

Langeduur scheurmoment begrensd : Ja

Staalkwaliteit hoofdwapening : 500  $\epsilon_{uk}$  : 2.50

Soort spanningsrekdiagram : Bi-lineair diagram met klimmende tak

Geprefabriceerd element : Nee

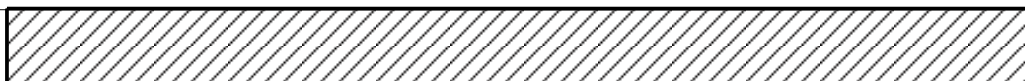
Project.....: 820.306

Onderdeel.....: Begane grondvloer / funderingsplaat | snede 3

| Betondekking                               |   | Boven                            |    |    | Onder         |    |    |
|--------------------------------------------|---|----------------------------------|----|----|---------------|----|----|
| Milieu                                     | : | XC2                              |    |    | XC3           |    |    |
| Gestort tegen bestaand beton               | : | Nee                              |    |    | Nee           |    |    |
| Element met plaatgeometrie                 | : | Ja                               |    |    | Ja            |    |    |
| Specifieke kwaliteitsbeheersing            | : | Nee                              |    |    | Nee           |    |    |
| Oneffen beton oppervlak                    | : | Nee                              |    |    | Nee           |    |    |
| Ondergrond                                 | : | Glad / N.v.t.                    |    |    | Glad / N.v.t. |    |    |
| Constructieklasse                          | : | S3                               |    |    | S3            |    |    |
| Grootste korrel                            | : | 31.5                             |    |    |               |    |    |
|                                            |   |                                  |    |    |               |    |    |
| Hoofdwapening                              | : | 1ste laag                        |    |    | 1ste laag     |    |    |
| Nominale dekking                           | : | 25                               |    |    | 25            |    |    |
| Toegepaste dekking                         | : | 35                               |    |    | 35            |    |    |
| Gelijkwaardige diameter                    | : | 8                                |    |    | 8             |    |    |
| $C_{min,b}$ $C_{min,dur}$ $\Delta C_{dur}$ | : | 8                                | 20 | 0  | 8             | 20 | 0  |
| $C_{min}$ $\Delta C_{dev}$ $C_{nom}$       | : | 20                               | 5  | 25 | 20            | 5  | 25 |
|                                            |   |                                  |    |    |               |    |    |
| Beugel / Verdeelwapening                   | : | 2de laag                         |    |    | 2de laag      |    |    |
| Nominale dekking                           | : | 25                               |    |    | 25            |    |    |
| Toegepaste dekking                         | : | 43                               |    |    | 43            |    |    |
| Gelijkwaardige diameter                    | : | 6                                |    |    | 6             |    |    |
| $C_{min,b}$ $C_{min,dur}$ $\Delta C_{dur}$ | : | 6                                | 20 | 0  | 6             | 20 | 0  |
| $C_{min}$ $\Delta C_{dev}$ $C_{nom}$       | : | 20                               | 5  | 25 | 20            | 5  | 25 |
|                                            |   |                                  |    |    |               |    |    |
| Wapening                                   |   | Boven                            |    |    | Onder         |    |    |
| Basiswapening                              | : | 8-150                            |    |    | 8-150         |    |    |
| Hoofdwapening laag                         | : | 1                                |    |    | 1             |    |    |
| Automatisch verhogen basiswap.             | : | Nee                              |    |    | Nee           |    |    |
| Art. 7.3.2 minimum wapening                | : | Ja                               |    |    | Ja            |    |    |
| Bijlegdiameters                            | : | 8;10;12                          |    |    | 8;10;12       |    |    |
| Diameter nuttige hoogte                    | : | 8.0                              |    |    | 8.0           |    |    |
| Diameter verdeelwapening                   | : | 6.0                              |    |    | 6.0           |    |    |
| Min.tussenruimte                           | : | 50                               |    |    | 50            |    |    |
| Aanhechting                                | : | Automatisch                      |    |    | Automatisch   |    |    |
|                                            |   |                                  |    |    |               |    |    |
| Hoofdwapening Fysisch lineair              |   | Ligger:1 Fundamentele combinatie |    |    |               |    |    |

8-150 a

ref.



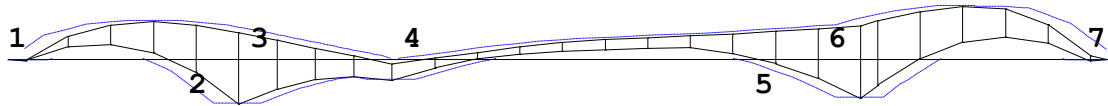
8-150 b

Project.....: 820.306

Onderdeel....: Begane grondvloer / funderingsplaat | snede 3

**MEd dekkingslijn** Fysisch lineair

Ligger:1 Fundamentele combinatie



### Hoofdwapening

Ligger:1

| Geb. | Pos.<br>[mm] | $M_{Ed}$<br>[kNm] | $M_{Rd}$<br>[kNm] | z B/O<br>[mm] | $A_b$<br>[mm <sup>2</sup> ] | $A_a$<br>[mm <sup>2</sup> ] | Basiswapening<br>+Bijlegwapening | Opm. |
|------|--------------|-------------------|-------------------|---------------|-----------------------------|-----------------------------|----------------------------------|------|
| 3    | 1350         | -7.30             | -23.11            | 84 Ond        | 160*                        | 336                         | 8-150                            | 54   |
| 5    | 5600         | 8.66              | 23.11             | 84 Bov        | 174*                        | 336                         | 8-150                            |      |

1,54

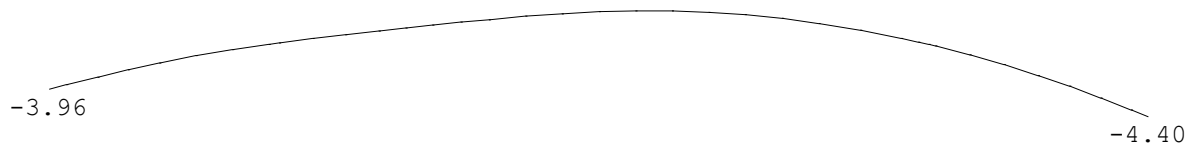
### Opmerkingen

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

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

**DOORBUIGINGEN w1** [mm]

Ligger:1 Blijvende combinatie

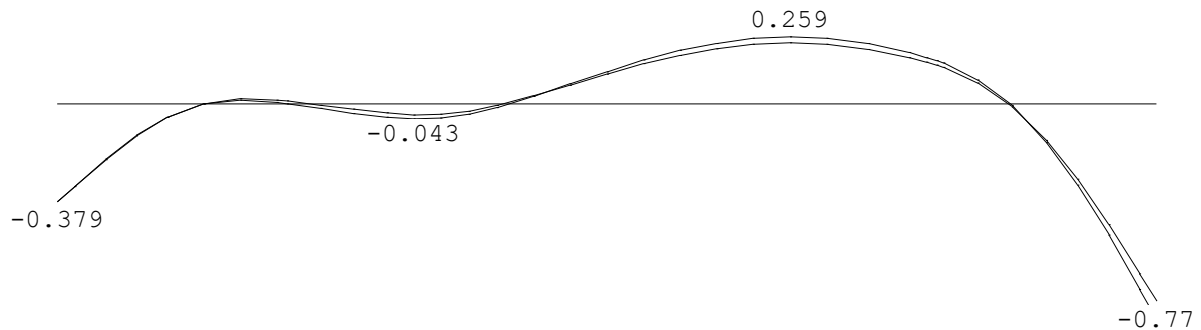


Project.....: 820.306

Onderdeel.....: Begane grondvloer / funderingsplaat | snede 3

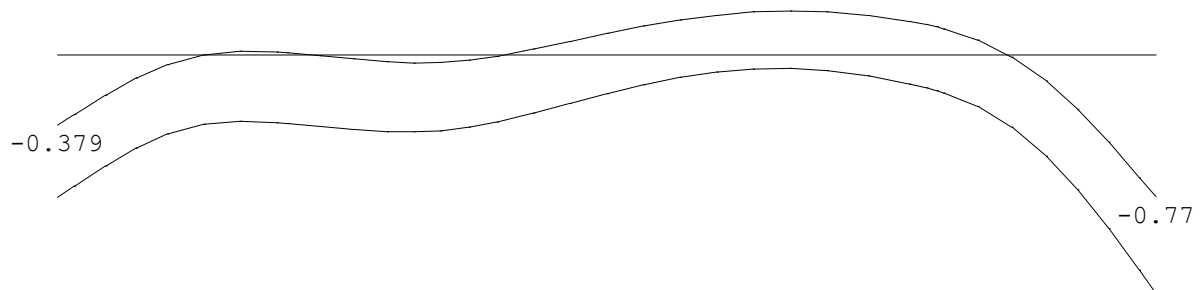
**DOORBUIGINGEN w2** [mm]

Ligger:1 Quasi-blijvende combinatie



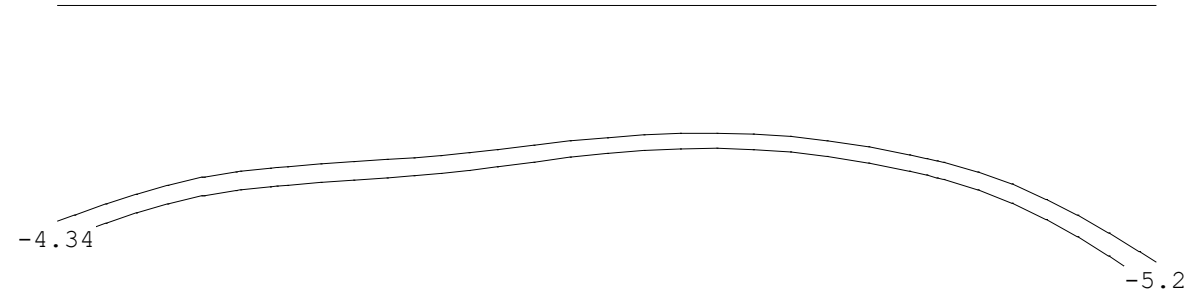
**DOORBUIGINGEN w<sub>bij</sub>** [mm]

Ligger:1 Quasi-blijvende combinatie



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

Ligger:1 Quasi-blijvende combinatie



**DOORBUIGINGEN**

Quasi-blijvende combinatie

| Veld | Zijde | positie | $l_{rep}$ | $w_1$ | $w_2$ | -- $w_{bij}$ -- | $w_{tot}$ | $w_c$ | -- $w_{max}$ -- |
|------|-------|---------|-----------|-------|-------|-----------------|-----------|-------|-----------------|
|      |       | [m]     | [mm]      | [mm]  | [mm]  | [mm] [lrep/]    | [mm]      | [mm]  | [mm] [lrep/]    |
| 1    | Pos.  | 4.300   | 6450      | 1.4   | 0.9   | 1.0 6205        | 2.4       |       | 2.4 2667        |

**Vorstrand pos. V1 (rondom) | 350\*600mm, wap. conform tekening F-01**

---

|                         |      |                                                              |
|-------------------------|------|--------------------------------------------------------------|
| Permanente belasting:   | W7a  | : $q_g = 27 \text{ kN/m}$                                    |
|                         | W7b  | : $q_g = 30 \text{ kN/m}$                                    |
|                         | W6a  | : $q_g = 17 \text{ kN/m}$                                    |
|                         | W6b  | : $q_g = 34 \text{ kN/m}$                                    |
|                         | W6c  | : $q_g = 26 \text{ kN/m}$                                    |
|                         | W6d  | : $q_g = 17 \text{ kN/m}$                                    |
|                         | W6e  | : $q_g = 13 \text{ kN/m}$                                    |
|                         | W11c | : $q_g = 20 \text{ kN/m}$                                    |
|                         | W11b | : $q_g = 24 \text{ kN/m}$                                    |
|                         | W11a | : $q_g = 19 \text{ kN/m}$                                    |
| Veranderlijke belasting | W7a  | : $q_q = (1 \text{ kN/m} + 2 \text{ kN/m}) = 3 \text{ kN/m}$ |
|                         | W7b  | : $q_q = (2 \text{ kN/m} + 1 \text{ kN/m}) = 3 \text{ kN/m}$ |
|                         | W6a  | : $q_q = (1 \text{ kN/m} + 1 \text{ kN/m}) = 2 \text{ kN/m}$ |
|                         | W6b  | : $q_q = (7 \text{ kN/m} + 2 \text{ kN/m}) = 9 \text{ kN/m}$ |
|                         | W6c  | : $q_q = (8 \text{ kN/m} + 1 \text{ kN/m}) = 9 \text{ kN/m}$ |
|                         | W6d  | : $q_q = (3 \text{ kN/m} + 1 \text{ kN/m}) = 4 \text{ kN/m}$ |
|                         | W6e  | : $q_q = (4 \text{ kN/m} + 1 \text{ kN/m}) = 5 \text{ kN/m}$ |
|                         | W11c | : $q_q = (2 \text{ kN/m} + 2 \text{ kN/m}) = 4 \text{ kN/m}$ |
|                         | W11b | : $q_q = (4 \text{ kN/m} + 2 \text{ kN/m}) = 6 \text{ kN/m}$ |
|                         | W11a | : $q_q = (2 \text{ kN/m} + 1 \text{ kN/m}) = 3 \text{ kN/m}$ |
| Windbelasting           | W7a  | : $P_q = -11 \text{ kN} / +11 \text{ kN}$                    |
|                         |      | : $P_q = +11 \text{ kN} / -11 \text{ kN}$                    |
|                         | W7b  | : $P_q = -11 \text{ kN} / +11 \text{ kN}$                    |
|                         |      | : $P_q = +11 \text{ kN} / -11 \text{ kN}$                    |
|                         | W6a  | : $P_q = -2 \text{ kN} / +2 \text{ kN}$                      |
|                         |      | : $P_q = +2 \text{ kN} / -2 \text{ kN}$                      |
|                         | W6b  | : $P_q = -3 \text{ kN} / +3 \text{ kN}$                      |
|                         |      | : $P_q = +3 \text{ kN} / -3 \text{ kN}$                      |
|                         | W6c  | : $P_q = -2 \text{ kN} / +2 \text{ kN}$                      |
|                         |      | : $P_q = +2 \text{ kN} / -2 \text{ kN}$                      |
|                         | W6d  | : $P_q = -2 \text{ kN} / +2 \text{ kN}$                      |
|                         |      | : $P_q = +2 \text{ kN} / -2 \text{ kN}$                      |
|                         | W6e  | : $P_q = -2 \text{ kN} / +2 \text{ kN}$                      |
|                         |      | : $P_q = +2 \text{ kN} / -2 \text{ kN}$                      |
|                         | W11c | : $P_q = -4 \text{ kN} / +5 \text{ kN}$                      |
|                         |      | : $P_q = +5 \text{ kN} / -4 \text{ kN}$                      |
|                         | W11b | : $P_q = -9 \text{ kN} / +10 \text{ kN}$                     |
|                         |      | : $P_q = +9 \text{ kN} / -8 \text{ kN}$                      |
|                         | W11a | : $P_q = -4 \text{ kN} / +7 \text{ kN}$                      |
|                         |      | : $P_q = -4 \text{ kN} / +7 \text{ kN}$                      |

Project.....: 820.306  
Onderdeel.....: vorstrand pos. V1  
Constructeur.:   
Dimensies.....: kN/m/rad  
Datum.....: 25/11/2020  
Bestand.....: N:\10. GRIPWERKEN\Werken  
2020\820306\Berekening\tijd\TS\Vorstrand pos. V1.dlw

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

Fysisch lineair : Er is gerekend met de e-modulus uit de materiaaltabel.  
Fys.NLE.kort : Er is gerekend met een gecorrigeerde e-modulus (korte duur).  
Deze e-mod. is berekend mbv de krachten uit de fysisch lineair berekening.

