

# UITBREIDING ZWEMBAD DE MEERKAMP TE AMSTELVEEN

## BEREKENING BOVENCONSTRUCTIE



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# 1 Inleiding

## 1.1 Inleiding

Voor het project, uitbreiding zwembad de Meerkamp te Amstelveen, is door de gemeente Amstelveen aan WSP opdracht verstrekt voor de advisering van de constructieve draagstructuur. In dit rapport wordt de berekening van de bovenconstructie van het gebouw nader beschouwd.

## 1.2 Uitgangspunten

De uitgangspunten voor de constructie zijn opgenomen in rapport R01 (Algemene omschrijving constructie en uitgangspunten rapport constructies). In dit rapport zijn de belastingen, ontwerp uitgangspunten, gehanteerde normen, etc. weergegeven. De stabiliteit van het gebouw is beschouwd in rapport R02 Stabiliteitsberekening.

## 2 Zwemzaal

### 2.1 Portalen

Op het dak van de zwemzaal is pv-panelen geplaatst, waar geen pv-panelen ligt is er gelegd met sedum.

Ligger op as 2 is maatgevend. Ligger op as 1 is zelfde gehouden als ligger op as 2. Ligger op as 1 kan blijven staan als de tussenkolommen op as 1 verwijderd worden bij uitbreiding.

Voor de verbinding tussen de kolom en ligger is er een excentriciteit van  $240/2+150 = 270\text{mm}$  meegenomen, het wordt als moment op de kolom gezet.

| Lijnlast   | b<br>m | $\alpha$ | kN/m <sup>2</sup> | kN/m <sup>2</sup> | overheersend |   |      |     |                   |
|------------|--------|----------|-------------------|-------------------|--------------|---|------|-----|-------------------|
| dak        | 5,45   | 100      | 1,10              | 0,56              | nee          | = | 6,0  | 3,1 | kN/m <sup>1</sup> |
| dak sedum  | 5,45   | 100      | 1,95              | 0,56              | nee          | = | 10,6 | 3,1 |                   |
| pv-panelen | 5,45   | 100      | 0,25              | 0,00              | nee          | = | 14   | 0,0 |                   |
|            |        |          |                   |                   |              |   | 18,0 | 6,1 | kN/m <sup>1</sup> |

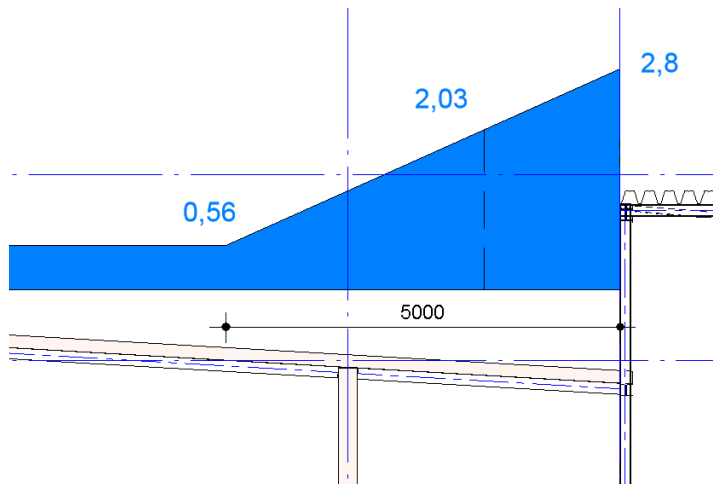
  

| Puntlast | b<br>m | L<br>m | $\alpha$ | kN/m <sup>2</sup> | kN/m <sup>2</sup> | overheersend |   |      |        |
|----------|--------|--------|----------|-------------------|-------------------|--------------|---|------|--------|
| gevel    | 5,45   | 5,60   | 100      | 1,00              | 0,00              | nee          | = | 30,5 | 0,0 kN |
|          |        |        |          |                   |                   |              |   | 30,5 | 0,0 kN |

De uitvoer van de berekeningen is opgenomen in bijlage A.

## 2.2 Portaal as 6

Op het rand van de dak is er sedum dak, ook is hier sneeuwophoping meegerekend.



| Lijnlast       | b    | m   | $\alpha$ | kN/m <sup>2</sup> | kN/m <sup>2</sup> | overheersend |   |     |                       |
|----------------|------|-----|----------|-------------------|-------------------|--------------|---|-----|-----------------------|
| dak            | 2,63 | 100 |          | 1,10              | 0,56              | nee          | = | 2,9 | 15 kN/m <sup>1</sup>  |
| dak sedum      | 1,73 | 100 |          | 1,95              | 0,56              | nee          | = | 3,4 | 10                    |
| pv-panelen     | 2,63 | 100 |          | 0,25              | 0,00              | nee          | = | 0,7 | 0,0                   |
| sneeuwophoping | 3,28 | 100 |          | 0,00              | 101               | nee          | = | 0,0 | 3,3                   |
|                |      |     |          |                   |                   |              |   | 6,9 | 5,7 kN/m <sup>1</sup> |

| Lijnlast  | b    | m   | $\alpha$ | kN/m <sup>2</sup> | kN/m <sup>2</sup> | overheersend |   |     |                       |
|-----------|------|-----|----------|-------------------|-------------------|--------------|---|-----|-----------------------|
| dak sedum | 4,35 | 100 |          | 1,95              | 0,56              | nee          | = | 8,5 | 2,4                   |
|           |      |     |          |                   |                   |              |   | 8,5 | 2,4 kN/m <sup>1</sup> |

| Puntlast | b    | L    | m   | $\alpha$ | kN/m <sup>2</sup> | kN/m <sup>2</sup> | overheersend |      |             |
|----------|------|------|-----|----------|-------------------|-------------------|--------------|------|-------------|
| gevel    | 4,35 | 5,60 | 100 |          | 100               | 0,00              | nee          | =    | 24,4 0,0 kN |
|          |      |      |     |          |                   |                   |              | 24,4 | 0,0 kN      |

De uitvoer van de berekeningen is opgenomen in bijlage B.

## 2.3 Randliggers

| Lijnlast       | b<br>m | $\alpha$ | kN/m <sup>2</sup> | kN/m <sup>2</sup> | overheersend |   |     |                       |
|----------------|--------|----------|-------------------|-------------------|--------------|---|-----|-----------------------|
| dak sedum      | 1,73   | 100      | 1,95              | 0,56              | nee          | = | 3,4 | 10                    |
| sneeuwophoping | 3,28   | 100      | 0,00              | 2,41              | nee          | = | 0,0 | 7,9                   |
|                |        |          |                   |                   |              |   | 3,4 | 8,9 kN/m <sup>1</sup> |

Eerste ligger staat voor de liggers dak op as A en N, R wind is 50,2 kN

Tweede ligger staat voor de liggers in de gevel op as A en N, er is een moment uit het vlak ingevoerd door windbelasting. Ook is er de eigengewicht van de gevel erop gezet.

$$M = 1/8 * 0,84 * 1,1 * 6,4 * 0,5 * 4,56^2 * 1,5 = 11,6 \text{ kNm}$$

Derde liggers staan voor de randliggers op as 8.

De uitvoer van de berekeningen is opgenomen in bijlage C.

## 2.4 Kolommen as 1

De dakligger op as 1 ligt op de kolom op as A en N. De tussenkolommen op as 1 kunnen uitgehaald worden bij de uitbreiding. De maatgevende kolom wordt gecontroleerd voor de status zonder uitbreiding.

| Puntlast  | b<br>m | L<br>m | $\alpha$ | kN/m <sup>2</sup> | kN/m <sup>2</sup> | overheersend |      |          |
|-----------|--------|--------|----------|-------------------|-------------------|--------------|------|----------|
| dak sedum | 2,65   | 5,59   | 100      | 1,95              | 0,56              | nee          | =    | 28,9 8,3 |
| gevel     | 5,59   | 5,60   | 100      | 1,00              | 0,00              | nee          | =    | 313 0,0  |
|           |        |        |          |                   |                   |              | 60,2 | 8,3 kN   |

De uitvoer van de berekeningen is opgenomen in bijlage D.

## 3 Technische ruimte

### 3.1 Dakliggers

| Lijnlast   | b<br>m | $\alpha$ | kN/m <sup>2</sup> | kN/m <sup>2</sup> | overheersend |   |     |                       |
|------------|--------|----------|-------------------|-------------------|--------------|---|-----|-----------------------|
| dak        | 5,75   | 100      | 0,40              | 0,56              | nee          | = | 2,3 | 3,2 kN/m <sup>1</sup> |
| pv-panelen | 5,75   | 100      | 0,25              | 0,00              | nee          | = | 14  | 0,0                   |
|            |        |          |                   |                   |              |   | 3,7 | 3,2 kN/m <sup>1</sup> |

De uitvoer van de berekeningen is opgenomen in bijlage E.

### 3.2 Ranliggers

| Lijnlast   | b<br>m | $\alpha$ | kN/m <sup>2</sup> | kN/m <sup>2</sup> | overheersend |   |     |                      |
|------------|--------|----------|-------------------|-------------------|--------------|---|-----|----------------------|
| dak        | 2,90   | 100      | 0,40              | 0,56              | nee          | = | 12  | 16 kN/m <sup>1</sup> |
| pv-panelen | 2,90   | 100      | 0,25              | 0,00              | nee          | = | 0,7 | 0,0                  |
|            |        |          |                   |                   |              |   | 19  | 16 kN/m <sup>1</sup> |

De uitvoer van de berekeningen is opgenomen in bijlage F.

### 3.3 Kolommen

| Puntlast | b<br>m | L<br>m | $\alpha$ | kN/m <sup>2</sup> | kN/m <sup>2</sup> | overheersend |   |      |        |
|----------|--------|--------|----------|-------------------|-------------------|--------------|---|------|--------|
| gevel    | 5,75   | 5,00   | 100      | 1,00              | 0,00              | nee          | = | 28,8 | 0,0 kN |
|          |        |        |          |                   |                   |              |   | 28,8 | 0,0 kN |

De eerste kolom staat voor de kolom in de gevel. De tweede kolom staat voor de kolom op as 9. Omdat het dak van de technische ruimte in twee delen die niet in dezelfde vlak liggen, moet de kolommen op as 9 de windbelasting doorgegeven.

$$R_{wind} = 0,84 * 1,1 * 0,85 * 2,8 * 5,725 = 12,6 \text{ kN}$$

De uitvoer van de berekeningen is opgenomen in bijlage G.

### 3.4 Randliggers tegen wind

| Lijnlast | b    | α    | kN/m² | kN/m² | overheersend |   |     |           |
|----------|------|------|-------|-------|--------------|---|-----|-----------|
|          | m    |      |       |       |              |   |     |           |
| wind     | 2,75 | 1,10 | 0,00  | 0,84  | nee          | = | 0,0 | 2,5 kN/m² |
|          |      |      |       |       |              |   | 0,0 | 2,5 kN/m² |

De dakligger op as H tussen as 9 en 12 en de dakliggers op as 12 tussen as H en K liggen op zijn kant (sterke as in de richting van wind). Ze worden gecontroleerde op de winbelasting. Windbelasting wordt als moment uit het vlak ingevoerd.

$$M = 1/8 * 2,5 * 8,04^2 * 1,5 = 30,3 \text{ kNm}$$

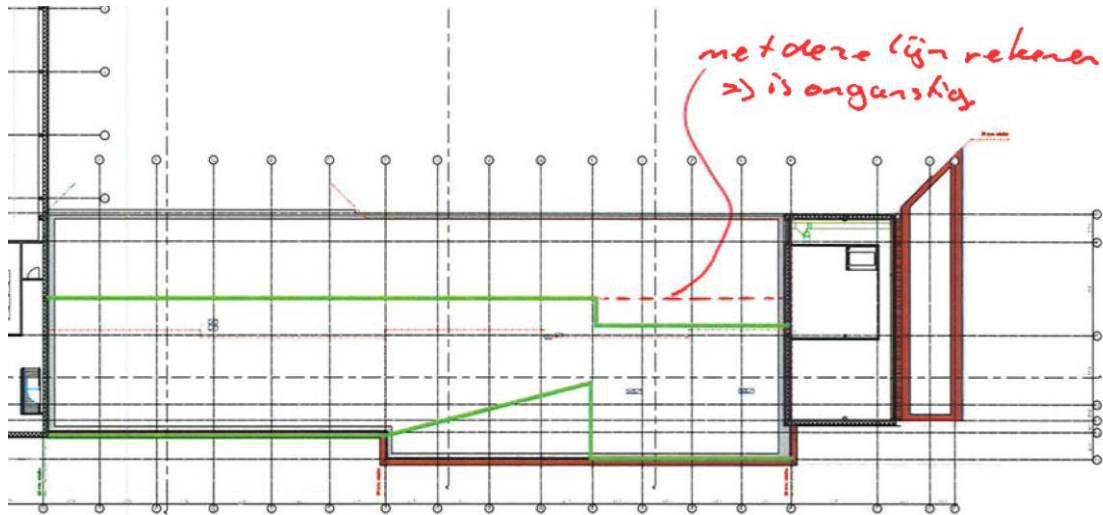
$$M = 1/8 * 2,5 * 5,775^2 * 1,5 = 15,7 \text{ kNm}$$

De uitvoer van de berekeningen is opgenomen in bijlage H.

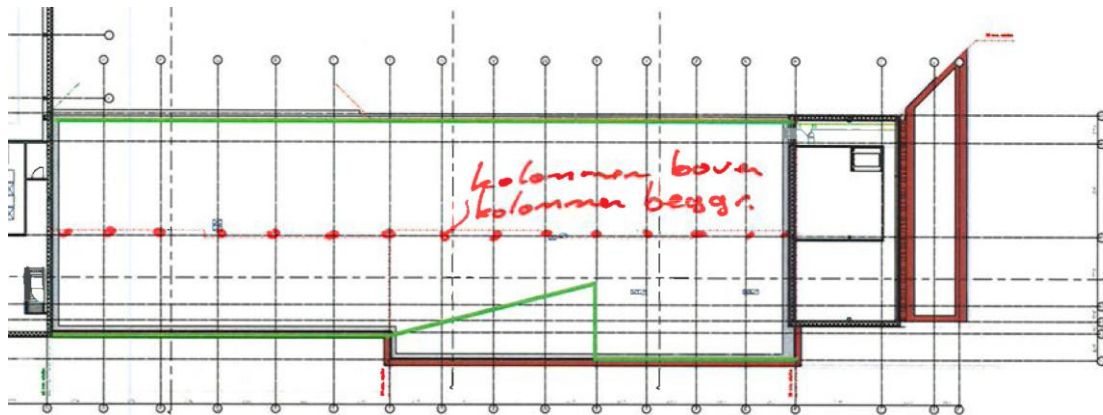
## 4 Kleedruimte

Voor de kleedruimte is er rekening gehouden dat op de verdieping uitgebreid kunnen worden.  
Er zijn 2 opties voor de uitbreiding.

Optie 1:



Optie 2:



Optie 1 is maatgevend voor de gevels as 12 en 13. Optie 2 is maatgevend voor doorsnede as 9 en gevel as 7. Kolomreacties van beide opties zijn bepaald, de constructie op de begane grond is getoetst op de maatgevende belasting van beiden opties.

## 4.1 Reacties uit uitbreiding

### Uitbreiding dak optie 1 as N

| Lijnlast | b    | $\alpha$ | kN/m <sup>2</sup> | kN/m <sup>2</sup> | overheersend |   |     |                      |
|----------|------|----------|-------------------|-------------------|--------------|---|-----|----------------------|
|          | m    |          |                   |                   |              |   |     |                      |
| dak      | 2,35 | 100      | 150               | 0,56              | nee          | = | 3,5 | 13 kN/m <sup>1</sup> |
|          |      |          |                   |                   |              |   | 3,5 | 13 kN/m <sup>1</sup> |

| Puntlast | b    | L    | $\alpha$ | kN/m <sup>2</sup> | kN/m <sup>2</sup> | overheersend |     |            |
|----------|------|------|----------|-------------------|-------------------|--------------|-----|------------|
|          | m    | m    |          |                   |                   |              |     |            |
| gevel    | 2,35 | 3,82 | 100      | 100               | 0,00              | nee          | =   | 9,0 0,0 kN |
|          |      |      |          |                   |                   |              | 9,0 | 0,0 kN     |

$$\begin{aligned}
 L &= 11,04 \text{ m} \\
 F_{eg} &= 3,5 * 11,04 * 1/2 + 9,0 = 28,44 \text{ kN} \\
 F_{sn} &= 1,3 * 11 * 1/2 = 7,264 \text{ kN}
 \end{aligned}$$

### Uitbreiding dak optie 1 as O-T

| Lijnlast | b    | $\alpha$ | kN/m <sup>2</sup> | kN/m <sup>2</sup> | overheersend |   |     |                       |
|----------|------|----------|-------------------|-------------------|--------------|---|-----|-----------------------|
|          | m    |          |                   |                   |              |   |     |                       |
| dak      | 4,84 | 100      | 150               | 0,56              | nee          | = | 7,3 | 2,7 kN/m <sup>1</sup> |
|          |      |          |                   |                   |              |   | 7,3 | 2,7 kN/m <sup>1</sup> |

| Puntlast | b    | L    | $\alpha$ | kN/m <sup>2</sup> | kN/m <sup>2</sup> | overheersend |      |             |
|----------|------|------|----------|-------------------|-------------------|--------------|------|-------------|
|          | m    | m    |          |                   |                   |              |      |             |
| gevel    | 4,84 | 3,82 | 100      | 100               | 0,00              | nee          | =    | 18,5 0,0 kN |
|          |      |      |          |                   |                   |              | 18,5 | 0,0 kN      |

$$\begin{aligned}
 L &= 11,04 \text{ m} \\
 F_{eg} &= 7,3 * 11,04 * 1/2 + 18,5 = 58,56 \text{ kN} \\
 F_{sn} &= 2,7 * 11 * 1/2 = 14,96 \text{ kN}
 \end{aligned}$$

### Uitbreiding dak optie 1 as U

| Lijnlast | b    | $\alpha$ | kN/m <sup>2</sup> | kN/m <sup>2</sup> | overheersend |   |     |                       |
|----------|------|----------|-------------------|-------------------|--------------|---|-----|-----------------------|
|          | m    |          |                   |                   |              |   |     |                       |
| dak      | 4,33 | 100      | 150               | 0,56              | nee          | = | 6,5 | 2,4 kN/m <sup>1</sup> |
|          |      |          |                   |                   |              |   | 6,5 | 2,4 kN/m <sup>1</sup> |

| Puntlast | b    | L    | $\alpha$ | kN/m <sup>2</sup> | kN/m <sup>2</sup> | overheersend |      |             |
|----------|------|------|----------|-------------------|-------------------|--------------|------|-------------|
|          | m    | m    |          |                   |                   |              |      |             |
| gevel    | 4,33 | 3,82 | 100      | 100               | 0,00              | nee          | =    | 16,5 0,0 kN |
|          |      |      |          |                   |                   |              | 16,5 | 0,0 kN      |

$$\begin{aligned}
 L &= 10,465 \text{ m} \\
 F_{eg} &= 6,5 * 10,47 * 1/2 + 16,5 = 50,47 \text{ kN} \\
 F_{sn} &= 2,4 * 10,47 * 1/2 = 12,67 \text{ kN}
 \end{aligned}$$

### Uitbreiding dak optie 1 as V

| Lijnlast | b    | $\alpha$ | kN/m <sup>2</sup> | kN/m <sup>2</sup> | overheersend |   |     |                       |
|----------|------|----------|-------------------|-------------------|--------------|---|-----|-----------------------|
|          | m    |          |                   |                   |              |   |     |                       |
| dak      | 4,33 | 100      | 150               | 0,56              | nee          | = | 6,5 | 2,4 kN/m <sup>1</sup> |
|          |      |          |                   |                   |              |   | 6,5 | 2,4 kN/m <sup>1</sup> |

| Puntlast | b    | L    | $\alpha$ | kN/m <sup>2</sup> | kN/m <sup>2</sup> | overheersend |      |             |
|----------|------|------|----------|-------------------|-------------------|--------------|------|-------------|
|          | m    | m    |          |                   |                   |              |      |             |
| gevel    | 4,33 | 3,82 | 100      | 100               | 0,00              | nee          | =    | 16,5 0,0 kN |
|          |      |      |          |                   |                   |              | 16,5 | 0,0 kN      |

$$L = 9,35 \text{ m}$$

$$F_{eg} = 6,5 * 9,35 * 1/2 + 16,5 = 46,85 \text{ kN}$$

$$F_{sn} = 2,4 * 9,35 * 1/2 = 11,32 \text{ kN}$$

### Uitbreiding dak optie 1 as W

| Lijnlast | b    | $\alpha$ | kN/m <sup>2</sup> | kN/m <sup>2</sup> | overheersend |   |     |                       |
|----------|------|----------|-------------------|-------------------|--------------|---|-----|-----------------------|
|          | m    |          |                   |                   |              |   |     |                       |
| dak      | 4,33 | 100      | 150               | 0,56              | nee          | = | 6,5 | 2,4 kN/m <sup>1</sup> |
|          |      |          |                   |                   |              |   | 6,5 | 2,4 kN/m <sup>1</sup> |

| Puntlast | b    | L    | $\alpha$ | kN/m <sup>2</sup> | kN/m <sup>2</sup> | overheersend |      |             |
|----------|------|------|----------|-------------------|-------------------|--------------|------|-------------|
|          | m    | m    |          |                   |                   |              |      |             |
| gevel    | 4,33 | 3,82 | 100      | 100               | 0,00              | nee          | =    | 16,5 0,0 kN |
|          |      |      |          |                   |                   |              | 16,5 | 0,0 kN      |

$$L = 8,24 \text{ m}$$

$$F_{eg} = 6,5 * 8,24 * 1/2 + 16,5 = 43,25 \text{ kN}$$

$$F_{sn} = 2,4 * 8,24 * 1/2 = 9,979 \text{ kN}$$

### Uitbreiding dak optie 1 as X-1

| Lijnlast | b    | $\alpha$ | kN/m <sup>2</sup> | kN/m <sup>2</sup> | overheersend |   |     |                       |
|----------|------|----------|-------------------|-------------------|--------------|---|-----|-----------------------|
|          | m    |          |                   |                   |              |   |     |                       |
| dak      | 2,00 | 100      | 150               | 0,56              | nee          | = | 3,0 | 1,1 kN/m <sup>1</sup> |
|          |      |          |                   |                   |              |   | 3,0 | 1,1 kN/m <sup>1</sup> |

| Puntlast | b    | L    | $\alpha$ | kN/m <sup>2</sup> | kN/m <sup>2</sup> | overheersend |      |             |
|----------|------|------|----------|-------------------|-------------------|--------------|------|-------------|
|          | m    | m    |          |                   |                   |              |      |             |
| gevel    | 4,24 | 3,82 | 100      | 100               | 0,00              | nee          | =    | 16,2 0,0 kN |
|          |      |      |          |                   |                   |              | 16,2 | 0,0 kN      |

$$L = 6,27 \text{ m}$$

$$F_{eg} = 3,0 * 6,27 * 1/2 + 16,2 = 25,6 \text{ kN}$$

$$F_{sn} = 1,1 * 6,27 * 1/2 = 3,511 \text{ kN}$$

### Uitbreiding dak optie 1 as X-2

| Lijnlast | b    | $\alpha$ | kN/m <sup>2</sup> | kN/m <sup>2</sup> | overheersend |   |     |                       |
|----------|------|----------|-------------------|-------------------|--------------|---|-----|-----------------------|
|          | m    |          |                   |                   |              |   |     |                       |
| dak      | 4,24 | 100      | 150               | 0,56              | nee          | = | 6,4 | 2,4 kN/m <sup>1</sup> |
|          |      |          |                   |                   |              |   | 6,4 | 2,4 kN/m <sup>1</sup> |

| Puntlast | b    | L    | $\alpha$ | kN/m <sup>2</sup> | kN/m <sup>2</sup> | overheersend |      |             |
|----------|------|------|----------|-------------------|-------------------|--------------|------|-------------|
|          | m    | m    |          |                   |                   |              |      |             |
| gevel    | 4,24 | 3,82 | 100      | 100               | 0,00              | nee          | =    | 16,2 0,0 kN |
|          |      |      |          |                   |                   |              | 16,2 | 0,0 kN      |

$$\begin{aligned}
 L &= 7,05 \text{ m} \\
 F_{eg} &= 6,4 * 7,05 * 1/2 + 16,2 = 38,62 \text{ kN} \\
 F_{sn} &= 2,4 * 7,05 * 1/2 = 8,37 \text{ kN}
 \end{aligned}$$

### Uitbreiding dak optie 1 as Y-A'

| Lijnlast | b    | $\alpha$ | kN/m <sup>2</sup> | kN/m <sup>2</sup> | overheersend |   |     |                       |
|----------|------|----------|-------------------|-------------------|--------------|---|-----|-----------------------|
|          | m    |          |                   |                   |              |   |     |                       |
| dak      | 4,16 | 100      | 150               | 0,56              | nee          | = | 6,2 | 2,3 kN/m <sup>1</sup> |
|          |      |          |                   |                   |              |   | 6,2 | 2,3 kN/m <sup>1</sup> |

| Puntlast | b    | L    | $\alpha$ | kN/m <sup>2</sup> | kN/m <sup>2</sup> | overheersend |      |             |
|----------|------|------|----------|-------------------|-------------------|--------------|------|-------------|
|          | m    | m    |          |                   |                   |              |      |             |
| gevel    | 4,16 | 3,82 | 100      | 100               | 0,00              | nee          | =    | 15,9 0,0 kN |
|          |      |      |          |                   |                   |              | 15,9 | 0,0 kN      |

$$\begin{aligned}
 L &= 13,3 \text{ m} \\
 F_{eg} &= 6,2 * 13,30 * 1/2 + 15,9 = 57,39 \text{ kN} \\
 F_{sn} &= 2,3 * 13,30 * 1/2 = 15,49 \text{ kN}
 \end{aligned}$$

De uitvoer van de berekeningen van optie 2 is opgenomen in bijlage I.

## 4.2 Ligger verdieping as 7

| Lijnlast        | b    |          |                   |                   |              |   |      |      |                   |
|-----------------|------|----------|-------------------|-------------------|--------------|---|------|------|-------------------|
|                 | m    | $\alpha$ | kN/m <sup>2</sup> | kN/m <sup>2</sup> | overheersend |   |      |      |                   |
| Verd.kpv 320+80 | 4,98 | 100      | 8,00              | 5,00              | nee          | = | 39,8 | 24,9 | kN/m <sup>1</sup> |
|                 |      |          |                   |                   |              |   | 39,8 | 24,9 | kN/m <sup>1</sup> |

De uitvoer van de berekeningen is opgenomen in bijlage J.

## 4.3 Ligger verdieping as 9

| Lijnlast        | b     |          |                   |                   |              |   |      |      |                   |
|-----------------|-------|----------|-------------------|-------------------|--------------|---|------|------|-------------------|
|                 | m     | $\alpha$ | kN/m <sup>2</sup> | kN/m <sup>2</sup> | overheersend |   |      |      |                   |
| Verd.kpv 320+80 | 7,78  | 100      | 8,00              | 5,00              | nee          | = | 62,2 | 38,9 | kN/m <sup>1</sup> |
| Verd.kpv 320+80 | 9,00  | 100      | 8,00              | 5,00              | nee          | = | 72,0 | 45,0 |                   |
| Verd.kpv 320+80 | 10,13 | 100      | 8,00              | 5,00              | nee          | = | 81,0 | 50,6 |                   |

De uitvoer van de berekeningen is opgenomen in bijlage K.

## 4.4 Ligger verdieping as 10

| Lijnlast        | b    |          |                   |                   |              |   |      |      |                   |
|-----------------|------|----------|-------------------|-------------------|--------------|---|------|------|-------------------|
|                 | m    | $\alpha$ | kN/m <sup>2</sup> | kN/m <sup>2</sup> | overheersend |   |      |      |                   |
| Verd.kpv 320+80 | 4,05 | 100      | 8,00              | 5,00              | nee          | = | 32,4 | 20,3 | kN/m <sup>1</sup> |
|                 |      |          |                   |                   |              |   | 32,4 | 20,3 | kN/m <sup>1</sup> |

De uitvoer van de berekeningen is opgenomen in bijlage L.

## 4.5 Ligger verdieping as 12

| Lijnlast        | b    |          |                   |                   |              |   |      |      |                   |
|-----------------|------|----------|-------------------|-------------------|--------------|---|------|------|-------------------|
|                 | m    | $\alpha$ | kN/m <sup>2</sup> | kN/m <sup>2</sup> | overheersend |   |      |      |                   |
| Verd.kpv 320+80 | 4,05 | 100      | 8,00              | 5,00              | nee          | = | 32,4 | 20,3 | kN/m <sup>1</sup> |
| Verd.kpv 200+80 | 1,22 | 100      | 6,85              | 5,00              | nee          | = | 8,4  | 6,1  |                   |

De uitvoer van de berekeningen is opgenomen in bijlage M.

## 4.6 Ligger verdieping as 13

| Lijnlast        | b    |          |                   |                   |              |   |     |      |                   |  |
|-----------------|------|----------|-------------------|-------------------|--------------|---|-----|------|-------------------|--|
|                 | m    | $\alpha$ | kN/m <sup>2</sup> | kN/m <sup>2</sup> | overheersend |   |     |      |                   |  |
| Verd.kpv 320+80 | 5,15 | 100      | 8,00              | 5,00              | nee          | = | 412 | 25,8 | kN/m <sup>1</sup> |  |
|                 |      |          |                   |                   |              |   | 412 | 25,8 | kN/m <sup>1</sup> |  |

De uitvoer van de berekeningen is opgenomen in bijlage N.

## 4.7 Luifel

| Lijnlast       | b<br>m | $\alpha$ | kN/m <sup>2</sup> | kN/m <sup>2</sup> | overheersend |   |     |      |                   |
|----------------|--------|----------|-------------------|-------------------|--------------|---|-----|------|-------------------|
| luifel         | 4,98   | 100      | 0,30              | 0,56              | nee          | = | 15  | 2,8  | kN/m <sup>1</sup> |
| sneeuwophoping | 4,98   | 100      | 0,00              | 2,80              | nee          | = | 0,0 | 13,9 |                   |
| sneeuwophoping | 4,98   | 100      | 0,00              | 191               | nee          | = | 0,0 | 9,5  |                   |

| Lijnlast       | b<br>m | $\alpha$ | kN/m <sup>2</sup> | kN/m <sup>2</sup> | overheersend |   |     |     |                   |
|----------------|--------|----------|-------------------|-------------------|--------------|---|-----|-----|-------------------|
| luifel         | 2,53   | 100      | 0,30              | 0,56              | nee          | = | 0,8 | 14  | kN/m <sup>1</sup> |
| sneeuwophoping | 2,53   | 100      | 0,00              | 2,80              | nee          | = | 0,0 | 7,1 |                   |
| sneeuwophoping | 2,53   | 100      | 0,00              | 191               | nee          | = | 0,0 | 4,8 |                   |

De uitvoer van de berekeningen is opgenomen in bijlage O.

## 4.8 Kolommen

De kolommen bij de kleedruimte moeten 60 minuten brandwerend zijn. De kolommen worden eerste getoetst met die erop staan, daarnaar is gekeken of de kolommen 60 minuten brandwerend kunnen zijn met de belastingen.

De uitvoer van de berekeningen is opgenomen in bijlage P.