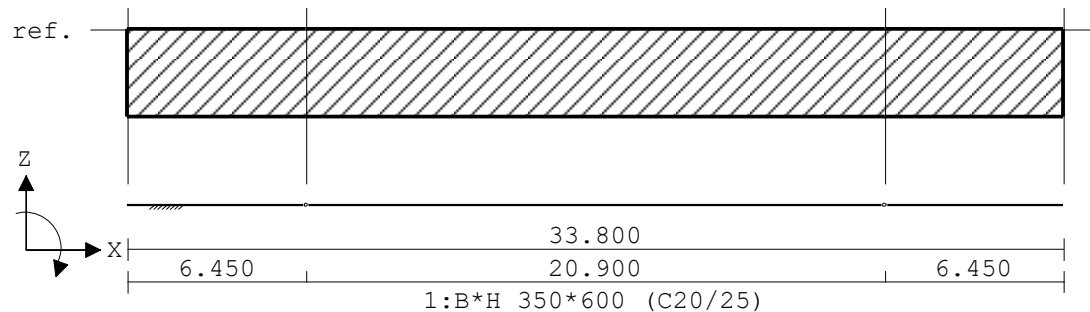
### Toegepaste normen volgens Eurocode met Nederlandse NB

|             |                          |                |             |
|-------------|--------------------------|----------------|-------------|
| Belastingen | NEN-EN 1990:2002         | C2:2010        | NB:2011(nl) |
|             | NEN-EN 1991-1-1:2002     | C1:2009        | NB:2011(nl) |
| Beton       | NEN-EN 1992-1-1:2011(nl) | C2/A1:2015(nl) | NB:2016(nl) |



### GEOMETRIE

Ligger:1



Project.....: 820.306  
Onderdeel.....: vorstrand pos. V1

#### VELDLENGTEN

Ligger:1

| Veld | Vanaf | Tot    | Lengte |
|------|-------|--------|--------|
| 1    | 0.000 | 33.800 | 33.800 |

#### MATERIALEN

| Mt | Omschrijving | E-modulus[N/mm <sup>2</sup> ] | S.G. | Pois. | Uitz. coëff |
|----|--------------|-------------------------------|------|-------|-------------|
| 1  | C20/25       | 7480                          | 25.0 | 0.20  | 1.0000e-05  |

#### MATERIALEN vervolg

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

#### PROFIELEN [mm]

| Prof. | Omschrijving | Materiaal | Oppervlak  | Traagheid  | Vormf. |
|-------|--------------|-----------|------------|------------|--------|
| 1     | B*H 350*600  | 1:C20/25  | 2.1000e+05 | 6.3000e+09 | 0.00   |

#### PROFIELEN vervolg [mm]

| Prof. | Staaftype | Breedte | Hoogte | e     | Type | b1 | h1 | b2 | h2 |
|-------|-----------|---------|--------|-------|------|----|----|----|----|
| 1     | 0:Normaal | 350     | 600    | 300.0 | 0:RH |    |    |    |    |

#### DOORSNEDEN

Ligger:1

| sector | Vanaf  | Tot    | Lengte | Profiel begin | z-begin | Profiel eind  | z-eind |
|--------|--------|--------|--------|---------------|---------|---------------|--------|
| 1      | 0.000  | 6.450  | 6.450  | 1:B*H 350*600 | 0.000   | 1:B*H 350*600 | 0.000  |
| 2      | 6.450  | 27.350 | 20.900 | 1:B*H 350*600 | 0.000   | 1:B*H 350*600 | 0.000  |
| 3      | 27.350 | 33.800 | 6.450  | 1:B*H 350*600 | 0.000   | 1:B*H 350*600 | 0.000  |
| sector | Vanaf  | Tot    | Lengte | Eindcode      | Bedding | Br.[mm]       |        |
| 1      | 0.000  | 6.450  | 6.450  | 0:Scharnier   | 7500    | 350           |        |
| 2      | 6.450  | 27.350 | 20.900 | 0:Scharnier   | 7500    | 350           |        |
| 3      | 27.350 | 33.800 | 6.450  | 1:Vast        | 7500    | 350           |        |

#### PROFIELVORMEN [mm]

|   |             |
|---|-------------|
| 1 | B*H 350*600 |
|---|-------------|



#### BELASTINGGEVALLEN

| B.G. | Omschrijving         | Belast/onbelast     | ψ <sub>0</sub> | ψ <sub>1</sub> | ψ <sub>2</sub> | e.g.  |
|------|----------------------|---------------------|----------------|----------------|----------------|-------|
| 1    | Permanent            | 2:Permanent EN1991  |                |                |                | -1.00 |
| 2    | Veranderlijk         | 1:Schaakbord EN1991 | 0.40           | 0.50           | 0.30           | 0.00  |
| 3    | Wind van links dwars | 1:Schaakbord EN1991 | 0.00           | 0.20           | 0.00           | 0.00  |
| 4    | Wind van rechts dwar | 1:Schaakbord EN1991 | 0.00           | 0.20           | 0.00           | 0.00  |
| 5    | Wind van links langs | 1:Schaakbord EN1991 | 0.00           | 0.20           | 0.00           | 0.00  |
| 6    | Wind van rechts lang | 1:Schaakbord EN1991 | 0.00           | 0.20           | 0.00           | 0.00  |

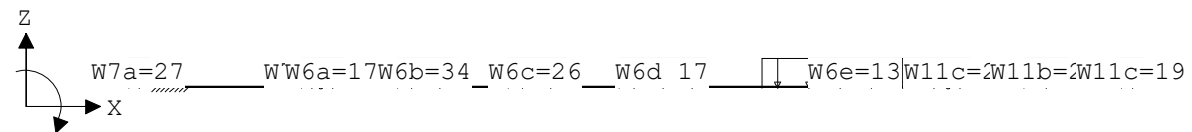
Project.....: 820.306  
Onderdeel....: vorstrand pos. V1

### BELASTINGGEVALLEN

| B.G. | Omschrijving                  | Type                           |
|------|-------------------------------|--------------------------------|
| 1    | Permanent                     | 1 Permanente belasting         |
| 2    | Veranderlijk                  | 2 Ver. bel. pers. ed. (p_rep)  |
| 3    | Wind van links dwarsrichting  | 7 Wind van links onderdruk A   |
| 4    | Wind van rechts dwarsrichting | 11 Wind van rechts onderdruk A |
| 5    | Wind van links langsrichting  | 8 Wind van links overdruk A    |
| 6    | Wind van rechts langsrichting | 12 Wind van rechts overdruk A  |

### VELDBELASTINGEN

Ligger:1 B.G:1 Permanent



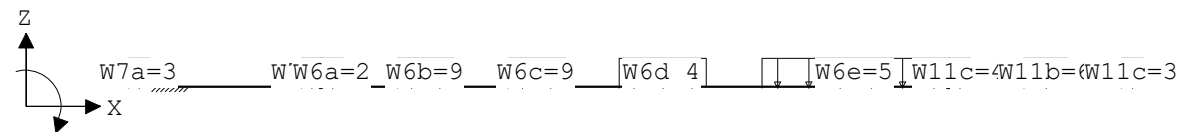
### VELDBELASTINGEN

Ligger:1 B.G:1 Permanent

| Last Ref. | Type     | Omschrijving | q1/p/m                              | q2      | psi | Afstand | Lengte |
|-----------|----------|--------------|-------------------------------------|---------|-----|---------|--------|
| 1         | 1:q-last | W7a          | -27.000                             | -27.000 |     | 0.000   | 0.700  |
| 2         | 1:q-last | W7b          | -30.000                             | -30.000 |     | 5.750   | 0.700  |
| 3         | 1:q-last | W6a          | -17.000                             | -17.000 |     | 6.450   | 0.700  |
| 4         | 1:q-last | W6b          | -34.000                             | -34.000 |     | 8.950   | 1.900  |
| 5         | 1:q-last | W6c          | -26.000                             | -26.000 |     | 12.650  | 1.900  |
| 6         | 1:q-last | W6d          | -17.000                             | -17.000 |     | 16.350  | 2.900  |
| 7         | 1:q-last | W6e          | -13.000                             | -13.000 |     | 21.100  | 6.250  |
| 8         | 1:q-last | W11c         | -20.000                             | -20.000 |     | 27.350  | 0.700  |
| 9         | 1:q-last | W11b         | -24.000                             | -24.000 |     | 29.850  | 1.450  |
| 10        | 1:q-last | W11c         | -19.000                             | -19.000 |     | 33.100  | 0.700  |
| 0.00 :    |          |              | (absoluut) grootste som reacties    |         |     |         |        |
| -535.90 : |          |              | (absoluut) grootste som belastingen |         |     |         |        |

### VELDBELASTINGEN

Ligger:1 B.G:2 Veranderlijk



### VELDBELASTINGEN

Ligger:1 B.G:2 Veranderlijk

| Last Ref. | Type     | Omschrijving | q1/p/m | q2     | psi | Afstand | Lengte |
|-----------|----------|--------------|--------|--------|-----|---------|--------|
| 1         | 1:q-last | W7a          | -3.000 | -3.000 |     | 0.000   | 0.700  |
| 2         | 1:q-last | W7b          | -3.000 | -3.000 |     | 5.750   | 0.700  |
| 3         | 1:q-last | W6a          | -2.000 | -2.000 |     | 6.450   | 0.700  |
| 4         | 1:q-last | W6b          | -9.000 | -9.000 |     | 8.950   | 1.900  |
| 5         | 1:q-last | W6c          | -9.000 | -9.000 |     | 12.650  | 1.900  |
| 6         | 1:q-last | W6d          | -4.000 | -4.000 |     | 16.350  | 2.900  |
| 7         | 1:q-last | W6e          | -5.000 | -5.000 |     | 21.100  | 6.250  |
| 8         | 1:q-last | W11c         | -4.000 | -4.000 |     | 27.350  | 0.700  |

Project.....: 820.306  
Onderdeel.....: vorstrand pos. V1

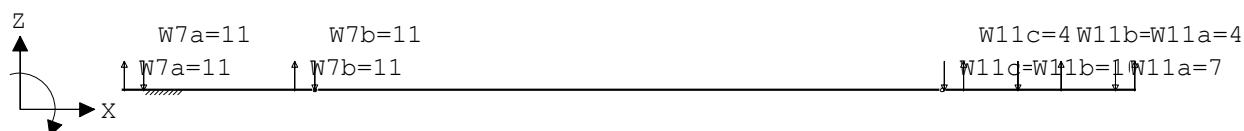
### VELDBELASTINGEN

Ligger:1 B.G:2 Veranderlijk

| Last Ref. | Type     | Omschrijving | q1/p/m | q2     | psi | Afstand | Lengte |
|-----------|----------|--------------|--------|--------|-----|---------|--------|
| 9         | 1:q-last | W11b         | -6.000 | -6.000 |     | 29.850  | 1.450  |
| 10        | 1:q-last | W11c         | -3.000 | -3.000 |     | 33.100  | 0.700  |

### VELDBELASTINGEN

Ligger:1 B.G:3 Wind van links dwarsrichting



### VELDBELASTINGEN

Ligger:1 B.G:3 Wind van links dwarsrichting

| Last Ref. | Type       | Omschrijving | q1/p/m  | q2 | psi | Afstand | Lengte |
|-----------|------------|--------------|---------|----|-----|---------|--------|
| 1         | 8:Puntlast | W7a          | 11.000  |    |     | 0.050   |        |
| 2         | 8:Puntlast | W7a          | -11.000 |    |     | 0.700   |        |
| 3         | 8:Puntlast | W7b          | 11.000  |    |     | 5.750   |        |
| 4         | 8:Puntlast | W7b          | -11.000 |    |     | 6.400   |        |
| 5         | 8:Puntlast | W11c         | -5.000  |    |     | 27.400  |        |
| 6         | 8:Puntlast | W11c         | 4.000   |    |     | 28.050  |        |
| 7         | 8:Puntlast | W11b         | -10.000 |    |     | 29.850  |        |
| 8         | 8:Puntlast | W11b         | 8.000   |    |     | 31.300  |        |
| 9         | 8:Puntlast | W11a         | 4.000   |    |     | 33.750  |        |
| 10        | 8:Puntlast | W11a         | -7.000  |    |     | 33.100  |        |

### VELDBELASTINGEN

Ligger:1 B.G:4 Wind van rechts dwarsrichting



### VELDBELASTINGEN

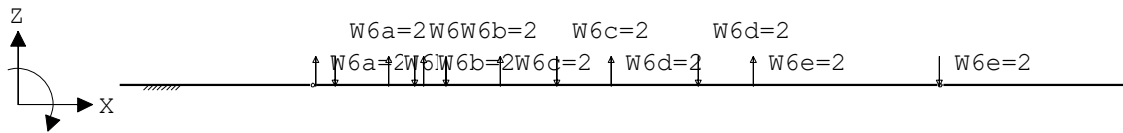
Ligger:1 B.G:4 Wind van rechts dwarsrichting

| Last Ref. | Type       | Omschrijving | q1/p/m  | q2 | psi | Afstand | Lengte |
|-----------|------------|--------------|---------|----|-----|---------|--------|
| 1         | 8:Puntlast | W7a          | -11.000 |    |     | 0.050   |        |
| 2         | 8:Puntlast | W7a          | 11.000  |    |     | 0.700   |        |
| 3         | 8:Puntlast | W7b          | -11.000 |    |     | 5.750   |        |
| 4         | 8:Puntlast | W7b          | 11.000  |    |     | 6.400   |        |
| 5         | 8:Puntlast | W11c         | 4.000   |    |     | 27.400  |        |
| 6         | 8:Puntlast | W11c         | -5.000  |    |     | 28.050  |        |
| 7         | 8:Puntlast | W11b         | 9.000   |    |     | 29.850  |        |
| 8         | 8:Puntlast | W11b         | -9.000  |    |     | 31.300  |        |
| 9         | 8:Puntlast | W11a         | -7.000  |    |     | 33.750  |        |
| 10        | 8:Puntlast | W11a         | 4.000   |    |     | 33.100  |        |

Project.....: 820.306  
Onderdeel.....: vorstrand pos. V1

### VELDBELASTINGEN

Ligger:1 B.G:5 Wind van links langsrichting



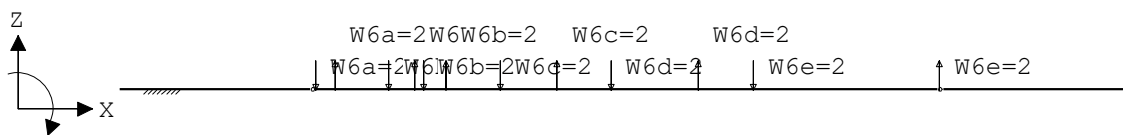
### VELDBELASTINGEN

Ligger:1 B.G:5 Wind van links langsrichting

| Last Ref. | Type       | Omschrijving | q1/p/m | q2 psi | Afstand | Lengte |
|-----------|------------|--------------|--------|--------|---------|--------|
| 1         | 8:Puntlast | W6a          | 2.000  |        | 6.500   |        |
| 2         | 8:Puntlast | W6a          | -2.000 |        | 7.150   |        |
| 3         | 8:Puntlast | W6b          | 3.000  |        | 8.950   |        |
| 4         | 8:Puntlast | W6b          | -2.000 |        | 10.850  |        |
| 5         | 8:Puntlast | W6c          | 2.000  |        | 12.650  |        |
| 6         | 8:Puntlast | W6c          | -2.000 |        | 14.550  |        |
| 7         | 8:Puntlast | W6d          | 2.000  |        | 16.350  |        |
| 8         | 8:Puntlast | W6d          | -2.000 |        | 19.250  |        |
| 9         | 8:Puntlast | W6e          | 2.000  |        | 21.100  |        |
| 10        | 8:Puntlast | W6e          | -2.000 |        | 27.300  |        |
| 11        | 8:Puntlast | W6b          | -3.000 |        | 9.800   |        |
| 12        | 8:Puntlast | W6b          | 2.000  |        | 10.100  |        |

### VELDBELASTINGEN

Ligger:1 B.G:6 Wind van rechts langsrichting



### VELDBELASTINGEN

Ligger:1 B.G:6 Wind van rechts langsrichting

| Last Ref. | Type       | Omschrijving | q1/p/m | q2 psi | Afstand | Lengte |
|-----------|------------|--------------|--------|--------|---------|--------|
| 1         | 8:Puntlast | W6a          | -2.000 |        | 6.500   |        |
| 2         | 8:Puntlast | W6a          | 2.000  |        | 7.150   |        |
| 3         | 8:Puntlast | W6b          | -3.000 |        | 8.950   |        |
| 4         | 8:Puntlast | W6b          | 2.000  |        | 10.850  |        |
| 5         | 8:Puntlast | W6c          | -2.000 |        | 12.650  |        |
| 6         | 8:Puntlast | W6c          | 2.000  |        | 14.550  |        |
| 7         | 8:Puntlast | W6d          | -2.000 |        | 16.350  |        |
| 8         | 8:Puntlast | W6d          | 2.000  |        | 19.250  |        |
| 9         | 8:Puntlast | W6e          | -2.000 |        | 21.100  |        |
| 10        | 8:Puntlast | W6e          | 2.000  |        | 27.300  |        |
| 11        | 8:Puntlast | W6b          | 3.000  |        | 9.800   |        |
| 12        | 8:Puntlast | W6b          | -2.000 |        | 10.100  |        |

Project.....: 820.306  
Onderdeel.....: vorstrand pos. V1

### BELASTINGCOMBINATIES

| BC | Type  | BG | Gen. | Factor | BG | Gen. | Factor | BG | Gen. | Factor | BG | Gen. | Factor |
|----|-------|----|------|--------|----|------|--------|----|------|--------|----|------|--------|
| 1  | Fund. | 1  | Perm | 1.22   |    |      |        |    |      |        |    |      |        |
| 2  | Fund. | 1  | Perm | 1.22   | 2  | psi0 | 1.35   |    |      |        |    |      |        |
| 3  | Fund. | 1  | Perm | 1.08   | 2  | Extr | 1.35   |    |      |        |    |      |        |
| 4  | Fund. | 1  | Perm | 1.08   | 3  | Extr | 1.35   |    |      |        |    |      |        |
| 5  | Fund. | 1  | Perm | 1.08   | 3  | Extr | 1.35   | 2  | psi0 | 1.35   |    |      |        |
| 6  | Fund. | 1  | Perm | 1.08   | 4  | Extr | 1.35   |    |      |        |    |      |        |
| 7  | Fund. | 1  | Perm | 1.08   | 4  | Extr | 1.35   | 2  | psi0 | 1.35   |    |      |        |
| 8  | Fund. | 1  | Perm | 1.08   | 5  | Extr | 1.35   |    |      |        |    |      |        |
| 9  | Fund. | 1  | Perm | 1.08   | 5  | Extr | 1.35   | 2  | psi0 | 1.35   |    |      |        |
| 10 | Fund. | 1  | Perm | 1.08   | 6  | Extr | 1.35   |    |      |        |    |      |        |
| 11 | Fund. | 1  | Perm | 1.08   | 6  | Extr | 1.35   | 2  | psi0 | 1.35   |    |      |        |
| 12 | Fund. | 1  | Perm | 0.90   |    |      |        |    |      |        |    |      |        |
| 13 | Fund. | 1  | Perm | 0.90   | 2  | psi0 | 1.35   |    |      |        |    |      |        |
| 14 | Fund. | 1  | Perm | 0.90   | 2  | Extr | 1.35   |    |      |        |    |      |        |
| 15 | Fund. | 1  | Perm | 0.90   | 3  | Extr | 1.35   |    |      |        |    |      |        |
| 16 | Fund. | 1  | Perm | 0.90   | 3  | Extr | 1.35   | 2  | psi0 | 1.35   |    |      |        |
| 17 | Fund. | 1  | Perm | 0.90   | 4  | Extr | 1.35   |    |      |        |    |      |        |
| 18 | Fund. | 1  | Perm | 0.90   | 4  | Extr | 1.35   | 2  | psi0 | 1.35   |    |      |        |
| 19 | Fund. | 1  | Perm | 0.90   | 5  | Extr | 1.35   |    |      |        |    |      |        |
| 20 | Fund. | 1  | Perm | 0.90   | 5  | Extr | 1.35   | 2  | psi0 | 1.35   |    |      |        |
| 21 | Fund. | 1  | Perm | 0.90   | 6  | Extr | 1.35   |    |      |        |    |      |        |
| 22 | Fund. | 1  | Perm | 0.90   | 6  | Extr | 1.35   | 2  | psi0 | 1.35   |    |      |        |
| 23 | Kar.  | 1  | Perm | 1.00   | 2  | Extr | 1.00   |    |      |        |    |      |        |
| 24 | Kar.  | 1  | Perm | 1.00   | 3  | Extr | 1.00   |    |      |        |    |      |        |
| 25 | Kar.  | 1  | Perm | 1.00   | 3  | Extr | 1.00   | 2  | psi0 | 1.00   |    |      |        |
| 26 | Kar.  | 1  | Perm | 1.00   | 4  | Extr | 1.00   |    |      |        |    |      |        |
| 27 | Kar.  | 1  | Perm | 1.00   | 4  | Extr | 1.00   | 2  | psi0 | 1.00   |    |      |        |
| 28 | Kar.  | 1  | Perm | 1.00   | 5  | Extr | 1.00   |    |      |        |    |      |        |
| 29 | Kar.  | 1  | Perm | 1.00   | 5  | Extr | 1.00   | 2  | psi0 | 1.00   |    |      |        |
| 30 | Kar.  | 1  | Perm | 1.00   | 6  | Extr | 1.00   |    |      |        |    |      |        |
| 31 | Kar.  | 1  | Perm | 1.00   | 6  | Extr | 1.00   | 2  | psi0 | 1.00   |    |      |        |
| 32 | Freq. | 1  | Perm | 1.00   |    |      |        |    |      |        |    |      |        |
| 33 | Freq. | 1  | Perm | 1.00   | 2  | psi1 | 1.00   |    |      |        |    |      |        |
| 34 | Freq. | 1  | Perm | 1.00   | 3  | psi1 | 1.00   |    |      |        |    |      |        |
| 35 | Freq. | 1  | Perm | 1.00   | 3  | psi1 | 1.00   | 2  | psi2 | 1.00   |    |      |        |
| 36 | Freq. | 1  | Perm | 1.00   | 4  | psi1 | 1.00   |    |      |        |    |      |        |
| 37 | Freq. | 1  | Perm | 1.00   | 4  | psi1 | 1.00   | 2  | psi2 | 1.00   |    |      |        |
| 38 | Freq. | 1  | Perm | 1.00   | 5  | psi1 | 1.00   |    |      |        |    |      |        |
| 39 | Freq. | 1  | Perm | 1.00   | 5  | psi1 | 1.00   | 2  | psi2 | 1.00   |    |      |        |
| 40 | Freq. | 1  | Perm | 1.00   | 6  | psi1 | 1.00   |    |      |        |    |      |        |
| 41 | Freq. | 1  | Perm | 1.00   | 6  | psi1 | 1.00   | 2  | psi2 | 1.00   |    |      |        |
| 42 | Quas. | 1  | Perm | 1.00   |    |      |        |    |      |        |    |      |        |
| 43 | Quas. | 1  | Perm | 1.00   | 2  | psi2 | 1.00   |    |      |        |    |      |        |
| 44 | Blij. | 1  | Perm | 1.00   |    |      |        |    |      |        |    |      |        |