# 5 Entree

## 5.1 Houten balklaag

| BEREKENING DAKLIGGER OP 2 STEUNPUNTEN                          |       |                             |                           |                                                                                                                                |                                      |                         |                       |                                        |                                        | V4.1              |                   |           |
|----------------------------------------------------------------|-------|-----------------------------|---------------------------|--------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|-------------------------|-----------------------|----------------------------------------|----------------------------------------|-------------------|-------------------|-----------|
| b (balk) :                                                     | 71    | mm                          | A =                       | 139                                                                                                                            | cm <sup>2</sup>                      | Hout kw:                | C24                   |                                        | keuze                                  |                   |                   |           |
| h (balk) :                                                     | 196   | mm                          | W <sub>y</sub> =          | 455                                                                                                                            | cm <sup>3</sup>                      | Gevolg Klasse :         | CC2                   |                                        | keuze                                  |                   |                   |           |
| L <sub>Oversp</sub> :                                          | 5,00  | 0,00                        | l <sub>y</sub> =          | 4,45E+03                                                                                                                       | cm <sup>4</sup>                      | Klim.kl :               | 1                     |                                        | keuze                                  |                   |                   |           |
| L <sub>Kip</sub> :                                             | 5,00  | m                           | k <sub>h</sub> =          | 1,00                                                                                                                           | fac                                  | Belasting:              | boven                 |                                        | keuze                                  |                   |                   |           |
| L <sub>Kip,wi</sub> :                                          | 5,00  | m                           | k <sub>def</sub> =        | 0,6                                                                                                                            | fac                                  | Steunen:                | boven                 |                                        | keuze                                  |                   |                   |           |
| g <sub>eg,k</sub> :                                            | 0,60  | kN/m <sup>2</sup> (excl eg) | k <sub>mod</sub> =        | 0,9                                                                                                                            | fac                                  | ψ <sub>0</sub> =        | 0                     |                                        |                                        |                   |                   |           |
| S <sub>k,sn;rep</sub> :                                        | 0,70  | kN/m <sup>2</sup> (basis)   | μ <sub>(sn)</sub> =       | 0,87                                                                                                                           | fac                                  | ψ <sub>1</sub> =        | 0,2                   |                                        | (t.b.v. brand)                         |                   |                   |           |
| q <sub>p,wi;rep</sub> :                                        | 0,49  | kN/m <sup>2</sup> (basis)   |                           | Zuiging                                                                                                                        | Druk                                 | ψ <sub>2</sub> =        | 0                     |                                        | (t.b.v. kruip)                         |                   |                   |           |
| (Windgebied 3, onbebouwd, h = 3,0 m)                           |       |                             | C <sub>(pe)</sub> =       | -0,8                                                                                                                           | 0,4                                  | fac                     | Ref.per :             | 50                                     | jaar                                   |                   |                   |           |
| q <sub>k,wb;rep</sub> :                                        | 1,00  | kN/m <sup>2</sup> (10m²)    | C <sub>(pi)</sub> =       | 0,2                                                                                                                            | -0,3                                 | fac                     |                       |                                        |                                        |                   |                   |           |
| F <sub>vb;k</sub> :                                            | 1,5   | kN                          | k <sub>r</sub> = 1,00 fac |                                                                                                                                |                                      |                         |                       |                                        |                                        |                   |                   |           |
| F <sub>vb,k</sub> :                                            | 1,50  | kN <sub>(gereduceerd)</sub> |                           |                                                                                                                                |                                      |                         |                       |                                        |                                        |                   |                   |           |
| Hoh afst :                                                     | 0,60  | m                           | Y <sub>g</sub> =          | 1,35                                                                                                                           | fac (6.10.a)                         | ψ <sub>t,sn</sub> =     | 1,00                  |                                        | fac NEN-EN 1991-1-3 bijl.D             |                   |                   |           |
| N <sub>eg,k</sub> :                                            | 0,00  | kN                          | Y <sub>g</sub> =          | 1,20                                                                                                                           | fac (6.10.b)                         | ψ <sub>t,wi</sub> =     | 1,00                  |                                        | fac NEN-EN 1991-1-4 4.2-4              |                   |                   |           |
| N <sub>vb,k</sub> :                                            | 0,00  | kN                          | Y <sub>q</sub> =          | 1,50                                                                                                                           | fac (6.10.b)                         | ψ <sub>t,vb</sub> =     | 1,00                  |                                        | fac 1990: bijl.A11                     |                   |                   |           |
|                                                                |       |                             |                           |                                                                                                                                |                                      | UC <sub>max,uls</sub> = | 0,66                  |                                        |                                        |                   |                   |           |
| Controle Uiterste grenstoestand: NEN 1995-1-1:2005+C1:2006     |       |                             |                           |                                                                                                                                |                                      |                         |                       |                                        |                                        |                   |                   |           |
| M <sub>d(6.10.b)</sub> =                                       | 4,42  | kNm                         | (kmod = 0,90)             | σ <sub>m,0;d</sub> =                                                                                                           | 9,73                                 | N/mm <sup>2</sup>       | <                     | f <sub>m,0,u;d</sub> =                 | 16,62                                  | N/mm <sup>2</sup> | UC : 0,59         |           |
|                                                                |       |                             | art 6.3.2. vgl.6.23       | σ <sub>c,0;d</sub> / ((k <sub>cy</sub> * f <sub>c,0;d</sub> ) + σ <sub>m,y;d</sub> / f <sub>m,y;d</sub> ) =                    | 0,00/(0,380*14,54)+9,73/16,62=       |                         |                       |                                        |                                        |                   | UC : 0,59         |           |
|                                                                |       |                             | art 6.3.2. vgl.6.24       | σ <sub>c,0;d</sub> / ((k <sub>cz</sub> * f <sub>c,0;d</sub> ) + k <sub>m</sub> * (σ <sub>m,y;d</sub> / f <sub>m,y;d</sub> )) = | 0,00/(0,056*14,54)+(0,7*9,73)/16,62= |                         |                       |                                        |                                        |                   | UC : 0,41         |           |
| M <sub>d,kip</sub> =                                           | 4,42  | kNm                         | art 6.3.3. vgl.6.33       | (lef = 4892mm ; σ <sub>m,crit</sub> = 30,35 N/mm <sup>2</sup> ; λ <sub>rel</sub> = 0,89 ; k <sub>crit</sub> = 0,893)           | σ <sub>m,d</sub> =                   | 9,73                    | N/mm <sup>2</sup>     | <                                      | k <sub>crit</sub> x f <sub>m,d</sub> = | 14,84             | N/mm <sup>2</sup> | UC : 0,66 |
| M <sub>wi,op</sub> =                                           | -0,18 | kNm                         | art 6.3.3. vgl.6.33       | σ <sub>m,d</sub> =                                                                                                             | 0,39                                 | N/mm <sup>2</sup>       | <                     | k <sub>crit</sub> x f <sub>m,d</sub> = | 15,41                                  | N/mm <sup>2</sup> | UC : 0,03         |           |
| V <sub>d,max</sub> =                                           | 3,54  | kN                          | art.6.17. vgl.6.13        | τ <sub>d</sub> =                                                                                                               | 0,38                                 | N/mm <sup>2</sup>       | <                     | f <sub>v,d</sub> =                     | 2,77                                   | N/mm <sup>2</sup> | UC : 0,14         |           |
|                                                                |       |                             |                           |                                                                                                                                |                                      |                         |                       |                                        |                                        |                   |                   |           |
| M <sub>d(6.10.a)</sub> =                                       | 1,81  | kNm                         | (kmod = 0,60)             | σ <sub>m,0;d</sub> =                                                                                                           | 3,99                                 | N/mm <sup>2</sup>       | <                     | f <sub>m,0,u;d</sub> =                 | 11,08                                  | N/mm <sup>2</sup> | UC : 0,36         |           |
|                                                                |       |                             | art 6.3.2. vgl.6.23       | σ <sub>c,0;d</sub> / ((k <sub>cy</sub> * f <sub>c,0;d</sub> ) + σ <sub>m,y;d</sub> / f <sub>m,y;d</sub> ) =                    | 0,00/(0,380*9,69)+3,99/11,08=        |                         |                       |                                        |                                        |                   | UC : 0,36         |           |
|                                                                |       |                             | art 6.3.2. vgl.6.24       | σ <sub>c,0;d</sub> / ((k <sub>cz</sub> * f <sub>c,0;d</sub> ) + k <sub>m</sub> * (σ <sub>m,y;d</sub> / f <sub>m,y;d</sub> )) = | 0,00/(0,056*9,69)+(0,7*3,99)/11,08=  |                         |                       |                                        |                                        |                   | UC : 0,25         |           |
| M <sub>d,kip</sub> =                                           | 1,81  | kNm                         | art 6.3.3. vgl.6.33       | (lef = 4892mm ; σ <sub>m,crit</sub> = 30,35 N/mm <sup>2</sup> ; λ <sub>rel</sub> = 0,89 ; k <sub>crit</sub> = 0,893)           | σ <sub>m,d</sub> =                   | 3,99                    | N/mm <sup>2</sup>     | <                                      | k <sub>crit</sub> x f <sub>m,d</sub> = | 9,89              | N/mm <sup>2</sup> | UC : 0,40 |
| V <sub>d,max</sub> =                                           | 1,45  | kN                          | art.6.17. vgl.6.13        | τ <sub>d</sub> =                                                                                                               | 0,16                                 | N/mm <sup>2</sup>       | <                     | f <sub>v,d</sub> =                     | 1,85                                   | N/mm <sup>2</sup> | UC : 0,08         |           |
|                                                                |       |                             |                           |                                                                                                                                |                                      |                         |                       |                                        |                                        |                   |                   |           |
| Controle Bruikbaarheidsgrenstoestand: NEN 1990-1-1 en 1995-1-1 |       |                             |                           |                                                                                                                                |                                      |                         |                       |                                        |                                        | Controle veld 1   |                   |           |
| u <sub>eg,on</sub> =                                           | 7,1   | mm                          | u <sub>bijk</sub> =       | 10,4                                                                                                                           | mm                                   | <                       | 0.004L                | 20,0                                   | mm                                     | UC : 0,52         |                   |           |
| u <sub>vb,ins</sub> =                                          | 6,1   | mm                          | toog:u <sub>c</sub> =     | 0                                                                                                                              | mm                                   |                         | (u <sub>kruip</sub> = | 4,3                                    | mm)                                    |                   |                   |           |
| f <sub>e</sub> =                                               | 0,0   | Hz                          | u <sub>net,fin</sub> =    | 17,5                                                                                                                           | mm                                   | <                       | 0.004 L               | 20,0                                   | mm                                     | UC : 0,87         |                   |           |

## 5.2 Spanten

Spanten tussen as 7 en 9 is maatgevend.

| Lijnlast | b    | $\alpha$ |                   |                   |              |   |     |     |                   |  |  |
|----------|------|----------|-------------------|-------------------|--------------|---|-----|-----|-------------------|--|--|
|          | m    |          | kN/m <sup>2</sup> | kN/m <sup>2</sup> | overheersend | = |     |     |                   |  |  |
| luifel   | 5,00 | 100      | 0,80              | 0,56              | nee          | = | 4,0 | 2,8 | kN/m <sup>1</sup> |  |  |
| luifel   | 5,00 | 100      | 0,80              | 0,60              | nee          | = | 4,0 | 3,0 | kN/m <sup>1</sup> |  |  |

| Puntlast | b    | L    | $\alpha$ |                   |                   |              |   |      |     |    |  |  |
|----------|------|------|----------|-------------------|-------------------|--------------|---|------|-----|----|--|--|
|          | m    | m    |          | kN/m <sup>2</sup> | kN/m <sup>2</sup> | overheersend | = |      |     |    |  |  |
| gevel    | 5,00 | 3,75 | 100      | 1,00              | 0,00              | nee          | = | 18,8 | 0,0 | kN |  |  |
|          |      |      |          |                   |                   |              |   | 18,8 | 0,0 | kN |  |  |

De uitvoer van de berekeningen is opgenomen in bijlage Q.

## 5.3 Opvanglijger spanten

Reacties uit spanten dak tussen as 7-9

Permanent: 16 kN

Sneeuw: 10 kN

Reacties uit spanten dak tussen as 9-10

Permanent: 12 kN

Sneeuw: 7 kN

Reacties uit spanten verdieping tussen as 7-9

Permanent: 42 kN

Veranderlijk: 3 kN

Reacties uit spanten verdieping tussen as 9-10

Permanent: 30 kN

Sneeuw: 2 kN

De uitvoer van de berekeningen is opgenomen in bijlage R.

## 5.4 Ligger naast bestaande as 7

| Lijnlast | b    | $\alpha$ | kN/m <sup>2</sup> | kN/m <sup>2</sup> | overheersend |   |     |                      |
|----------|------|----------|-------------------|-------------------|--------------|---|-----|----------------------|
|          | m    |          |                   |                   |              |   |     |                      |
| luifel   | 3,00 | 100      | 0,80              | 0,56              | nee          | = | 2,4 | 17 kN/m <sup>1</sup> |

De uitvoer van de berekeningen is opgenomen in bijlage S.

## 5.5 Spant as 7

| Lijnlast | b    | $\alpha$ | kN/m <sup>2</sup> | kN/m <sup>2</sup> | overheersend |   |     |                      |
|----------|------|----------|-------------------|-------------------|--------------|---|-----|----------------------|
|          | m    |          |                   |                   |              |   |     |                      |
| luifel   | 2,76 | 100      | 0,80              | 0,56              | nee          | = | 2,2 | 15 kN/m <sup>1</sup> |
| luifel   | 2,76 | 100      | 0,80              | 0,60              | nee          | = | 2,2 | 17 kN/m <sup>1</sup> |
| luifel   | 3,00 | 100      | 0,80              | 0,56              | nee          | = | 2,4 | 17                   |

| Puntlast | b    | L    | $\alpha$ | kN/m <sup>2</sup> | kN/m <sup>2</sup> | overheersend |   |      |        |
|----------|------|------|----------|-------------------|-------------------|--------------|---|------|--------|
|          | m    | m    |          |                   |                   |              |   |      |        |
| gevel    | 2,76 | 3,75 | 100      | 100               | 0,00              | nee          | = | 10,4 | 0,0 kN |
|          |      |      |          |                   |                   |              |   | 10,4 | 0,0 kN |

De uitvoer van de berekeningen is opgenomen in bijlage T.

## 5.6 Dakligger as B'

Voor reacties op de dakligger op as B' zie overzicht kolomreacties.

De uitvoer van de berekeningen is opgenomen in bijlage U.

## 5.7 Liggers verdieping

| Lijnlast        | b    | $\alpha$ | kN/m <sup>2</sup> | kN/m <sup>2</sup> | overheersend |   |      |                        |
|-----------------|------|----------|-------------------|-------------------|--------------|---|------|------------------------|
|                 | m    |          |                   |                   |              |   |      |                        |
| Verd.kpv 320+80 | 3,80 | 100      | 8,00              | 5,00              | nee          | = | 30,4 | 19,0 kN/m <sup>1</sup> |
| Verd.kpv 320+80 | 2,64 | 100      | 8,00              | 5,00              | nee          | = | 21,1 | 13,2                   |

De uitvoer van de berekeningen is opgenomen in bijlage V.

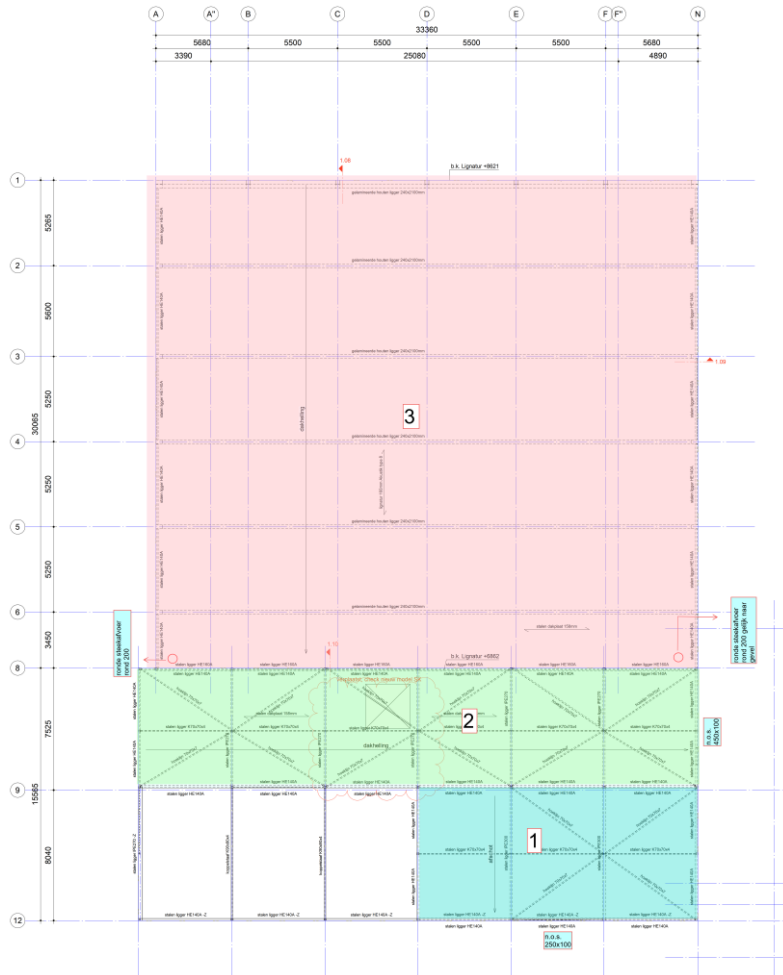
## 5.8 Kolommen

De kolommen met de maatgevende reacties wordt gecontroleerd.

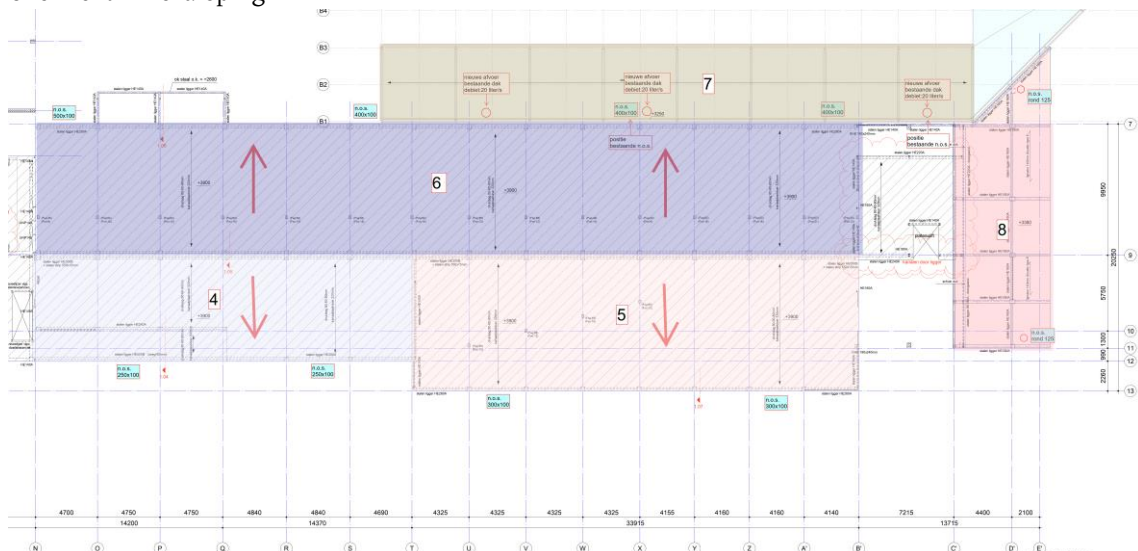
De uitvoer van de berekeningen is opgenomen in bijlage W.

## 6 Noodoverstort

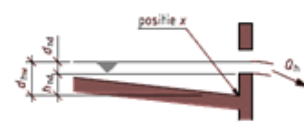
Overzicht dak



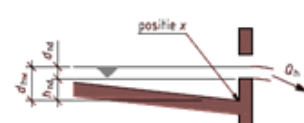
## Overzicht 1<sup>e</sup> verdieping



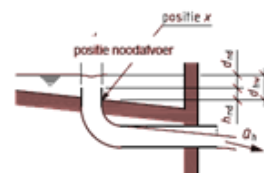
| Rechte vrije overlaat |              | 1       | 2       |                   |
|-----------------------|--------------|---------|---------|-------------------|
| oppervlakte dakvlak   | A            | 142     | 260     | m <sup>2</sup>    |
| breedte noodafvoer    | b            | 250     | 450     | mm                |
| hoogte noodafvoer     | h            | 100     | 100     | mm                |
| inplakhoogte          | $h_{nd}$     | 30      | 30      | mm                |
| aantal noodafvoeren   | n            | 1       | 1       |                   |
| volumieke massa water | $\gamma$     | 10      | 10      | kN/m <sup>3</sup> |
| regenintensiteit      | $i_r$        | 5,0E-05 | 5,0E-05 | m/s               |
| debiet noodafvoeren   | $Q_h$        | 0,007   | 0,013   | m <sup>3</sup> /s |
| debiet per noodafvoer | $Q_{hi}$     | 0,007   | 0,013   | m <sup>3</sup> /s |
| waterh. boven noodaf. | $d_{nd}$     | 65      | 66      | mm                |
| waterhoogte           | $d_{hw}$     | 95      | 96      | mm                |
| maximale waterhoogte  | $d_{hw,max}$ | 100     | 100     | mm                |
| regenbelasting        | $p_w$        | 0,95    | 0,96    | kN/m <sup>2</sup> |



| Rechte vrije overlaat |              | 4       | 5       | 6       | 7       |                   |
|-----------------------|--------------|---------|---------|---------|---------|-------------------|
| oppervlakte dakvlak   | A            | 230     | 350     | 882     | 1160    | m <sup>2</sup>    |
| breedte noodafvoer    | b            | 250     | 300     | 400     | 1000    | mm                |
| hoogte noodafvoer     | h            | 100     | 100     | 100     | 100     | mm                |
| inplakhoogte          | $h_{nd}$     | 30      | 30      | 30      | 30      | mm                |
| aantal noodafvoeren   | n            | 2       | 2       | 4       | 3       |                   |
| volumieke massa water | $\gamma$     | 10      | 10      | 10      | 10      | kN/m <sup>3</sup> |
| regenintensiteit      | $i_r$        | 5,0E-05 | 5,0E-05 | 5,0E-05 | 5,0E-05 | m/s               |
| debiet noodafvoeren   | $Q_h$        | 0,012   | 0,018   | 0,044   | 0,058   | m <sup>3</sup> /s |
| debiet per noodafvoer | $Q_{hi}$     | 0,006   | 0,009   | 0,011   | 0,019   | m <sup>3</sup> /s |
| waterh. boven noodaf. | $d_{nd}$     | 57      | 66      | 64      | 50      | mm                |
| waterhoogte           | $d_{hw}$     | 87      | 96      | 94      | 80      | mm                |
| maximale waterhoogte  | $d_{hw,max}$ | 100     | 100     | 100     | 100     | mm                |
| regenbelasting        | $p_w$        | 0,87    | 0,96    | 0,94    | 0,80    | kN/m <sup>2</sup> |



| Ronde steekafvoer       |            | 3       | 8       |                   |
|-------------------------|------------|---------|---------|-------------------|
| oppervlakte dakvlak     | A          | 755     | 255     | m <sup>2</sup>    |
| binnenmiddellijn afvoer | d          | 170     | 117     | mm                |
| inplakhoogte            | $h_{nd}$   | 30      | 30      | mm                |
| aantal noodafvoeren     | n          | 2       | 2       |                   |
| volumieke massa water   | $\gamma$   | 10      | 10      | kN/m <sup>3</sup> |
| regenintensiteit        | $i_r$      | 5,0E-05 | 5,0E-05 | m/s               |
| debiet noodafvoeren     | $Q_h$      | 0,038   | 0,013   | m <sup>3</sup> /s |
| debiet per noodafvoer   | $Q_{hi}$   | 0,019   | 0,006   | m <sup>3</sup> /s |
| maximaal debiet         | $Q_{hi,u}$ | 0,030   | 0,012   | m <sup>3</sup> /s |
| waterh. boven noodaf.   | $d_{nd}$   | 67      | 42      | mm                |
| waterhoogte             | $d_{hw}$   | 97      | 72      | mm                |
| regenbelasting          | $p_w$      | 0,97    | 0,72    | kN/m <sup>2</sup> |





## Bijlage A Uitvoer zwemzaal portalen

**Technosoft Raamwerken release 6.75b  
2023**

**26 jan**

Project.....: SGU021041 - Uitbreiding zwembad de Meerkant te Amstelveen  
Onderdeel.....: Zwemzaal portaal  
Dimensies.....: kN;m;rad (tenzij anders aangegeven)  
Datum.....: 15/11/2022  
Bestand.....: H:\SGU021041\BEREKENINGEN\04\_DO\Zwemzaal portaal.rww

Belastingbreedte.: 5.450  
Rekenmodel.....: 2e-orde-elastisch.  
Theorieën voor de bepaling van de krachtsverdeling:  
1) Losse belastinggevallen:  
Lineaire-elasticiteitstheorie  
2) Uiterste grenstoestand:  
Geometrisch niet lineair alle staven.  
Fysisch lineair alle staven.  
3) Gebruiksgrenstoestand:  
Lineaire-elasticiteitstheorie

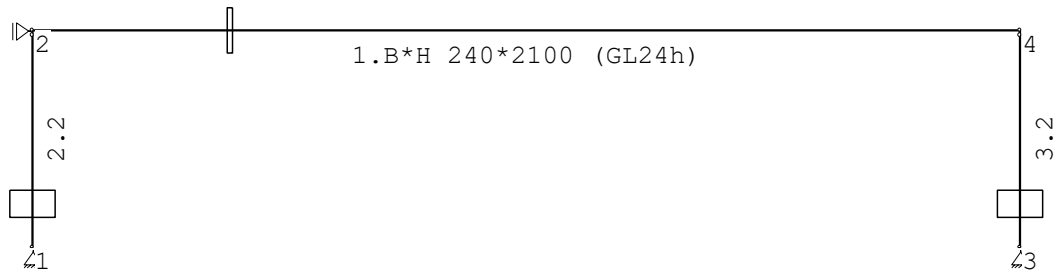
Maximum aantal iteraties.....: 50  
Max.deellengte kolommen/wanden: 0.500 Max.deellengte balken/vloeren:  
0.500  
Max. X-verplaatsing in UGT.....: 0.500 Max. Z-verplaatsing in UGT....:  
0.250

Gunstige werking van de permanente belasting wordt automatisch verwerkt.

### **Toegepaste normen volgens Eurocode met Nederlandse NB**

|             |                      |                 |
|-------------|----------------------|-----------------|
| Belastingen | NEN-EN 1990:2002     | C2:2010,A1:2019 |
| NB:2019(nl) | NEN-EN 1991-1-1:2002 | C1/C11:2019     |
| NB:2019(nl) | NEN-EN 1991-1-3:2003 | C1:2009         |
| NB:2011(nl) | NEN-EN 1991-1-4:2005 | C2:2011         |
| NB:2011(nl) | NEN-EN 1995-1-1:2005 | A1:2011,C1:2006 |
| Hout        |                      |                 |
| NB:2013(nl) | NEN-EN 14080:2013    |                 |

### **GEOMETRIE**





Project.....: SGU021041 - Uitbreiding zwembad de Meerkant te Amstelveen  
Onderdeel.....: Zwemzaal portaal

## MATERIALEN

| Mt | Kwaliteit | E-modulus[N/mm <sup>2</sup> ] | S.G. | S.G.verhoogd | Pois. | Uitz. coëff |
|----|-----------|-------------------------------|------|--------------|-------|-------------|
| 1  | GL24h     | 11500                         | 3.8  | 4.6          | 1.00  | 5.0000e-06  |

Bij de bepaling v.h. e.g. van houten staven is de S.G.verhoogd toegepast.

## PROFIELEN [mm]

| Prof.      | Omschrijving | Materiaal | Oppervlak  |
|------------|--------------|-----------|------------|
| Traagheid  | Vormf.       |           |            |
| 1          | B*H 240*2100 | 1:GL24h   | 5.0400e+05 |
| 1.8522e+11 | 0.00         |           |            |
| 2          | B*H 240*400  | 1:GL24h   | 9.6000e+04 |
| 1.2800e+09 | 0.00         |           |            |

## PROFIELEN vervolg [mm]

| Prof. | Staaftype | Breedte | Hoogte | e      | Type | b1 | h1 | b2 | h2 |
|-------|-----------|---------|--------|--------|------|----|----|----|----|
| 1     | 0:Normaal | 240     | 2100   | 1050.0 | 0:RH |    |    |    |    |
| 2     | 0:Normaal | 240     | 400    | 200.0  | 0:RH |    |    |    |    |

## PROFIELVORMEN [mm]

|   |              |                                                                                     |
|---|--------------|-------------------------------------------------------------------------------------|
| 1 | B*H 240*2100 |  |
| 2 | B*H 240*400  |  |

## KNOPEN

| Knoop | X      | Z     |
|-------|--------|-------|
| 1     | 0.000  | 0.500 |
| 2     | 0.000  | 7.835 |
| 3     | 33.360 | 0.500 |
| 4     | 33.360 | 7.835 |

## STAVEN

| St.    | ki   | kj | Profiel        | Aansl.i | Aansl.j |
|--------|------|----|----------------|---------|---------|
| Lengte | Opm. |    |                |         |         |
| 1      | 2    | 4  | 1:B*H 240*2100 | NDM     | NDM     |
| 33.360 |      |    |                |         |         |
| 2      | 1    | 2  | 2:B*H 240*400  | NDM     | ND-     |
| 7.335  |      |    |                |         |         |
| 3      | 3    | 4  | 2:B*H 240*400  | NDM     | ND-     |
| 7.335  |      |    |                |         |         |



## VASTE STEUNPUNTEN

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

Project.....: SGU021041 - Uitbreiding zwembad de Meerkant te Amstelveen  
Onderdeel.....: Zwemzaal portaal

## BELASTINGGENERATIE ALGEMEEN.

|                              |       |                         |      |
|------------------------------|-------|-------------------------|------|
| Betrouwbaarheidsklasse.....: | 2     | Referentieperiode.....: | 50   |
| Gebouwdiepte.....:           | 30.07 | Gebouwhoogte.....:      | 7.84 |
| Niveau aansl.terrein.....:   | 0.00  | E.g. scheid.w. [kN/m2]: | 1.20 |

## WIND

|                                    |                                         |
|------------------------------------|-----------------------------------------|
| Terrein categorie ...[4.3.2]....:  | Onbebouwd                               |
| Windgebied .....                   | 2 Vb,0 ..[4.2].....:                    |
| 27.000                             |                                         |
| Positie spant in het gebouw.....:  | 0.000 Kr ....[4.3.2].....:              |
| 0.209                              |                                         |
| z0 .....                           | [4.3.2]....: 0.200 Zmin ..[4.3.2].....: |
| 4.000                              |                                         |
| Co wind van links ..[4.3.3]....:   | 1.000 Co wind van rechts.....:          |
| 1.000                              |                                         |
| Co wind loodrecht ..[4.3.3]....:   | 1.000                                   |
| Cpi wind van links ..[7.2.9]....:  | 0.200 -0.300                            |
| Cpi windloodrecht ...[7.2.9]....:  | 0.200 -0.300                            |
| Cpi wind van rechts ..[7.2.9]....: | 0.200 -0.300                            |
| Cfr windwrijving ....[7.5].....:   | 0.040                                   |

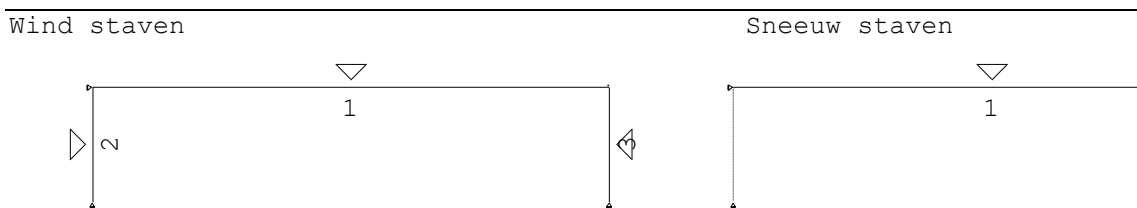
## SNEEUW

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

## STAFTYPEN

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

## LASTVELDEN



## WIND DAKTYPES

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

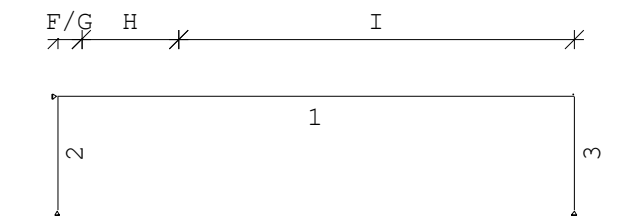


Project.....: SGU021041 - Uitbreiding zwembad de Meerkant te Amstelveen  
Onderdeel.....: Zwemzaal portaal

## WIND ZONES

Wind van links

Wind van rechts



### WIND VAN LINKS ZONES

| Nr. | Staal | Positie | Lengte | Zone |
|-----|-------|---------|--------|------|
| 1   | 2     | 0.000   | 7.335  | D    |
| 2   | 1     | 0.000   | 1.567  | F/G  |
| 3   | 1     | 1.567   | 6.268  | H    |
| 4   | 1     | 7.835   | 25.525 | I    |
| 5   | 3     | 0.000   | 7.335  | E    |

### Wind indexen

| Index    | CsCd | Cpe/Cpi | qp    | breedte | reductie | Qw     | Zone |
|----------|------|---------|-------|---------|----------|--------|------|
| Hoek(en) |      |         |       |         |          |        |      |
| Qw1      |      | 0.300   | 0.779 | 5.450   |          | -1.273 | -i   |
| Qw2      |      | -0.300  | 0.779 | 5.450   |          | 1.273  | -i   |
| Qw3      | 1.00 | 0.800   | 0.779 | 5.450   |          | -3.396 | D    |
| Qw4      | 1.00 | -1.800  | 0.779 | 3.918   |          | 5.492  | F    |
| Qw5      | 1.00 | -1.200  | 0.779 | 1.532   |          | 1.432  | G    |
| Qw6      | 1.00 | -0.700  | 0.779 | 5.450   |          | 2.971  | H    |
| Qw7      | 1.00 | -0.200  | 0.779 | 5.450   |          | 0.849  | I    |
| Qw8      | 1.00 | 0.500   | 0.779 | 5.450   |          | -2.122 | E    |
| Qw9      |      | -0.040  | 0.779 | 5.450   |          | 0.170  |      |
| Qw10     |      | -0.200  | 0.779 | 5.450   |          | 0.849  | +i   |
| Qw11     |      | 0.200   | 0.779 | 5.450   |          | -0.849 | +i   |
| Qw12     | 1.00 | 0.200   | 0.779 | 5.450   |          | -0.849 | I    |
|          |      |         |       |         |          |        | 0.0  |
|          |      |         |       |         |          |        | 0.0  |
|          |      |         |       |         |          |        | 0.0  |
|          |      |         |       |         |          |        | 0.0  |
|          |      |         |       |         |          |        | 0.0  |
|          |      |         |       |         |          |        | 0.0  |

### SNEEUW DAKTYPEN

| Staal | artikel             |
|-------|---------------------|
| 1-1   | 5.3.2 Lessenaarsdak |

### Sneeuw indexen

| Index | art   | $\mu$ | $s_k$ | red. | posfac | breedte | $Q_s$ | hoek |
|-------|-------|-------|-------|------|--------|---------|-------|------|
| Qs1   | 5.3.2 | 0.800 | 0.70  | 1.00 |        | 5.450   | 3.052 | 0.0  |

Project.....: SGU021041 - Uitbreiding zwembad de Meerkant te Amstelveen  
Onderdeel.....: Zwemzaal portaal

## BELASTINGGEVALLEN

| B.G. | Omschrijving                     | Type               |
|------|----------------------------------|--------------------|
|      | 1 Permanente belasting EGZ=-1.00 | 1                  |
| g    | 2 Wind van links onderdruk A     | 7                  |
| g    | 3 Wind van links overdruk A      | 8                  |
| g    | 4 Wind van links onderdruk B     | 9                  |
| g    | 5 Wind van links overdruk B      | 10                 |
|      | 6 Windbok onderdruk A            | 11 Wind van rechts |
| g*   | 7 Sneeuw A                       | 22                 |

g = gegenereerd belastinggeval

\* = belastinggeval bevat 1 of meer handmatig toegevoegde en/of gewijzigde lasten

## BELASTINGGEVALLEN vervolg

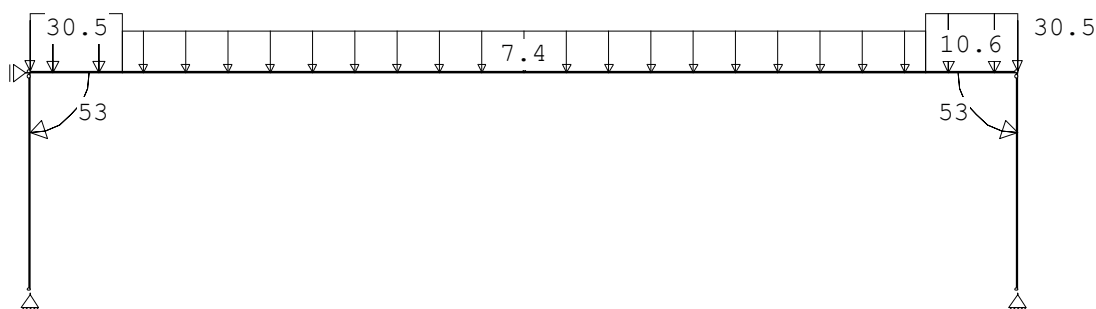
| B.G. | Omschrijving                 | Belastingduurklasse |
|------|------------------------------|---------------------|
|      | 1 Permanente belasting       | Blijvend            |
|      | 2 Wind van links onderdruk A | Kort                |
|      | 3 Wind van links overdruk A  | Kort                |
|      | 4 Wind van links onderdruk B | Kort                |
|      | 5 Wind van links overdruk B  | Kort                |
|      | 6 Windbok                    | Kort                |
|      | 7 Sneeuw A                   | Kort                |

## BELASTINGEN

B.G.:1 Permanente

belasting

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



## KNOOPBELASTINGEN

B.G.:1 Permanente

belasting

| Last | Knoop | Richting  | waarde  | $\psi_0$ | $\psi_1$ | $\psi_2$ |
|------|-------|-----------|---------|----------|----------|----------|
| 1    | 2     | Z         | -30.500 |          |          |          |
| 2    | 4     | Z         | -30.500 |          |          |          |
| 3    | 2     | Rotatie Y | 53.000  |          |          |          |
| 4    | 4     | Rotatie Y | -53.000 |          |          |          |

Project.....: SGU021041 - Uitbreiding zwembad de Meerkant te Amstelveen  
Onderdeel.....: Zwemzaal portaal

## STAAFBELASTINGEN

B.G:1 Permanente

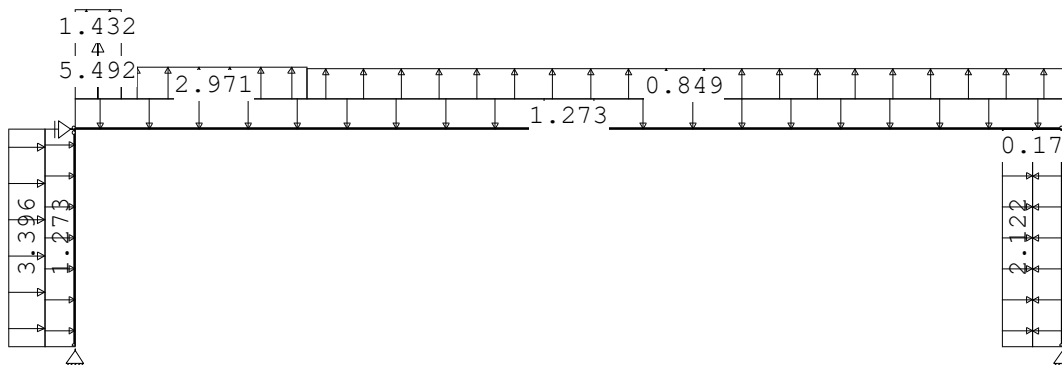
belasting

| Staaftype | Type       | q1/p/m | q2     | A      | B      | $\psi_0$ |
|-----------|------------|--------|--------|--------|--------|----------|
| $\psi_1$  | $\psi_2$   |        |        |        |        |          |
| 1         | 1:QZLokaal | -10.60 | -10.60 | 0.000  | 30.260 |          |
| 1         | 1:QZLokaal | -7.40  | -7.40  | 3.100  | 3.100  |          |
| 1         | 1:QZLokaal | -10.60 | -10.60 | 30.260 | 0.000  |          |

## BELASTINGEN

B.G:2 Wind van links

onderdruk A



## STAAFBELASTINGEN

B.G:2 Wind van links

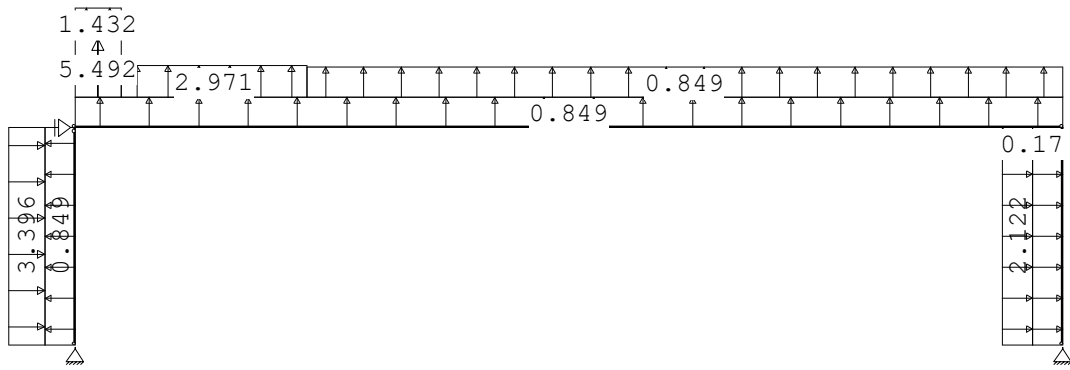
onderdruk A

| Staaftype | Type       | Index | q1/p/m | q2    | A      | B      | $\psi_0$ |
|-----------|------------|-------|--------|-------|--------|--------|----------|
| $\psi_1$  | $\psi_2$   |       |        |       |        |        |          |
| 2         | 1:QZLokaal | Qw1   | -1.27  | -1.27 | 0.000  | 0.000  | 0.00     |
| 0.20      | 0.00       |       |        |       |        |        |          |
| 1         | 1:QZLokaal | Qw1   | -1.27  | -1.27 | 0.000  | 0.000  | 0.00     |
| 0.20      | 0.00       |       |        |       |        |        |          |
| 3         | 1:QZLokaal | Qw2   | 1.27   | 1.27  | 0.000  | 0.000  | 0.00     |
| 0.20      | 0.00       |       |        |       |        |        |          |
| 2         | 1:QZLokaal | Qw3   | -3.40  | -3.40 | 0.000  | 0.000  | 0.00     |
| 0.20      | 0.00       |       |        |       |        |        |          |
| 1         | 1:QZLokaal | Qw4   | 5.49   | 5.49  | 0.000  | 31.793 | 0.00     |
| 0.20      | 0.00       |       |        |       |        |        |          |
| 1         | 1:QZLokaal | Qw5   | 1.43   | 1.43  | 0.000  | 31.793 | 0.00     |
| 0.20      | 0.00       |       |        |       |        |        |          |
| 1         | 1:QZLokaal | Qw6   | 2.97   | 2.97  | 1.567  | 25.525 | 0.00     |
| 0.20      | 0.00       |       |        |       |        |        |          |
| 1         | 1:QZLokaal | Qw7   | 0.85   | 0.85  | 7.835  | 0.000  | 0.00     |
| 0.20      | 0.00       |       |        |       |        |        |          |
| 3         | 1:QZLokaal | Qw8   | -2.12  | -2.12 | 0.000  | 0.000  | 0.00     |
| 0.20      | 0.00       |       |        |       |        |        |          |
| 1         | 2:QXLokaal | Qw9   | 0.17   | 0.17  | 31.340 | 0.000  | 0.00     |
| 0.20      | 0.00       |       |        |       |        |        |          |

## BELASTINGEN

B.G:3 Wind van links

overdruk A



Project.....: SGU021041 - Uitbreiding zwembad de Meerkant te Amstelveen  
Onderdeel.....: Zwemzaal portaal

## STAAFBELASTINGEN

B.G:3 Wind van links

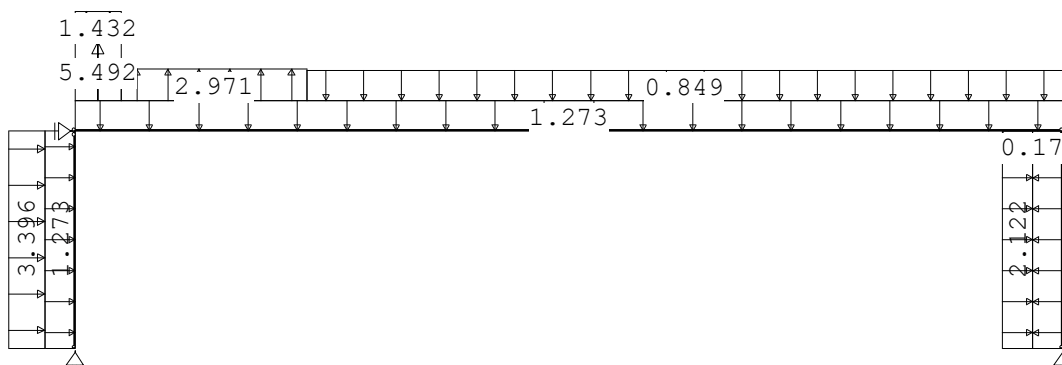
overdruk A

| Staaftype | Type     | Index        | q1/p/m | q2    | A     | B      | $\psi_0$ |
|-----------|----------|--------------|--------|-------|-------|--------|----------|
| $\psi_1$  | $\psi_2$ |              |        |       |       |        |          |
| 0.20      | 0.00     | 2 1:QZLokaal | Qw10   | 0.85  | 0.85  | 0.000  | 0.000    |
| 0.20      | 0.00     | 1 1:QZLokaal | Qw10   | 0.85  | 0.85  | 0.000  | 0.000    |
| 0.20      | 0.00     | 3 1:QZLokaal | Qw11   | -0.85 | -0.85 | 0.000  | 0.000    |
| 0.20      | 0.00     | 2 1:QZLokaal | Qw3    | -3.40 | -3.40 | 0.000  | 0.000    |
| 0.20      | 0.00     | 1 1:QZLokaal | Qw4    | 5.49  | 5.49  | 0.000  | 31.793   |
| 0.20      | 0.00     | 1 1:QZLokaal | Qw5    | 1.43  | 1.43  | 0.000  | 31.793   |
| 0.20      | 0.00     | 1 1:QZLokaal | Qw6    | 2.97  | 2.97  | 1.567  | 25.525   |
| 0.20      | 0.00     | 1 1:QZLokaal | Qw7    | 0.85  | 0.85  | 7.835  | 0.000    |
| 0.20      | 0.00     | 3 1:QZLokaal | Qw8    | -2.12 | -2.12 | 0.000  | 0.000    |
| 0.20      | 0.00     | 1 2:QXLokaal | Qw9    | 0.17  | 0.17  | 31.340 | 0.000    |

## BELASTINGEN

B.G:4 Wind van links

onderdruk B



## STAAFBELASTINGEN

B.G:4 Wind van links

onderdruk B

| Staaftype | Type     | Index        | q1/p/m | q2    | A     | B     | $\psi_0$ |
|-----------|----------|--------------|--------|-------|-------|-------|----------|
| $\psi_1$  | $\psi_2$ |              |        |       |       |       |          |
| 0.20      | 0.00     | 2 1:QZLokaal | Qw1    | -1.27 | -1.27 | 0.000 | 0.000    |
| 0.20      | 0.00     | 1 1:QZLokaal | Qw1    | -1.27 | -1.27 | 0.000 | 0.000    |
| 0.20      | 0.00     | 3 1:QZLokaal | Qw2    | 1.27  | 1.27  | 0.000 | 0.000    |



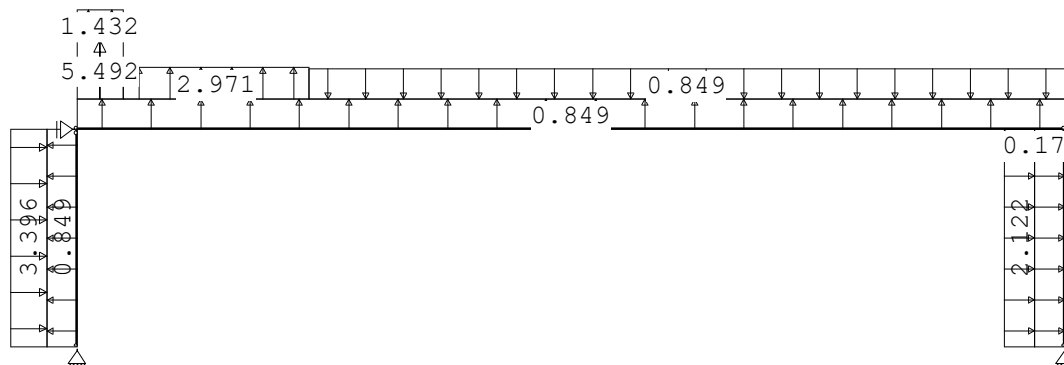
|      |            |      |       |       |        |        |      |
|------|------------|------|-------|-------|--------|--------|------|
| 2    | 1:QZLokaal | Qw3  | -3.40 | -3.40 | 0.000  | 0.000  | 0.00 |
| 0.20 | 0.00       |      |       |       |        |        |      |
| 1    | 1:QZLokaal | Qw4  | 5.49  | 5.49  | 0.000  | 31.793 | 0.00 |
| 0.20 | 0.00       |      |       |       |        |        |      |
| 1    | 1:QZLokaal | Qw5  | 1.43  | 1.43  | 0.000  | 31.793 | 0.00 |
| 0.20 | 0.00       |      |       |       |        |        |      |
| 1    | 1:QZLokaal | Qw6  | 2.97  | 2.97  | 1.567  | 25.525 | 0.00 |
| 0.20 | 0.00       |      |       |       |        |        |      |
| 1    | 1:QZLokaal | Qw12 | -0.85 | -0.85 | 7.835  | 0.000  | 0.00 |
| 0.20 | 0.00       |      |       |       |        |        |      |
| 3    | 1:QZLokaal | Qw8  | -2.12 | -2.12 | 0.000  | 0.000  | 0.00 |
| 0.20 | 0.00       |      |       |       |        |        |      |
| 1    | 2:QXLokaal | Qw9  | 0.17  | 0.17  | 31.340 | 0.000  | 0.00 |
| 0.20 | 0.00       |      |       |       |        |        |      |

Project.....: SGU021041 - Uitbreiding zwembad de Meerkant te Amstelveen  
Onderdeel.....: Zwemzaal portaal

## BELASTINGEN

B.G:5 Wind van links

overdruk B



## STAAFBELASTINGEN

B.G:5 Wind van links

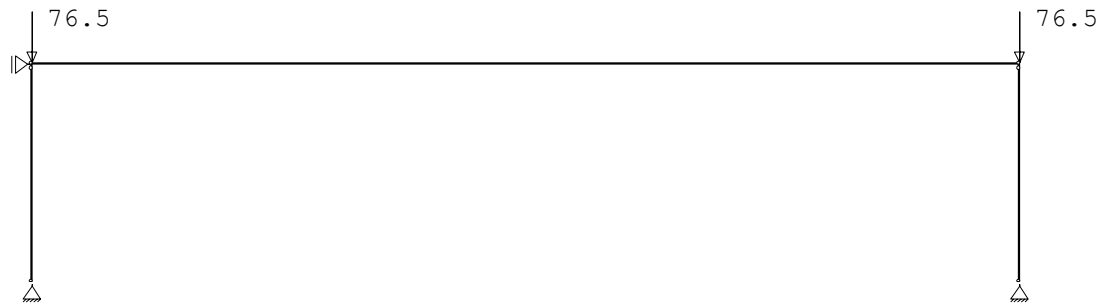
overdruk B

| Staaftype    | Index    | q1/p/m | q2    | A      | B      | $\psi_0$ |
|--------------|----------|--------|-------|--------|--------|----------|
| $\psi_1$     | $\psi_2$ |        |       |        |        |          |
| 2 1:QZLokaal | Qw10     | 0.85   | 0.85  | 0.000  | 0.000  | 0.00     |
| 0.20 0.00    |          |        |       |        |        |          |
| 1 1:QZLokaal | Qw10     | 0.85   | 0.85  | 0.000  | 0.000  | 0.00     |
| 0.20 0.00    |          |        |       |        |        |          |
| 3 1:QZLokaal | Qw11     | -0.85  | -0.85 | 0.000  | 0.000  | 0.00     |
| 0.20 0.00    |          |        |       |        |        |          |
| 2 1:QZLokaal | Qw3      | -3.40  | -3.40 | 0.000  | 0.000  | 0.00     |
| 0.20 0.00    |          |        |       |        |        |          |
| 1 1:QZLokaal | Qw4      | 5.49   | 5.49  | 0.000  | 31.793 | 0.00     |
| 0.20 0.00    |          |        |       |        |        |          |
| 1 1:QZLokaal | Qw5      | 1.43   | 1.43  | 0.000  | 31.793 | 0.00     |
| 0.20 0.00    |          |        |       |        |        |          |
| 1 1:QZLokaal | Qw6      | 2.97   | 2.97  | 1.567  | 25.525 | 0.00     |
| 0.20 0.00    |          |        |       |        |        |          |
| 1 1:QZLokaal | Qw12     | -0.85  | -0.85 | 7.835  | 0.000  | 0.00     |
| 0.20 0.00    |          |        |       |        |        |          |
| 3 1:QZLokaal | Qw8      | -2.12  | -2.12 | 0.000  | 0.000  | 0.00     |
| 0.20 0.00    |          |        |       |        |        |          |
| 1 2:QXLokaal | Qw9      | 0.17   | 0.17  | 31.340 | 0.000  | 0.00     |
| 0.20 0.00    |          |        |       |        |        |          |

## BELASTINGEN

B.G:6

Windbok



## KNOOPBELASTINGEN

B.G:6

Windbok

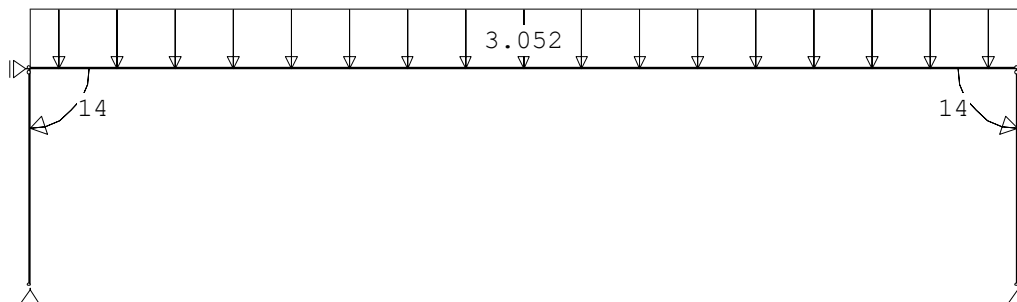
| Last | Knoop | Richting | waarde  | $\psi_0$ | $\psi_1$ | $\psi_2$ |
|------|-------|----------|---------|----------|----------|----------|
| 1    | 2     | Z        | -76.500 | 0.00     | 0.20     | 0.00     |
| 2    | 4     | Z        | -76.500 | 0.00     | 0.20     | 0.00     |

Project.....: SGU021041 - Uitbreiding zwembad de Meerkant te Amstelveen  
Onderdeel.....: Zwemzaal portaal

## BELASTINGEN

B.G:7

Sneeuw A



## KNOOPBELASTINGEN

B.G:7

Sneeuw A

| Last | Knoop | Richting  | waarde  | $\psi_0$ | $\psi_1$ | $\psi_2$ | Opm. |
|------|-------|-----------|---------|----------|----------|----------|------|
| 1    | 2     | Rotatie Y | 14.000  | 0.00     | 0.20     | 0.00     | *    |
| 2    | 4     | Rotatie Y | -14.000 | 0.00     | 0.20     | 0.00     | *    |

Opmerkingen

[\*] Deze belasting is handmatig toegevoegd of gewijzigd.

## STAAFBELASTINGEN

B.G:7

Sneeuw A

| Staat    | Type        | Index | q1/p/m | q2    | A     | B     | $\psi_0$ |
|----------|-------------|-------|--------|-------|-------|-------|----------|
| $\psi_1$ | $\psi_2$    |       |        |       |       |       |          |
| 1        | 3:QZgeProj. | Qs1   | -3.05  | -3.05 | 0.000 | 0.000 | 0.00     |
| 0.20     | 0.00        |       |        |       |       |       |          |

## REACTIES

1e orde

| Kn. | B.G. | X      | Z      | M |
|-----|------|--------|--------|---|
| 1   | 1    | 0.00   | 205.94 |   |
| 1   | 2    | -17.12 | -13.64 |   |
| 1   | 3    | -9.34  | -49.04 |   |
| 1   | 4    | -17.12 | 2.94   |   |
| 1   | 5    | -9.34  | -32.46 |   |
| 1   | 6    | 0.00   | 76.50  |   |
| 1   | 7    | 0.00   | 50.91  |   |
| 2   | 1    | 0.00   |        |   |
| 2   | 2    | -20.58 |        |   |
| 2   | 3    | -20.58 |        |   |
| 2   | 4    | -20.58 |        |   |
| 2   | 5    | -20.58 |        |   |
| 2   | 6    | 0.00   |        |   |
| 2   | 7    | 0.00   |        |   |
| 3   | 1    | 0.00   | 205.94 |   |
| 3   | 2    | -3.11  | 4.98   |   |
| 3   | 3    | -10.90 | -30.42 |   |



|   |   |        |       |
|---|---|--------|-------|
| 3 | 4 | -3.11  | 31.74 |
| 3 | 5 | -10.90 | -3.66 |
| 3 | 6 | 0.00   | 76.50 |
| 3 | 7 | 0.00   | 50.91 |



Project.....: SGU021041 - Uitbreiding zwembad de Meerkant te Amstelveen  
Onderdeel.....: Zwemzaal portaal

## BEREKENINGSTATUS

| B.C. | Iteratie | Status                 |
|------|----------|------------------------|
| 1    | 3        | Nauwkeurigheid bereikt |
| 2    | 3        | Nauwkeurigheid bereikt |
| 3    | 3        | Nauwkeurigheid bereikt |
| 4    | 3        | Nauwkeurigheid bereikt |
| 5    | 3        | Nauwkeurigheid bereikt |
| 6    | 3        | Nauwkeurigheid bereikt |
| 7    | 3        | Nauwkeurigheid bereikt |
| 8    | 3        | Nauwkeurigheid bereikt |
| 9    | 3        | Nauwkeurigheid bereikt |
| 10   | 3        | Nauwkeurigheid bereikt |
| 11   | 3        | Nauwkeurigheid bereikt |
| 12   | 3        | Nauwkeurigheid bereikt |
| 13   | 3        | Nauwkeurigheid bereikt |
| 14   | 3        | Nauwkeurigheid bereikt |
| 15   | 1        | Lineaire berekening    |
| 16   | 1        | Lineaire berekening    |
| 17   | 1        | Lineaire berekening    |
| 18   | 1        | Lineaire berekening    |
| 19   | 1        | Lineaire berekening    |
| 20   | 1        | Lineaire berekening    |
| 21   | 1        | Lineaire berekening    |
| 22   | 1        | Lineaire berekening    |
| 23   | 1        | Lineaire berekening    |
| 24   | 1        | Lineaire berekening    |
| 25   | 1        | Lineaire berekening    |
| 26   | 1        | Lineaire berekening    |
| 27   | 1        | Lineaire berekening    |
| 28   | 1        | Lineaire berekening    |
| 29   | 1        | Lineaire berekening    |

## BELASTINGCOMBINATIES

| BC | Type  |      |           |   |                |
|----|-------|------|-----------|---|----------------|
| 1  | Fund. | 1.35 | $G_{k,1}$ |   |                |
| 2  | Fund. | 0.90 | $G_{k,1}$ |   |                |
| 3  | Fund. | 1.20 | $G_{k,1}$ | + | 1.50 $Q_{k,2}$ |
| 4  | Fund. | 1.20 | $G_{k,1}$ | + | 1.50 $Q_{k,3}$ |
| 5  | Fund. | 1.20 | $G_{k,1}$ | + | 1.50 $Q_{k,4}$ |
| 6  | Fund. | 1.20 | $G_{k,1}$ | + | 1.50 $Q_{k,5}$ |
| 7  | Fund. | 1.20 | $G_{k,1}$ | + | 1.50 $Q_{k,6}$ |
| 8  | Fund. | 1.20 | $G_{k,1}$ | + | 1.50 $Q_{k,7}$ |
| 9  | Fund. | 0.90 | $G_{k,1}$ | + | 1.50 $Q_{k,2}$ |
| 10 | Fund. | 0.90 | $G_{k,1}$ | + | 1.50 $Q_{k,3}$ |
| 11 | Fund. | 0.90 | $G_{k,1}$ | + | 1.50 $Q_{k,4}$ |
| 12 | Fund. | 0.90 | $G_{k,1}$ | + | 1.50 $Q_{k,5}$ |
| 13 | Fund. | 0.90 | $G_{k,1}$ | + | 1.50 $Q_{k,6}$ |
| 14 | Fund. | 0.90 | $G_{k,1}$ | + | 1.50 $Q_{k,7}$ |



Project.....: SGU021041 - Uitbreiding zwembad de Meerkant te Amstelveen  
Onderdeel.....: Zwemzaal portaal

## BELASTINGCOMBINATIES

| BC Type  |      |           |   |               |           |
|----------|------|-----------|---|---------------|-----------|
| 15 Kar.  | 1.00 | $G_{k,1}$ | + | 1.00          | $Q_{k,2}$ |
| 16 Kar.  | 1.00 | $G_{k,1}$ | + | 1.00          | $Q_{k,3}$ |
| 17 Kar.  | 1.00 | $G_{k,1}$ | + | 1.00          | $Q_{k,4}$ |
| 18 Kar.  | 1.00 | $G_{k,1}$ | + | 1.00          | $Q_{k,5}$ |
| 19 Kar.  | 1.00 | $G_{k,1}$ | + | 1.00          | $Q_{k,6}$ |
| 20 Kar.  | 1.00 | $G_{k,1}$ | + | 1.00          | $Q_{k,7}$ |
| 21 Quas. | 1.00 | $G_{k,1}$ |   |               |           |
| 22 Freq. | 1.00 | $G_{k,1}$ |   |               |           |
| 23 Freq. | 1.00 | $G_{k,1}$ | + | 1.00 $\psi_1$ | $Q_{k,2}$ |
| 24 Freq. | 1.00 | $G_{k,1}$ | + | 1.00 $\psi_1$ | $Q_{k,3}$ |
| 25 Freq. | 1.00 | $G_{k,1}$ | + | 1.00 $\psi_1$ | $Q_{k,4}$ |
| 26 Freq. | 1.00 | $G_{k,1}$ | + | 1.00 $\psi_1$ | $Q_{k,5}$ |
| 27 Freq. | 1.00 | $G_{k,1}$ | + | 1.00 $\psi_1$ | $Q_{k,6}$ |
| 28 Freq. | 1.00 | $G_{k,1}$ | + | 1.00 $\psi_1$ | $Q_{k,7}$ |
| 29 Blij. | 1.00 | $G_{k,1}$ |   |               |           |

## GUNSTIGE WERKING PERMANENTE BELASTINGEN

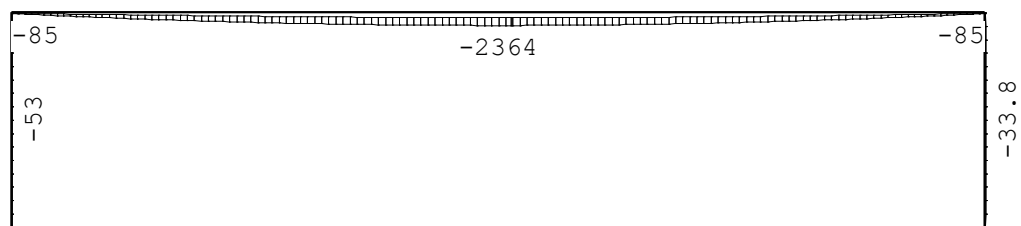
| BC Staven met gunstige werking |                            |
|--------------------------------|----------------------------|
| 1                              | Geen                       |
| 2                              | Alle staven de factor:0.90 |
| 3                              | Geen     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



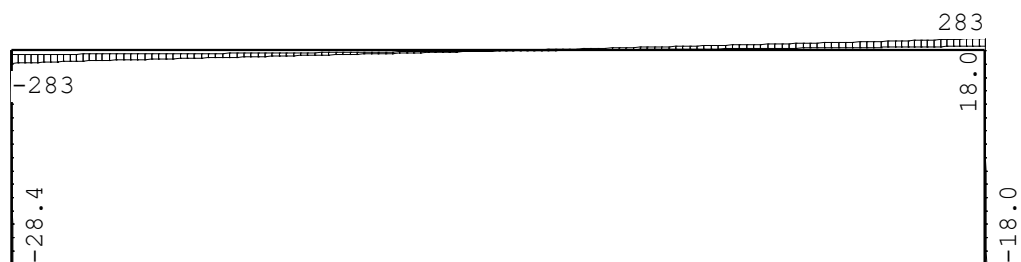
Project.....: SGU021041 - Uitbreiding zwembad de Meerkant te Amstelveen  
Onderdeel.....: Zwemzaal portaal

## OMHULLENDE VAN DE FUNDAMENTELE COMBINATIES

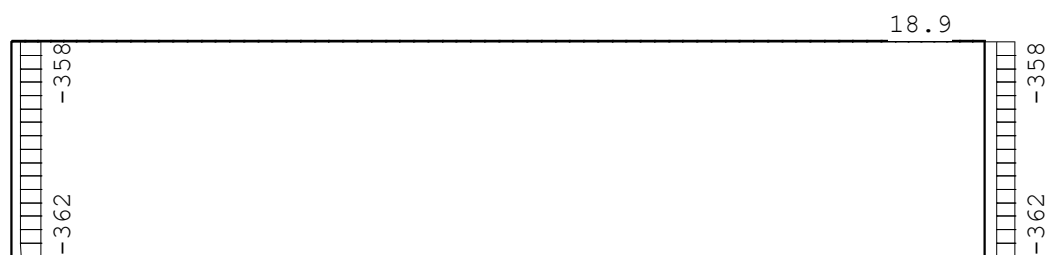
**MOMENTEN** 2e orde Fundamentele  
combinatie



**DWARSKRACHTEN** 2e orde Fundamentele  
combinatie



**NORMAALKRACHTEN** 2e orde Fundamentele  
combinatie



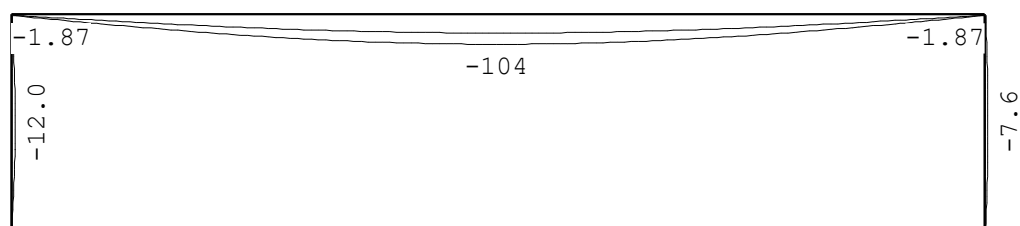
**REACTIES** 2e orde Fundamentele  
combinatie

| Kn.   | X-min  | X-max | Z-min  | Z-max  | M-min |
|-------|--------|-------|--------|--------|-------|
| M-max |        |       |        |        |       |
| 1     | -25.68 | 0.00  | 111.79 | 361.88 |       |
| 2     | -31.49 | 0.09  |        |        |       |
| 3     | -16.36 | -0.01 | 139.72 | 361.88 |       |

Project.....: SGU021041 - Uitbreiding zwembad de Meerkant te Amstelveen  
Onderdeel.....: Zwemzaal portaal

## OMHULLENDE VAN DE KARAKTERISTIEKE COMBINATIES

**VERPLAATSINGEN** 1e orde [mm] Karakteristieke combinatie



## MATERIAALGEGEVENS

| Mt  | Kwaliteit    | $f_{m,y,k}$ | $\rho_k$             | $\rho_{mean}$        | $f_{t,0,k}$          | $f_{t,90,k}$         | $f_{c,0,k}$          |
|-----|--------------|-------------|----------------------|----------------------|----------------------|----------------------|----------------------|
|     | $f_{c,90,k}$ | $f_{v,k}$   | [N/mm <sup>2</sup> ] | [kg/m <sup>3</sup> ] | [N/mm <sup>2</sup> ] | [N/mm <sup>2</sup> ] | [N/mm <sup>2</sup> ] |
| 1   | GL24h        | 24          | 385                  | 462                  | 19.2                 | 0.5                  | 24.0                 |
| 2.5 | 3.5          |             |                      |                      |                      |                      |                      |