Project.....: 820.306  
Onderdeel.....: vorstrand pos. V1

### GUNSTIGE WERKING PERMANENTE BELASTINGEN

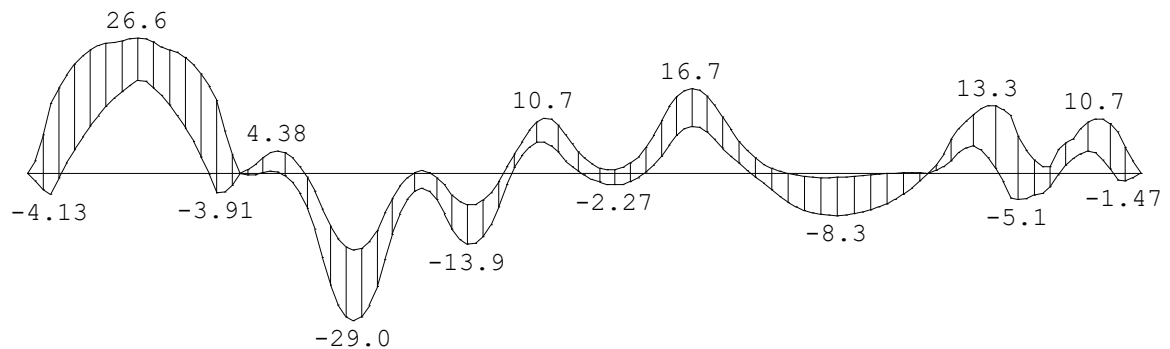
BC Velden met gunstige werking

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

### OMHULLENDE VAN DE FUNDAMENTELE COMBINATIES

**MOMENTEN** Fysisch lineair

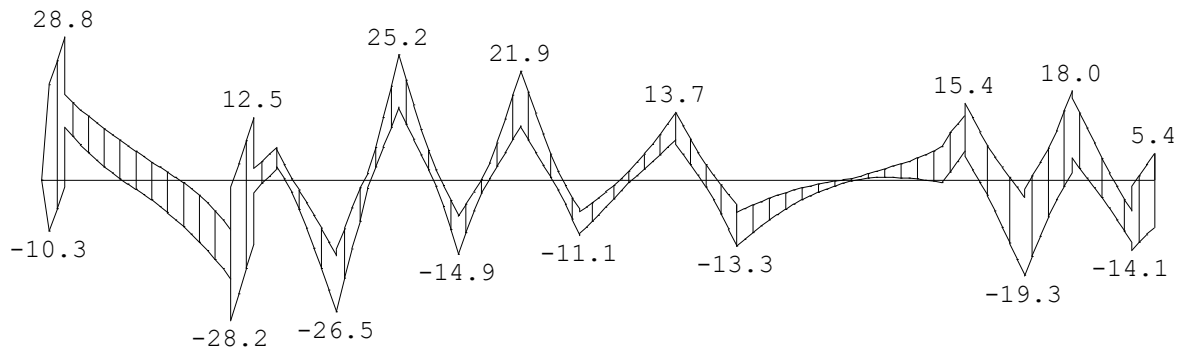
Ligger:1 Fundamentele combinatie



Project.....: 820.306  
Onderdeel.....: vorstrand pos. V1

**DWARSKRACHTEN** Fysisch lineair

Ligger:1 Fundamentele combinatie



**TUSSENpunten** Fysisch lineair

Ligger:1 Fundamentele combinatie

| Veld | Pos.   | Grondspan. [kN/m <sup>2</sup> ] |        | Dwarskr |        | Moment |        |
|------|--------|---------------------------------|--------|---------|--------|--------|--------|
|      |        | min.                            | max.   | min.    | max.   | min.   | max.   |
| 1    | 0.000  | 27.637                          | 50.721 | 0.00    | 0.00   | 0.00   | 0.00   |
| 1    | 0.233  | 27.235                          | 48.436 | -10.32  | 19.31  | -1.45  | 2.50   |
| 1    | 0.700  | 26.378                          | 43.977 | -1.15   | 28.77  | -4.13  | 13.69  |
| 1    | 0.700  | 26.378                          | 43.977 | 10.66   | 17.27  | -4.13  | 13.69  |
| 1    | 1.141  | 25.477                          | 40.682 | 7.38    | 14.35  | 1.46   | 18.89  |
| 1    | 1.582  | 24.624                          | 38.139 | 4.55    | 11.96  | 6.25   | 22.48  |
| 1    | 2.023  | 23.963                          | 36.145 | 2.10    | 9.76   | 10.28  | 24.67  |
| 1    | 2.463  | 23.616                          | 34.818 | -0.07   | 7.68   | 13.61  | 25.63  |
| 1    | 2.904  | 23.683                          | 34.241 | -2.05   | 5.64   | 16.26  | 26.10  |
| 1    | 3.345  | 24.245                          | 34.461 | -3.97   | 3.60   | 18.21  | 26.57  |
| 1    | 3.826  | 25.461                          | 35.653 | -6.56   | 1.69   | 16.83  | 25.80  |
| 1    | 4.307  | 26.816                          | 37.790 | -9.34   | -0.49  | 13.42  | 24.30  |
| 1    | 4.788  | 28.562                          | 40.791 | -12.41  | -3.06  | 8.91   | 22.76  |
| 1    | 5.269  | 30.388                          | 44.517 | -15.88  | -6.15  | 3.18   | 19.50  |
| 1    | 5.750  | 32.328                          | 48.760 | -19.80  | -9.87  | -3.92  | 14.21  |
| 1    | 5.750  | 32.328                          | 48.760 | -28.23  | -1.44  | -3.92  | 14.21  |
| 1    | 6.100  | 33.679                          | 52.017 | -20.25  | 5.61   | -3.04  | 5.90   |
| 1    | 6.450  | 34.979                          | 55.308 | -12.70  | 12.52  | -0.00  | 0.00   |
| 1    | 6.450  | 34.979                          | 55.308 | -2.52   | 2.34   | 0.00   | 0.00   |
| 1    | 6.683  | 36.276                          | 56.898 | -0.69   | 3.68   | -0.37  | 0.70   |
| 1    | 7.150  | 38.865                          | 60.091 | 2.15    | 6.59   | 0.10   | 3.00   |
| 1    | 7.150  | 38.865                          | 60.091 | 2.62    | 6.13   | 0.10   | 3.00   |
| 1    | 7.375  | 40.113                          | 61.649 | 0.33    | 3.09   | 0.44   | 4.03   |
| 1    | 7.600  | 41.365                          | 63.228 | -2.41   | 0.33   | 0.24   | 4.38   |
| 1    | 8.050  | 43.874                          | 66.447 | -9.67   | -4.53  | -1.84  | 2.96   |
| 1    | 8.500  | 46.335                          | 69.671 | -17.78  | -9.72  | -6.97  | -0.81  |
| 1    | 8.950  | 48.624                          | 73.255 | -26.49  | -15.22 | -16.56 | -7.00  |
| 1    | 8.950  | 48.624                          | 73.255 | -26.49  | -13.89 | -16.56 | -7.00  |
| 1    | 9.425  | 50.641                          | 76.502 | -13.77  | -5.61  | -25.92 | -12.98 |
| 1    | 9.900  | 52.054                          | 78.838 | -1.61   | 1.38   | -29.02 | -15.12 |
| 1    | 10.375 | 52.798                          | 80.150 | 6.66    | 12.62  | -26.03 | -13.48 |
| 1    | 10.850 | 52.946                          | 80.545 | 14.62   | 25.16  | -17.05 | -7.84  |
| 1    | 10.850 | 52.946                          | 80.545 | 14.33   | 25.16  | -17.05 | -7.84  |

Project.....: 820.306  
Onderdeel.....: vorstrand pos. V1

**TUSSENpunten** Fysisch lineair Ligger:1 Fundamentele combinatie

| Veld | Pos.   | Grondspan. [kN/m2] |        | Dwarskr |       | Moment |       |
|------|--------|--------------------|--------|---------|-------|--------|-------|
|      |        | min.               | max.   | min.    | max.  | min.   | max.  |
| 1    | 11.225 | 52.667             | 80.398 | 9.17    | 16.72 | -9.33  | -3.38 |
| 1    | 11.600 | 52.186             | 80.053 | 4.05    | 8.79  | -4.64  | -0.54 |
| 1    | 11.975 | 51.678             | 79.600 | -1.26   | 2.04  | -2.96  | 0.48  |
| 1    | 12.312 | 51.227             | 79.124 | -7.65   | -2.56 | -4.38  | -0.36 |
| 1    | 12.650 | 50.769             | 78.575 | -14.91  | -7.02 | -8.02  | -2.22 |
| 1    | 12.650 | 50.769             | 78.575 | -14.91  | -7.29 | -8.02  | -2.22 |
| 1    | 13.006 | 50.229             | 77.819 | -8.37   | -3.60 | -12.03 | -4.92 |
| 1    | 13.362 | 49.600             | 76.847 | -2.62   | 0.15  | -13.93 | -6.23 |
| 1    | 13.600 | 49.109             | 76.037 | 0.27    | 3.46  | -13.77 | -6.25 |
| 1    | 14.075 | 47.965             | 74.059 | 5.51    | 12.26 | -10.17 | -3.82 |
| 1    | 14.550 | 46.669             | 71.730 | 10.95   | 21.95 | -2.28  | 1.24  |
| 1    | 14.550 | 46.669             | 71.730 | 10.69   | 21.95 | -2.28  | 1.24  |
| 1    | 15.000 | 45.436             | 69.450 | 5.52    | 13.38 | 3.48   | 6.06  |
| 1    | 15.450 | 44.331             | 67.349 | 0.52    | 5.16  | 6.10   | 10.03 |
| 1    | 15.675 | 43.849             | 66.412 | -2.00   | 1.76  | 6.07   | 10.74 |
| 1    | 16.012 | 43.224             | 65.179 | -6.39   | -2.34 | 4.75   | 10.04 |
| 1    | 16.350 | 42.686             | 64.106 | -11.11  | -5.95 | 2.36   | 7.60  |
| 1    | 16.350 | 42.686             | 64.106 | -10.71  | -6.35 | 2.36   | 7.60  |
| 1    | 16.625 | 42.294             | 63.347 | -8.89   | -4.98 | 0.82   | 5.04  |
| 1    | 16.900 | 41.928             | 62.643 | -7.03   | -3.58 | -0.38  | 2.96  |
| 1    | 16.900 | 41.928             | 62.643 | -7.03   | -3.58 | -0.38  | 2.96  |
| 1    | 17.252 | 41.468             | 61.795 | -4.56   | -1.72 | -1.47  | 1.41  |
| 1    | 17.605 | 40.981             | 60.970 | -2.06   | 0.23  | -2.19  | 0.68  |
| 1    | 17.840 | 40.637             | 60.426 | -0.55   | 1.76  | -2.27  | 0.70  |
| 1    | 18.310 | 39.905             | 59.352 | 2.23    | 5.29  | -1.71  | 1.93  |
| 1    | 18.780 | 39.146             | 58.346 | 5.12    | 9.14  | 0.17   | 5.08  |
| 1    | 19.250 | 38.438             | 57.524 | 8.14    | 13.45 | 3.29   | 10.38 |
| 1    | 19.250 | 38.438             | 57.524 | 7.25    | 13.69 | 3.29   | 10.38 |
| 1    | 19.712 | 37.887             | 57.069 | 3.15    | 8.17  | 7.37   | 15.06 |
| 1    | 20.175 | 37.522             | 57.119 | -1.32   | 3.14  | 9.22   | 16.68 |
| 1    | 20.637 | 37.481             | 57.727 | -6.74   | -0.95 | 8.11   | 15.23 |
| 1    | 21.100 | 37.778             | 58.846 | -13.28  | -4.85 | 4.85   | 11.12 |
| 1    | 21.100 | 37.778             | 58.846 | -13.28  | -6.41 | 4.85   | 11.12 |
| 1    | 21.564 | 38.371             | 60.334 | -10.68  | -5.13 | 2.17   | 6.57  |
| 1    | 22.029 | 39.153             | 61.996 | -8.34   | -3.88 | -0.43  | 3.40  |
| 1    | 22.493 | 40.041             | 63.683 | -6.27   | -2.78 | -2.75  | 1.30  |
| 1    | 22.957 | 40.969             | 65.283 | -4.46   | -1.84 | -5.11  | 0.21  |
| 1    | 23.421 | 41.862             | 66.711 | -2.91   | -1.05 | -6.81  | -0.45 |
| 1    | 23.886 | 42.352             | 67.909 | -1.72   | -0.42 | -7.85  | -0.79 |
| 1    | 24.350 | 42.562             | 68.842 | -0.69   | 0.05  | -8.30  | -0.88 |
| 1    | 24.600 | 42.594             | 69.225 | -0.25   | 0.32  | -8.33  | -0.84 |
| 1    | 25.100 | 42.485             | 69.744 | 0.43    | 1.26  | -7.96  | -0.66 |
| 1    | 25.600 | 42.150             | 69.947 | 0.56    | 2.26  | -7.26  | -0.39 |
| 1    | 26.017 | 41.705             | 69.894 | 0.50    | 3.08  | -6.23  | -0.17 |
| 1    | 26.433 | 41.142             | 69.686 | 0.32    | 3.97  | -4.80  | 0.01  |
| 1    | 26.850 | 40.485             | 69.356 | 0.04    | 5.11  | -2.93  | 0.09  |
| 1    | 27.350 | 39.617             | 68.864 | -0.45   | 6.65  | 0.00   | 0.00  |

Project.....: 820.306  
Onderdeel.....: vorstrand pos. V1

**TUSSENpunten** Fysisch lineair Ligger:1 Fundamentele combinatie

| Veld | Pos.   | Grondspan. [kN/m <sup>2</sup> ] |        | Dwarskr |       | Moment |       |
|------|--------|---------------------------------|--------|---------|-------|--------|-------|
|      |        | min.                            | max.   | min.    | max.  | min.   | max.  |
| 1    | 27.350 | 39.617                          | 68.864 | -0.45   | 6.65  | 0.00   | 0.00  |
| 1    | 27.700 | 39.324                          | 66.956 | 2.67    | 10.43 | 0.89   | 2.72  |
| 1    | 28.050 | 39.049                          | 65.095 | 5.82    | 13.03 | 2.41   | 6.64  |
| 1    | 28.050 | 39.049                          | 65.095 | 4.80    | 15.40 | 2.41   | 6.64  |
| 1    | 28.387 | 38.841                          | 63.430 | 0.80    | 11.09 | 4.51   | 9.49  |
| 1    | 28.725 | 38.731                          | 61.916 | -3.09   | 6.83  | 5.30   | 11.47 |
| 1    | 29.175 | 38.847                          | 60.215 | -9.48   | 2.60  | 3.09   | 13.29 |
| 1    | 29.512 | 39.087                          | 59.155 | -14.30  | -0.41 | -0.34  | 12.92 |
| 1    | 29.850 | 39.050                          | 58.207 | -19.02  | -3.47 | -4.86  | 11.30 |
| 1    | 29.850 | 39.050                          | 58.207 | -19.27  | -1.87 | -4.86  | 11.30 |
| 1    | 30.092 | 38.955                          | 57.567 | -15.25  | 0.85  | -5.13  | 7.28  |
| 1    | 30.454 | 38.775                          | 56.740 | -9.27   | 5.01  | -4.65  | 3.54  |
| 1    | 30.817 | 38.537                          | 55.959 | -3.96   | 9.89  | -3.96  | 1.25  |
| 1    | 31.300 | 38.124                          | 54.811 | 1.57    | 18.03 | -0.38  | 4.64  |
| 1    | 31.300 | 38.124                          | 54.811 | 4.41    | 16.53 | -0.38  | 4.64  |
| 1    | 31.750 | 37.439                          | 54.963 | 0.40    | 10.50 | 2.88   | 6.74  |
| 1    | 32.200 | 36.804                          | 56.009 | -3.43   | 4.31  | 4.33   | 10.08 |
| 1    | 32.425 | 36.544                          | 56.648 | -5.53   | 1.38  | 3.98   | 10.70 |
| 1    | 32.762 | 36.231                          | 57.778 | -9.11   | -2.62 | 1.68   | 10.18 |
| 1    | 33.100 | 35.809                          | 59.070 | -12.60  | -6.16 | -1.43  | 8.19  |
| 1    | 33.100 | 35.809                          | 59.070 | -14.07  | -1.25 | -1.43  | 8.19  |
| 1    | 33.333 | 35.413                          | 60.058 | -12.45  | 0.93  | -1.47  | 5.10  |
| 1    | 33.800 | 34.589                          | 62.144 | -9.45   | 5.40  | -0.00  | 0.00  |

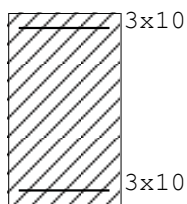
**PROFIELGEGEVENS Balk** [N] [mm] t.b.v. profiel:1 B\*H 350\*600

**Algemeen**

Materiaal : C20/25  
Oppervlak : 2.100000e+05 Traagheid : 6.3000e+09  
Staaftype : 0: normaal Vormfactor : 0.00

**Doorsnede**

breedte : 350 hoogte : 600 zwaartepunt tov onderkant : 300  
Referentie : Boven



Fictieve dikte : 221.1  
Gedrongen inwendige hefboomsarm : Automatisch berekend  
Breedte lastvlak  $a_b$  6.1(10) : 0

Project.....: 820.306

Onderdeel....: vorstrand pos. V1

|                                      |                                           |                      |         |
|--------------------------------------|-------------------------------------------|----------------------|---------|
| Betonkwaliteit element               | : C20/25                                  | Kruipcoëf.           | : 3.010 |
| Treksterkte $f_{ct,eff}$ art. 7.1(2) | : $f_{ctm,fl}$ ( 2.21 N/mm <sup>2</sup> ) |                      |         |
| Soort spanningsrekdiagram            | : Parabolisch - rechthoekig diagram       |                      |         |
| Doorbuiging volgens art.7.3.4(3)     | : Ja                                      |                      |         |
| Langeduur scheurmoment begrensd      | : Ja                                      |                      |         |
| Staalkwaliteit hoofdwapening         | : 500                                     | $\epsilon_{uk}$      | : 2.50  |
| Soort spanningsrekdiagram            | : Bi-lineair diagram met klimmende tak    |                      |         |
| Staalkwaliteit beugels               | : 500                                     |                      |         |
| Beugelwapening boven steunpunten:    | Ja                                        |                      |         |
| Bundels toepassen                    | : Nee                                     | Breedte stortstleuf: | 50      |
| Geprefabriceerd element              | : Nee                                     |                      |         |