## MATERIAALGEGEVENS (vervolg)

| Mt   | Kwaliteit        | $G_{mean}$           | $E_{0,05}$           | $E_{90,mean}$        | $E_{0,mean}$         | Klimaatklasse | $k_{def}$ |
|------|------------------|----------------------|----------------------|----------------------|----------------------|---------------|-----------|
|      | $E_{0,mean,fin}$ | [N/mm <sup>2</sup> ] | [N/mm <sup>2</sup> ] | [N/mm <sup>2</sup> ] | [N/mm <sup>2</sup> ] |               |           |
| 1    | GL24h            | 650                  | 9600                 | 300                  | 11500                | I             | 0.60      |
| 7188 |                  |                      |                      |                      |                      |               |           |

## KIPSTABILITEIT

| Staafl | Plts. aangr. | l sys. [m]                   | Kipsteunafstanden [m]               |
|--------|--------------|------------------------------|-------------------------------------|
| 1      | 1.0*h        | boven: 33.36<br>onder: 33.36 | 25*1,283;1,285<br>0;33.360          |
| 2      | 1.0*h        | boven: 7.34<br>onder: 7.34   | 0;2.195;3.355;1.785<br>0;5.55;1.785 |
| 3      | 0.0*h        | boven: 7.34<br>onder: 7.34   | 0;2.195;3.355;1.785<br>0;5.55;1.785 |

## STABILITEIT

| Stf        | $b_{gem}$  | $h_{gem}$ | $l_{sys}$ | $l_{buc, y/z}$ | $\lambda_y$ | $\lambda_z$ | $\lambda_{rel, y/z}$ | $\beta_c$ | $k_y$ | $k_z$ |       |       |
|------------|------------|-----------|-----------|----------------|-------------|-------------|----------------------|-----------|-------|-------|-------|-------|
| $k_{c, y}$ | $k_{c, z}$ |           |           |                |             |             |                      |           |       |       |       |       |
|            | [mm]       | [mm]      | [mm]      | [mm]           |             |             |                      |           |       |       |       |       |
| 1          | 240        | 2100      | 33360     | nvt            | 33000       | 55.0        | 476.3                | 0.876     | 7.581 | 0.1   | 0.912 |       |
| 29.598     | 0.856      | 0.017     |           |                |             |             |                      |           |       |       |       |       |
| 2          | 240        | 400       | 7335      | nvt            | 5550        | 63.5        | 80.1                 | 1.011     | 1.275 | 0.1   | 1.047 | 1.361 |



0.759 0.544  
3 240 400 7335 nvt 5550 63.5 80.1 1.011 1.275 0.1 1.047 1.361  
0.759 0.544

Project.....: SGU021041 - Uitbreiding zwembad de Meerkant te Amstelveen  
Onderdeel.....: Zwemzaal portaal

## TOETSING SPANNINGEN

| Staaft                                                                              | 1                          | BC / Sit.              | 1 / 1                      | UC frm(6.33)         |
|-------------------------------------------------------------------------------------|----------------------------|------------------------|----------------------------|----------------------|
| 0.98                                                                                |                            |                        |                            |                      |
| Maatgevend is buiging (EN 1995-1-1 art. 6.3.3(3)) aan bovenzijde staaft             |                            |                        |                            |                      |
| Belastingduurklasse                                                                 | Blijvend                   |                        |                            |                      |
| Positie 16680 [mm]                                                                  |                            |                        |                            |                      |
| Breedte 240.00 [mm]                                                                 | Hoogte                     | 2100.00 [mm]           | Materiaal                  |                      |
| 1:GL24h                                                                             |                            |                        |                            |                      |
| $k_{m o d}$                                                                         | 0.60 [-]                   | $k_h (f t o k)$        | 1.00 [-]                   | $k_h (f m k)$        |
| 1.00 [-]                                                                            |                            |                        |                            |                      |
| $f_{m, y, d}$                                                                       | 11.52 [N/mm <sup>2</sup> ] | $f_{c, 0, d}$          | 11.52 [N/mm <sup>2</sup> ] | $f_{t, 0, d}$        |
| 9.22 [N/mm <sup>2</sup> ]                                                           |                            |                        |                            |                      |
| $f_{v, d}$                                                                          | 1.68 [N/mm <sup>2</sup> ]  | $f_{c, 90, d}$         | 1.20 [N/mm <sup>2</sup> ]  | $f_{t, 90, d}$       |
| 0.24 [N/mm <sup>2</sup> ]                                                           |                            |                        |                            |                      |
| N                                                                                   | 1.44 [kN]                  | D                      | 0.00 [kN]                  | M -                  |
| 1919.08 [kNm]                                                                       |                            |                        |                            |                      |
| $\sigma_{t, 0, d}$                                                                  | 0.00 [N/mm <sup>2</sup> ]  | $\tau_d$               | 0.00 [N/mm <sup>2</sup> ]  | $\sigma_{m, y, d}$ - |
| 10.88 [N/mm <sup>2</sup> ]                                                          |                            |                        |                            |                      |
| $k_{c, z}$                                                                          | 0.02 [-]                   | $k_m$                  | 0.70 [-]                   | $l_{e f, y}$         |
| 5483.00 [mm]                                                                        |                            |                        |                            |                      |
| $\sigma_{m y, c r i t}$                                                             | 37.46 [N/mm <sup>2</sup> ] | $\lambda_{r e l, m y}$ | 0.80 [-]                   | $k_{c r i t, y}$     |
| 0.96 [-]                                                                            |                            |                        |                            |                      |
| Staaft                                                                              | 2                          | BC / Sit.              | 5 / 1                      | UC frm(6.23)         |
| 0.66                                                                                |                            |                        |                            |                      |
| Maatg. is norm.drukker. + buiging (EN 1995-1-1 art. 6.3.2(3)) aan bovenzijde staaft |                            |                        |                            |                      |
| Belastingduurklasse                                                                 | Kort                       |                        |                            |                      |
| Positie 3667 [mm]                                                                   |                            |                        |                            |                      |
| Breedte 240.00 [mm]                                                                 | Hoogte                     | 400.00 [mm]            | Materiaal                  |                      |
| 1:GL24h                                                                             |                            |                        |                            |                      |
| $k_{m o d}$                                                                         | 0.90 [-]                   | $k_h (f t o k)$        | 1.04 [-]                   | $k_h (f m k)$        |
| 1.04 [-]                                                                            |                            |                        |                            |                      |
| $f_{m, y, d}$                                                                       | 18.00 [N/mm <sup>2</sup> ] | $f_{c, 0, d}$          | 17.28 [N/mm <sup>2</sup> ] | $f_{t, 0, d}$        |
| 14.40 [N/mm <sup>2</sup> ]                                                          |                            |                        |                            |                      |
| $f_{v, d}$                                                                          | 2.52 [N/mm <sup>2</sup> ]  | $f_{c, 90, d}$         | 1.80 [N/mm <sup>2</sup> ]  | $f_{t, 90, d}$       |
| 0.36 [N/mm <sup>2</sup> ]                                                           |                            |                        |                            |                      |
| N                                                                                   | -249.40 [kN]               | D                      | -0.25 [kN]                 | M -                  |
| 53.42 [kNm]                                                                         |                            |                        |                            |                      |
| $\sigma_{c, 0, d}$                                                                  | 2.60 [N/mm <sup>2</sup> ]  | $\tau_d$               | 0.00 [N/mm <sup>2</sup> ]  | $\sigma_{m, y, d}$ - |
| 8.35 [N/mm <sup>2</sup> ]                                                           |                            |                        |                            |                      |



|                      |                             |                     |          |              |
|----------------------|-----------------------------|---------------------|----------|--------------|
| $k_{c,z}$            | 0.54 [-]                    | $k_m$               | 0.70 [-] | $l_{ef,y}$   |
| 4155.00 [mm]         |                             |                     |          |              |
| $\sigma_{m y, crit}$ | 259.51 [N/mm <sup>2</sup> ] | $\lambda_{rel, my}$ | 0.30 [-] | $k_{crit,y}$ |
| 1.00 [-]             |                             |                     |          |              |



Project.....: SGU021041 - Uitbreiding zwembad de Meerkant te Amstelveen  
Onderdeel.....: Zwemzaal portaal

#### TOETSING SPANNINGEN

**Staaft**                    **3**                    **BC / Sit.**                    **6 / 1**                    **UC frm(6.23)**  
**0.48**

Maatg. is norm.drukk. + buiging (EN 1995-1-1 art. 6.3.2(3)) aan bovenzijde staaft

Belastingduurklasse                    Kort

Positie                    3667                    [mm]

Breedte                    240.00                    [mm]                    Hoogte                    400.00                    [mm]                    Materiaal  
1:GL24h

$k_{mod}$                     0.90                    [-]                     $k_{h(f t o k)}$                     1.04                    [-]                     $k_{h(f m k)}$   
1.04                    [-]

$f_{m, y, d}$                     18.00                    [N/mm<sup>2</sup>]                     $f_{c, 0, d}$                     17.28                    [N/mm<sup>2</sup>]                     $f_{t, 0, d}$   
14.40                    [N/mm<sup>2</sup>]

$f_{v, d}$                     2.52                    [N/mm<sup>2</sup>]                     $f_{c, 90, d}$                     1.80                    [N/mm<sup>2</sup>]                     $f_{t, 90, d}$   
0.36                    [N/mm<sup>2</sup>]

N                    -239.61                    [kN]                    D                    -0.15                    [kN]                    M                    -  
33.82                    [kNm]

$\sigma_{c, 0, d}$                     2.50                    [N/mm<sup>2</sup>]                     $\tau_d$                     0.00                    [N/mm<sup>2</sup>]                     $\sigma_{m, y, d}$                     -  
5.28                    [N/mm<sup>2</sup>]

$k_{c, z}$                     0.54                    [-]                     $k_m$                     0.70                    [-]                     $l_{ef, y}$   
3155.00                    [mm]

$\sigma_{m, y, crit}$                     341.77                    [N/mm<sup>2</sup>]                     $\lambda_{rel, my}$                     0.26                    [-]                     $k_{crit, y}$   
1.00                    [-]

#### TOETSING DOORBUIGING

| Stf | Soort | Mtg | $l_{sys}$ | Overstek | BC | Sit | $u_{bij}$ | Toelaatbaar | $u_{fin, net}$ |
|-----|-------|-----|-----------|----------|----|-----|-----------|-------------|----------------|
|     |       |     | [mm]      | i        | j  |     | [mm]      | [mm]        | *l             |
|     |       |     |           |          |    |     |           |             | [mm]           |

|   |     |    |       |     |     |    |   |       |        |       |        |   |
|---|-----|----|-------|-----|-----|----|---|-------|--------|-------|--------|---|
| 1 | Dak | db | 33360 | Nee | Nee | 21 | 1 | -70.9 | -133.4 | 0.004 | -149.0 | - |
|   |     |    |       |     |     |    |   |       |        |       |        |   |

#### TOETSING DOORBUIGING (vervolg)

| Stf | Soort | Mtg | $l_{sys}$ | Overstek | Zeeg | BC | Sit | $u_{inst}$ | Toelaatbaar |
|-----|-------|-----|-----------|----------|------|----|-----|------------|-------------|
|     |       |     | [mm]      | i        | j    |    |     | [mm]       | [mm]        |
|     |       |     |           |          |      |    |     |            | *l          |

|   |     |    |       |     |     |     |    |   |        |        |       |
|---|-----|----|-------|-----|-----|-----|----|---|--------|--------|-------|
| 1 | Dak | db | 33360 | Nee | Nee | 0.0 | 20 | 1 | -102.1 | -133.4 | 0.004 |
|---|-----|----|-------|-----|-----|-----|----|---|--------|--------|-------|

#### TOETSING HORIZONTALE VERPLAATSING

| Staaft | Mtg | $l_{sys}$ | BC | Sit | $w_{tot}$ | Toelaatbaar |
|--------|-----|-----------|----|-----|-----------|-------------|
|        |     | [mm]      |    |     | [mm]      | [mm] [h/ ]  |

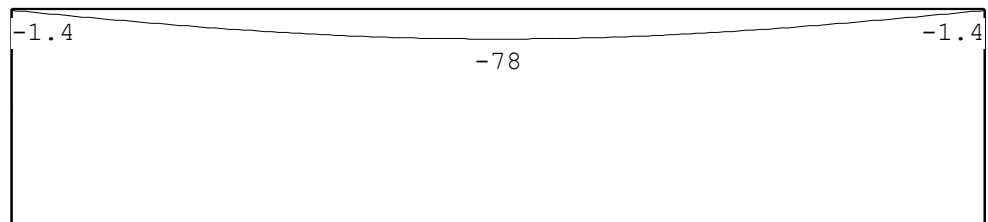
|   |    |      |    |   |       |       |
|---|----|------|----|---|-------|-------|
| 2 | db | 7335 | 15 | 1 | -12.0 | -24.5 |
| 3 | db | 7335 | 16 | 1 | -7.6  | -24.5 |



Project.....: SGU021041 - Uitbreiding zwembad de Meerkant te Amstelveen  
Onderdeel.....: Zwemzaal portaal

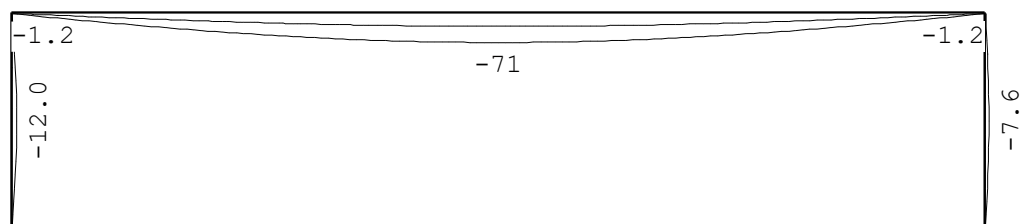
## VERVORMINGEN $w_1$ combinatie

Blijvende



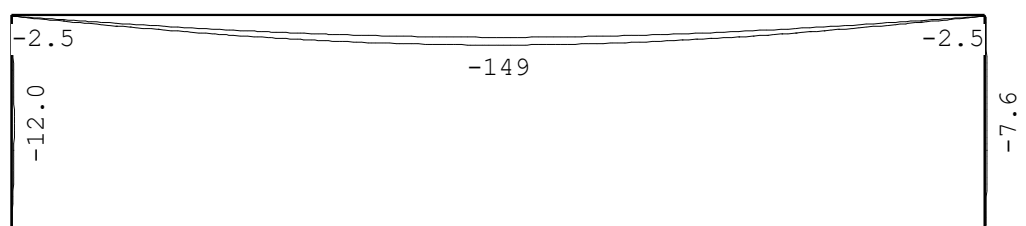
## VERVORMINGEN $w_{bij}$ combinatie

Karakteristieke



## VERVORMINGEN $w_{max}$ combinatie

Karakteristieke



## DOORBUIGINGEN combinatie

Karakteristieke

| Nr.             | staven | Zijde | positie | $l_{rep}$ | $w_1$ | $w_2$ | $w_{bij}$ | $w_{tot}$ | $w_c$ |
|-----------------|--------|-------|---------|-----------|-------|-------|-----------|-----------|-------|
| -- $w_{max}$ -- |        |       |         |           |       |       |           |           |       |
|                 |        |       | [m]     | [mm]      | [mm]  | [mm]  | [mm]      | [mm]      | [mm]  |
|                 |        |       |         |           |       |       |           |           |       |
| 1               | 1      | Neg.  | 16.680  | 33360     | -78.1 | -46.9 | -70.9     | 471       | -149  |
| -149            | 224    |       |         |           |       |       |           |           |       |



## Bijlage B Uitvoer zwemzaal portaal as 6

**Technosoft Raamwerken release 6.75b  
2023**

**26 jan**

Project.....: SGU021041 - Uitbreiding zwembad de Meerkant te  
Amstelveen  
Onderdeel.....: Zwemzaal portaal as 6  
Dimensies.....: kN;m;rad (tenzij anders aangegeven)  
Datum.....: 15/11/2022  
Bestand.....: H:\SGU021041\BEREKENINGEN\04\_DO\Zwemzaal portaal as  
6.rww

Belastingbreedte.: 5.250  
Rekenmodel.....: 2e-orde-elastisch.  
Theorieën voor de bepaling van de krachtsverdeling:  
1) Losse belastinggevallen:  
Lineaire-elasticiteitstheorie  
2) Uiterste grenstoestand:  
Geometrisch niet lineair alle staven.  
Fysisch lineair alle staven.  
3) Gebruiksgrenstoestand:  
Lineaire-elasticiteitstheorie

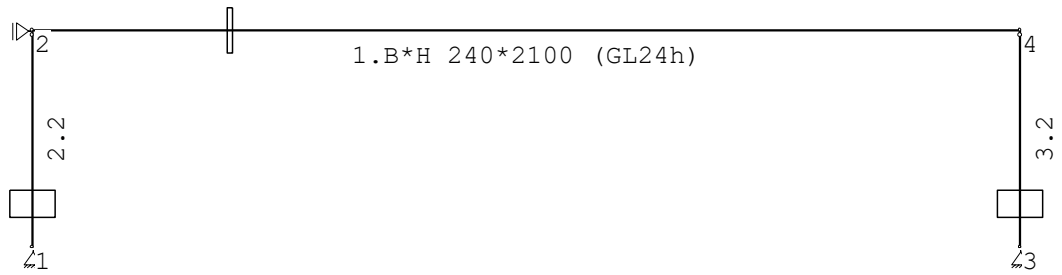
Maximum aantal iteraties.....: 50  
Max.deellengte kolommen/wanden: 0.500 Max.deellengte balken/vloeren:  
0.500  
Max. X-verplaatsing in UGT.....: 0.500 Max. Z-verplaatsing in UGT....:  
0.250

Gunstige werking van de permanente belasting wordt automatisch  
verwerkt.

### **Toegepaste normen volgens Eurocode met Nederlandse NB**

|             |                      |                 |
|-------------|----------------------|-----------------|
| Belastingen | NEN-EN 1990:2002     | C2:2010,A1:2019 |
| NB:2019(nl) | NEN-EN 1991-1-1:2002 | C1/C11:2019     |
| NB:2019(nl) | NEN-EN 1991-1-4:2005 | C2:2011         |
| NB:2011(nl) | NEN-EN 1995-1-1:2005 | A1:2011,C1:2006 |
| Hout        | NEN-EN 1995-1-1:2005 | A1:2011,C1:2006 |
| NB:2013(nl) | NEN-EN 14080:2013    |                 |

### **GEOMETRIE**



## MATERIALEN

| Mt | Kwaliteit | E-modulus[N/mm <sup>2</sup> ] | S.G. | S.G.verhoogd | Pois. | Uitz. coëff |
|----|-----------|-------------------------------|------|--------------|-------|-------------|
| 1  | GL24h     | 11500                         | 3.8  | 4.6          | 1.00  | 5.0000e-06  |

Bij de bepaling v.h. e.g. van houten staven is de S.G.verhoogd toegepast.



Project.....: SGU021041 - Uitbreiding zwembad de Meerkant te Amstelveen  
Onderdeel.....: Zwemzaal portaal as 6

### PROFIELEN [mm]

| Prof. Omschrijving                | Materiaal | Oppervlak  |
|-----------------------------------|-----------|------------|
| Traagheid Vormf.                  |           |            |
| 1 B*H 240*2100<br>1.8522e+11 0.00 | 1:GL24h   | 5.0400e+05 |
| 2 B*H 240*400<br>1.2800e+09 0.00  | 1:GL24h   | 9.6000e+04 |

### PROFIELEN vervolg [mm]

| Prof. Staaftype | Breedte | Hoogte | e      | Type | b1 | h1 | b2 | h2 |
|-----------------|---------|--------|--------|------|----|----|----|----|
| 1 0:Normaal     | 240     | 2100   | 1050.0 | 0:RH |    |    |    |    |
| 2 0:Normaal     | 240     | 400    | 200.0  | 0:RH |    |    |    |    |

### PROFIELVORMEN [mm]

1 B\*H 240\*2100



2 B\*H 240\*400



### KNOPEN

| Knoop | X      | Z     |
|-------|--------|-------|
| 1     | 0.000  | 0.500 |
| 2     | 0.000  | 7.835 |
| 3     | 33.360 | 0.500 |
| 4     | 33.360 | 7.835 |

### STAVEN

| St.    | ki   | kj | Profiel        | Aansl.i | Aansl.j |
|--------|------|----|----------------|---------|---------|
| Lengte | Opm. |    |                |         |         |
| 1      | 2    | 4  | 1:B*H 240*2100 | NDM     | NDM     |
| 33.360 |      |    |                |         |         |
| 2      | 1    | 2  | 2:B*H 240*400  | NDM     | ND-     |
| 7.335  |      |    |                |         |         |
| 3      | 3    | 4  | 2:B*H 240*400  | NDM     | ND-     |
| 7.335  |      |    |                |         |         |

### VASTE STEUNPUNTEN

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

### BELASTINGGENERATIE ALGEMEEN.

Betrouwbaarheidsklasse.....: 2 Referentieperiode.....: 50



|                            |       |                         |      |
|----------------------------|-------|-------------------------|------|
| Gebouwdiepte.....:         | 30.07 | Gebouwhoogte.....:      | 7.84 |
| Niveau aansl.terrein.....: | 0.00  | E.g. scheid.w. [kN/m2]: | 1.20 |

Project.....: SGU021041 - Uitbreiding zwembad de Meerkant te Amstelveen  
Onderdeel.....: Zwemzaal portaal as 6

## WIND

Terrein categorie ...[4.3.2]....: Onbebouwd  
Windgebied .....: 2  $V_{b,0}$  ..[4.2].....: 27.000  
Positie spant in het gebouw....: 0.000  $K_r$  ....[4.3.2].....: 0.209  
 $z_0$  .....[4.3.2]....: 0.200  $z_{min}$  ..[4.3.2].....: 4.000  
Co wind van links ..[4.3.3]....: 1.000 Co wind van rechts....: 1.000  
Co wind loodrecht ..[4.3.3]....: 1.000  
Cpi wind van links ..[7.2.9]....: 0.200 -0.300  
Cpi windloodrecht ...[7.2.9]....: 0.200 -0.300  
Cpi wind van rechts .[7.2.9]....: 0.200 -0.300  
Cfr windwrijving ....[7.5].....: 0.040

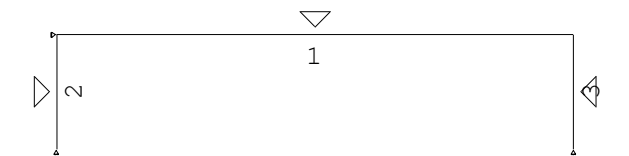
## STAFTYPEN

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

## LASTVELDEN

Wind staven

Sneeuw staven



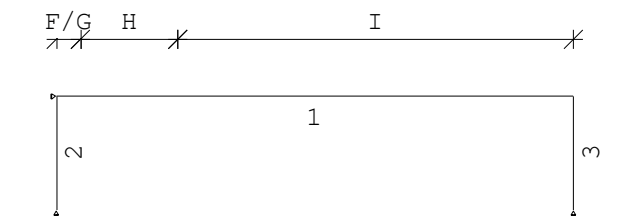
## WIND DAKTYPES

| Nr. | Staaf Type | reductie bij wind van links | reductie bij wind van rechts | Cpe   |
|-----|------------|-----------------------------|------------------------------|-------|
| 1   | 2 Gevel    | 1.000                       | 1.000                        | 7.2.2 |
| 2   | 1 Plat dak | 1.000                       | 1.000                        | 7.2.3 |
| 3   | 3 Gevel    | 1.000                       | 1.000                        | 7.2.2 |

## WIND ZONES

Wind van links

Wind van rechts





Project.....: SGU021041 - Uitbreiding zwembad de Meerkant te Amstelveen  
Onderdeel.....: Zwemzaal portaal as 6

#### WIND VAN LINKS ZONES

| Nr. | Staaf | Positie | Lengte | Zone |
|-----|-------|---------|--------|------|
| 1   | 2     | 0.000   | 7.335  | D    |
| 2   | 1     | 0.000   | 1.567  | F/G  |
| 3   | 1     | 1.567   | 6.268  | H    |
| 4   | 1     | 7.835   | 25.525 | I    |
| 5   | 3     | 0.000   | 7.335  | E    |

#### Wind indexen

| Index    | CsCd | Cpe/Cpi | qp    | breedte | reductie | Qw     | Zone  |
|----------|------|---------|-------|---------|----------|--------|-------|
| Hoek(en) |      |         |       |         |          |        |       |
| Qw1      |      | 0.300   | 0.779 | 5.250   |          | -1.227 | -i    |
| Qw2      |      | -0.300  | 0.779 | 5.250   |          | 1.227  | -i    |
| Qw3      | 1.00 | 0.800   | 0.779 | 5.250   |          | -3.271 | D     |
| Qw4      | 1.00 | -1.800  | 0.779 | 3.774   |          | 5.290  | F 0.0 |
| Qw5      | 1.00 | -1.200  | 0.779 | 1.476   |          | 1.380  | G 0.0 |
| Qw6      | 1.00 | -0.700  | 0.779 | 5.250   |          | 2.862  | H 0.0 |
| Qw7      | 1.00 | -0.200  | 0.779 | 5.250   |          | 0.818  | I 0.0 |
| Qw8      | 1.00 | 0.500   | 0.779 | 5.250   |          | -2.044 | E     |
| Qw9      |      | -0.040  | 0.779 | 5.250   |          | 0.164  | 0.0   |
| Qw10     |      | -0.200  | 0.779 | 5.250   |          | 0.818  | +i    |
| Qw11     |      | 0.200   | 0.779 | 5.250   |          | -0.818 | +i    |
| Qw12     | 1.00 | 0.200   | 0.779 | 5.250   |          | -0.818 | I 0.0 |

#### BELASTINGGEVALLEN

| B.G. | Omschrijving                     | Type        |
|------|----------------------------------|-------------|
|      | 1 Permanente belasting EGZ=-1.00 | 1           |
| g    | 2 Wind van links onderdruk A     | 7           |
| g    | 3 Wind van links overdruk A      | 8           |
| g    | 4 Wind van links onderdruk B     | 9           |
| g    | 5 Wind van links overdruk B      | 10          |
|      | 6 Sneeuw                         | 22 Sneeuw A |

g = gegenereerd belastinggeval

#### BELASTINGGEVALLEN vervolg

| B.G. | Omschrijving                 | Belastingduurklasse |
|------|------------------------------|---------------------|
|      | 1 Permanente belasting       | Blijvend            |
|      | 2 Wind van links onderdruk A | Kort                |
|      | 3 Wind van links overdruk A  | Kort                |
|      | 4 Wind van links onderdruk B | Kort                |
|      | 5 Wind van links overdruk B  | Kort                |
|      | 6 Sneeuw                     | Kort                |

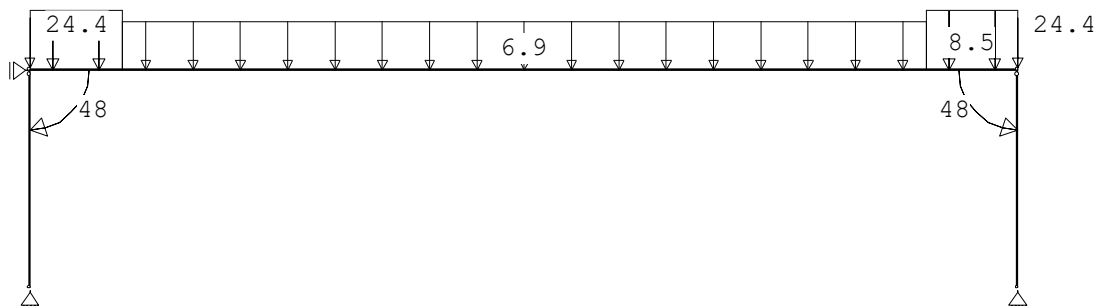
Project.....: SGU021041 - Uitbreiding zwembad de Meerkant te Amstelveen  
Onderdeel.....: Zwemzaal portaal as 6

## BELASTINGEN

B.G:1 Permanente

belasting

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



## KNOOPBELASTINGEN

B.G:1 Permanente

belasting

| Last | Knoop | Richting  | waarde  | $\psi_0$ | $\psi_1$ | $\psi_2$ |
|------|-------|-----------|---------|----------|----------|----------|
| 1    | 2     | Z         | -24.400 |          |          |          |
| 2    | 4     | Z         | -24.400 |          |          |          |
| 3    | 2     | Rotatie Y | 48.000  |          |          |          |
| 4    | 4     | Rotatie Y | -48.000 |          |          |          |

## STAAFBELASTINGEN

B.G:1 Permanente

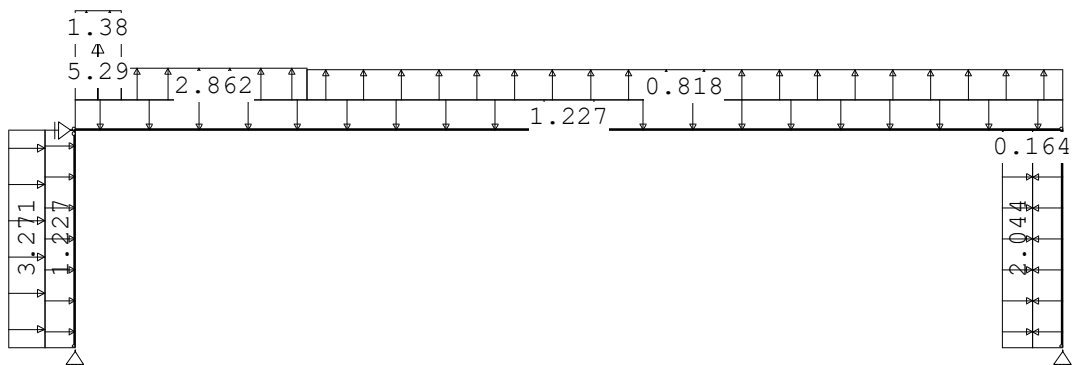
belasting

| Staat    | Type       | $q_1/p/m$ | $q_2$ | A      | B      | $\psi_0$ |
|----------|------------|-----------|-------|--------|--------|----------|
| $\psi_1$ | $\psi_2$   |           |       |        |        |          |
| 1        | 1:QZLokaal | -8.50     | -8.50 | 0.000  | 30.260 |          |
| 1        | 1:QZLokaal | -6.90     | -6.90 | 3.100  | 3.100  |          |
| 1        | 1:QZLokaal | -8.50     | -8.50 | 30.260 | 0.000  |          |

## BELASTINGEN

B.G:2 Wind van links

onderdruk A



Project.....: SGU021041 - Uitbreiding zwembad de Meerkant te Amstelveen  
Onderdeel.....: Zwemzaal portaal as 6

## STAAFBELASTINGEN

B.G:2 Wind van links

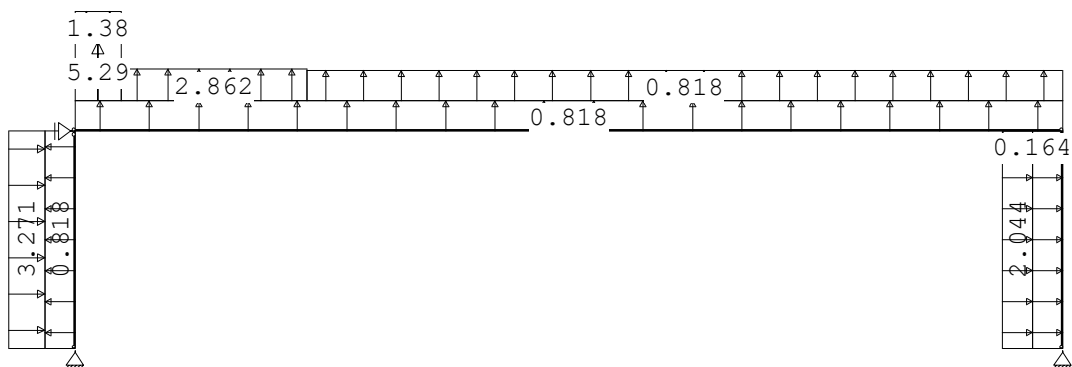
onderdruk A

| Staaftype |                      | Index | q1/p/m | q2    | A      | B      | $\psi_0$ |
|-----------|----------------------|-------|--------|-------|--------|--------|----------|
| $\psi_1$  | $\psi_2$             |       |        |       |        |        |          |
| 0.20      | 2 1:QZLokaal<br>0.00 | Qw1   | -1.23  | -1.23 | 0.000  | 0.000  | 0.00     |
| 0.20      | 1 1:QZLokaal<br>0.00 | Qw1   | -1.23  | -1.23 | 0.000  | 0.000  | 0.00     |
| 0.20      | 3 1:QZLokaal<br>0.00 | Qw2   | 1.23   | 1.23  | 0.000  | 0.000  | 0.00     |
| 0.20      | 2 1:QZLokaal<br>0.00 | Qw3   | -3.27  | -3.27 | 0.000  | 0.000  | 0.00     |
| 0.20      | 1 1:QZLokaal<br>0.00 | Qw4   | 5.29   | 5.29  | 0.000  | 31.793 | 0.00     |
| 0.20      | 1 1:QZLokaal<br>0.00 | Qw5   | 1.38   | 1.38  | 0.000  | 31.793 | 0.00     |
| 0.20      | 1 1:QZLokaal<br>0.00 | Qw6   | 2.86   | 2.86  | 1.567  | 25.525 | 0.00     |
| 0.20      | 1 1:QZLokaal<br>0.00 | Qw7   | 0.82   | 0.82  | 7.835  | 0.000  | 0.00     |
| 0.20      | 3 1:QZLokaal<br>0.00 | Qw8   | -2.04  | -2.04 | 0.000  | 0.000  | 0.00     |
| 0.20      | 1 2:QXLokaal<br>0.00 | Qw9   | 0.16   | 0.16  | 31.340 | 0.000  | 0.00     |

## BELASTINGEN

B.G:3 Wind van links

overdruk A



## STAAFBELASTINGEN

B.G:3 Wind van links

overdruk A

| Staaft Type |            | Index | q1/p/m | q2    | A     | B     | $\psi_0$ |
|-------------|------------|-------|--------|-------|-------|-------|----------|
| $\psi_1$    | $\psi_2$   |       |        |       |       |       |          |
| 2           | 1:QZLokaal | Qw10  | 0.82   | 0.82  | 0.000 | 0.000 | 0.00     |
| 0.20        | 0.00       |       |        |       |       |       |          |
| 1           | 1:QZLokaal | Qw10  | 0.82   | 0.82  | 0.000 | 0.000 | 0.00     |
| 0.20        | 0.00       |       |        |       |       |       |          |
| 3           | 1:QZLokaal | Qw11  | -0.82  | -0.82 | 0.000 | 0.000 | 0.00     |
| 0.20        | 0.00       |       |        |       |       |       |          |



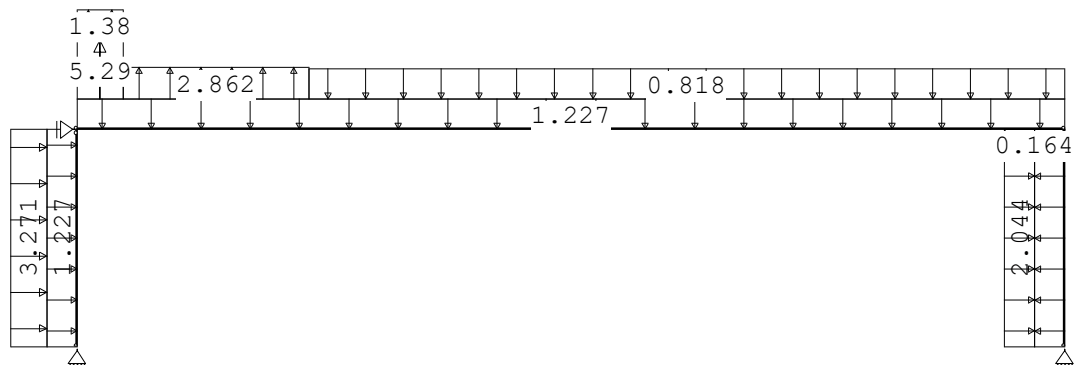
|      |            |     |       |       |        |        |      |
|------|------------|-----|-------|-------|--------|--------|------|
| 2    | 1:QZLokaal | Qw3 | -3.27 | -3.27 | 0.000  | 0.000  | 0.00 |
| 0.20 | 0.00       |     |       |       |        |        |      |
| 1    | 1:QZLokaal | Qw4 | 5.29  | 5.29  | 0.000  | 31.793 | 0.00 |
| 0.20 | 0.00       |     |       |       |        |        |      |
| 1    | 1:QZLokaal | Qw5 | 1.38  | 1.38  | 0.000  | 31.793 | 0.00 |
| 0.20 | 0.00       |     |       |       |        |        |      |
| 1    | 1:QZLokaal | Qw6 | 2.86  | 2.86  | 1.567  | 25.525 | 0.00 |
| 0.20 | 0.00       |     |       |       |        |        |      |
| 1    | 1:QZLokaal | Qw7 | 0.82  | 0.82  | 7.835  | 0.000  | 0.00 |
| 0.20 | 0.00       |     |       |       |        |        |      |
| 3    | 1:QZLokaal | Qw8 | -2.04 | -2.04 | 0.000  | 0.000  | 0.00 |
| 0.20 | 0.00       |     |       |       |        |        |      |
| 1    | 2:QXLokaal | Qw9 | 0.16  | 0.16  | 31.340 | 0.000  | 0.00 |
| 0.20 | 0.00       |     |       |       |        |        |      |

Project.....: SGU021041 - Uitbreiding zwembad de Meerkant te Amstelveen  
Onderdeel.....: Zwemzaal portaal as 6

## BELASTINGEN

B.G:4 Wind van links

onderdruk B



## STAAFBELASTINGEN

B.G:4 Wind van links

onderdruk B

| Staaftype    | Index    | q1/p/m | q2    | A      | B      | $\psi_0$ |
|--------------|----------|--------|-------|--------|--------|----------|
| $\psi_1$     | $\psi_2$ |        |       |        |        |          |
| 2 1:QZLokaal | Qw1      | -1.23  | -1.23 | 0.000  | 0.000  | 0.00     |
| 0.20 0.00    |          |        |       |        |        |          |
| 1 1:QZLokaal | Qw1      | -1.23  | -1.23 | 0.000  | 0.000  | 0.00     |
| 0.20 0.00    |          |        |       |        |        |          |
| 3 1:QZLokaal | Qw2      | 1.23   | 1.23  | 0.000  | 0.000  | 0.00     |
| 0.20 0.00    |          |        |       |        |        |          |
| 2 1:QZLokaal | Qw3      | -3.27  | -3.27 | 0.000  | 0.000  | 0.00     |
| 0.20 0.00    |          |        |       |        |        |          |
| 1 1:QZLokaal | Qw4      | 5.29   | 5.29  | 0.000  | 31.793 | 0.00     |
| 0.20 0.00    |          |        |       |        |        |          |
| 1 1:QZLokaal | Qw5      | 1.38   | 1.38  | 0.000  | 31.793 | 0.00     |
| 0.20 0.00    |          |        |       |        |        |          |
| 1 1:QZLokaal | Qw6      | 2.86   | 2.86  | 1.567  | 25.525 | 0.00     |
| 0.20 0.00    |          |        |       |        |        |          |
| 1 1:QZLokaal | Qw12     | -0.82  | -0.82 | 7.835  | 0.000  | 0.00     |
| 0.20 0.00    |          |        |       |        |        |          |
| 3 1:QZLokaal | Qw8      | -2.04  | -2.04 | 0.000  | 0.000  | 0.00     |
| 0.20 0.00    |          |        |       |        |        |          |
| 1 2:QXLokaal | Qw9      | 0.16   | 0.16  | 31.340 | 0.000  | 0.00     |
| 0.20 0.00    |          |        |       |        |        |          |

## BELASTINGEN

B.G:5 Wind van links

overdruk B





Project.....: SGU021041 - Uitbreiding zwembad de Meerkant te Amstelveen  
Onderdeel.....: Zwemzaal portaal as 6

## STAAFBELASTINGEN

B.G:5 Wind van links

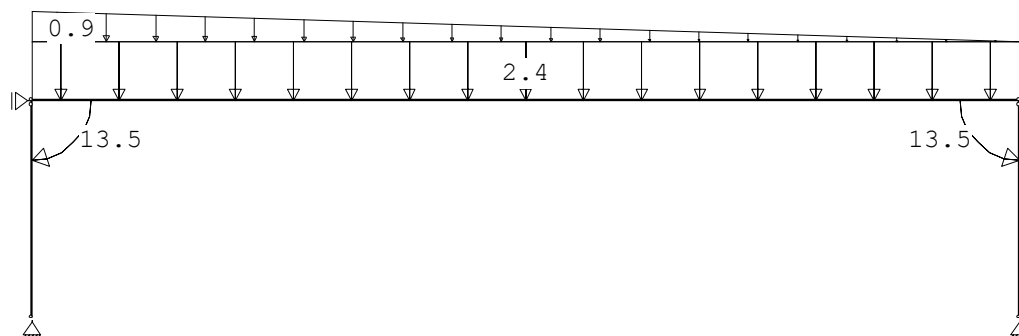
overdruk B

| Staaf    | Type         | Index | q1/p/m | q2    | A      | B      | $\psi_0$ |
|----------|--------------|-------|--------|-------|--------|--------|----------|
| $\psi_1$ | $\psi_2$     |       |        |       |        |        |          |
| 0.20     | 2 1:QZLokaal | Qw10  | 0.82   | 0.82  | 0.000  | 0.000  | 0.00     |
| 0.00     |              |       |        |       |        |        |          |
| 0.20     | 1 1:QZLokaal | Qw10  | 0.82   | 0.82  | 0.000  | 0.000  | 0.00     |
| 0.00     |              |       |        |       |        |        |          |
| 0.20     | 3 1:QZLokaal | Qw11  | -0.82  | -0.82 | 0.000  | 0.000  | 0.00     |
| 0.00     |              |       |        |       |        |        |          |
| 0.20     | 2 1:QZLokaal | Qw3   | -3.27  | -3.27 | 0.000  | 0.000  | 0.00     |
| 0.00     |              |       |        |       |        |        |          |
| 0.20     | 1 1:QZLokaal | Qw4   | 5.29   | 5.29  | 0.000  | 31.793 | 0.00     |
| 0.00     |              |       |        |       |        |        |          |
| 0.20     | 1 1:QZLokaal | Qw5   | 1.38   | 1.38  | 0.000  | 31.793 | 0.00     |
| 0.00     |              |       |        |       |        |        |          |
| 0.20     | 1 1:QZLokaal | Qw6   | 2.86   | 2.86  | 1.567  | 25.525 | 0.00     |
| 0.00     |              |       |        |       |        |        |          |
| 0.20     | 1 1:QZLokaal | Qw12  | -0.82  | -0.82 | 7.835  | 0.000  | 0.00     |
| 0.00     |              |       |        |       |        |        |          |
| 0.20     | 3 1:QZLokaal | Qw8   | -2.04  | -2.04 | 0.000  | 0.000  | 0.00     |
| 0.00     |              |       |        |       |        |        |          |
| 0.20     | 1 2:QXLokaal | Qw9   | 0.16   | 0.16  | 31.340 | 0.000  | 0.00     |
| 0.00     |              |       |        |       |        |        |          |

## BELASTINGEN

B.G:6

Sneeuw



## KNOOPBELASTINGEN

B.G:6

Sneeuw

| Last | Knoop | Richting  | waarde  | $\psi_0$ | $\psi_1$ | $\psi_2$ |
|------|-------|-----------|---------|----------|----------|----------|
| 1    | 2     | Rotatie Y | 13.500  | 0.00     | 0.20     | 0.00     |
| 2    | 4     | Rotatie Y | -13.500 | 0.00     | 0.20     | 0.00     |

## STAAFBELASTINGEN

B.G:6

Sneeuw

| Staaf    | Type     | q1/p/m | q2 | A | B | $\psi_0$ |
|----------|----------|--------|----|---|---|----------|
| $\psi_1$ | $\psi_2$ |        |    |   |   |          |



|      |            |       |       |       |       |      |
|------|------------|-------|-------|-------|-------|------|
| 1    | 1:QZLokaal | -2.40 | -2.40 | 0.000 | 0.000 | 0.00 |
| 0.20 | 0.00       |       |       |       |       |      |
| 1    | 1:QZLokaal | -0.90 | 0.00  | 0.000 | 0.000 | 0.00 |
| 0.20 | 0.00       |       |       |       |       |      |

**REACTIES** 1e orde

| Kn. | B.G. | X      | Z      | M |
|-----|------|--------|--------|---|
| 1   | 1    | 0.00   | 186.54 |   |
| 1   | 2    | -16.49 | -13.14 |   |
| 1   | 3    | -9.00  | -47.24 |   |
| 1   | 4    | -16.49 | 2.83   |   |
| 1   | 5    | -9.00  | -31.27 |   |
| 1   | 6    | 0.00   | 50.04  |   |



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Onderdeel.....: Zwemzaal portaal as 6

## REACTIES 1e orde

| Kn. | B.G. | X      | Z      | M |
|-----|------|--------|--------|---|
| 2   | 1    | 0.00   |        |   |
| 2   | 2    | -19.82 |        |   |
| 2   | 3    | -19.82 |        |   |
| 2   | 4    | -19.82 |        |   |
| 2   | 5    | -19.82 |        |   |
| 2   | 6    | 0.00   |        |   |
| 3   | 1    | 0.00   | 186.54 |   |
| 3   | 2    | -3.00  | 4.80   |   |
| 3   | 3    | -10.50 | -29.30 |   |
| 3   | 4    | -3.00  | 30.57  |   |
| 3   | 5    | -10.50 | -3.53  |   |
| 3   | 6    | 0.00   | 45.04  |   |

## BEREKENINGSTATUS

| B.C. | Iteratie | Status                 |
|------|----------|------------------------|
| 1    | 3        | Nauwkeurigheid bereikt |
| 2    | 3        | Nauwkeurigheid bereikt |
| 3    | 3        | Nauwkeurigheid bereikt |
| 4    | 3        | Nauwkeurigheid bereikt |
| 5    | 3        | Nauwkeurigheid bereikt |
| 6    | 3        | Nauwkeurigheid bereikt |
| 7    | 3        | Nauwkeurigheid bereikt |
| 8    | 3        | Nauwkeurigheid bereikt |
| 9    | 3        | Nauwkeurigheid bereikt |
| 10   | 3        | Nauwkeurigheid bereikt |
| 11   | 3        | Nauwkeurigheid bereikt |
| 12   | 3        | Nauwkeurigheid bereikt |
| 13   | 1        | Lineaire berekening    |
| 14   | 1        | Lineaire berekening    |
| 15   | 1        | Lineaire berekening    |
| 16   | 1        | Lineaire berekening    |
| 17   | 1        | Lineaire berekening    |
| 18   | 1        | Lineaire berekening    |
| 19   | 1        | Lineaire berekening    |
| 20   | 1        | Lineaire berekening    |
| 21   | 1        | Lineaire berekening    |
| 22   | 1        | Lineaire berekening    |
| 23   | 1        | Lineaire berekening    |
| 24   | 1        | Lineaire berekening    |
| 25   | 1        | Lineaire berekening    |



Project.....: SGU021041 - Uitbreiding zwembad de Meerkant te Amstelveen  
 Onderdeel.....: Zwemzaal portaal as 6

## BELASTINGCOMBINATIES

| BC Type  |      |           |   |      |                  |
|----------|------|-----------|---|------|------------------|
| 1 Fund.  | 1.35 | $G_{k,1}$ |   |      |                  |
| 2 Fund.  | 0.90 | $G_{k,1}$ |   |      |                  |
| 3 Fund.  | 1.20 | $G_{k,1}$ | + | 1.50 | $Q_{k,2}$        |
| 4 Fund.  | 1.20 | $G_{k,1}$ | + | 1.50 | $Q_{k,3}$        |
| 5 Fund.  | 1.20 | $G_{k,1}$ | + | 1.50 | $Q_{k,4}$        |
| 6 Fund.  | 1.20 | $G_{k,1}$ | + | 1.50 | $Q_{k,5}$        |
| 7 Fund.  | 1.20 | $G_{k,1}$ | + | 1.50 | $Q_{k,6}$        |
| 8 Fund.  | 0.90 | $G_{k,1}$ | + | 1.50 | $Q_{k,2}$        |
| 9 Fund.  | 0.90 | $G_{k,1}$ | + | 1.50 | $Q_{k,3}$        |
| 10 Fund. | 0.90 | $G_{k,1}$ | + | 1.50 | $Q_{k,4}$        |
| 11 Fund. | 0.90 | $G_{k,1}$ | + | 1.50 | $Q_{k,5}$        |
| 12 Fund. | 0.90 | $G_{k,1}$ | + | 1.50 | $Q_{k,6}$        |
| 13 Kar.  | 1.00 | $G_{k,1}$ | + | 1.00 | $Q_{k,2}$        |
| 14 Kar.  | 1.00 | $G_{k,1}$ | + | 1.00 | $Q_{k,3}$        |
| 15 Kar.  | 1.00 | $G_{k,1}$ | + | 1.00 | $Q_{k,4}$        |
| 16 Kar.  | 1.00 | $G_{k,1}$ | + | 1.00 | $Q_{k,5}$        |
| 17 Kar.  | 1.00 | $G_{k,1}$ | + | 1.00 | $Q_{k,6}$        |
| 18 Quas. | 1.00 | $G_{k,1}$ |   |      |                  |
| 19 Freq. | 1.00 | $G_{k,1}$ |   |      |                  |
| 20 Freq. | 1.00 | $G_{k,1}$ | + | 1.00 | $\psi_1 Q_{k,2}$ |
| 21 Freq. | 1.00 | $G_{k,1}$ | + | 1.00 | $\psi_1 Q_{k,3}$ |
| 22 Freq. | 1.00 | $G_{k,1}$ | + | 1.00 | $\psi_1 Q_{k,4}$ |
| 23 Freq. | 1.00 | $G_{k,1}$ | + | 1.00 | $\psi_1 Q_{k,5}$ |
| 24 Freq. | 1.00 | $G_{k,1}$ | + | 1.00 | $\psi_1 Q_{k,6}$ |
| 25 Blij. | 1.00 | $G_{k,1}$ |   |      |                  |

## GUNSTIGE WERKING PERMANENTE BELASTINGEN

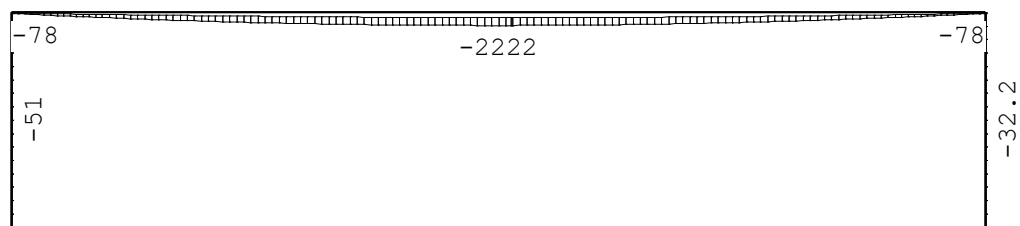
| BC Staven met gunstige werking |                            |
|--------------------------------|----------------------------|
| 1                              | Geen                       |
| 2                              | Alle staven de factor:0.90 |
| 3                              | Geen     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



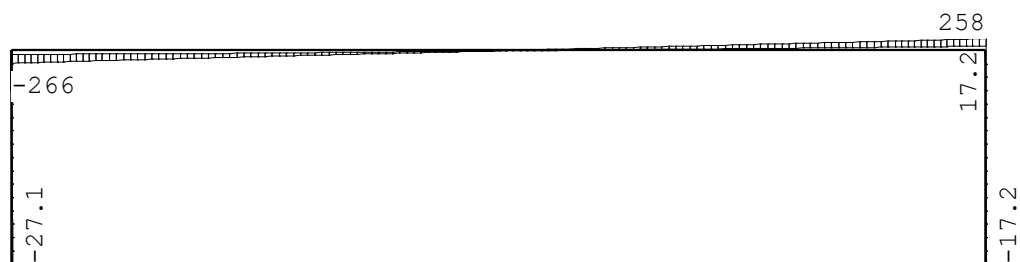
Project.....: SGU021041 - Uitbreiding zwembad de Meerkant te Amstelveen  
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## OMHULLENDE VAN DE FUNDAMENTELE COMBINATIES

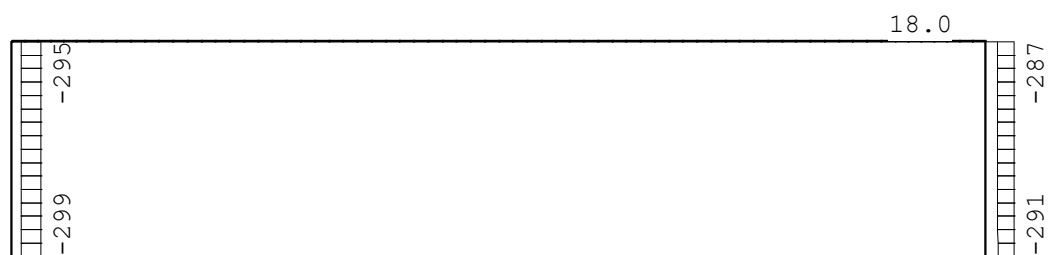
**MOMENTEN** 2e orde Fundamentele  
combinatie



**DWARSKRACHTEN** 2e orde Fundamentele  
combinatie



**NORMAALKRACHTEN** 2e orde Fundamentele  
combinatie



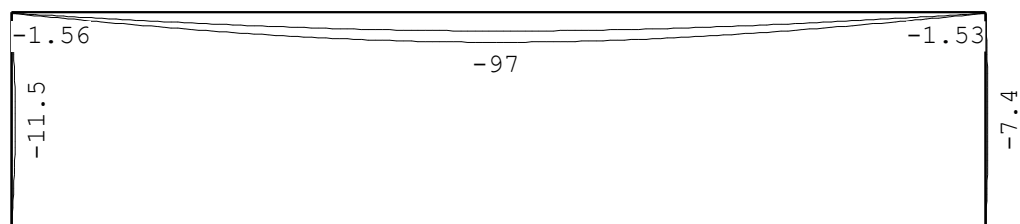
**REACTIES** 2e orde Fundamentele  
combinatie

| Kn.   | X-min  | X-max | Z-min  | Z-max  | M-min |
|-------|--------|-------|--------|--------|-------|
| M-max |        |       |        |        |       |
| 1     | -24.74 | 0.00  | 97.03  | 298.90 |       |
| 2     | -30.30 | 0.20  |        |        |       |
| 3     | -15.76 | -0.01 | 123.94 | 291.40 |       |

Project.....: SGU021041 - Uitbreiding zwembad de Meerkant te Amstelveen  
Onderdeel.....: Zwemzaal portaal as 6

## OMHULLENDE VAN DE KARAKTERISTIEKE COMBINATIES

**VERPLAATSINGEN** 1e orde [mm] Karakteristieke combinatie



## MATERIAALGEGEVENS

| Mt  | Kwaliteit    | $f_{m,y,k}$ | $\rho_k$             | $\rho_{mean}$        | $f_{t,0,k}$          | $f_{t,90,k}$         | $f_{c,0,k}$          |
|-----|--------------|-------------|----------------------|----------------------|----------------------|----------------------|----------------------|
|     | $f_{c,90,k}$ | $f_{v,k}$   | [N/mm <sup>2</sup> ] | [kg/m <sup>3</sup> ] | [N/mm <sup>2</sup> ] | [N/mm <sup>2</sup> ] | [N/mm <sup>2</sup> ] |
| 1   | GL24h        | 24          | 385                  | 462                  | 19.2                 | 0.5                  | 24.0                 |
| 2.5 | 3.5          |             |                      |                      |                      |                      |                      |

## MATERIAALGEGEVENS (vervolg)

| Mt   | Kwaliteit        | $G_{mean}$           | $E_{0,05}$           | $E_{90,mean}$        | $E_{0,mean}$         | Klimaatklasse | $k_{def}$ |
|------|------------------|----------------------|----------------------|----------------------|----------------------|---------------|-----------|
|      | $E_{0,mean,fin}$ | [N/mm <sup>2</sup> ] | [N/mm <sup>2</sup> ] | [N/mm <sup>2</sup> ] | [N/mm <sup>2</sup> ] |               |           |
| 1    | GL24h            | 650                  | 9600                 | 300                  | 11500                | I             | 0.60      |
| 7188 |                  |                      |                      |                      |                      |               |           |

## KIPSTABILITEIT

| Staaft | Plts. aangr. | l sys. [m]                   | Kipsteunafstanden [m]               |
|--------|--------------|------------------------------|-------------------------------------|
| 1      | 1.0*h        | boven: 33.36<br>onder: 33.36 | 25*1,283;1,285<br>0;33.360          |
| 2      | 1.0*h        | boven: 7.34<br>onder: 7.34   | 0;2.195;3.355;1.785<br>0;5.55;1.785 |
| 3      | 0.0*h        | boven: 7.34<br>onder: 7.34   | 0;2.195;3.355;1.785<br>0;5.55;1.785 |

## STABILITEIT

| Stf       | $b_{gem}$ | $h_{gem}$ | $l_{sys}$ | $l_{buc,y/z}$ | $\lambda_y$ | $\lambda_z$ | $\lambda_{rel,y/z}$ | $\beta_c$ | $k_y$ | $k_z$ |       |       |
|-----------|-----------|-----------|-----------|---------------|-------------|-------------|---------------------|-----------|-------|-------|-------|-------|
| $k_{c,y}$ | $k_{c,z}$ |           |           |               |             |             |                     |           |       |       |       |       |
|           | [mm]      | [mm]      | [mm]      | [mm]          |             |             |                     |           |       |       |       |       |
| 1         | 240       | 2100      | 33360     | nvt           | 33000       | 55.0        | 476.3               | 0.876     | 7.581 | 0.1   | 0.912 |       |
| 29.598    | 0.856     | 0.017     |           |               |             |             |                     |           |       |       |       |       |
| 2         | 240       | 400       | 7335      | nvt           | 5550        | 63.5        | 80.1                | 1.011     | 1.275 | 0.1   | 1.047 | 1.361 |



0.759 0.544  
3 240 400 7335 nvt 5550 63.5 80.1 1.011 1.275 0.1 1.047 1.361  
0.759 0.544

Project.....: SGU021041 - Uitbreiding zwembad de Meerkant te Amstelveen  
Onderdeel.....: Zwemzaal portaal as 6

## TOETSING SPANNINGEN

| Staaft                                                                              | 1                          | BC / Sit.              | 1 / 1                      | UC frm(6.33)         |
|-------------------------------------------------------------------------------------|----------------------------|------------------------|----------------------------|----------------------|
| 0.93                                                                                |                            |                        |                            |                      |
| Maatgevend is buiging (EN 1995-1-1 art. 6.3.3(3)) aan bovenzijde staaft             |                            |                        |                            |                      |
| Belastingduurklasse                                                                 |                            | Blijvend               |                            |                      |
| Positie 16680 [mm]                                                                  |                            |                        |                            |                      |
| Breedte 240.00 [mm]                                                                 |                            | Hoogte 2100.00 [mm]    |                            | Materiaal            |
| 1:GL24h                                                                             |                            |                        |                            |                      |
| $k_{m o d}$                                                                         | 0.60 [-]                   | $k_h (f t o k)$        | 1.00 [-]                   | $k_h (f m k)$        |
| 1.00 [-]                                                                            |                            |                        |                            |                      |
| $f_{m, y, d}$                                                                       | 11.52 [N/mm <sup>2</sup> ] | $f_{c, 0, d}$          | 11.52 [N/mm <sup>2</sup> ] | $f_{t, 0, d}$        |
| 9.22 [N/mm <sup>2</sup> ]                                                           |                            |                        |                            |                      |
| $f_{v, d}$                                                                          | 1.68 [N/mm <sup>2</sup> ]  | $f_{c, 90, d}$         | 1.20 [N/mm <sup>2</sup> ]  | $f_{t, 90, d}$       |
| 0.24 [N/mm <sup>2</sup> ]                                                           |                            |                        |                            |                      |
| N                                                                                   | 1.20 [kN]                  | D                      | 0.00 [kN]                  | M -                  |
| 1808.10 [kNm]                                                                       |                            |                        |                            |                      |
| $\sigma_{t, 0, d}$                                                                  | 0.00 [N/mm <sup>2</sup> ]  | $\tau_d$               | 0.00 [N/mm <sup>2</sup> ]  | $\sigma_{m, y, d}$ - |
| 10.25 [N/mm <sup>2</sup> ]                                                          |                            |                        |                            |                      |
| $k_{c, z}$                                                                          | 0.02 [-]                   | $k_m$                  | 0.70 [-]                   | $l_{e f, y}$         |
| 5483.00 [mm]                                                                        |                            |                        |                            |                      |
| $\sigma_{m y, c r i t}$                                                             | 37.46 [N/mm <sup>2</sup> ] | $\lambda_{r e l, m y}$ | 0.80 [-]                   | $k_{c r i t, y}$     |
| 0.96 [-]                                                                            |                            |                        |                            |                      |
| Staaft                                                                              | 2                          | BC / Sit.              | 5 / 1                      | UC frm(6.23)         |
| 0.62                                                                                |                            |                        |                            |                      |
| Maatg. is norm.drukker. + buiging (EN 1995-1-1 art. 6.3.2(3)) aan bovenzijde staaft |                            |                        |                            |                      |
| Belastingduurklasse                                                                 |                            | Kort                   |                            |                      |
| Positie 3667 [mm]                                                                   |                            |                        |                            |                      |
| Breedte 240.00 [mm]                                                                 |                            | Hoogte 400.00 [mm]     |                            | Materiaal            |
| 1:GL24h                                                                             |                            |                        |                            |                      |
| $k_{m o d}$                                                                         | 0.90 [-]                   | $k_h (f t o k)$        | 1.04 [-]                   | $k_h (f m k)$        |
| 1.04 [-]                                                                            |                            |                        |                            |                      |
| $f_{m, y, d}$                                                                       | 18.00 [N/mm <sup>2</sup> ] | $f_{c, 0, d}$          | 17.28 [N/mm <sup>2</sup> ] | $f_{t, 0, d}$        |
| 14.40 [N/mm <sup>2</sup> ]                                                          |                            |                        |                            |                      |
| $f_{v, d}$                                                                          | 2.52 [N/mm <sup>2</sup> ]  | $f_{c, 90, d}$         | 1.80 [N/mm <sup>2</sup> ]  | $f_{t, 90, d}$       |
| 0.36 [N/mm <sup>2</sup> ]                                                           |                            |                        |                            |                      |
| N                                                                                   | -225.98 [kN]               | D                      | -0.21 [kN]                 | M -                  |
| 50.82 [kNm]                                                                         |                            |                        |                            |                      |
| $\sigma_{c, 0, d}$                                                                  | 2.35 [N/mm <sup>2</sup> ]  | $\tau_d$               | 0.00 [N/mm <sup>2</sup> ]  | $\sigma_{m, y, d}$ - |
| 7.94 [N/mm <sup>2</sup> ]                                                           |                            |                        |                            |                      |



|                      |                             |                     |          |              |
|----------------------|-----------------------------|---------------------|----------|--------------|
| $k_{c,z}$            | 0.54 [-]                    | $k_m$               | 0.70 [-] | $l_{ef,y}$   |
| 4155.00 [mm]         |                             |                     |          |              |
| $\sigma_{m y, crit}$ | 259.51 [N/mm <sup>2</sup> ] | $\lambda_{rel, my}$ | 0.30 [-] | $k_{crit,y}$ |
| 1.00 [-]             |                             |                     |          |              |



Project.....: SGU021041 - Uitbreiding zwembad de Meerkant te Amstelveen  
Onderdeel.....: Zwemzaal portaal as 6

#### TOETSING SPANNINGEN

**Staaft**                    **3**                    **BC / Sit.**                    **6 / 1**                    **UC frm(6.23)**  
**0.45**

Maatg. is norm.drukkkr. + buiging (EN 1995-1-1 art. 6.3.2(3)) aan bovenzijde staaft

Belastingduurklasse                    Kort

Positie                    3667                    [mm]

Breedte                    240.00                    [mm]                    Hoogte                    400.00                    [mm]                    Materiaal  
1:GL24h

$k_{mod}$                     0.90                    [-]                     $k_h(f_{tok})$                     1.04                    [-]                     $k_h(f_{mk})$   
1.04                    [-]

$f_{m,y,d}$                     18.00                    [N/mm<sup>2</sup>]                     $f_{c,0,d}$                     17.28                    [N/mm<sup>2</sup>]                     $f_{t,0,d}$   
14.40                    [N/mm<sup>2</sup>]

$f_{v,d}$                     2.52                    [N/mm<sup>2</sup>]                     $f_{c,90,d}$                     1.80                    [N/mm<sup>2</sup>]                     $f_{t,90,d}$   
0.36                    [N/mm<sup>2</sup>]

N                    -216.54                    [kN]                    D                    -0.13                    [kN]                    M                    -  
32.18                    [kNm]

$\sigma_{c,0,d}$                     2.26                    [N/mm<sup>2</sup>]                     $\tau_d$                     0.00                    [N/mm<sup>2</sup>]                     $\sigma_{m,y,d}$                     -  
5.03                    [N/mm<sup>2</sup>]

$k_{c,z}$                     0.54                    [-]                     $k_m$                     0.70                    [-]                     $l_{ef,y}$   
3155.00                    [mm]

$\sigma_{m,y,crit}$                     341.77                    [N/mm<sup>2</sup>]                     $\lambda_{rel,my}$                     0.26                    [-]                     $k_{crit,y}$   
1.00                    [-]

#### TOETSING DOORBUIGING

| Stf | Soort | Mtg | $l_{sys}$ | Overstek | BC | Sit | $u_{bij}$ | Toelaatbaar | $u_{fin,net}$ |
|-----|-------|-----|-----------|----------|----|-----|-----------|-------------|---------------|
|     |       |     | [mm]      | i        | j  |     | [mm]      | [mm]        | *l            |
|     |       |     | [mm]      |          |    |     | [mm]      | [mm]        | [mm]          |

|   |     |    |       |     |     |    |   |       |        |       |        |   |
|---|-----|----|-------|-----|-----|----|---|-------|--------|-------|--------|---|
| 1 | Dak | db | 33360 | Nee | Nee | 18 | 1 | -66.6 | -133.4 | 0.004 | -140.1 | - |
|   |     |    |       |     |     |    |   |       |        |       |        |   |