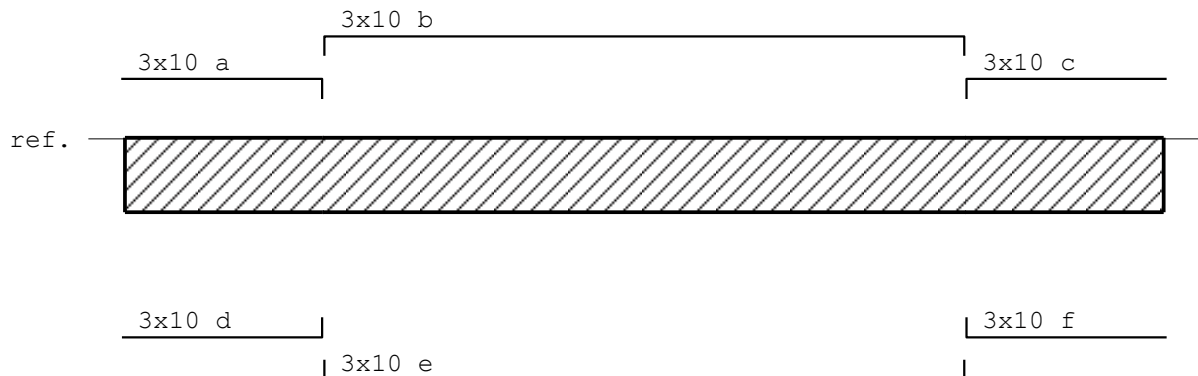
|                                            |   |               |  |               |
|--------------------------------------------|---|---------------|--|---------------|
| <b>Betondekking</b>                        |   | Boven         |  | Onder         |
| Milieu                                     | : | XC3           |  | XC3           |
| Gestort tegen bestaand beton               | : | Nee           |  | Nee           |
| Element met plaatgeometrie                 | : | Nee           |  | Nee           |
| Specifieke kwaliteitsbeheersing            | : | Nee           |  | Nee           |
| Oneffen beton oppervlak                    | : | Nee           |  | Nee           |
| Ondergrond                                 | : | Glad / N.v.t. |  | Glad / N.v.t. |
| Constructieklasse                          | : | S4            |  | S4            |
| Grootste korrel                            | : | 31.5          |  |               |
| Hoofdwapening                              | : | 2de laag      |  | 2de laag      |
| Nominale dekking                           | : | 30            |  | 30            |
| Toegepaste dekking                         | : | 43            |  | 43            |
| Toegepaste zijdekking                      | : | 43            |  |               |
| Gelijkwaardige diameter                    | : | 10            |  | 10            |
| $C_{min,b}$ $C_{min,dur}$ $\Delta C_{dur}$ | : | 10 25 0       |  | 10 25 0       |
| $C_{min}$ $\Delta C_{dev}$ $C_{nom}$       | : | 25 5 30       |  | 25 5 30       |
| Beugel / Verdeelwapening                   | : | 1ste laag     |  | 1ste laag     |
| Nominale dekking                           | : | 30            |  | 30            |
| Toegepaste dekking                         | : | 35            |  | 35            |
| Toegepaste zijdekking                      | : | 35            |  |               |
| Gelijkwaardige diameter                    | : | 8             |  | 8             |
| $C_{min,b}$ $C_{min,dur}$ $\Delta C_{dur}$ | : | 8 25 0        |  | 8 25 0        |
| $C_{min}$ $\Delta C_{dev}$ $C_{nom}$       | : | 25 5 30       |  | 25 5 30       |

|                                |   |             |  |             |
|--------------------------------|---|-------------|--|-------------|
| <b>Wapening</b>                |   | Boven       |  | Onder       |
| Basiswapening buitenste laag   | : | 3x10        |  | 3x10        |
| H.o.h.afstand 2e laag          | : | 0           |  | 0           |
| Automatisch verhogen basiswap. | : | Nee         |  | Nee         |
| Art. 7.3.2 minimum wapening    | : | Ja          |  | Ja          |
| Bijlegdiameters                | : | 10;12;16    |  | 10;12;16    |
| Diameter nuttige hoogte        | : | 10.0        |  | 10.0        |
| Min.tussenruimte               | : | 50          |  | 50          |
| Aanhechting                    | : | Automatisch |  | Automatisch |

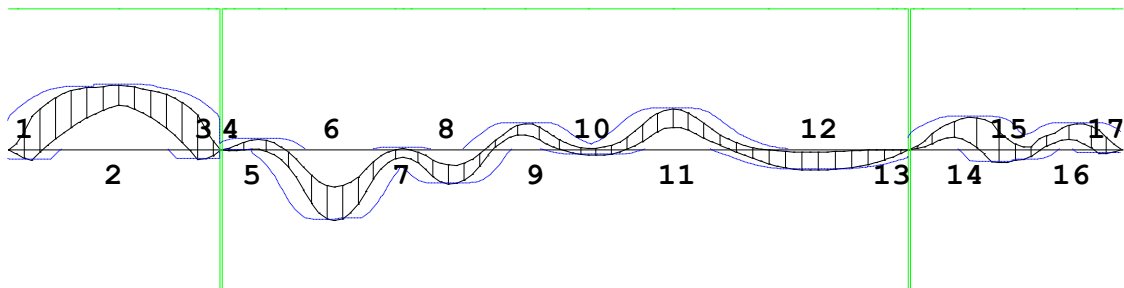
|                                       |   |                      |                        |     |
|---------------------------------------|---|----------------------|------------------------|-----|
| <b>Beugels</b>                        |   |                      |                        |     |
| Voorkeur h.o.h. afstand               | : | 300;150;100;75;60;50 |                        |     |
| Beugeldiameter                        | : | 8                    |                        |     |
| Betonkwaliteit                        | : | C20/25               |                        |     |
| Breedte t.b.v. dwarskracht            | : | 350                  | Hoogte t.b.v. dwarskr: | 600 |
| Aantal beugelsneden per beugel        | : | 2 Ontwerpen          |                        |     |
| Min. hoek betondrukdiagonaal $\theta$ | : | 21.8                 | z berekenen via:       | MRd |

Project.....: 820.306  
Onderdeel.....: vorstrand pos. V1

**Hoofdwapening** Fysisch lineair Ligger:1 Fundamentele combinatie



**MEd dekkingslijn** Fysisch lineair Ligger:1 Fundamentele combinatie



**Hoofdwapening**

Ligger:1

| Geb. | Pos.<br>[mm] | $M_{Ed}$<br>[kNm] | $M_{Rd}$<br>[kNm] | z B/O<br>[mm] | $A_b$<br>[mm <sup>2</sup> ] | $A_a$<br>[mm <sup>2</sup> ] | Basiswapening<br>+Bijlegwapening | Opm. |
|------|--------------|-------------------|-------------------|---------------|-----------------------------|-----------------------------|----------------------------------|------|
| 6    | 9900         | -29.02            | -57.91            | 477 Ond       | 180*                        | 236                         | 3x10                             | 54   |
| 2    | 3345         | 26.57             | 57.91             | 477 Bov       | 180*                        | 236                         | 3x10                             | 54   |

Opmerkingen

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

**Scheurvorming volgens artikel 7.3.4**

Ligger:1

| Geb. | Pos.<br>[mm] | Zijde | $M_{E, freq}$<br>[kNm] | $s_{r, max}$<br>[mm] | $\epsilon_{sm} - \epsilon_{cm}$<br>[%] | $w_k$<br>[mm] | $k_x$ | $w_{max}$<br>[mm] | U.C. | Opm. |
|------|--------------|-------|------------------------|----------------------|----------------------------------------|---------------|-------|-------------------|------|------|
| 1    | 3345         | Bov   | 22.01                  | 340                  | 0.529                                  | 0.180         | 1.17  | 0.350             | 0.51 |      |
| 1    | 9900         | Ond   | -22.10                 | 340                  | 0.531                                  | 0.181         | 1.17  | 0.350             | 0.52 |      |

Project.....: 820.306  
Onderdeel.....: vorstrand pos. V1

### Dwarskrachtwapening

Ligger:1

| Geb. | Vanaf<br>[mm] | Tot<br>[mm] | Beugels | Lengte<br>[mm] | $A_{sw}$<br>[mm <sup>2</sup> /m] | $V_{Ed}$<br>[kN] | $A_{opg}$<br>[mm <sup>2</sup> ] | Opm. |
|------|---------------|-------------|---------|----------------|----------------------------------|------------------|---------------------------------|------|
| 1    | 0             | 6450        | Ø8-300  | 6450           | 250                              | 29               |                                 |      |
| 2    | 6450          | 27350       | Ø8-300  | 20900          | 250                              | 26               |                                 |      |
| 3    | 27350         | 33800       | Ø8-300  | 6450           | 250                              | 19               |                                 |      |

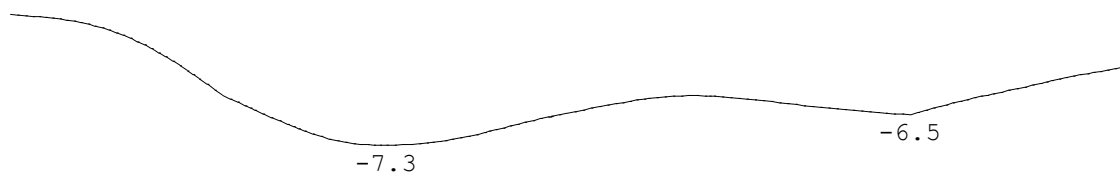
### Schuiifspanningen

Ligger:1

| Geb. | Vanaf<br>[mm] | Tot<br>[mm] | $\theta$<br>[ ° ] | $V_{Ed}$<br>[ kN ] | $V_{Rd, C}$ | $V_{Rd, S}$ | $V_{Ed} < V_{Rd} < V_{Rd, Max}$<br>[ N/mm <sup>2</sup> ] | Opm. |      |
|------|---------------|-------------|-------------------|--------------------|-------------|-------------|----------------------------------------------------------|------|------|
| 1    | 0             | 6450        | 21.8              | 28.77              | 0.32        | 0.90        | 0.15                                                     | 0.90 | 2.20 |
| 2    | 6450          | 27350       | 21.8              | 26.49              | 0.32        | 0.90        | 0.14                                                     | 0.90 | 2.20 |
| 3    | 27350         | 33800       | 21.8              | 19.27              | 0.32        | 0.90        | 0.10                                                     | 0.90 | 2.20 |

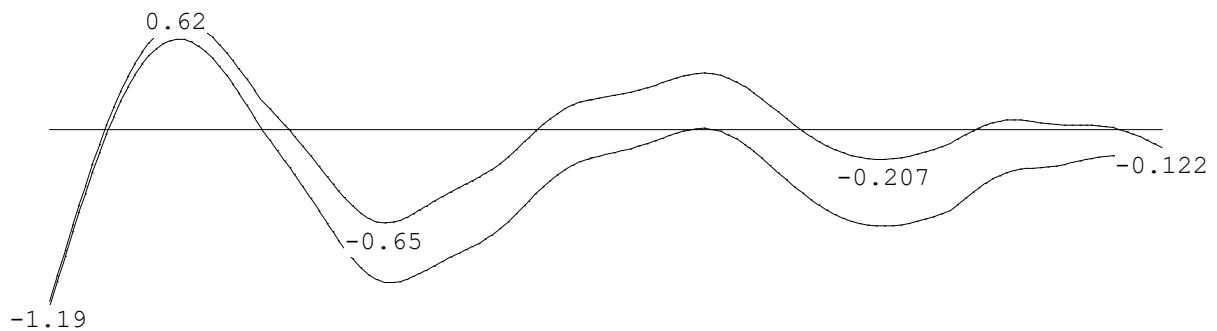
### DOORBUIGINGEN w1 [mm]

Ligger:1 Blijvende combinatie



### DOORBUIGINGEN w2 [mm]

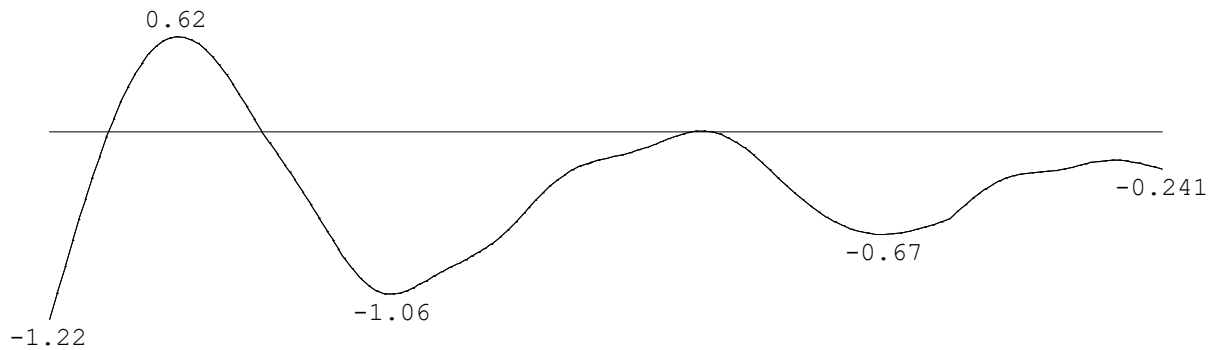
Ligger:1 Quasi-blijvende combinatie



Project.....: 820.306  
 Onderdeel.....: vorstrand pos. V1

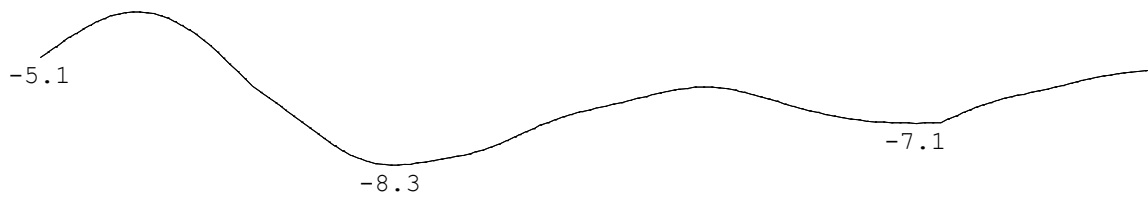
**DOORBUIGINGEN  $w_{bij}$**  [mm]