#### TOETSING DOORBUIGING (vervolg)

| Stf | Soort | Mtg | $l_{sys}$ | Overstek | Zeeg | BC   | Sit | $u_{inst}$ | Toelaatbaar |
|-----|-------|-----|-----------|----------|------|------|-----|------------|-------------|
|     |       |     | [mm]      | i        | j    | [mm] |     | [mm]       | [mm]        |
|     |       |     |           |          |      |      |     | [mm]       | *l          |

|   |     |    |       |     |     |     |    |   |       |        |       |
|---|-----|----|-------|-----|-----|-----|----|---|-------|--------|-------|
| 1 | Dak | db | 33360 | Nee | Nee | 0.0 | 17 | 1 | -96.0 | -133.4 | 0.004 |
|---|-----|----|-------|-----|-----|-----|----|---|-------|--------|-------|

#### TOETSING HORIZONTALE VERPLAATSING

| Staaft | Mtg | $l_{sys}$ | BC | Sit | $w_{tot}$ | Toelaatbaar |
|--------|-----|-----------|----|-----|-----------|-------------|
|        |     | [mm]      |    |     | [mm]      | [mm] [h/ ]  |

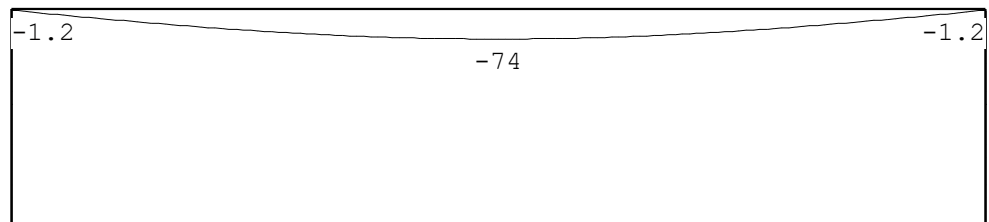
|   |    |      |    |   |       |       |
|---|----|------|----|---|-------|-------|
| 2 | db | 7335 | 13 | 1 | -11.5 | -24.5 |
| 3 | db | 7335 | 14 | 1 | -7.3  | -24.5 |



Project.....: SGU021041 - Uitbreiding zwembad de Meerkant te Amstelveen  
Onderdeel.....: Zwemzaal portaal as 6

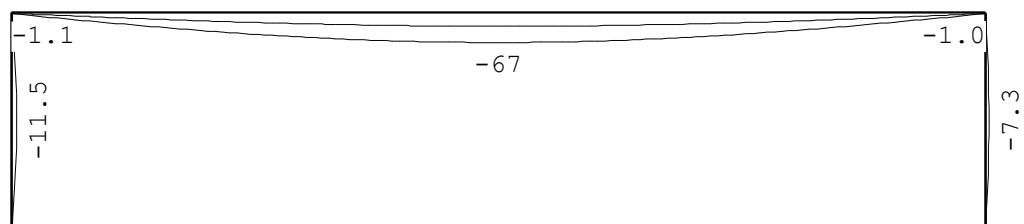
### VERVORMINGEN $w_1$ combinatie

Blijvende



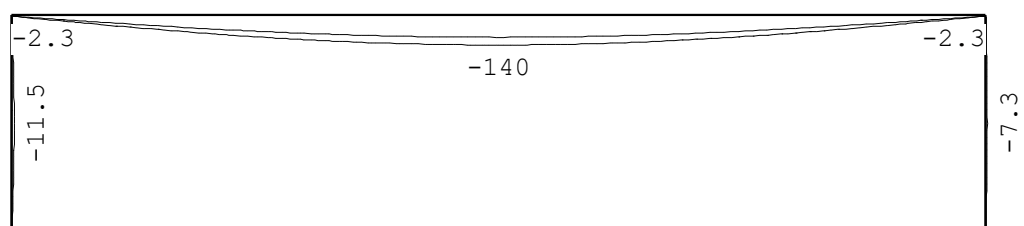
### VERVORMINGEN $w_{bij}$ combinatie

Karakteristieke



### VERVORMINGEN $w_{max}$ combinatie

Karakteristieke



### DOORBUIGINGEN combinatie

Karakteristieke

| Nr.             | staven | Zijde | positie | $l_{rep}$ | $w_1$ | $w_2$ | $w_{bij}$ | $w_{tot}$ | $w_c$ |
|-----------------|--------|-------|---------|-----------|-------|-------|-----------|-----------|-------|
| -- $w_{max}$ -- |        |       |         |           |       |       |           |           |       |
|                 |        |       | [m]     | [mm]      | [mm]  | [mm]  | [mm]      | [mm]      | [mm]  |
|                 |        |       |         |           |       |       |           |           |       |
| 1               | 1      | Neg.  | 16.680  | 33360     | -73.5 | -44.1 | -66.6     | 501       | -140  |
| -140            | 238    |       |         |           |       |       |           |           |       |

## Bijlage C Uitvoer zwemzaal randliggers

**Technosoft Raamwerken release 6.75b**  
**2023**

**26 jan**

Project.....: Sgu021041 - Uitbreiding zwembad de Meerkant te Amstelveen  
Onderdeel.....: Zwemzaal randligger  
Dimensies.....: kN;m;rad (tenzij anders aangegeven)  
Datum.....: 14/11/2022  
Bestand.....: H:\SGU021041\BEREKENINGEN\04\_DO\Zwemzaal randligger.rww

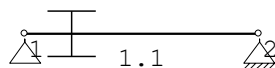
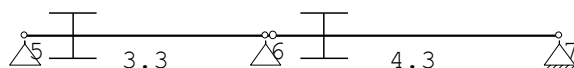
Rekenmodel.....: 1e-orde-elastisch.  
Theorie voor de bepaling van de krachtsverdeling:  
Geometrisch lineair.  
Fysisch lineair.

Gunstige werking van de permanente belasting wordt automatisch verwerkt.

## Toegepaste normen volgens Eurocode met Nederlandse NB

|             |                      |                 |
|-------------|----------------------|-----------------|
| Belastingen | NEN-EN 1990:2002     | C2:2010,A1:2019 |
| NB:2019(nl) |                      |                 |
|             | NEN-EN 1991-1-1:2002 | C1/C11:2019     |
| NB:2019(nl) |                      |                 |
| Staal       | NEN-EN 1993-1-1:2006 | C2:2011,A1:2016 |
| NB:2016(nl) |                      |                 |

## GEOMETRIE



## MATERIALEN

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

## PROFIELEN [mm]

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



|                 |        |            |
|-----------------|--------|------------|
| 2 HEA140 (90)   | 1:S235 | 3.1420e+03 |
| 3.8900e+06 0.00 |        |            |
| 3 HEA160        | 1:S235 | 3.8800e+03 |
| 1.6730e+07 0.00 |        |            |



Project.....: Sgu021041 - Uitbreiding zwembad de Meerkant te Amstelveen  
Onderdeel.....: Zwemzaal randligger

### PROFIELEN vervolg [mm]

| Prof. | Staaftype | Breedte | Hoogte | e    | Type | b1 | h1 | b2 |
|-------|-----------|---------|--------|------|------|----|----|----|
| h2    |           |         |        |      |      |    |    |    |
| 1     | 0:Normaal | 140     | 133    | 66.5 |      |    |    |    |
| 2     | 0:Normaal | 140     | 133    | 70.0 |      |    |    |    |
| 3     | 0:Normaal | 160     | 152    | 76.0 |      |    |    |    |

### KNOPEN

| Knoop | X     | Z     | Knoop | X      | Z     |
|-------|-------|-------|-------|--------|-------|
| 1     | 0.000 | 0.000 | 6     | 4.685  | 6.000 |
| 2     | 4.560 | 0.000 | 7     | 10.410 | 6.000 |
| 3     | 0.000 | 3.000 | 8     | 2.280  | 3.000 |
| 4     | 4.560 | 3.000 |       |        |       |
| 5     | 0.000 | 6.000 |       |        |       |

### STAVEN

| St.    | ki   | kj | Profiel       | Aansl.i | Aansl.j |
|--------|------|----|---------------|---------|---------|
| Lengte | Opm. |    |               |         |         |
| 1      | 1    | 2  | 1:HEA140      | NDM     | NDM     |
| 4.560  |      |    |               |         |         |
| 2      | 3    | 8  | 2:HEA140 (90) | NDM     | NDM     |
| 2.280  |      |    |               |         |         |
| 3      | 5    | 6  | 3:HEA160      | NDM     | NDM     |
| 4.685  |      |    |               |         |         |
| 4      | 6    | 7  | 3:HEA160      | ND-     | NDM     |
| 5.725  |      |    |               |         |         |
| 5      | 8    | 4  | 2:HEA140 (90) | NDM     | NDM     |
| 2.280  |      |    |               |         |         |

### VASTE STEUNPUNTEN

| Nr. | knoop | Kode | XZR 1=vast 0=vrij | Hoek |
|-----|-------|------|-------------------|------|
| 1   | 1     | 010  |                   | 0.00 |
| 2   | 2     | 110  |                   | 0.00 |
| 3   | 3     | 010  |                   | 0.00 |
| 4   | 4     | 110  |                   | 0.00 |
| 5   | 5     | 010  |                   | 0.00 |
| 6   | 6     | 010  |                   | 0.00 |
| 7   | 7     | 110  |                   | 0.00 |
| 8   | 8     | 110  |                   | 0.00 |

### BELASTINGGEVALLEN

| B.G. | Omschrijving         | Type             |
|------|----------------------|------------------|
| 1    | Permanente belasting | EGZ=-1.00        |
| 2    | Wind                 | 7 Wind van links |
|      | onderdruk A          |                  |

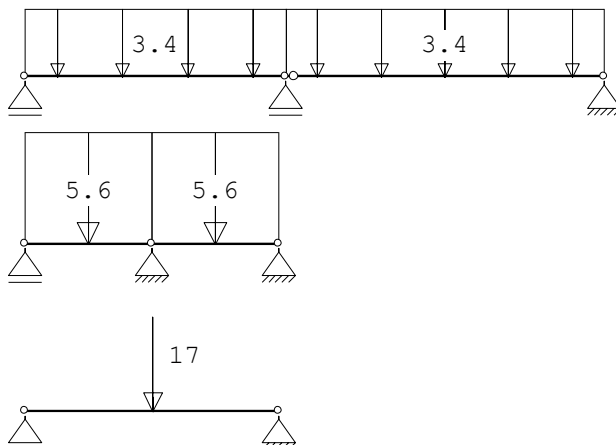
Project.....: Sgu021041 - Uitbreiding zwembad de Meerkant te Amstelveen  
Onderdeel.....: Zwemzaal randligger

## BELASTINGEN

B.G:1 Permanente

belasting

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



## STAAFBELASTINGEN

B.G:1 Permanente

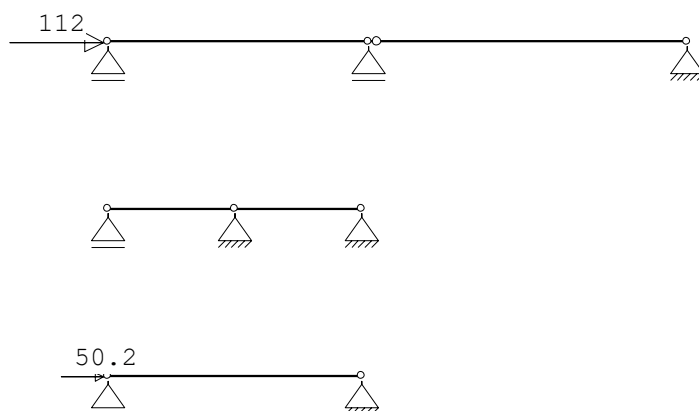
belasting

| Staaftype | Type       | q1/p/m | q2    | A     | B     | $\psi_0$ |
|-----------|------------|--------|-------|-------|-------|----------|
| $\psi_1$  | $\psi_2$   |        |       |       |       |          |
| 3         | 1:QZLokaal | -3.40  | -3.40 | 0.000 | 0.000 |          |
| 4         | 1:QZLokaal | -3.40  | -3.40 | 0.000 | 0.000 |          |
| 2         | 1:QZLokaal | -5.60  | -5.60 | 0.000 | 0.000 |          |
| 5         | 1:QZLokaal | -5.60  | -5.60 | 0.000 | 0.000 |          |
| 1         | 8:PZLokaal | -17.00 |       | 2.300 |       |          |

## BELASTINGEN

B.G:2

Wind



Project.....: Sgu021041 - Uitbreiding zwembad de Meerkant te Amstelveen  
Onderdeel.....: Zwemzaal randligger

## KNOOPBELASTINGEN

B.G:2

Wind

| Last | Knoop | Richting | waarde  | $\psi_0$ | $\psi_1$ | $\psi_2$ |
|------|-------|----------|---------|----------|----------|----------|
| 1    | 5     | X        | 112.000 | 0.00     | 0.20     | 0.00     |
| 2    | 1     | X        | 50.200  | 0.00     | 0.20     | 0.00     |

## BELASTINGCOMBINATIES

| BC | Type                                  |
|----|---------------------------------------|
| 1  | Fund. 1.20 $G_{k,1}$ + 1.50 $Q_{k,2}$ |
| 2  | Fund. 1.20 $G_{k,1}$                  |
| 3  | Kar. 1.00 $G_{k,1}$ + 1.00 $Q_{k,2}$  |
| 4  | Kar. 1.00 $G_{k,1}$                   |
| 5  | Blij. 1.00 $G_{k,1}$                  |

## GUNSTIGE WERKING PERMANENTE BELASTINGEN

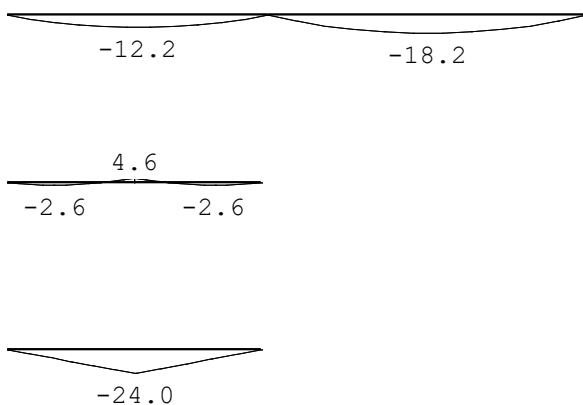
| BC | Staven met gunstige werking |
|----|-----------------------------|
| 1  | Geen                        |
| 2  | Geen                        |

## OMHULLENDE VAN DE FUNDAMENTELE COMBINATIES

### MOMENTEN

Fundamentele

combinatie

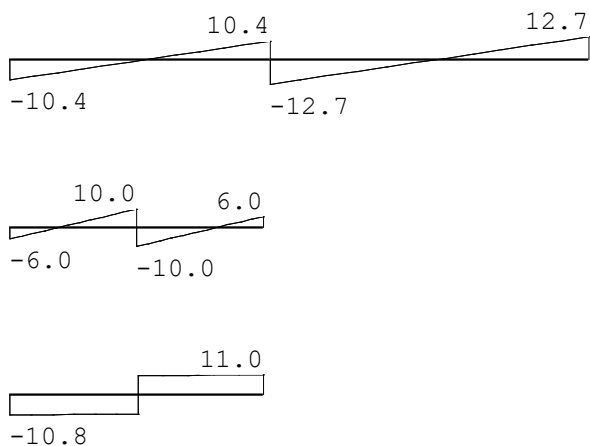


Project.....: Sgu021041 - Uitbreiding zwembad de Meerkant te Amstelveen  
Onderdeel.....: Zwemzaal randligger

## DWARSKRACHTEN

Fundamentele

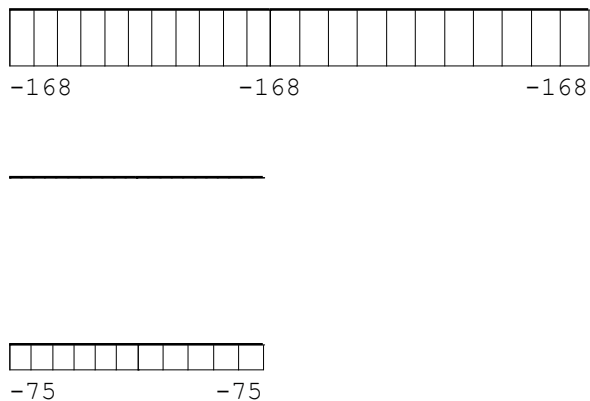
combinatie



## NORMAALKRACHTEN

Fundamentele

combinatie



## REACTIES

Fundamentele

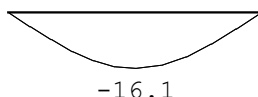
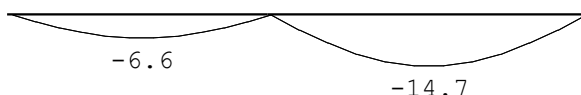
combinatie

| Kn.   | X-min   | X-max | Z-min | Z-max | M-min |
|-------|---------|-------|-------|-------|-------|
| M-max |         |       |       |       |       |
| 1     |         |       | 10.79 | 10.79 |       |
| 2     | -75.30  | 0.00  | 10.96 | 10.96 |       |
| 3     |         |       | 6.00  | 6.00  |       |
| 4     | 0.00    | 0.00  | 6.00  | 6.00  |       |
| 5     |         |       | 10.41 | 10.41 |       |
| 6     |         |       | 23.14 | 23.14 |       |
| 7     | -168.00 | 0.00  | 12.73 | 12.73 |       |
| 8     | 0.00    | 0.00  | 20.00 | 20.00 |       |

Project.....: Sgu021041 - Uitbreiding zwembad de Meerkant te Amstelveen  
Onderdeel.....: Zwemzaal randligger

## OMHULLENDE VAN DE KARAKTERISTIEKE COMBINATIES

**VERPLAATSINGEN** [mm] Karakteristieke combinatie



## STAALPROFIELEN - ALGEMENE GEGEVENS

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

## PROFIEL/MATERIAAL

| P/M drsn.<br>nr.<br>klasse | Profielnaam | Vloeisp.<br>[N/mm <sup>2</sup> ] | Productie<br>methode | Min. |
|----------------------------|-------------|----------------------------------|----------------------|------|
|----------------------------|-------------|----------------------------------|----------------------|------|

|   |             |     |         |  |
|---|-------------|-----|---------|--|
| 1 | HEA140      | 235 | Gewalst |  |
| 1 |             |     |         |  |
| 2 | HEA140 (90) | 235 | Gewalst |  |
| 1 |             |     |         |  |
| 3 | HEA160      | 235 | Gewalst |  |
| 1 |             |     |         |  |

Partiële veiligheidsfactoren:

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

## KNIKSTABILITEIT

Extra

Extra

| Staaft<br>aanp. z | $l_{sys}$<br>[m] | Classif. y<br>sterke as | $l_{knik,y}$<br>[m] | aanp. y<br>[kN] | Classif. z<br>zwakke as | $l_{knik,z}$<br>[m] |
|-------------------|------------------|-------------------------|---------------------|-----------------|-------------------------|---------------------|
|-------------------|------------------|-------------------------|---------------------|-----------------|-------------------------|---------------------|



|     |       |           |       |     |           |       |
|-----|-------|-----------|-------|-----|-----------|-------|
| 1   | 4.560 | Geschoord | 4.560 | 0.0 | Geschoord | 4.560 |
| 0.0 |       |           |       |     |           |       |
| 2-5 | 4.560 | Geschoord | 4.560 | 0.0 | Geschoord | 4.560 |
| 0.0 |       |           |       |     |           |       |
| 3   | 4.685 | Geschoord | 4.685 | 0.0 | Geschoord | 4.685 |
| 0.0 |       |           |       |     |           |       |
| 4   | 5.725 | Geschoord | 5.725 | 0.0 | Geschoord | 5.725 |
| 0.0 |       |           |       |     |           |       |

Project.....: Sgu021041 - Uitbreiding zwembad de Meerkant te Amstelveen  
Onderdeel.....: Zwemzaal randligger

## KIPSTABILITEIT

| Staafl | Plts.<br>aanr. | l gaffel | Kipsteunafstanden |
|--------|----------------|----------|-------------------|
|        |                | [m]      | [m]               |
| 1      | 1.0*h          | boven:   | 4.56 3*1,52       |
|        |                | onder:   | 4.56 4,56         |
| 2-5    | 1.0*h          | boven:   | 4.56 4.560        |
|        |                | onder:   | 4.56 4.560        |
| 3      | 1.0*h          | boven:   | 4.68 3*1,562      |
|        |                | onder:   | 4.68 4,685        |
| 4      | 1.0*h          | boven:   | 5.72 3*1,908      |
|        |                | onder:   | 5.72 5.725        |

## KRACHTEN UIT HET VLAK

| Staafl | Mbegin<br>[kNm] | Mmidden<br>[kNm] | Meinde<br>[kNm] | Vbegin<br>[kN] | Vtpv<br>[kN] | Mmax<br>[kN] | Veinde<br>[kN] | Mx<br>[kNm] |
|--------|-----------------|------------------|-----------------|----------------|--------------|--------------|----------------|-------------|
| 2-5    | 0.0             | 11.6             | 0.0             | 0.0            | 0.0          | 0.0          | 0.0            | 0.0         |

## TOETSING SPANNINGEN

Staafl P/M BC Sit Kl Plaats Norm Artikel Formule Hoogste toetsing  
Opm.

| nr. |   |   |   |   |        |         |       |        | U.C. [N/mm <sup>2</sup> ] |
|-----|---|---|---|---|--------|---------|-------|--------|---------------------------|
| 1   | 1 | 1 | 1 | 1 | Staafl | EN3-1-1 | 6.3.3 | (6.61) | 0.760 179                 |
| 2-5 | 2 | 1 | 1 | 1 | Staafl | EN3-1-1 | 6.3.3 | (6.62) | 0.502 118                 |
| 42  |   |   |   |   |        |         |       |        |                           |
| 3   | 3 | 1 | 1 | 1 | Staafl | EN3-1-1 | 6.3.3 | (6.61) | 0.475 112                 |
| 4   | 3 | 1 | 1 | 1 | Staafl | EN3-1-1 | 6.3.3 | (6.62) | 0.878 206                 |

Opmerkingen:

[ 42] Waarschuwing: Er sluiten tussentijds staven en/of opleggingen aan.

## TOETSING DOORBUIGING

| Staafl      | Soort | Mtg | Lengte | Overst | Zeeg | u <sub>tot</sub> | BC | Sit    | u           |
|-------------|-------|-----|--------|--------|------|------------------|----|--------|-------------|
| Toelaatbaar |       |     | [m]    | I      | J    | [mm]             |    |        | [mm]        |
| *1          |       |     |        |        |      |                  |    |        |             |
| 1           | Dak   | db  | 4.56   | N      | N    | 0.0 -16.1        | 3  | 1 Eind | -16.1 -18.2 |
| 0.004       |       |     |        |        |      |                  |    |        |             |
| 2-5         | Dak   | db  | 4.56   | N      | N    | 0.0 -1.0         | 3  | 1 Eind | -1.0 -18.2  |
| 0.004       |       |     |        |        |      |                  |    |        |             |
| 3           | Dak   | db  | 4.68   | N      | N    | 0.0 -6.6         | 3  | 1 Eind | -6.6 -18.7  |
| 0.004       |       |     |        |        |      |                  |    |        |             |
| 4           | Dak   | db  | 5.72   | N      | N    | 0.0 -14.7        | 3  | 1 Eind | -14.7 -22.9 |
| 0.004       |       |     |        |        |      |                  |    |        |             |

## TOETSING HOR. VERPLAATSING GLOBAAL

Er is een maximale horizontale verplaatsing van 0.0014 [m] gevonden bij knoop 5 en combinatie 3; belastingsituatie 1 (combinatietype 2). Bij een hoogte van 6.000 [m] levert dit h / 4193 (toel.: h / 300).



## Bijlage D Uitvoer zwemzaal kolommen as 1

**Technosoft Raamwerken release 6.75b**  
**2023**

**26 jan**

Project.....: SGU021041 - Uitbreiding zwembad de Meerkant te Amstelveen  
Onderdeel.....: zwemzaal kolom as 1  
Dimensies.....: kN;m;rad (tenzij anders aangegeven)  
Datum.....: 15/11/2022  
Bestand.....: H:\SGU021041\BEREKENINGEN\04\_DO\Zwemzaal kolom as 1.rww

Belastingbreedte.: 5.590  
Rekenmodel.....: 2e-orde-elastisch.  
Theorieën voor de bepaling van de krachtsverdeling:  
1) Losse belastinggevallen:  
Lineaire-elasticiteitstheorie  
2) Uiterste grenstoestand:  
Geometrisch niet lineair alle staven.  
Fysisch lineair alle staven.  
3) Gebruiksgrenstoestand:  
Lineaire-elasticiteitstheorie

Maximum aantal iteraties.....: 50  
Max.deellengte kolommen/wanden: 0.500 Max.deellengte balken/vloeren:  
0.500  
Max. X-verplaatsing in UGT.....: 0.500 Max. Z-verplaatsing in UGT....:  
0.250

Gunstige werking van de permanente belasting wordt automatisch verwerkt.

### **Toegepaste normen volgens Eurocode met Nederlandse NB**

|             |                      |                 |
|-------------|----------------------|-----------------|
| Belastingen | NEN-EN 1990:2002     | C2:2010,A1:2019 |
| NB:2019(nl) | NEN-EN 1991-1-1:2002 | C1/C11:2019     |
| NB:2019(nl) | NEN-EN 1991-1-3:2003 | C1:2009         |
| NB:2011(nl) | NEN-EN 1991-1-4:2005 | C2:2011         |
| NB:2011(nl) | NEN-EN 1995-1-1:2005 | A1:2011,C1:2006 |
| Hout        |                      |                 |
| NB:2013(nl) | NEN-EN 14080:2013    |                 |

### **GEOMETRIE**



Project.....: SGU021041 - Uitbreiding zwembad de Meerkant te Amstelveen  
Onderdeel.....: zwemzaal kolom as 1

## MATERIALEN

| Mt | Kwaliteit | E-modulus[N/mm <sup>2</sup> ] | S.G. | S.G.verhoogd | Pois. | Uitz. coëff |
|----|-----------|-------------------------------|------|--------------|-------|-------------|
|----|-----------|-------------------------------|------|--------------|-------|-------------|

|   |       |       |     |     |      |            |
|---|-------|-------|-----|-----|------|------------|
| 1 | GL24h | 11500 | 3.8 | 4.6 | 1.00 | 5.0000e-06 |
|---|-------|-------|-----|-----|------|------------|

Bij de bepaling v.h. e.g. van houten staven is de S.G.verhoogd toegepast.

## PROFIELEN [mm]

| Prof.     | Omschrijving | Materiaal | Oppervlak |
|-----------|--------------|-----------|-----------|
| Traagheid | Vormf.       |           |           |

|            |             |         |            |
|------------|-------------|---------|------------|
| 1          | B*H 240*500 | 1:GL24h | 1.2000e+05 |
| 2.5000e+09 | 0.00        |         |            |
| 2          | B*H 240*250 | 1:GL24h | 6.0000e+04 |
| 3.1250e+08 | 0.00        |         |            |

## PROFIELEN vervolg [mm]

| Prof. | Staaftype | Breedte | Hoogte | e | Type | b1 | h1 | b2 |
|-------|-----------|---------|--------|---|------|----|----|----|
| h2    |           |         |        |   |      |    |    |    |

|   |           |     |     |       |      |  |  |  |
|---|-----------|-----|-----|-------|------|--|--|--|
| 1 | 0:Normaal | 240 | 500 | 250.0 | 0:RH |  |  |  |
| 2 | 0:Normaal | 240 | 250 | 125.0 | 0:RH |  |  |  |

## PROFIELVORMEN [mm]

|   |             |                                                                                     |
|---|-------------|-------------------------------------------------------------------------------------|
| 1 | B*H 240*500 |  |
| 2 | B*H 240*250 |  |

## KNOPEN

| Knoop | X     | Z     |
|-------|-------|-------|
| 1     | 0.000 | 0.500 |
| 2     | 0.000 | 8.500 |
| 3     | 0.000 | 6.100 |

## STAVEN

| St.    | ki   | kj | Profiel       | Aansl.i | Aansl.j |
|--------|------|----|---------------|---------|---------|
| Lengte | Opm. |    |               |         |         |
| 1      | 1    | 3  | 1:B*H 240*500 | NDM     | NDM     |
| 5.600  |      |    |               |         |         |
| 2      | 3    | 2  | 2:B*H 240*250 | NDM     | NDM     |
| 2.400  |      |    |               |         |         |

## VASTE STEUNPUNTEN

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



2 2 100 0.00

#### **BELASTINGENERATIE ALGEMEEN.**

---

|                              |       |                         |      |
|------------------------------|-------|-------------------------|------|
| Betrouwbaarheidsklasse.....: | 2     | Referentieperiode.....: | 50   |
| Gebouwdiepte.....:           | 30.07 | Gebouwhoogte.....:      | 8.50 |
| Niveau aansl.terrein.....:   | 0.00  | E.g. scheid.w. [kN/m2]: | 1.20 |

Project.....: SGU021041 - Uitbreiding zwembad de Meerkant te Amstelveen  
Onderdeel.....: zwemzaal kolom as 1

## WIND

Terrein categorie ...[4.3.2]....: Onbebouwd  
Windgebied .....: 2  $V_{b,0}$  ..[4.2].....: 27.000  
Positie spant in het gebouw....: 0.000  $K_r$  ....[4.3.2].....: 0.209  
 $z_0$  .....[4.3.2]....: 0.200  $z_{min}$  ..[4.3.2].....: 4.000  
Co wind van links ..[4.3.3]....: 1.000 Co wind van rechts....: 1.000  
Co wind loodrecht ..[4.3.3]....: 1.000  
Cpi wind van links ..[7.2.9]....: 0.200 -0.300  
Cpi windloodrecht ...[7.2.9]....: 0.200 -0.300  
Cpi wind van rechts .[7.2.9]....: 0.200 -0.300  
Cfr windwrijving ....[7.5].....: 0.040

## SNEEUW

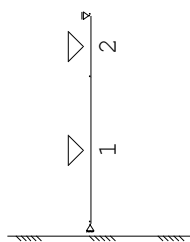
Sneeuwbelasting (sk) 50 jaar : 0.70  
Sneeuwbelasting (sn) n jaar : 0.70

## STAFTYPEN

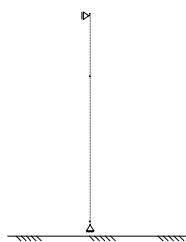
| Type            | staven |
|-----------------|--------|
| 5:Linker gevel. | : 1,2  |

## LASTVELDEN

Wind staven



Sneeuw staven



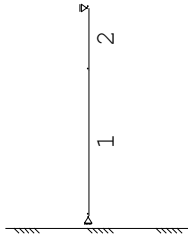
## WIND DAKTYPES

| Nr. | Staaf Type | reductie bij<br>wind van links | reductie bij<br>wind van rechts | Cpe   |
|-----|------------|--------------------------------|---------------------------------|-------|
| 1   | 1-2 Gevel  | 1.000                          | 1.000                           | 7.2.2 |

## WIND ZONES

Wind van links

Wind van rechts



Project.....: SGU021041 - Uitbreiding zwembad de Meerkant te Amstelveen  
Onderdeel.....: zwemzaal kolom as 1

#### WIND VAN LINKS ZONES

| Nr. | Staat | Positie | Lengte | Zone |
|-----|-------|---------|--------|------|
| 1   | 1-2   | 0.000   | 8.000  | D    |

#### Wind indexen

| Index    | CsCd | Cpe/Cpi | qp    | breedte | reductie | Qw     | Zone |
|----------|------|---------|-------|---------|----------|--------|------|
| Hoek(en) |      |         |       |         |          |        |      |
| Qw1      |      | 0.300   | 0.802 | 5.590   |          | -1.345 | -i   |
| Qw2      | 1.00 | 0.800   | 0.802 | 5.590   |          | -3.587 | D    |
| Qw3      |      | -0.200  | 0.802 | 5.590   |          | 0.897  | +i   |

#### BELASTINGGEVALLEN

| B.G. | Omschrijving                     | Type |
|------|----------------------------------|------|
|      | 1 Permanente belasting EGZ=-1.00 | 1    |
| g    | 2 Wind van links onderdruk A     | 7    |
| g    | 3 Wind van links overdruk A      | 8    |
|      | 4 Sneeuw A                       | 22   |

g = gegenereerd belastinggeval

#### BELASTINGGEVALLEN vervolg

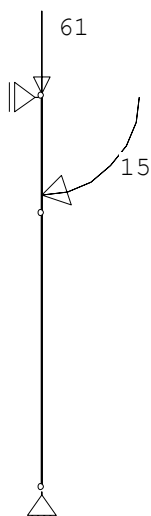
| B.G. | Omschrijving                 | Belastingduurklasse |
|------|------------------------------|---------------------|
|      | 1 Permanente belasting       | Blijvend            |
|      | 2 Wind van links onderdruk A | Kort                |
|      | 3 Wind van links overdruk A  | Kort                |
|      | 4 Sneeuw A                   | Kort                |

#### BELASTINGEN

B.G:1 Permanente

belasting

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



Project.....: SGU021041 - Uitbreiding zwembad de Meerkant te Amstelveen  
Onderdeel.....: zwemzaal kolom as 1

## KNOOPBELASTINGEN

B.G:1 Permanente

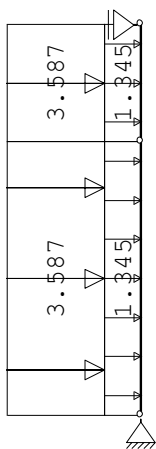
belasting

| Last | Knoop | Richting  | waarde  | $\psi_0$ | $\psi_1$ | $\psi_2$ |
|------|-------|-----------|---------|----------|----------|----------|
| 1    | 2     | Z         | -61.000 |          |          |          |
| 2    | 2     | Rotatie Y | 15.000  |          |          |          |