Ligger:1 Quasi-blijvende combinatie



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

Ligger:1 Quasi-blijvende combinatie



**DOORBUIGINGEN**

Quasi-blijvende combinatie

Alle vervormingen zijn kleiner dan  $l_{rep}/9999$  of  $h/9999$

**Sonderingen**



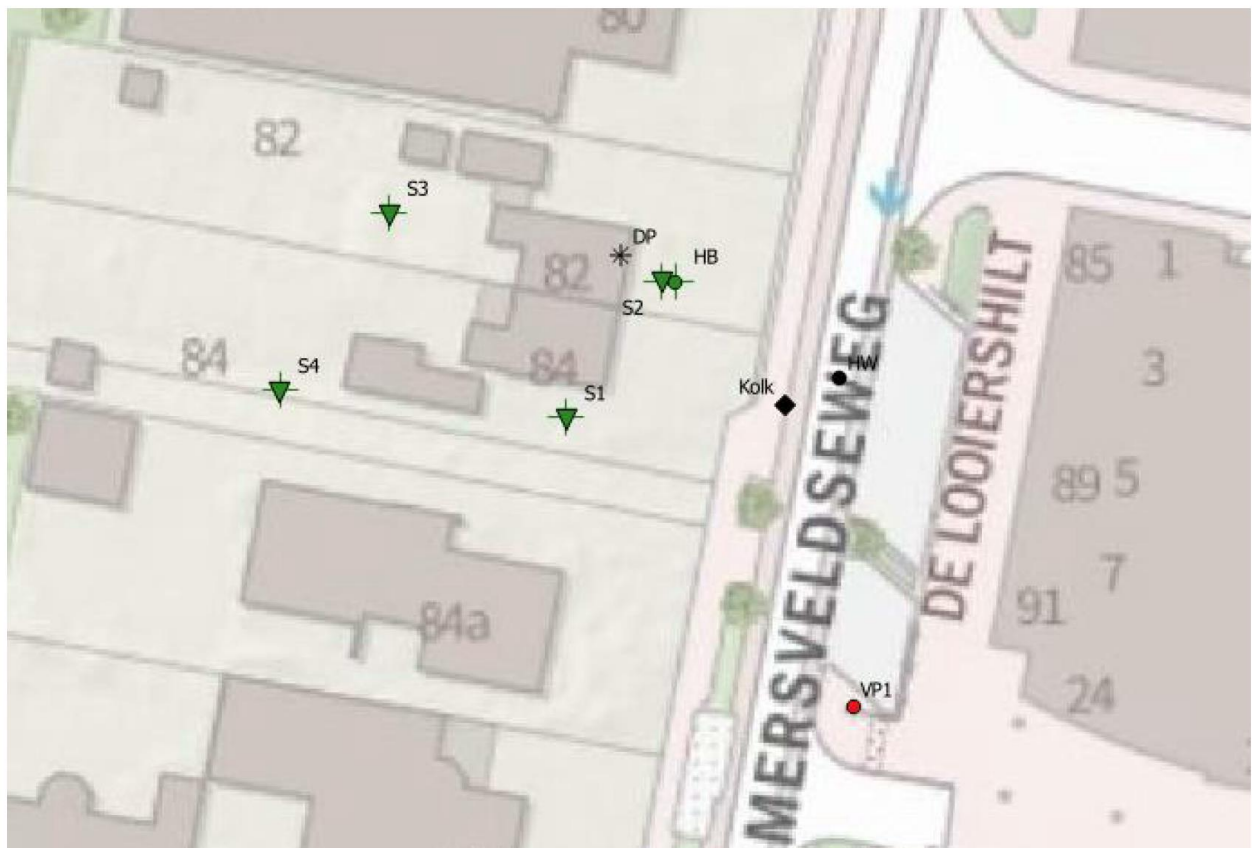
Opdrachtnummer: 200400  
Opdrachtgever: ELEMENT Buildings

**Sondeerrapport**

Sondeerlocatie: **Hamersveldseweg 82-84 te Leusden**

Datum: **22 december 2020**





### H3 Waterpassing

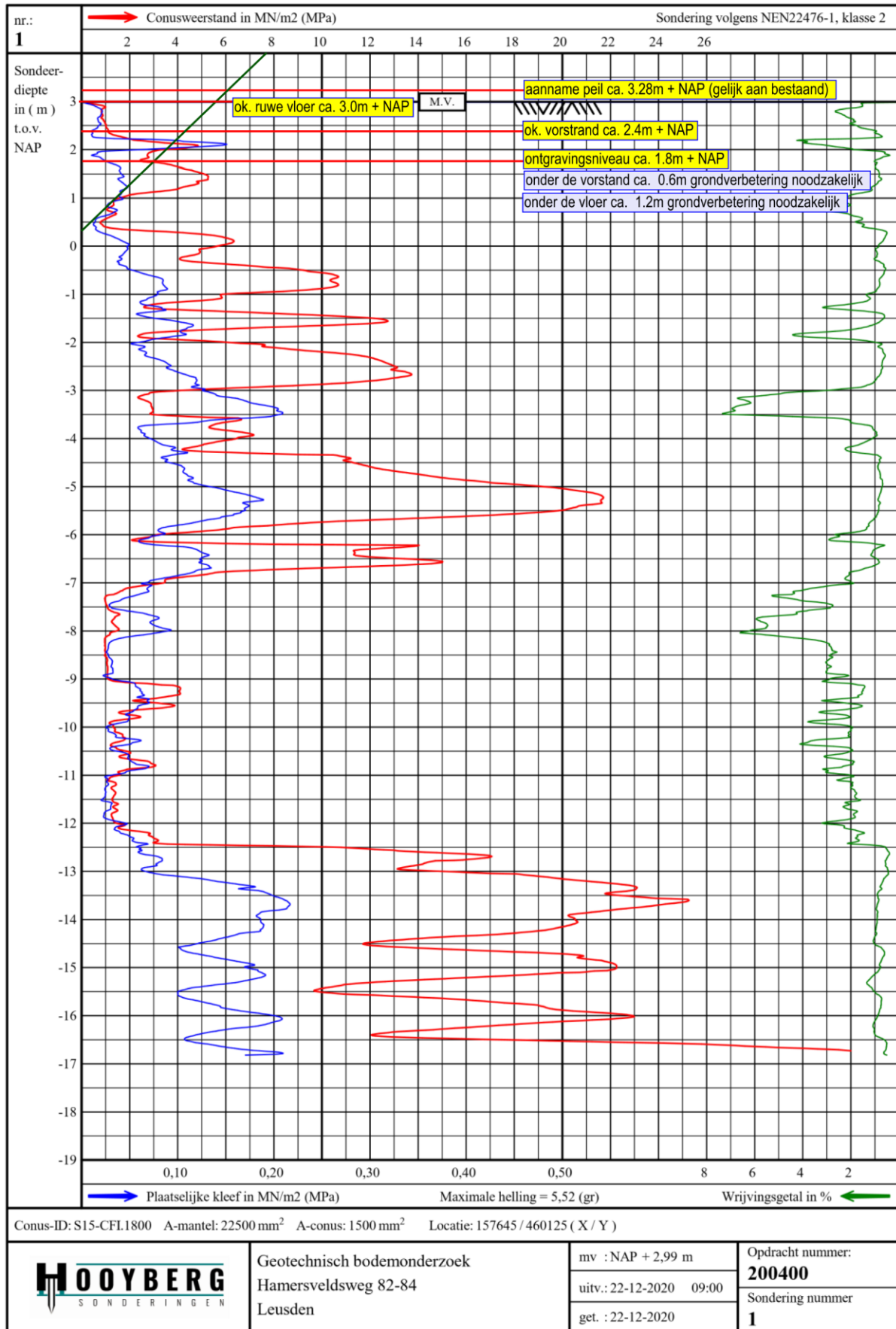
De sonderingen, handboring en de vaste punten zijn ingemeten met een Stonex S9 RTK GNSS meetsysteem. De punten worden aangeduid d.m.v. een X- en Y-coördinaat en NAP-hoogte.

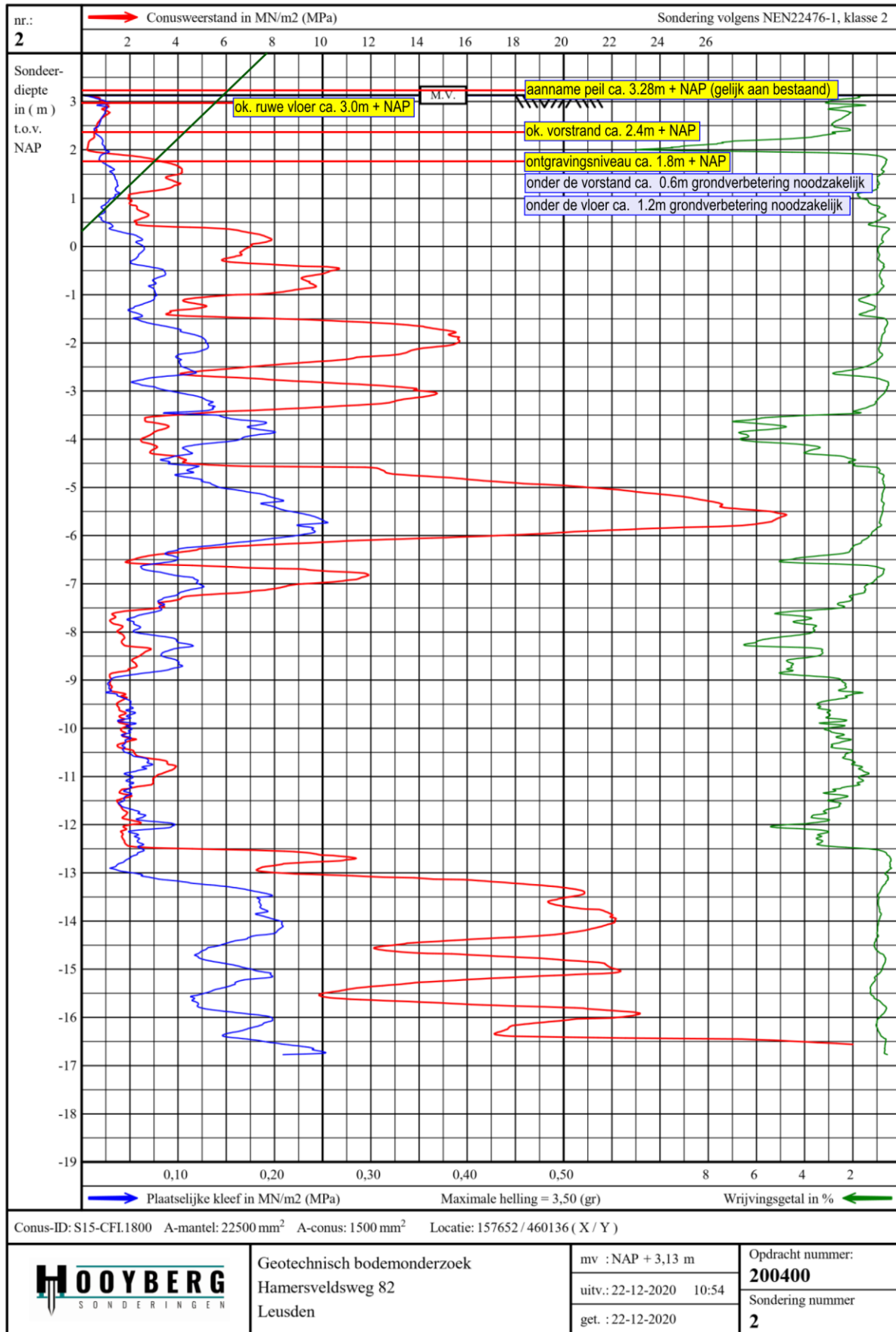
| Sondeer nummer | X-coördinaat | Y-coördinaat | Z t.o.v. NAP |
|----------------|--------------|--------------|--------------|
| 01             | 157645.21    | 460125.55    | 2.99         |
| 02             | 157652.79    | 460136.48    | 3.13         |
| 03             | 157632.73    | 460141.79    | 3.14         |
| 04             | 157624.31    | 460128.41    | 2.71         |

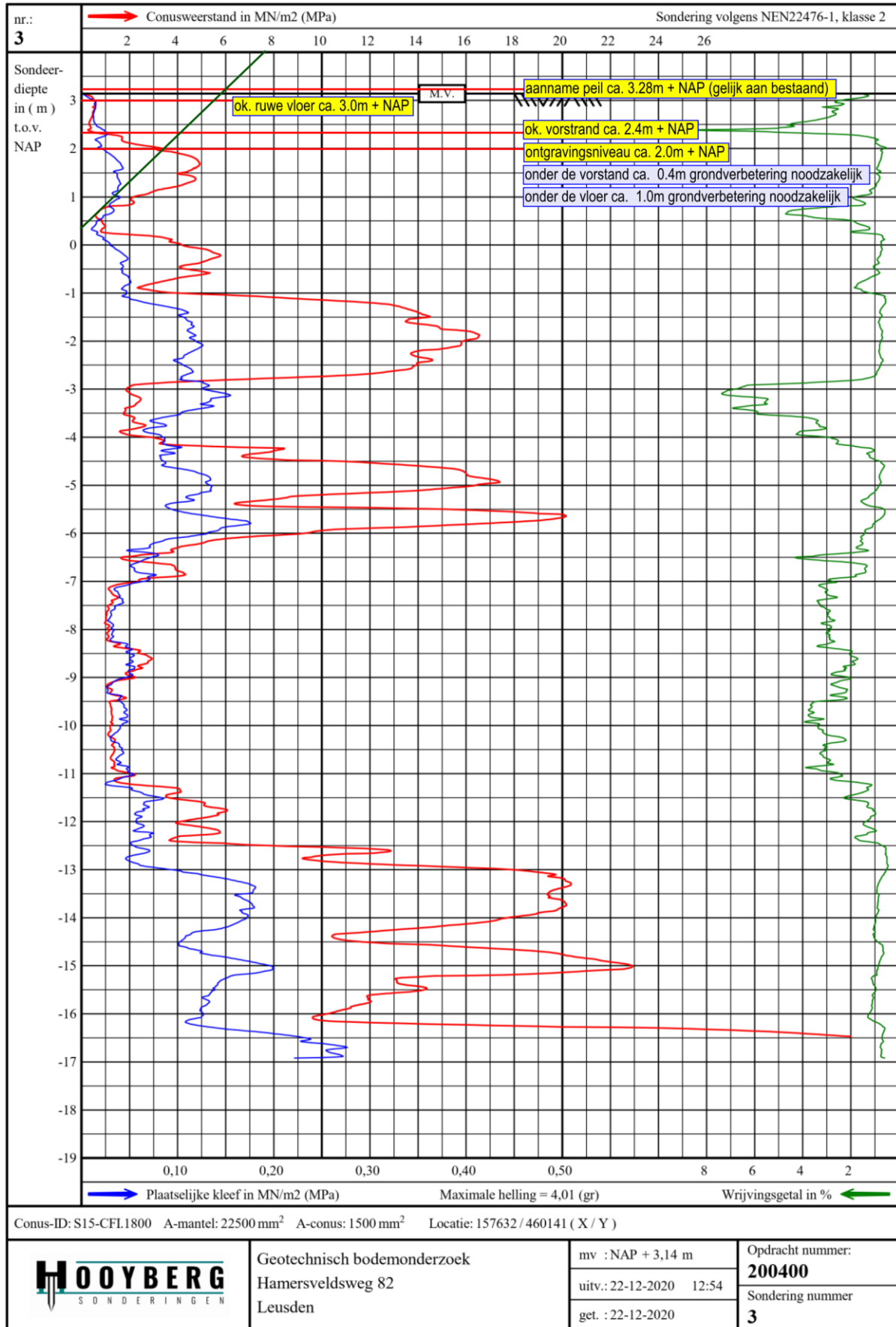
| Handboor nummer | X-coördinaat | Y-coördinaat | Z t.o.v. NAP |
|-----------------|--------------|--------------|--------------|
| 01              | 157652.63    | 460135.91    | 3.13         |

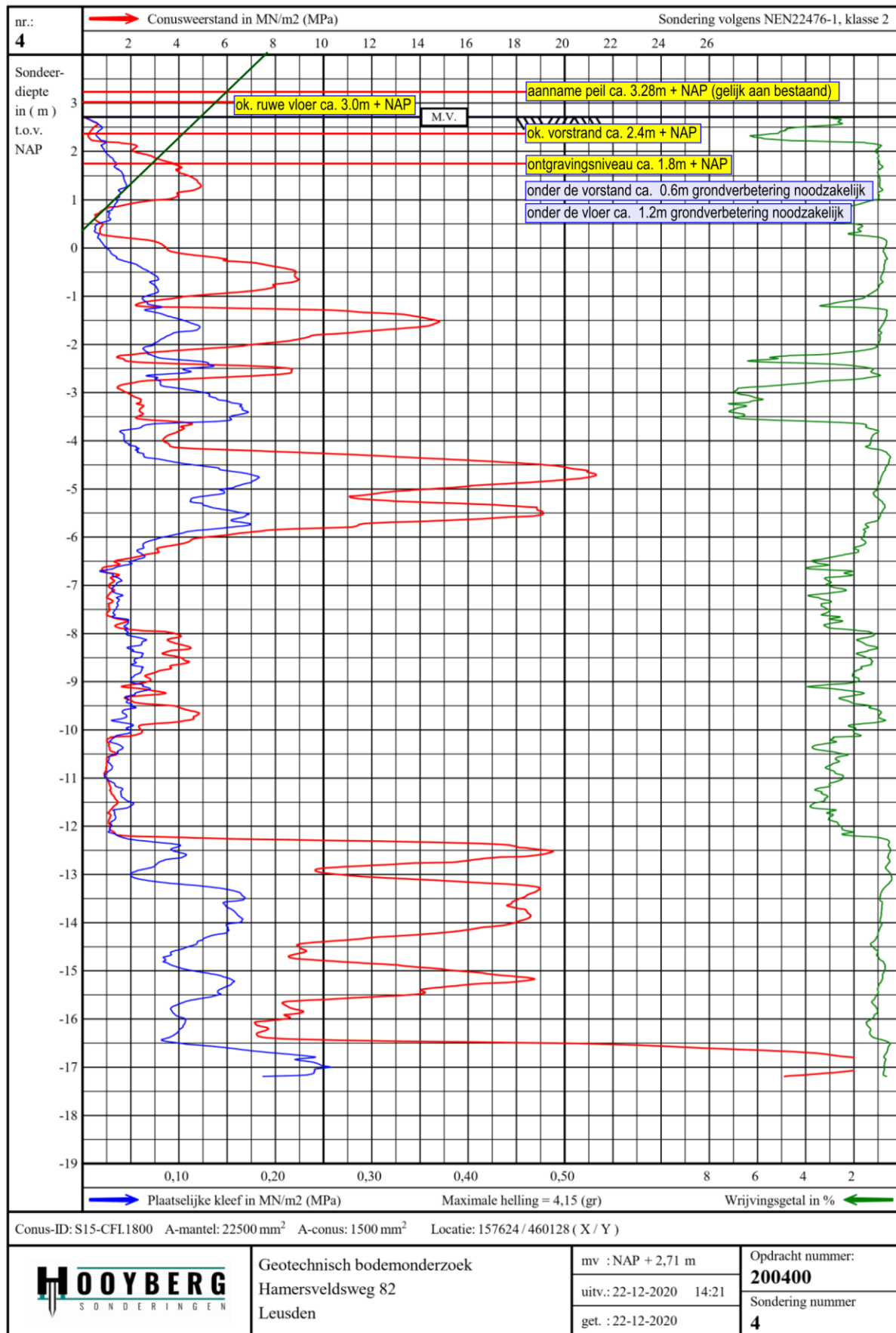
| Vaste punten         | X-coördinaat | Y-coördinaat | Z t.o.v. NAP |
|----------------------|--------------|--------------|--------------|
| Dorpel               | 157649.44    | 460138.02    | 3.28         |
| Hart van de weg (HW) | 157664.56    | 460128.62    | 3.07         |
| Vast punt (VP1)      | 157665.70    | 460104.69    | 3.27         |
| Kolk                 | 157661.12    | 460127.52    | 3.08         |

\*Waterpas meetgegevens zijn uitsluitend bedoeld voor dit onderzoek.











Opdrachtnummer: 200400  
Opdrachtgever: ELEMENT Buildings

### **Bijlage B. Handboring**

| Diepte    | Hoofdbestand | Toevoeging | Kleur      |
|-----------|--------------|------------|------------|
| 0.00-0.50 | Zand         | S1,K1      | Grijs      |
| 0.50-0.90 | Zand         | S1,K3      | Grijs      |
| 0.90-1.30 | Klei         | S1,Z2,H1   | Grijsbruin |
| 1.30-1.70 | Zand         | S1         | Grijs      |
|           |              |            |            |

**Grondwater op 1.30 meter – maaiveld**

### **Betekenis toevoeging**

Z = Zand, S = Silt, K = Klei, P = Puin, H = Humeus, Gr= Grind

1 = zwak, 2 = matig, 3 = sterk

## Fundatiedraagvermogen

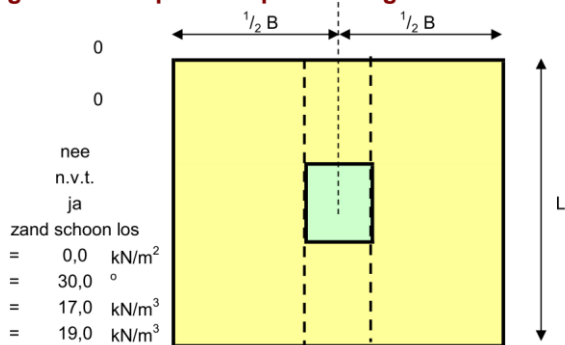
### tabellen met draagkracht **centrisch belaste** funderingstroken en poeren op staal volgens NEN 9997-1

werk  
werknummer  
onderdeel

rekening houden met grondwater tot onderkant van de fundering  
grondwaterstand boven de onderkant fundering  
gegevens grondparameters uit tabel 2.b van NEN 9997-1 halen?  
grondsoort uit tabel 2.b

effectieve cohesie  
effectieve hoek van inwendige wrijving  
repr. volumieke gewicht droge grond  
repr. volumieke gewicht verzadigde grond

$c'$  = 0,0 kN/m<sup>2</sup>  
 $\phi'$  = 30,0 °  
 $\gamma$  = 17,0 kN/m<sup>3</sup>  
 $\gamma_{sat}$  = 19,0 kN/m<sup>3</sup>

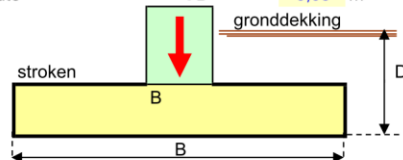


#### geometrie voor **centrische belasting** (in tabelvorm)

start gronddekking  $D = 0,00$  m  
toename gronddekking  $\delta D = 0,20$  m

#### tabel rekenwaarde opneembare belasting stroken

strooklengte  $L = 10,00$  m  
start strookbreedte  $B = 0,35$  m  
toename breedte  $\delta B = 0,05$  m



| stroken $L = 10,00$ | opneembare grondspanning in kN/m <sup>2</sup> |       |       |       |       |       |
|---------------------|-----------------------------------------------|-------|-------|-------|-------|-------|
|                     | gronddekking D                                |       |       |       |       |       |
|                     | 0,00                                          | 0,20  | 0,40  | 0,60  | 0,80  | 1,00  |
| strookbreedte B     |                                               |       |       |       |       |       |
| 0,35                | 31,5                                          | 71,4  | 111,4 | 151,3 | 191,3 | 231,2 |
| 0,40                | 35,9                                          | 76,0  | 116,0 | 156,0 | 196,0 | 236,1 |
| 0,45                | 40,4                                          | 80,5  | 120,6 | 160,7 | 200,8 | 240,9 |
| 0,50                | 44,8                                          | 85,0  | 125,2 | 165,4 | 205,6 | 245,8 |
| 0,55                | 49,2                                          | 89,5  | 129,8 | 170,1 | 210,4 | 250,7 |
| 0,60                | 53,6                                          | 94,0  | 134,3 | 174,7 | 215,1 | 255,5 |
| 0,65                | 58,0                                          | 98,4  | 138,9 | 179,4 | 219,8 | 260,3 |
| 0,70                | 62,3                                          | 102,9 | 143,4 | 184,0 | 224,5 | 265,1 |
| 0,75                | 66,7                                          | 107,3 | 148,0 | 188,6 | 229,3 | 269,9 |
| 0,80                | 71,0                                          | 111,7 | 152,5 | 193,2 | 233,9 | 274,7 |
| 0,85                | 75,3                                          | 116,2 | 157,0 | 197,8 | 238,6 | 279,4 |
| 0,90                | 79,6                                          | 120,5 | 161,5 | 202,4 | 243,3 | 284,2 |

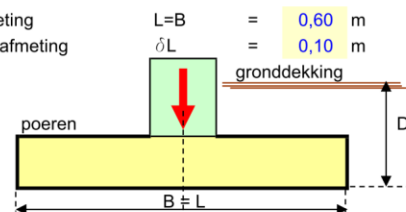
| stroken $L = 10,00$ | opneembare lijnlast in kN/m |       |       |       |       |       |
|---------------------|-----------------------------|-------|-------|-------|-------|-------|
|                     | gronddekking D              |       |       |       |       |       |
|                     | 0,00                        | 0,20  | 0,40  | 0,60  | 0,80  | 1,00  |
| strookbreedte B     |                             |       |       |       |       |       |
| 0,35                | 11,0                        | 25,0  | 39,0  | 53,0  | 66,9  | 80,9  |
| 0,40                | 14,4                        | 30,4  | 46,4  | 62,4  | 78,4  | 94,4  |
| 0,45                | 18,2                        | 36,2  | 54,3  | 72,3  | 90,4  | 108,4 |
| 0,50                | 22,4                        | 42,5  | 62,6  | 82,7  | 102,8 | 122,9 |
| 0,55                | 27,1                        | 49,2  | 71,4  | 93,5  | 115,7 | 137,9 |
| 0,60                | 32,2                        | 56,4  | 80,6  | 104,8 | 129,1 | 153,3 |
| 0,65                | 37,7                        | 64,0  | 90,3  | 116,6 | 142,9 | 169,2 |
| 0,70                | 43,6                        | 72,0  | 100,4 | 128,8 | 157,2 | 185,6 |
| 0,75                | 50,0                        | 80,5  | 111,0 | 141,5 | 171,9 | 202,4 |
| 0,80                | 56,8                        | 89,4  | 122,0 | 154,6 | 187,2 | 219,7 |
| 0,85                | 64,0                        | 98,7  | 133,4 | 168,1 | 202,8 | 237,5 |
| 0,90                | 71,7                        | 108,5 | 145,3 | 182,1 | 218,9 | 255,8 |

#### uitgangspunten

gedraineerde ondergrond  
 $H_d$  is verwaarloosbaar klein t.o.v.  $V_d$ )  
de onderkant van de fundering is vlak  
de grond onder de strook of poer is niet gelaagd

#### tabel rekenwaarde opneembare belasting vierkante poeren $L=B$

start poerafmeting  $L=B = 0,60$  m  
toename poerafmeting  $\delta L = 0,10$  m



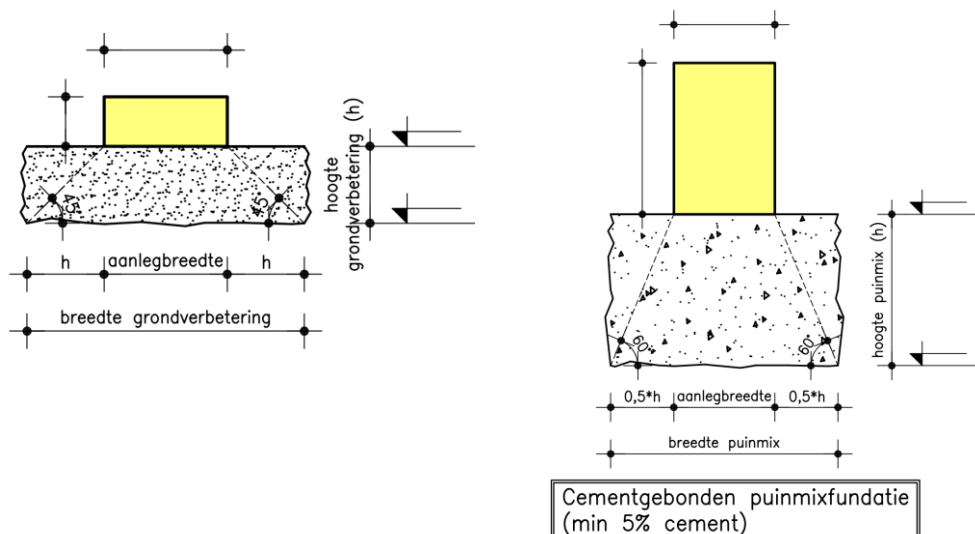
| poeren $L=B$ | opneembare grondspanning in kN/m <sup>2</sup> |       |       |       |       |       |
|--------------|-----------------------------------------------|-------|-------|-------|-------|-------|
|              | gronddekking D                                |       |       |       |       |       |
|              | 0,00                                          | 0,20  | 0,40  | 0,60  | 0,80  | 1,00  |
| poer $B=L$   |                                               |       |       |       |       |       |
| 0,60         | 38,2                                          | 95,2  | 152,1 | 209,1 | 266,1 | 323,0 |
| 0,70         | 44,6                                          | 101,5 | 158,5 | 215,5 | 272,4 | 329,4 |
| 0,80         | 50,9                                          | 107,9 | 164,9 | 221,8 | 278,8 | 335,7 |
| 0,90         | 57,3                                          | 114,3 | 171,2 | 228,2 | 285,1 | 342,1 |
| 1,00         | 63,7                                          | 120,6 | 177,6 | 234,6 | 291,5 | 348,5 |
| 1,10         | 70,0                                          | 127,0 | 184,0 | 240,9 | 297,9 | 354,8 |
| 1,20         | 76,4                                          | 133,4 | 190,3 | 247,3 | 304,2 | 361,2 |
| 1,30         | 82,8                                          | 139,7 | 196,7 | 253,7 | 310,6 | 367,6 |
| 1,40         | 89,1                                          | 146,1 | 203,1 | 260,0 | 317,0 | 373,9 |
| 1,50         | 95,5                                          | 152,5 | 209,4 | 266,4 | 323,3 | 380,3 |
| 1,60         | 101,9                                         | 158,8 | 215,8 | 272,7 | 329,7 | 386,7 |
| 1,70         | 108,2                                         | 165,2 | 222,2 | 279,1 | 336,1 | 393,0 |

| poeren $L=B$ | opneembare totale belasting in kN per poer |      |      |      |      |      |
|--------------|--------------------------------------------|------|------|------|------|------|
|              | gronddekking D                             |      |      |      |      |      |
|              | 0,00                                       | 0,20 | 0,40 | 0,60 | 0,80 | 1,00 |
| poer $B=L$   |                                            |      |      |      |      |      |
| 0,60         | 14                                         | 34   | 55   | 75   | 96   | 116  |
| 0,70         | 22                                         | 50   | 78   | 106  | 133  | 161  |
| 0,80         | 33                                         | 69   | 106  | 142  | 178  | 215  |
| 0,90         | 46                                         | 93   | 139  | 185  | 231  | 277  |
| 1,00         | 64                                         | 121  | 178  | 235  | 292  | 348  |
| 1,10         | 85                                         | 154  | 223  | 292  | 360  | 429  |
| 1,20         | 110                                        | 192  | 274  | 356  | 438  | 520  |
| 1,30         | 140                                        | 236  | 332  | 429  | 525  | 621  |
| 1,40         | 175                                        | 286  | 398  | 510  | 621  | 733  |
| 1,50         | 215                                        | 343  | 471  | 599  | 728  | 856  |
| 1,60         | 261                                        | 407  | 552  | 698  | 844  | 990  |
| 1,70         | 313                                        | 477  | 642  | 807  | 971  | 1136 |