## BELASTINGEN

B.G:2 Wind van links

onderdruk A



## STAAFBELASTINGEN

B.G:2 Wind van links

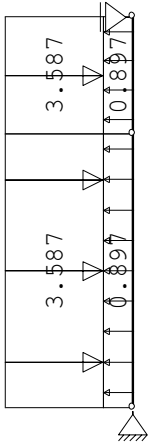
onderdruk A

| Staaftype         | Index | $q_1/p/m$ | $q_2$ | A     | B     | $\psi_0$ |
|-------------------|-------|-----------|-------|-------|-------|----------|
| $\psi_1$ $\psi_2$ |       |           |       |       |       |          |
| 1 1:QZLokaal      | Qw1   | -1.35     | -1.35 | 0.000 | 0.000 | 0.00     |
| 0.20 0.00         |       |           |       |       |       |          |
| 2 1:QZLokaal      | Qw1   | -1.35     | -1.35 | 0.000 | 0.000 | 0.00     |
| 0.20 0.00         |       |           |       |       |       |          |
| 1 1:QZLokaal      | Qw2   | -3.59     | -3.59 | 0.000 | 0.000 | 0.00     |
| 0.20 0.00         |       |           |       |       |       |          |
| 2 1:QZLokaal      | Qw2   | -3.59     | -3.59 | 0.000 | 0.000 | 0.00     |
| 0.20 0.00         |       |           |       |       |       |          |

## BELASTINGEN

B.G:3 Wind van links

overdruk A



Project.....: SGU021041 - Uitbreiding zwembad de Meerkant te Amstelveen  
Onderdeel.....: zwemzaal kolom as 1

## STAAFBELASTINGEN

B.G:3 Wind van links

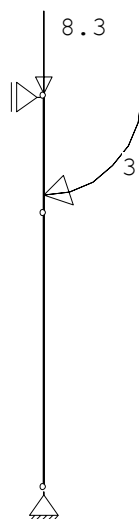
overdruk A

| Staaftype | Type       | Index | q1/p/m | q2    | A     | B     | $\psi_0$ |
|-----------|------------|-------|--------|-------|-------|-------|----------|
| $\psi_1$  | $\psi_2$   |       |        |       |       |       |          |
| 1         | 1:QZLokaal | Qw3   | 0.90   | 0.90  | 0.000 | 0.000 | 0.00     |
| 0.20      | 0.00       |       |        |       |       |       |          |
| 2         | 1:QZLokaal | Qw3   | 0.90   | 0.90  | 0.000 | 0.000 | 0.00     |
| 0.20      | 0.00       |       |        |       |       |       |          |
| 1         | 1:QZLokaal | Qw2   | -3.59  | -3.59 | 0.000 | 0.000 | 0.00     |
| 0.20      | 0.00       |       |        |       |       |       |          |
| 2         | 1:QZLokaal | Qw2   | -3.59  | -3.59 | 0.000 | 0.000 | 0.00     |
| 0.20      | 0.00       |       |        |       |       |       |          |

## BELASTINGEN

B.G:4

Sneeuw A



## KNOOPBELASTINGEN

B.G:4

Sneeuw A

| Last | Knoop | Richting  | waarde | $\psi_0$ | $\psi_1$ | $\psi_2$ |
|------|-------|-----------|--------|----------|----------|----------|
| 1    | 2     | Rotatie Y | 3.000  | 0.00     | 0.20     | 0.00     |
| 2    | 2     | Z         | -8.300 | 0.00     | 0.20     | 0.00     |

## REACTIES

1e orde

| Kn. | B.G. | X      | Z     | M |
|-----|------|--------|-------|---|
| 1   | 1    | 1.88   | 64.77 |   |
| 1   | 2    | -19.73 | 0.00  |   |
| 1   | 3    | -10.76 | 0.00  |   |
| 1   | 4    | 0.38   | 8.30  |   |
| 2   | 1    | -1.87  |       |   |
| 2   | 2    | -19.73 |       |   |
| 2   | 3    | -10.76 |       |   |
| 2   | 4    | -0.37  |       |   |



## **BEREKENINGSTATUS**

| B.C. | Iteratie | Status |
|------|----------|--------|
|------|----------|--------|



Project.....: SGU021041 - Uitbreiding zwembad de Meerkant te Amstelveen  
Onderdeel.....: zwemzaal kolom as 1

#### BEREKENINGSTATUS

| B.C. | Iteratie | Status                 |
|------|----------|------------------------|
| 1    | 3        | Nauwkeurigheid bereikt |
| 2    | 3        | Nauwkeurigheid bereikt |
| 3    | 3        | Nauwkeurigheid bereikt |
| 4    | 3        | Nauwkeurigheid bereikt |
| 5    | 3        | Nauwkeurigheid bereikt |
| 6    | 3        | Nauwkeurigheid bereikt |
| 7    | 3        | Nauwkeurigheid bereikt |
| 8    | 3        | Nauwkeurigheid bereikt |
| 9    | 1        | Lineaire berekening    |
| 10   | 1        | Lineaire berekening    |
| 11   | 1        | Lineaire berekening    |
| 12   | 1        | Lineaire berekening    |
| 13   | 1        | Lineaire berekening    |
| 14   | 1        | Lineaire berekening    |
| 15   | 1        | Lineaire berekening    |
| 16   | 1        | Lineaire berekening    |
| 17   | 1        | Lineaire berekening    |

#### BELASTINGCOMBINATIES

| BC | Type  |      |           |   |                       |
|----|-------|------|-----------|---|-----------------------|
| 1  | Fund. | 1.35 | $G_{k,1}$ |   |                       |
| 2  | Fund. | 0.90 | $G_{k,1}$ |   |                       |
| 3  | Fund. | 1.20 | $G_{k,1}$ | + | 1.50 $Q_{k,2}$        |
| 4  | Fund. | 1.20 | $G_{k,1}$ | + | 1.50 $Q_{k,3}$        |
| 5  | Fund. | 1.20 | $G_{k,1}$ | + | 1.50 $Q_{k,4}$        |
| 6  | Fund. | 0.90 | $G_{k,1}$ | + | 1.50 $Q_{k,2}$        |
| 7  | Fund. | 0.90 | $G_{k,1}$ | + | 1.50 $Q_{k,3}$        |
| 8  | Fund. | 0.90 | $G_{k,1}$ | + | 1.50 $Q_{k,4}$        |
| 9  | Kar.  | 1.00 | $G_{k,1}$ | + | 1.00 $Q_{k,2}$        |
| 10 | Kar.  | 1.00 | $G_{k,1}$ | + | 1.00 $Q_{k,3}$        |
| 11 | Kar.  | 1.00 | $G_{k,1}$ | + | 1.00 $Q_{k,4}$        |
| 12 | Quas. | 1.00 | $G_{k,1}$ |   |                       |
| 13 | Freq. | 1.00 | $G_{k,1}$ |   |                       |
| 14 | Freq. | 1.00 | $G_{k,1}$ | + | 1.00 $\psi_1 Q_{k,2}$ |
| 15 | Freq. | 1.00 | $G_{k,1}$ | + | 1.00 $\psi_1 Q_{k,3}$ |
| 16 | Freq. | 1.00 | $G_{k,1}$ | + | 1.00 $\psi_1 Q_{k,4}$ |
| 17 | Blij. | 1.00 | $G_{k,1}$ |   |                       |

Project.....: SGU021041 - Uitbreiding zwembad de Meerkant te Amstelveen  
Onderdeel.....: zwemzaal kolom as 1

### **GUNSTIGE WERKING PERMANENTE BELASTINGEN**

BC Staven met gunstige werking

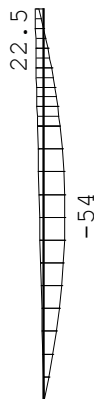
- 1 Geen
- 2 Alle staven de factor:0.90
- 3 Geen
- 4 Geen
- 5 Geen
- 6 Alle staven de factor:0.90
- 7 Alle staven de factor:0.90
- 8 Alle staven de factor:0.90

### **OMHULLENDE VAN DE FUNDAMENTELE COMBINATIES**

**MOMENTEN**  
combinatie

2e orde

Fundamentele





Project.....: SGU021041 - Uitbreiding zwembad de Meerkant te Amstelveen  
Onderdeel.....: zwemzaal kolom as 1

**DWARSKRACHTEN**  
combinatie

2e orde

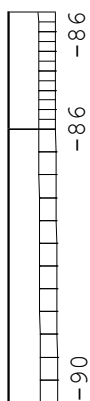
Fundamentele



**NORMAALKRACHTEN**  
combinatie

2e orde

Fundamentele



**REACTIES**  
combinatie

2e orde

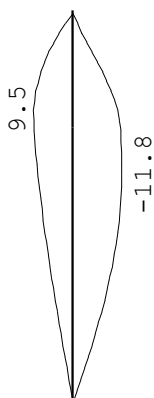
Fundamentele

| Kn.   | X-min  | X-max | Z-min | Z-max | M-min |
|-------|--------|-------|-------|-------|-------|
| M-max |        |       |       |       |       |
| 1     | -27.90 | 2.81  | 58.29 | 90.17 |       |
| 2     | -31.85 | -1.69 |       |       |       |

Project.....: SGU021041 - Uitbreiding zwembad de Meerkant te Amstelveen  
Onderdeel.....: zwemzaal kolom as 1

## OMHULLENDE VAN DE KARAKTERISTIEKE COMBINATIES

**VERPLAATSINGEN** 1e orde [mm] Karakteristieke combinatie



## MATERIAALGEGEVENS

| Mt  | Kwaliteit | $f_{m,y,k}$          | $\rho_k$             | $\rho_{mean}$        | $f_{t,0,k}$          | $f_{t,90,k}$         | $f_{c,0,k}$          |
|-----|-----------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|
|     |           | [N/mm <sup>2</sup> ] | [kg/m <sup>3</sup> ] | [kg/m <sup>3</sup> ] | [N/mm <sup>2</sup> ] | [N/mm <sup>2</sup> ] | [N/mm <sup>2</sup> ] |
| 1   | GL24h     | 24                   | 385                  | 462                  | 19.2                 | 0.5                  | 24.0                 |
| 2.5 | 3.5       |                      |                      |                      |                      |                      |                      |

## MATERIAALGEGEVENS (vervolg)

| Mt   | Kwaliteit | $G_{mean}$           | $E_{0,05}$           | $E_{90,mean}$        | $E_{0,mean}$         | Klimaatklasse | $k_{def}$ |
|------|-----------|----------------------|----------------------|----------------------|----------------------|---------------|-----------|
|      |           | [N/mm <sup>2</sup> ] | [N/mm <sup>2</sup> ] | [N/mm <sup>2</sup> ] | [N/mm <sup>2</sup> ] |               |           |
| 1    | GL24h     | 650                  | 9600                 | 300                  | 11500                | I             | 0.60      |
| 7188 |           |                      |                      |                      |                      |               |           |

## KIPSTABILITEIT

| Staafl | Plts. aangr. | l sys.      | Kipsteunafstanden |
|--------|--------------|-------------|-------------------|
|        |              | [m]         | [m]               |
| 1-2    | 1.0*h        | boven: 8.00 | 0;2,195;5,805     |
|        |              | onder: 8.00 | 0;8               |

## STABILITEIT

| Stf       | $b_{gem}$ | $h_{gem}$ | $l_{sys}$ | $l_{buc,y/z}$ | $\lambda_y$ | $\lambda_z$ | $\lambda_{rel,y/z}$ | $\beta_c$ | $k_y$ | $k_z$ |       |       |
|-----------|-----------|-----------|-----------|---------------|-------------|-------------|---------------------|-----------|-------|-------|-------|-------|
| $k_{c,y}$ | $k_{c,z}$ |           |           |               |             |             |                     |           |       |       |       |       |
|           | [mm]      | [mm]      | [mm]      | [mm]          | [mm]        |             |                     |           |       |       |       |       |
| 1         | 240       | 425       | 5600      | nvt           | 5800        | 65.2        | 83.7                | 1.038     | 1.332 | 0.1   | 1.075 | 1.439 |



0.737 0.504  
2 240 425 2400 nvt 5800 65.2 83.7 1.038 1.332 0.1 1.075 1.439  
0.737 0.504

Project.....: SGU021041 - Uitbreiding zwembad de Meerkant te Amstelveen  
Onderdeel.....: zwemzaal kolom as 1

## TOETSING SPANNINGEN

**Staaft 1** **BC / Sit.** **3 / 1** **UC frm(6.23)**  
**0.35**

Maatg. is norm.drukk. + buiging (EN 1995-1-1 art. 6.3.2(3)) aan bovenzijde staaft

Belastingduurklasse Kort

Positie 3733 [mm]

Breedte 240.00 [mm] Hoogte 500.00 [mm] Materiaal  
1:GL24h

$k_{m,0,d}$  0.90 [-]  $k_{h(f t o k)}$  1.02 [-]  $k_{h(f m k)}$   
1.02 [-]

$f_{m,y,d}$  17.60 [N/mm<sup>2</sup>]  $f_{c,0,d}$  17.28 [N/mm<sup>2</sup>]  $f_{t,0,d}$   
14.08 [N/mm<sup>2</sup>]

$f_{v,d}$  2.52 [N/mm<sup>2</sup>]  $f_{c,90,d}$  1.80 [N/mm<sup>2</sup>]  $f_{t,90,d}$   
0.36 [N/mm<sup>2</sup>]

N -75.06 [kN] D 0.02 [kN] M -  
52.35 [kNm]

$\sigma_{c,0,d}$  0.63 [N/mm<sup>2</sup>]  $\tau_d$  0.00 [N/mm<sup>2</sup>]  $\sigma_{m,y,d}$  -  
5.23 [N/mm<sup>2</sup>]

$k_{c,z}$  0.56 [-]  $k_m$  0.70 [-]  $l_{ef,y}$   
6805.00 [mm]

$\sigma_{m,y,crit}$  159.79 [N/mm<sup>2</sup>]  $\lambda_{rel,my}$  0.39 [-]  $k_{crit,y}$   
1.00 [-]

**Staaft 2** **BC / Sit.** **6 / 1** **UC frm(6.23)**  
**0.97**

Maatg. is norm.drukk. + buiging (EN 1995-1-1 art. 6.3.2(3)) aan bovenzijde staaft

Belastingduurklasse Kort

Positie 0 [mm]

Breedte 240.00 [mm] Hoogte 250.00 [mm] Materiaal  
1:GL24h

$k_{m,0,d}$  0.90 [-]  $k_{h(f t o k)}$  1.09 [-]  $k_{h(f m k)}$   
1.09 [-]

$f_{m,y,d}$  18.86 [N/mm<sup>2</sup>]  $f_{c,0,d}$  17.28 [N/mm<sup>2</sup>]  $f_{t,0,d}$   
15.09 [N/mm<sup>2</sup>]

$f_{v,d}$  2.52 [N/mm<sup>2</sup>]  $f_{c,90,d}$  1.80 [N/mm<sup>2</sup>]  $f_{t,90,d}$   
0.36 [N/mm<sup>2</sup>]

N -55.24 [kN] D 13.72 [kN] M -  
41.87 [kNm]

$\sigma_{c,0,d}$  0.92 [N/mm<sup>2</sup>]  $\tau_d$  0.34 [N/mm<sup>2</sup>]  $\sigma_{m,y,d}$  -



16.75 [N/mm<sup>2</sup>]

$k_{c,z}$  1.00 [-]  $k_m$  0.70 [-]  $l_{ef,y}$

6224.50 [mm]

$\sigma_{m y, crit}$  174.70 [N/mm<sup>2</sup>]  $\lambda_{rel, my}$  0.37 [-]  $k_{crit,y}$

1.00 [-]

## TOETSING HORIZONTALE VERPLAATSING

| Staafl | Mtg | $l_{sys}$<br>[mm] | BC | Sit | $w_{tot}$<br>[mm] | Toelaatbaar<br>[mm] [h/ ] |     |
|--------|-----|-------------------|----|-----|-------------------|---------------------------|-----|
| 1      | db  | 8000              | 9  | 1   | -11.8             | -26.7                     | 300 |
| 2      | db  | 8000              | 9  | 1   | -11.6             | -26.7                     | 300 |



Project.....: SGU021041 - Uitbreiding zwembad de Meerkant te Amstelveen  
Onderdeel.....: zwemzaal kolom as 1

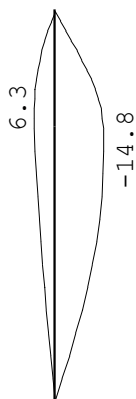
## VERVORMINGEN w1 combinatie

Blijvende



## VERVORMINGEN w bij combinatie

Karakteristieke

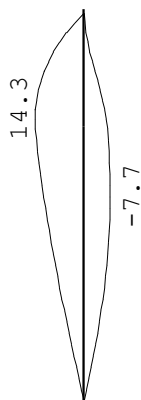




Project.....: SGU021041 - Uitbreiding zwembad de Meerkant te  
Amstelveen  
Onderdeel.....: zwemzaal kolom as 1

**VERVORMINGEN  $W_{max}$**   
combinatie

Karakteristieke



## Bijlage E Uitvoer TR dakliggers

**Technosoft Liggers release 6.73a**  
**2023**

**26 jan**

Project.....: SGU021041 - Uitbreiding zwembad de Meerkant te Amstelveen  
Onderdeel.....: TR dakliggers  
Dimensies.....: kN/m/rad  
Datum.....: 15/11/2022  
Bestand.....: H:\SGU021041\BEREKENINGEN\04\_DO\TR dakligger.dlw

Betrouwbaarheidsklasse : 2 Referentieperiode : 50

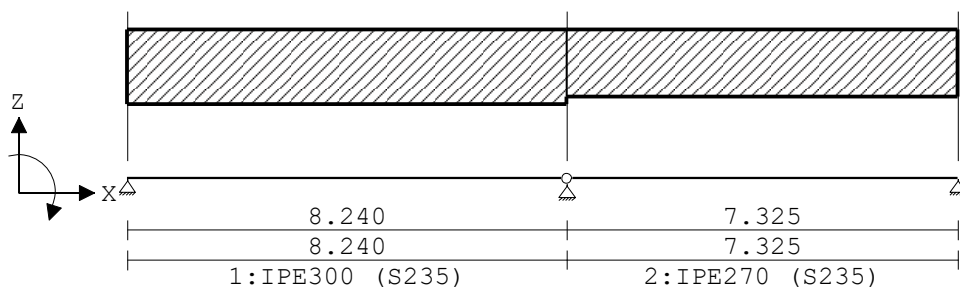
### Toegepaste normen volgens Eurocode met Nederlandse NB

|             |                      |                 |
|-------------|----------------------|-----------------|
| Belastingen | NEN-EN 1990:2002     | C2:2010,A1:2019 |
| NB:2019(nl) |                      |                 |
|             | NEN-EN 1991-1-1:2002 | C1/C11:2019     |
| NB:2019(nl) |                      |                 |
| Staal       | NEN-EN 1993-1-1:2006 | C2:2011,A1:2016 |
| NB:2016(nl) |                      |                 |

### LIGGER:1

#### GEOMETRIE

Ligger:1



#### VELDLENGHTEN

Ligger:1

| Veld | Vanaf | Tot    | Lengte |
|------|-------|--------|--------|
| 1    | 0.000 | 8.240  | 8.240  |
| 2    | 8.240 | 15.565 | 7.325  |

#### MATERIALEN

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

#### PROFIELEN [mm]

| Prof. Omschrijving | Materiaal | Oppervlak |
|--------------------|-----------|-----------|
| Traagheid Vormf.   |           |           |



|            |        |      |
|------------|--------|------|
| 1          | IPE300 |      |
| 8.3560e+07 |        | 0.00 |
| 2          | IPE270 |      |
| 5.7900e+07 |        | 0.00 |

1:S235

5.3800e+03

1:S235

4.5900e+03

Project.....: SGU021041 - Uitbreiding zwembad de Meerkant te Amstelveen  
Onderdeel.....: TR dakliggers

## PROFIELEN vervolg [mm]

| Prof. | Staaftype | Breedte | Hoogte | e     | Type | b1 | h1 | b2 | h2 |
|-------|-----------|---------|--------|-------|------|----|----|----|----|
| 1     | 0:Normaal | 150     | 300    | 150.0 |      |    |    |    |    |
| 2     | 0:Normaal | 135     | 270    | 135.0 |      |    |    |    |    |

## DOORSNEDEN

Ligger:1

| sector | Vanaf | Tot    | Lengte | Profiel begin | z-begin | Profiel eind | z-eind |
|--------|-------|--------|--------|---------------|---------|--------------|--------|
| 1      | 0.000 | 8.240  | 8.240  | 1:IPE300      | 0.000   | 1:IPE300     | 0.000  |
| 2      | 8.240 | 15.565 | 7.325  | 2:IPE270      | 0.000   | 2:IPE270     | 0.000  |

| sector | Vanaf | Tot    | Lengte | Eindcode    | Bedding | Br. [mm] |
|--------|-------|--------|--------|-------------|---------|----------|
| 1      | 0.000 | 8.240  | 8.240  | 0:Scharnier |         |          |
| 2      | 8.240 | 15.565 | 7.325  | 1:Vast      |         |          |

## PROFIELVORMEN [mm]

1 IPE300



2 IPE270



## BELASTINGGEVALLEN

| B.G.  | Omschrijving | Belast/onbelast     | $\psi_0$ | $\psi_1$ | $\psi_2$ |
|-------|--------------|---------------------|----------|----------|----------|
| 1     | Permanent    | 2:Permanent EN1991  |          |          |          |
| -1.00 |              |                     |          |          |          |
| 2     | Sneeuw       | 1:Schaakbord EN1991 | 0.00     | 0.20     | 0.00     |
| 0.00  |              |                     |          |          |          |

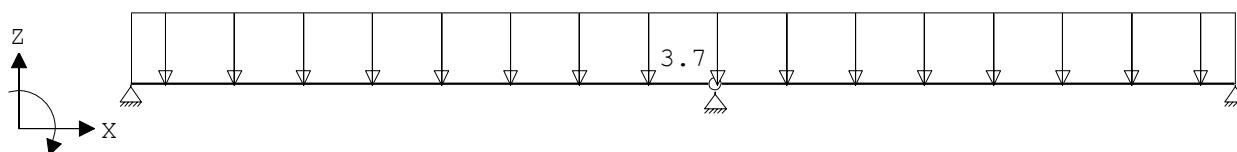
## BELASTINGGEVALLEN

| B.G. | Omschrijving | Type                   |
|------|--------------|------------------------|
| 1    | Permanent    | 1 Permanente belasting |
| 2    | Sneeuw       | 22 Sneeuw A            |

## VELDBELASTINGEN

Ligger:1 B.G:1

Permanent





## VELDBELASTINGEN

Ligger:1 B.G:1

Permanent

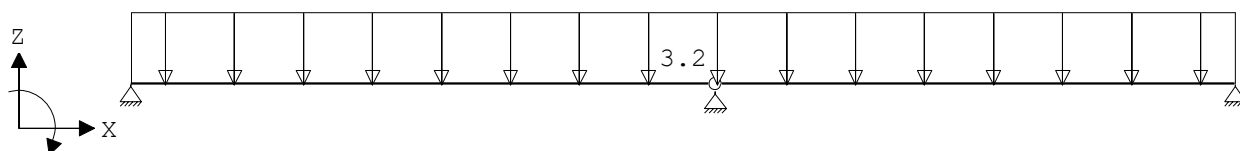
| Last Ref. | Type     | Omschrijving | q1/p/m | q2     | psi |
|-----------|----------|--------------|--------|--------|-----|
| Afstand   | Lengte   |              |        |        |     |
| 1         | 1:q-last |              | -3.700 | -3.700 |     |
| 0.000     | 15.565   |              |        |        |     |

Project.....: SGU021041 - Uitbreiding zwembad de Meerkant te Amstelveen  
Onderdeel.....: TR dakliggers

## VELDBELASTINGEN

Ligger:1 B.G:2

Sneeuw



## VELDBELASTINGEN

Ligger:1 B.G:2

Sneeuw

| Last Ref. | Type     | Omschrijving | q1/p/m | q2     | psi |
|-----------|----------|--------------|--------|--------|-----|
| Afstand   | Lengte   |              |        |        |     |
| 1         | 1:q-last |              | -3.200 | -3.200 |     |
| 0.000     | 15.565   |              |        |        |     |

## BELASTINGCOMBINATIES

| BC Type | BG | Gen. | Factor | BG     | Gen. | Factor | BG | Gen. | Factor | BG | Gen. | Factor |
|---------|----|------|--------|--------|------|--------|----|------|--------|----|------|--------|
| 1 Fund. | 1  | Perm | 1.35   |        |      |        |    |      |        |    |      |        |
| 2 Fund. | 1  | Perm | 1.20   | 2 Extr |      | 1.50   |    |      |        |    |      |        |
| 3 Fund. | 1  | Perm | 0.90   |        |      |        |    |      |        |    |      |        |
| 4 Fund. | 1  | Perm | 0.90   | 2 Extr |      | 1.50   |    |      |        |    |      |        |
| 5 Kar.  | 1  | Perm | 1.00   | 2 Extr |      | 1.00   |    |      |        |    |      |        |
| 6 Freq. | 1  | Perm | 1.00   |        |      |        |    |      |        |    |      |        |
| 7 Freq. | 1  | Perm | 1.00   | 2 psil |      | 1.00   |    |      |        |    |      |        |
| 8 Quas. | 1  | Perm | 1.00   |        |      |        |    |      |        |    |      |        |
| 9 Blij. | 1  | Perm | 1.00   |        |      |        |    |      |        |    |      |        |

## GUNSTIGE WERKING PERMANENTE BELASTINGEN

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

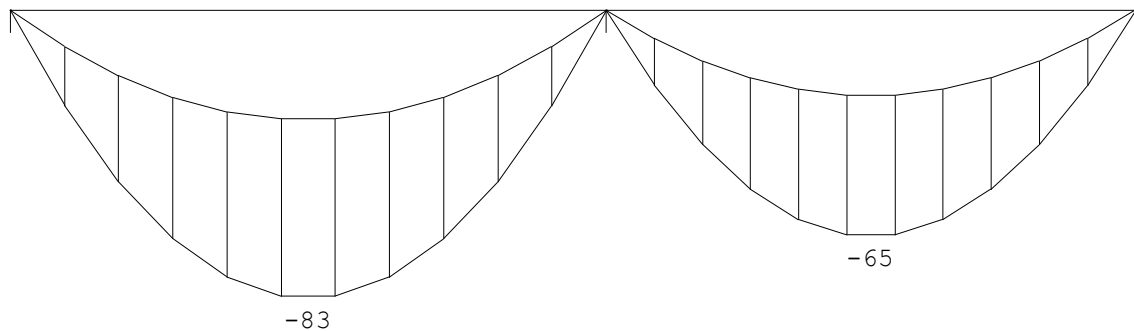
Project.....: SGU021041 - Uitbreiding zwembad de Meerkant te Amstelveen  
Onderdeel.....: TR dakliggers

## OMHULLENDE VAN DE FUNDAMENTELE COMBINATIES

### MOMENTEN

Ligger:1 Fundamentele

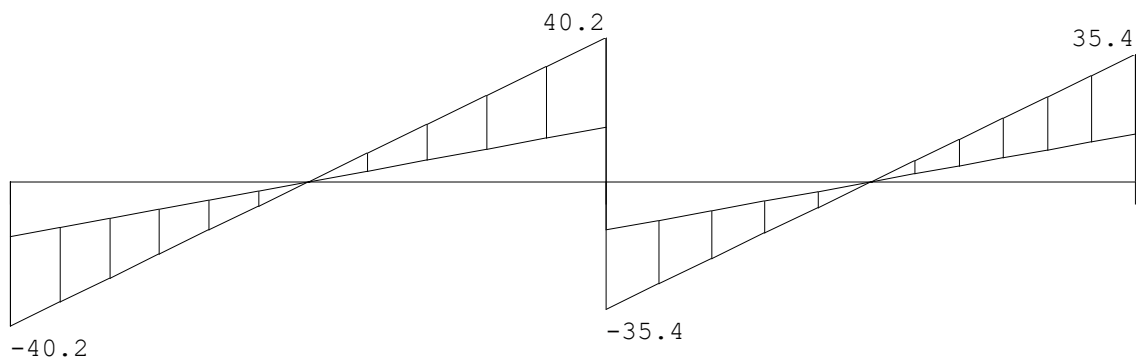
combinatie



### DWARSKRACHTEN

Ligger:1 Fundamentele

combinatie



Fmin:15.3

28.7

13.4

Fmax:40.2

76

35.4

### REACTIES

Ligger:1 Fundamentele

combinatie

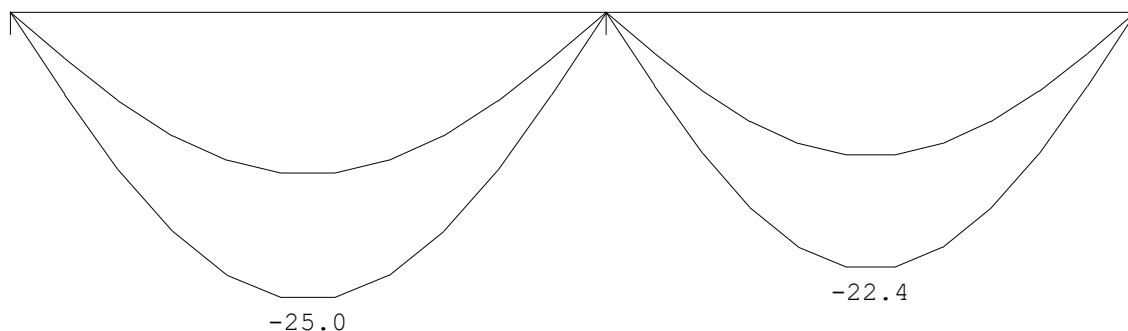
| Stp | Fmin  | Fmax  | Mmin | Mmax |
|-----|-------|-------|------|------|
| 1   | 15.29 | 40.16 | 0.00 | 0.00 |
| 2   | 28.67 | 75.58 | 0.00 | 0.00 |
| 3   | 13.38 | 35.43 | 0.00 | 0.00 |

Project.....: SGU021041 - Uitbreiding zwembad de Meerkant te Amstelveen  
Onderdeel.....: TR dakliggers

## OMHULLENDE VAN DE KARAKTERISTIEKE COMBINATIES

**VERPLAATSINGEN** [mm]  
combinatie

Ligger:1 Karakteristieke



## STAALPROFIELEN - ALGEMENE GEGEVENS

Ligger:1

Stabiliteit: Classificatie gehele constructie: Geschoord

### PROFIEL/MATERIAAL

| P/M    | Profielnaam | Vloeisp.             | Productie | Min. |
|--------|-------------|----------------------|-----------|------|
| drsn.  |             | [N/mm <sup>2</sup> ] | methode   |      |
| nr.    |             |                      |           |      |
| klasse |             |                      |           |      |

|   |        |     |         |  |
|---|--------|-----|---------|--|
| 1 | IPE300 | 235 | Gewalst |  |
| 1 |        |     |         |  |
| 2 | IPE270 | 235 | Gewalst |  |
| 1 |        |     |         |  |

Partiële veiligheidsfactoren:

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

### KIPSTABILITEIT

Ligger:1

| Staafl | Plts. | l gaffel | Kipsteunafstanden |
|--------|-------|----------|-------------------|
| aangr. |       | [m]      | [m]               |

|   |       |        |                 |
|---|-------|--------|-----------------|
| 1 | 1.0*h | boven: | 8.24 4,12;4,12  |
|   |       | onder: | 8.24 8.240      |
| 2 | 1.0*h | boven: | 7.32 3,65;3,675 |
|   |       | onder: | 7.32 7.325      |

### TOETSING SPANNINGEN

Ligger:1

| Staafl | P/M | BC | Sit | Kl | Plaats | Norm | Artikel | Formule | Hoogste toetsing |
|--------|-----|----|-----|----|--------|------|---------|---------|------------------|
| Opm.   |     |    |     |    |        |      |         |         |                  |

| nr. |   |   |   |   |        |         |       | U.C. [N/mm <sup>2</sup> ] |
|-----|---|---|---|---|--------|---------|-------|---------------------------|
| 1   | 1 | 2 | 1 | 1 | Staafl | EN3-1-1 | 6.3.2 | (6.54) 0.896 210          |
| 2   | 2 | 2 | 1 | 1 | Staafl | EN3-1-1 | 6.3.2 | (6.54) 0.883 207          |