## Richtlijnen grondverbetering

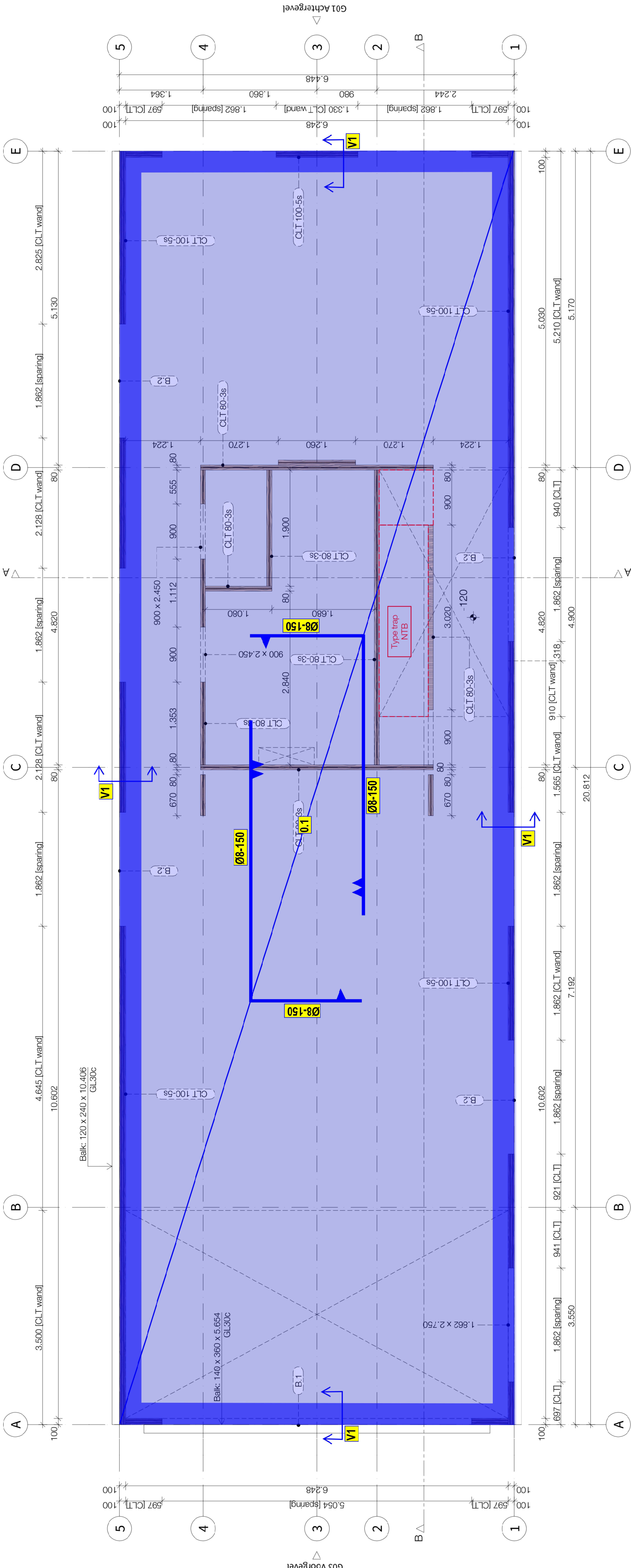
### Algemene richtlijnen voor het uitvoeren van een grondverbetering en voor het aanbrengen van zand naast en onder op staal te funderen constructies

1. Het toe te passen materiaal moet schoon zijn dat liefst niet meer dan 5 gewichtsprocenten (bepaald van de korrels) aan deeltjes  $<60\mu\text{m}$  bevat. In veel gevallen kan ook materiaal tot een maximum van 10 gewichtsprocenten  $<60\mu\text{m}$  worden gebruikt.
2. Het zand dient laagsgewijs mechanisch te worden verdicht. De laagdikte mag niet te groot zijn, afhankelijk van de wijze van verdichten:  
trilsleden met een gewicht van 500 à 1000 kg: laagdikte ca. 30 cm  
trilsleden met een gewicht van 1000 à 2000 kg: laagdikte 30 à 60 cm  
bulldozers, loaders, trilwalsen, bandenwalsen: ca. 30 cm.  
Verdichting in 4 gangen, overlappend. De verdichting dient te beginnen op de bodem van de ontgraving, indien deze uit zand bestaat en mogelijk door het ontgraven is geroerd of reeds van nature losgepakt was. Bij grondverbeteringen van kleine afmeting wordt het gebruik van mechanische stampers aanbevolen.
3. De grondwaterstand mag in het algemeen niet hoger zijn dan 0,5m onder het te verdichten oppervlak. Bij toepassing van zwaardere trilapparatuur kan het nodig zijn, dat de grondwaterstand nog dieper moet liggen. Zo nodig zal een bronbemaling moeten worden geïnstalleerd. Bij het afzetten van de bronbemaling mag het grondwater slechts geleidelijk opkomen.
4. Tenzij anders vermeld in het advies, zal de aanlegbreedte van de grondverbetering zo groot moeten zijn dat de funderingsdruk binnen de grondverbetering onder een hoek van 45 graden kan spreiden.
5. De kwaliteit van de grondverbetering dient gelijkmatig te zijn. Dit kan worden gecontroleerd aan de hand van sonderingen en indien niet anders mogelijk, eenvoudig doorprikken met een staaf. Het resultaat zal tenminste op een diepte van 0,6m een conusweerstand van  $6 \text{ MN/m}^2$  moeten opleveren en tot deze diepte gelijkmatig moeten toenemen. Een goede grondverbetering levert conusweerstand van tenminste  $10 \text{ MN/m}^2$  beneden een diepte van 0,6m. Zettingen t.g.v. klink zullen, als aan het bovenstaande voldaan is, nauwelijks optreden.
6. Het aanplempen of inwateren van zand levert een grondverbetering van onvoldoende kwaliteit.



# CONSTRUCTIE BIJLAGE A CONSTRUCTIETEKENING F-01

G04 Linker zijgevel



## RENVOOI BETONCONSTRUCTIE

| sterkteklasse: | C20/25 | milieu-klasse | milieuklasse: | w.c.f.: | min. cementgehalte: | cementklasse: | betonstaal: | milieu-klasse | buitenbedekking op de buitenste wapening (mm) | toeslag bij brandwerendheid |                      |               |       |    | toeslag bij oncon- tr. br oppervlak |     |    |    |    |        |        |         |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
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|                | XC2    |               |               |         |                     |               |             |               |                                               | < 0.60                      | 280 $\frac{kg}{m^3}$ | CEM III B42.5 | B500B | X1 |                                     | XC2 | X3 | X4 | X5 | 60 min | 90 min | 120 min |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                |        |               |               |         |                     |               |             |               |                                               |                             |                      |               |       |    |                                     |     |    |    |    |        |        |         |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

opmerkingen:

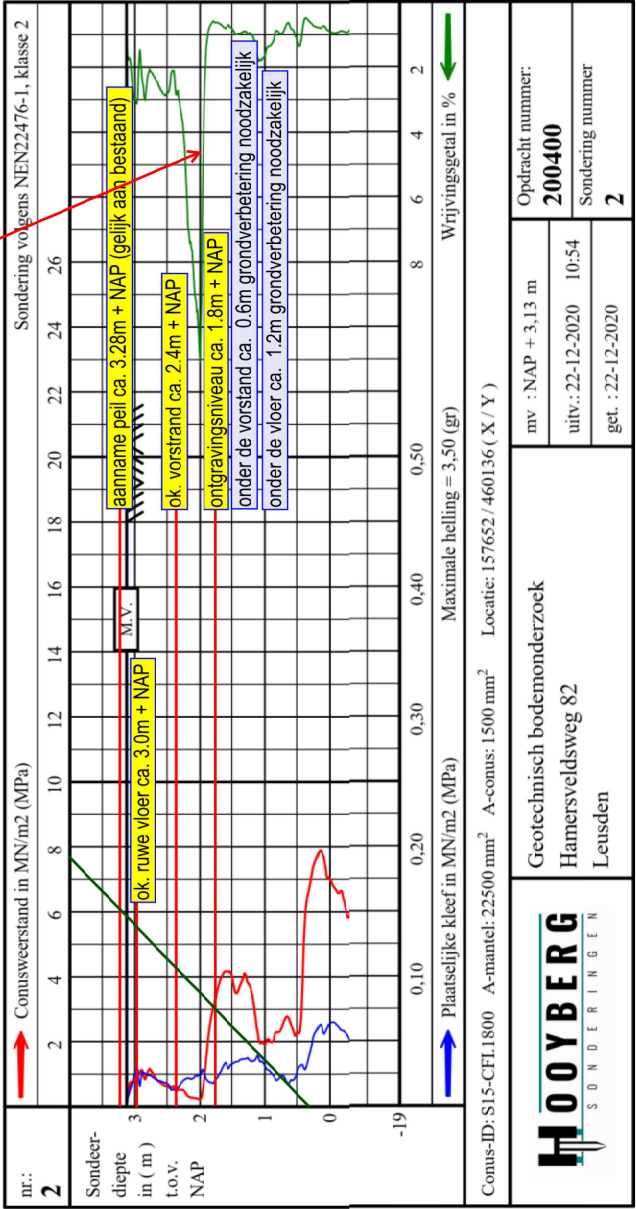
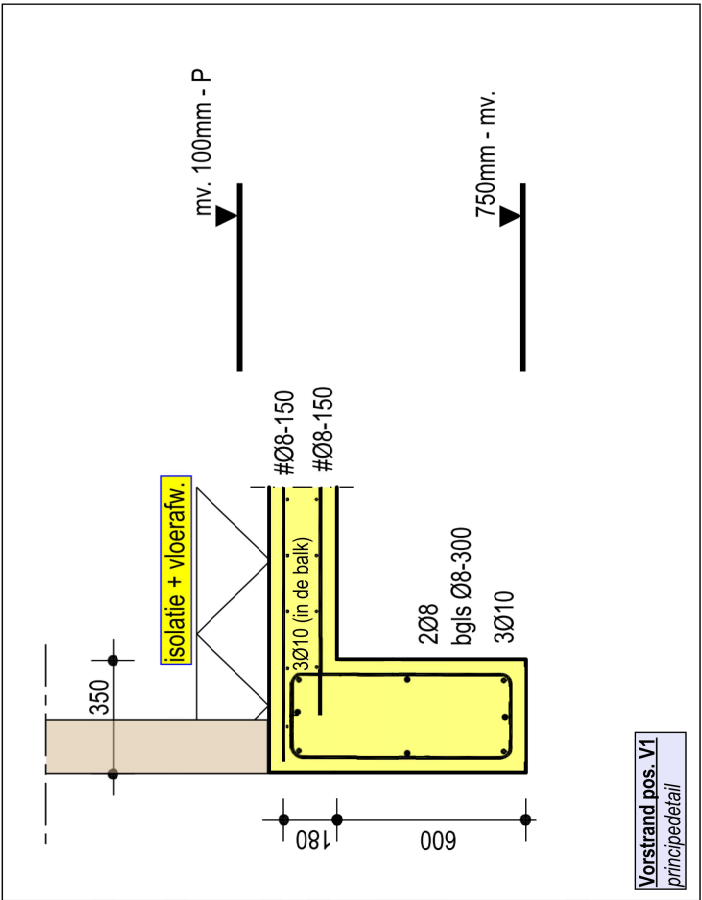
- verankeringslengte: tenzij anders vermeld! min. 50 x dia.
- maatvoering gebaseerd op tekening architect
- voor ontbrekende maatvoering zie tekening architect
- maatvoering controleren

| minimale lastlengten wapening |  | Ø6  | Ø8  | Ø10 | Ø12 | Ø16 | Ø20  | Ø25  |
|-------------------------------|--|-----|-----|-----|-----|-----|------|------|
| staafdiameter                 |  | 300 | 310 | 400 | 470 | 630 | 810  | 990  |
| algemeen                      |  | 300 | 390 | 500 | 590 | 790 | 1010 | 1240 |
| boven                         |  | 300 | 390 | 500 | 590 | 790 | 1010 | 1240 |
| alle maten in mm              |  |     |     |     |     |     |      |      |

## PRINCIPE AANSLUITINGEN

**RENVOOI**  
0.1 = begane grondvloer / funderingsplaat: d= 180mm (wapening conform plattegrond)  
V1 = vorstrand afm.: 350x600mm (conform principe-detail)

G02 Rechter zijgevel



## PRINCIPE AANSLUITINGEN

Werk: **Nieuwbouw woning a/d Hamersveldseweg 82/84 te Leusden**

Onderdeel: **Begane grondvloer / Funderingsplaat**

Opdrachtgever: **Solid Timber | Ketjapweg 18 | 3541 RH Utrecht**

Datum: **26-04-2021**

Wijziging: **-**

Afm: **A2**

Schaal: **1:50**

Werknr: **820.306**

Fase: **Bouwaanvraag**

Teknr:

Projectleider:

Constru

Constructie

Projectleider:

Constru

Constructie

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**A**

**HARTMAN**  
ingenieursbureau  
constructies

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