## TOETSING DOORBUIGING

Ligger:1

Staaft Soort Mtg Lengte Overst Zeeg  $u_{tot}$  BC Sit

Toelaatbaar

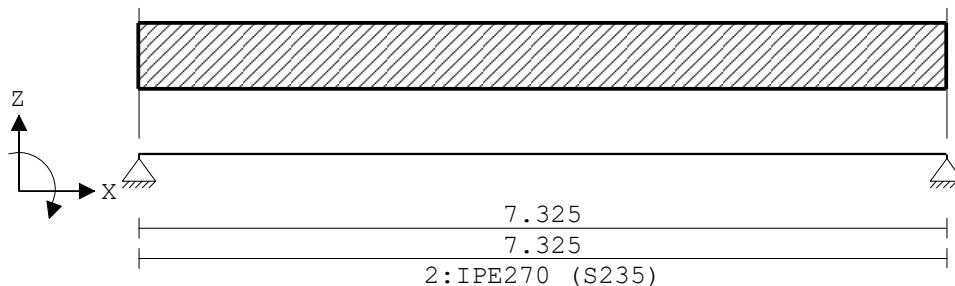
|       |     |    | [m]  | I | J | [mm] | [mm]  |   |   |      | [mm]  | [mm]  |
|-------|-----|----|------|---|---|------|-------|---|---|------|-------|-------|
| *1    |     |    |      |   |   |      |       |   |   |      |       |       |
| 1     | Dak | db | 8.24 | N | N | 0.0  | -25.0 | 5 | 1 | Eind | -25.0 | -33.0 |
| 0.004 |     | db |      |   |   |      |       | 5 | 1 | Bijk | -10.9 | -33.0 |
| 0.004 |     |    |      |   |   |      |       |   |   |      |       |       |
| 2     | Dak | db | 7.32 | N | N | 0.0  | -22.4 | 5 | 1 | Eind | -22.4 | -29.3 |
| 0.004 |     | db |      |   |   |      |       | 5 | 1 | Bijk | -9.9  | -29.3 |
| 0.004 |     |    |      |   |   |      |       |   |   |      |       |       |

Project.....: SGU021041 - Uitbreiding zwembad de Meerkant te Amstelveen  
Onderdeel.....: TR dakliggers

## LIGGER: 2

### GEOMETRIE

Ligger:2



### VELDLENGTEN

Ligger:2

| Veld | Vanaf | Tot   | Lengte |
|------|-------|-------|--------|
| 1    | 0.000 | 7.325 | 7.325  |

### DOORSNEDEN

Ligger:2

| sector | Vanaf | Tot   | Lengte | Profiel begin | z-begin | Profiel eind |
|--------|-------|-------|--------|---------------|---------|--------------|
| 1      | 0.000 | 7.325 | 7.325  | 2:IPE270      | 0.000   | 2:IPE270     |

| sector | Vanaf | Tot   | Lengte | Eindcode | Bedding | Br.[mm] |
|--------|-------|-------|--------|----------|---------|---------|
| 1      | 0.000 | 7.325 | 7.325  | 1:Vast   |         |         |

### PROFIELVORMEN [mm]

1 IPE300

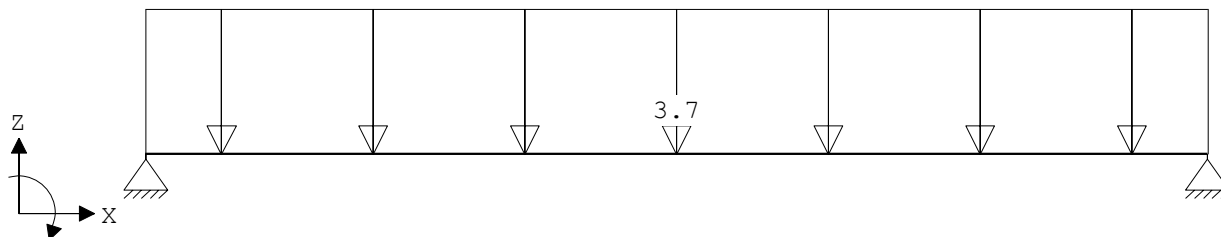
2 IPE270



### VELDBELASTINGEN

Ligger:2 B.G:1

Permanent



Project.....: SGU021041 - Uitbreiding zwembad de Meerkant te Amstelveen  
Onderdeel.....: TR dakliggers

## VELDBELASTINGEN

Ligger:2 B.G:1

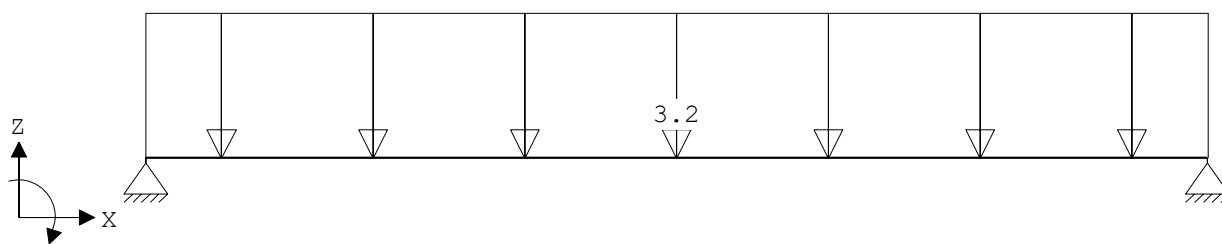
Permanent

| Last Ref. | Type     | Omschrijving | q1/p/m | q2     | psi |
|-----------|----------|--------------|--------|--------|-----|
| Afstand   | Lengte   |              |        |        |     |
| 1         | 1:q-last |              | -3.700 | -3.700 |     |
| 0.000     | 7.325    |              |        |        |     |

## VELDBELASTINGEN

Ligger:2 B.G:2

Sneeuw



## VELDBELASTINGEN

Ligger:2 B.G:2

Sneeuw

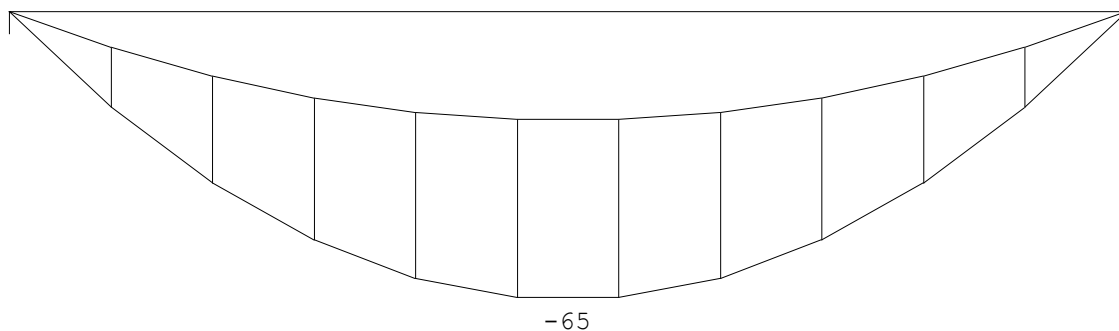
| Last Ref. | Type     | Omschrijving | q1/p/m | q2     | psi |
|-----------|----------|--------------|--------|--------|-----|
| Afstand   | Lengte   |              |        |        |     |
| 1         | 1:q-last |              | -3.200 | -3.200 |     |
| 0.000     | 7.325    |              |        |        |     |

## OMHULLENDE VAN DE FUNDAMENTELE COMBINATIES

### MOMENTEN

Ligger:2 Fundamentele

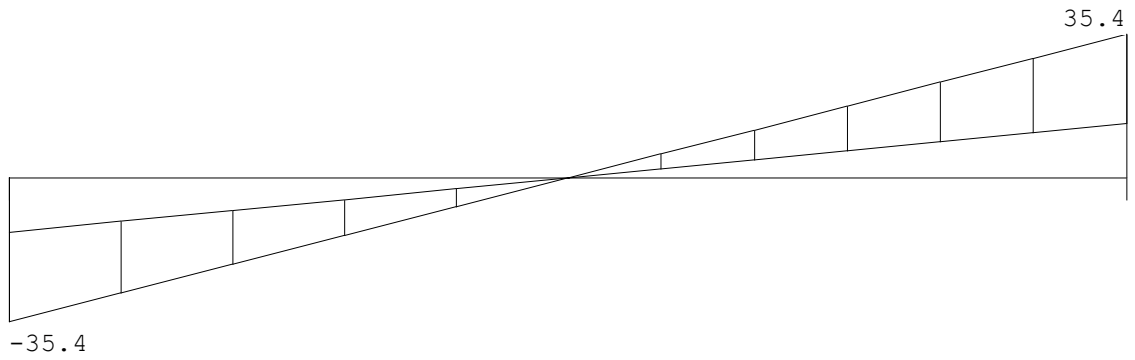
combinatie



### DWARSKRACHTEN

Ligger:2 Fundamentele

combinatie



Fmin:13.4  
Fmax:35.4

13.4  
35.4



Project.....: SGU021041 - Uitbreiding zwembad de Meerkant te Amstelveen  
Onderdeel.....: TR dakliggers

## REACTIES

Ligger:2 Fundamentele

combinatie

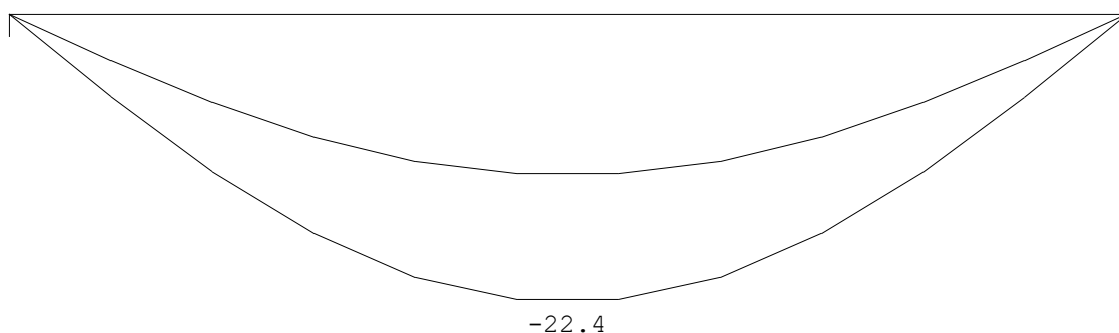
| Stp | Fmin  | Fmax  | Mmin | Mmax |
|-----|-------|-------|------|------|
| 1   | 13.38 | 35.43 | 0.00 | 0.00 |
| 2   | 13.38 | 35.43 | 0.00 | 0.00 |

## OMHULLENDE VAN DE KARAKTERISTIEKE COMBINATIES

### VERPLAATSINGEN [mm]

Ligger:2 Karakteristieke

combinatie



## KIPSTABILITEIT

Ligger:2

| Staafl | Plts. aangr. | l gaffel | Kipsteunafstanden |
|--------|--------------|----------|-------------------|
|        |              | [m]      | [m]               |
| 1      | 1.0*h        | boven:   | 7.32 3,45;3,875   |
|        |              | onder:   | 7.32 7.325        |

## TOETSING SPANNINGEN

Ligger:2

Staafl P/M BC Sit Kl Plaats Norm Artikel Formule Hoogste toetsing

| Opm. | nr.                                 | U.C. [N/mm <sup>2</sup> ] |
|------|-------------------------------------|---------------------------|
| 1    | 2 2 1 1 Staafl EN3-1-1 6.3.2 (6.54) | 0.931 219                 |

## TOETSING DOORBUIGING

Ligger:2

| Staafl      | Soort | Mtg | Lengte | Overst | Zeeg | u <sub>tot</sub> | BC    | Sit | u      |       |       |
|-------------|-------|-----|--------|--------|------|------------------|-------|-----|--------|-------|-------|
| Toelaatbaar |       |     | [m]    | I      | J    | [mm]             | [mm]  |     | [mm]   | [mm]  |       |
| *1          |       |     |        |        |      |                  |       |     |        |       |       |
| 1           | Vloer | db  | 7.32   | N      | N    | 0.0              | -22.4 | 5   | 1 Eind | -22.4 | ±29.3 |
| 0.004       |       |     |        |        |      |                  |       |     |        |       |       |
|             |       | db  |        |        |      |                  |       | 5   | 1 Bijk | -9.9  | ±22.0 |
| 0.003       |       |     |        |        |      |                  |       |     |        |       |       |

## Bijlage F Uitvoer TR randliggers

**Technosoft Raamwerken release 6.75b**  
**2023**

**26 jan**

Project.....: Sgu021041 - Uitbreiding zwembad de Meerkant te Amstelveen  
Onderdeel.....: TR randligger  
Dimensies.....: kN;m;rad (tenzij anders aangegeven)  
Datum.....: 14/11/2022  
Bestand.....: H:\SGU021041\BEREKENINGEN\04\_DO\TR randligger.rww

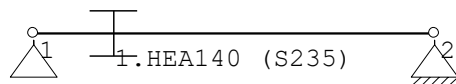
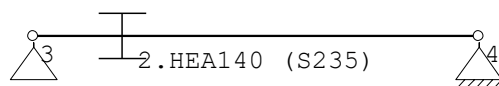
Rekenmodel.....: 1e-orde-elastisch.  
Theorie voor de bepaling van de krachtsverdeling:  
Geometrisch lineair.  
Fysisch lineair.

Gunstige werking van de permanente belasting wordt automatisch verwerkt.

### Toegepaste normen volgens Eurocode met Nederlandse NB

|             |                      |                 |
|-------------|----------------------|-----------------|
| Belastingen | NEN-EN 1990:2002     | C2:2010,A1:2019 |
| NB:2019(nl) |                      |                 |
|             | NEN-EN 1991-1-1:2002 | C1/C11:2019     |
| NB:2019(nl) |                      |                 |
| Staal       | NEN-EN 1993-1-1:2006 | C2:2011,A1:2016 |
| NB:2016(nl) |                      |                 |

### GEOMETRIE



### MATERIALEN

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

### PROFIELEN [mm]

| Prof.      | Omschrijving | Materiaal | Oppervlak  |
|------------|--------------|-----------|------------|
| Traagheid  | Vormf.       |           |            |
| 1          | HEA140       | 1:S235    | 3.1420e+03 |
| 1.0330e+07 | 0.00         |           |            |
| 2          | HEA140 (90)  | 1:S235    | 3.1420e+03 |
| 3.8900e+06 | 0.00         |           |            |



3 HEA160  
1.6730e+07 0.00

1:S235

3.8800e+03

### PROFIELEN vervolg [mm]

| Prof. | Staaftype | Breedte | Hoogte | e    | Type | b1 | h1 | b2 |
|-------|-----------|---------|--------|------|------|----|----|----|
| h2    |           |         |        |      |      |    |    |    |
| 1     | 0:Normaal | 140     | 133    | 66.5 |      |    |    |    |
| 2     | 0:Normaal | 140     | 133    | 70.0 |      |    |    |    |
| 3     | 0:Normaal | 160     | 152    | 76.0 |      |    |    |    |

Project.....: Sgu021041 - Uitbreiding zwembad de Meerkant te Amstelveen  
Onderdeel.....: TR randligger

## KNOPEN

| Knoop | X      | Z     |
|-------|--------|-------|
| 1     | 0.000  | 0.000 |
| 2     | 5.200  | 0.000 |
| 3     | -0.000 | 3.000 |
| 4     | 5.775  | 3.000 |

## STAVEN

| St.    | ki   | kj | Profiel  | Aansl.i | Aansl.j |
|--------|------|----|----------|---------|---------|
| Lengte | Opm. |    |          |         |         |
| 1      | 1    | 2  | 1:HEA140 | NDM     | NDM     |
| 5.200  |      |    |          |         |         |
| 2      | 3    | 4  | 1:HEA140 | NDM     | NDM     |
| 5.775  |      |    |          |         |         |

## VASTE STEUNPUNTEN

| Nr. | knoop | Kode | XZR 1=vast 0=vrij | Hoek |
|-----|-------|------|-------------------|------|
| 1   | 1     | 010  |                   | 0.00 |
| 2   | 2     | 110  |                   | 0.00 |
| 3   | 3     | 010  |                   | 0.00 |
| 4   | 4     | 110  |                   | 0.00 |

## BELASTINGGEVALLEN

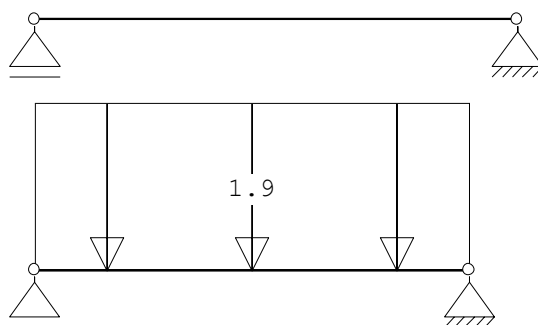
| B.G. | Omschrijving         | EGZ=-1.00 | Type             |
|------|----------------------|-----------|------------------|
| 1    | Permanente belasting |           | 1                |
| 2    | Wind onderdruk A     |           | 7 Wind van links |

## BELASTINGEN

B.G.:1 Permanente

belasting

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



## STAAFBELASTINGEN

B.G.:1 Permanente

belasting

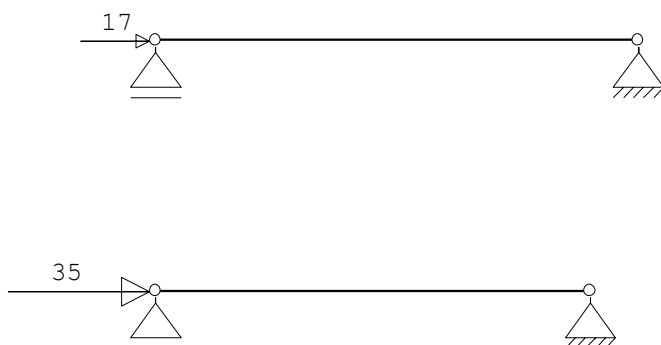
| Staat    | Type       | q1/p/m | q2    | A     | B     | $\psi_0$ |
|----------|------------|--------|-------|-------|-------|----------|
| $\psi_1$ | $\psi_2$   |        |       |       |       |          |
| 1        | 1:QZLokaal | -1.90  | -1.90 | 0.000 | 0.000 |          |

Project.....: Sgu021041 - Uitbreiding zwembad de Meerkant te Amstelveen  
Onderdeel.....: TR randligger

## BELASTINGEN

B.G:2

Wind



## KNOOPBELASTINGEN

B.G:2

Wind

| Last | Knoop | Richting | waarde | $\Psi_0$ | $\Psi_1$ | $\Psi_2$ |
|------|-------|----------|--------|----------|----------|----------|
| 1    | 1     | X        | 35.000 | 0.00     | 0.20     | 0.00     |
| 2    | 3     | X        | 17.000 | 0.00     | 0.20     | 0.00     |

## BELASTINGCOMBINATIES

| BC | Type                                  |
|----|---------------------------------------|
| 1  | Fund. 1.20 $G_{k,1}$ + 1.50 $Q_{k,2}$ |
| 2  | Fund. 1.20 $G_{k,1}$                  |
| 3  | Kar. 1.00 $G_{k,1}$ + 1.00 $Q_{k,2}$  |
| 4  | Kar. 1.00 $G_{k,1}$                   |
| 5  | Blij. 1.00 $G_{k,1}$                  |

## GUNSTIGE WERKING PERMANENTE BELASTINGEN

| BC | Staven met gunstige werking |
|----|-----------------------------|
| 1  | Geen                        |
| 2  | Geen                        |

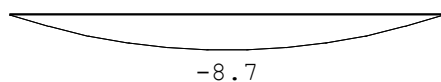
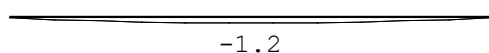
Project.....: Sgu021041 - Uitbreiding zwembad de Meerkant te Amstelveen  
Onderdeel.....: TR randligger

## OMHULLENDE VAN DE FUNDAMENTELE COMBINATIES

### MOMENTEN

Fundamentele

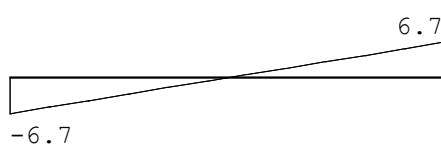
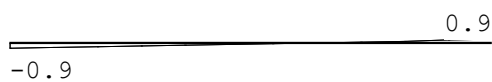
combinatie



### DWARSKRACHTEN

Fundamentele

combinatie

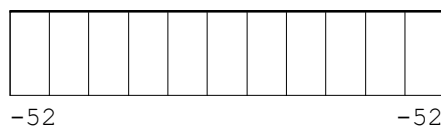
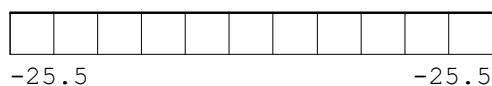


Project.....: Sgu021041 - Uitbreiding zwembad de Meerkant te Amstelveen  
Onderdeel.....: TR randligger

## NORMAALKRACHTEN

Fundamentele

combinatie



## REACTIES

Fundamentele

combinatie

| Kn.   | X-min  | X-max | Z-min | Z-max | M-min |
|-------|--------|-------|-------|-------|-------|
| M-max |        |       |       |       |       |
| 1     |        |       | 6.70  | 6.70  |       |
| 2     | -52.50 | 0.00  | 6.70  | 6.70  |       |
| 3     |        |       | 0.85  | 0.85  |       |
| 4     | -25.50 | 0.00  | 0.85  | 0.85  |       |

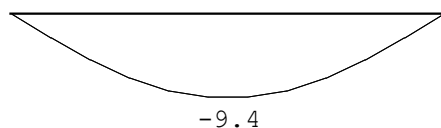
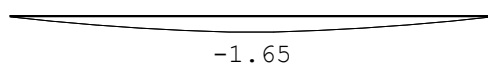
## OMHULLENDE VAN DE KARAKTERISTIEKE COMBINATIES

### VERPLAATSINGEN

[mm]

Karakteristieke

combinatie





Project.....: Sgu021041 - Uitbreiding zwembad de Meerkant te Amstelveen  
Onderdeel.....: TR randligger

## STAALPROFIELEN - ALGEMENE GEGEVENS

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

## PROFIEL/MATERIAAL

| P/M drsn.<br>nr.<br>klasse | Profielnaam                   | Vloeisp.<br>[N/mm <sup>2</sup> ] | Productie<br>methode | Min. |
|----------------------------|-------------------------------|----------------------------------|----------------------|------|
| 1                          | HEA140                        | 235                              | Gewalst              |      |
| 1                          | 2 HEA140 (90)                 | 235                              | Gewalst              |      |
| 1                          | 3 HEA160                      | 235                              | Gewalst              |      |
| 1                          | Partiële veiligheidsfactoren: |                                  |                      |      |
|                            | Gamma M;0                     | : 1.00                           | Gamma M;1            | :    |
|                            | 1.00                          |                                  |                      |      |

## KNIKSTABILITEIT

Extra

| Staaft<br>aanp. z | l <sub>sys</sub><br>[m] | Classif. y<br>sterke as | l <sub>knik,y</sub><br>[m] | aanp. y<br>[kN] | Classif. z<br>zwakke as | l <sub>knik,z</sub><br>[m] |
|-------------------|-------------------------|-------------------------|----------------------------|-----------------|-------------------------|----------------------------|
| 1                 | 5.200                   | Geschoord               | 5.200                      | 0.0             | Geschoord               | 5.200                      |
| 0.0               |                         |                         |                            |                 |                         |                            |
| 2                 | 5.775                   | Geschoord               | 5.775                      | 0.0             | Geschoord               | 5.775                      |
| 0.0               |                         |                         |                            |                 |                         |                            |

## KIPSTABILITEIT

| Staaft<br>aanp. | Plts.<br>aanp. | l gaffel<br>[m]            | Kipsteunafstanden<br>[m] |
|-----------------|----------------|----------------------------|--------------------------|
| 1               | 1.0*h          | boven: 5.20<br>onder: 5.20 | 5.2<br>5.2               |
| 2               | 1.0*h          | boven: 5.78<br>onder: 5.78 | 5.775<br>5.775           |

## TOETSING SPANNINGEN

| Staaft<br>Opm. | P/M | BC | Sit | Kl | Plaats | Norm    | Artikel | Formule | Hoogste toetsing          |
|----------------|-----|----|-----|----|--------|---------|---------|---------|---------------------------|
|                | nr. |    |     |    |        |         |         |         | U.C. [N/mm <sup>2</sup> ] |
| 1              | 1   | 1  | 1   | 1  | Staaft | EN3-1-1 | 6.3.3   | (6.62)  | 0.518 122                 |
| 2              | 1   | 1  | 1   | 1  | Staaft | EN3-1-1 | 6.3.3   | (6.62)  | 0.170 40                  |

## TOETSING DOORBUIGING



| Staaft<br>Toelaatbaar | Soort | Mtg | Lengte | Overst | Zeeg | $u_{tot}$ | BC   | Sit | $u$    |      |       |
|-----------------------|-------|-----|--------|--------|------|-----------|------|-----|--------|------|-------|
|                       |       |     | [m]    | I      | J    | [mm]      |      |     | [mm]   | [mm] |       |
| *1                    |       |     |        |        |      |           |      |     |        |      |       |
| 1                     | Dak   | db  | 5.20   | N      | N    | 0.0       | -9.4 | 3   | 1 Eind | -9.4 | -20.8 |
| 0.004                 |       |     |        |        |      |           |      |     |        |      |       |
| 2                     | Dak   | db  | 5.78   | N      | N    | 0.0       | -1.6 | 3   | 1 Eind | -1.6 | -23.1 |
| 0.004                 |       |     |        |        |      |           |      |     |        |      |       |

## TOETSING HOR. VERPLAATSING GLOBAAL

Er is een maximale horizontale verplaatsing van 0.0001 [m] gevonden bij knoop 3 en combinatie 3; belastingsituatie 1 (combinatietype 2). Bij een hoogte van 3.000 [m] levert dit  $h/9999$  (toel.:  $h/300$ ).

## Bijlage G Uitvoer TR kolommen

**Technosoft Raamwerken release 6.75b**  
**2023**

**26 jan**

Project.....: SGU021041 - Uitbreiding zwembad de Meerkant te Amstelveen  
Onderdeel.....: TR kolom  
Dimensies.....: kN;m;rad (tenzij anders aangegeven)  
Datum.....: 16/11/2022  
Bestand.....: H:\SGU021041\BEREKENINGEN\04\_DO\TR kolom.rww

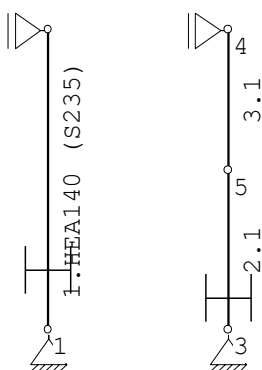
Belastingbreedte.: 5.750  
Rekenmodel.....: 1e-orde-elastisch.  
Theorie voor de bepaling van de krachtsverdeling:  
Geometrisch lineair.  
Fysisch lineair.

Gunstige werking van de permanente belasting wordt automatisch verwerkt.

### Toegepaste normen volgens Eurocode met Nederlandse NB

|             |                      |                 |
|-------------|----------------------|-----------------|
| Belastingen | NEN-EN 1990:2002     | C2:2010,A1:2019 |
| NB:2019(nl) |                      |                 |
|             | NEN-EN 1991-1-1:2002 | C1/C11:2019     |
| NB:2019(nl) |                      |                 |
|             | NEN-EN 1991-1-4:2005 | C2:2011         |
| NB:2011(nl) |                      |                 |
| Staal       | NEN-EN 1993-1-1:2006 | C2:2011,A1:2016 |
| NB:2016(nl) |                      |                 |

### GEOMETRIE



### MATERIALEN

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

### PROFIELEN [mm]

| Prof. | Omschrijving | Materiaal | Oppervlak |
|-------|--------------|-----------|-----------|
|-------|--------------|-----------|-----------|



Traagheid Vormf.

|            |        |            |
|------------|--------|------------|
| 1 HEA140   | 1:S235 | 3.1420e+03 |
| 1.0330e+07 | 0.00   |            |



Project.....: SGU021041 - Uitbreiding zwembad de Meerkant te  
Amstelveen  
Onderdeel.....: TR kolom

### PROFIELEN vervolg [mm]

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

### PROFIELVORMEN [mm]

1 HEA140



### KNOPEN

| Knoop | X     | Z     |
|-------|-------|-------|
| 1     | 0.000 | 4.000 |
| 2     | 0.000 | 9.000 |
| 3     | 3.000 | 4.000 |
| 4     | 3.000 | 9.000 |
| 5     | 3.000 | 6.660 |

### STAVEN

| St.    | ki   | kj | Profiel  | Aansl.i | Aansl.j |
|--------|------|----|----------|---------|---------|
| Lengte | Opm. |    |          |         |         |
| 1      | 1    | 2  | 1:HEA140 | NDM     | NDM     |
| 5.000  |      |    |          |         |         |
| 2      | 3    | 5  | 1:HEA140 | NDM     | NDM     |
| 2.660  |      |    |          |         |         |
| 3      | 5    | 4  | 1:HEA140 | NDM     | NDM     |
| 2.340  |      |    |          |         |         |

### VASTE STEUNPUNTEN

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

### BELASTINGGENERATIE ALGEMEEN.

|                              |       |                         |      |
|------------------------------|-------|-------------------------|------|
| Betrouwbaarheidsklasse.....: | 2     | Referentieperiode.....: | 50   |
| Gebouwdiepte.....:           | 34.45 | Gebouwhoogte.....:      | 9.00 |
| Niveau aansl.terrein.....:   | 0.00  | E.g. scheid.w. [kN/m2]: | 1.20 |

### WIND

|                                   |                            |
|-----------------------------------|----------------------------|
| Terrein categorie ...[4.3.2]....: | Onbebouwd                  |
| Windgebied .....                  | 2 Vb,0 ..[4.2].....:       |
| 27.000                            |                            |
| Positie spant in het gebouw.....: | 0.000 Kr ....[4.3.2].....: |
| 0.209                             |                            |
| z0 .....[4.3.2].....:             | 0.200 Zmin ..[4.3.2].....: |
| 4.000                             |                            |

Project.....: SGU021041 - Uitbreiding zwembad de Meerkant te Amstelveen  
Onderdeel.....: TR kolom

## WIND

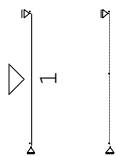
Co wind van links ..[4.3.3]....: 1.000 Co wind van rechts.....: 1.000  
Co wind loodrecht ..[4.3.3]....: 1.000  
Cpi wind van links ..[7.2.9]....: 0.200 -0.300  
Cpi windloodrecht ...[7.2.9]....: 0.200 -0.300  
Cpi wind van rechts .[7.2.9]....: 0.200 -0.300  
Cfr windwrijving ....[7.5].....: 0.040

## STAFTYPEN

| Type            | staven |
|-----------------|--------|
| 4:Wand / kolom. | : 2,3  |
| 5:Linker gevel. | : 1    |

## LASTVELDEN

Wind staven Sneeuw staven

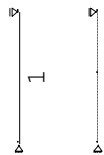


## WIND DAKTYPES

| Nr. | Staaft Type | reductie bij<br>wind van links | reductie bij<br>wind van rechts | Cpe   |
|-----|-------------|--------------------------------|---------------------------------|-------|
| 1   | 1 Gevel     | 1.000                          | 1.000                           | 7.2.2 |

## WIND ZONES

Wind van links Wind van rechts



Project.....: SGU021041 - Uitbreiding zwembad de Meerkant te Amstelveen  
Onderdeel.....: TR kolom

#### WIND VAN LINKS ZONES

| Nr. | Staal | Positie | Lengte | Zone |
|-----|-------|---------|--------|------|
| 1   | 1     | 0.000   | 5.000  | D    |

#### Wind indexen

| Index    | CsCd | Cpe/Cpi | qp    | breedte | reductie | Qw     | Zone |
|----------|------|---------|-------|---------|----------|--------|------|
| Hoek(en) |      |         |       |         |          |        |      |
| Qw1      |      | 0.300   | 0.819 | 5.750   |          | -1.412 | -i   |
| Qw2      | 1.00 | 0.800   | 0.819 | 5.750   |          | -3.766 | D    |
| Qw3      |      | -0.200  | 0.819 | 5.750   |          | 0.942  | +i   |

#### BELASTINGGEVALLEN

| B.G.        | Omschrijving                   | Type               |
|-------------|--------------------------------|--------------------|
| 1           | Permanente belasting EGZ=-1.00 | 1                  |
| g*          | 2 Wind van links onderdruk A   | 7                  |
| g           | 3 Wind van links overdruk A    | 8                  |
|             | 4 Wind druk                    | 11 Wind van rechts |
| onderdruk A |                                |                    |
|             | 5 Wind trek                    | 12 Wind van rechts |
| overdruk A  |                                |                    |
|             | 6 Sneeuw                       | 22 Sneeuw A        |
|             | 7 Knik                         | 0 Onbekend         |

g = gegenereerd belastinggeval

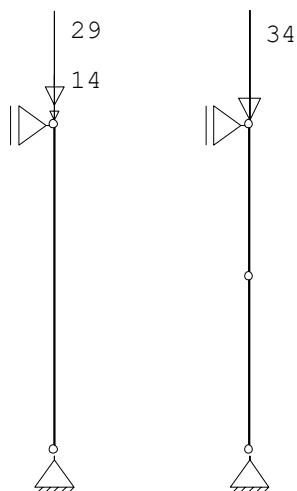
\* = belastinggeval bevat 1 of meer handmatig toegevoegde en/of gewijzigde lasten

#### BELASTINGEN

B.G:1 Permanente

belasting

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



Project.....: SGU021041 - Uitbreiding zwembad de Meerkant te Amstelveen  
Onderdeel.....: TR kolom

## KNOOPBELASTINGEN

B.G:1 Permanente

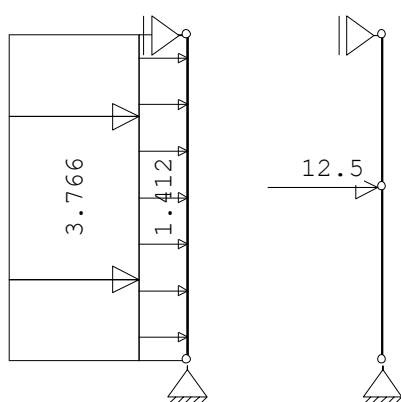
belasting

| Last | Knoop | Richting | waarde  | $\psi_0$ | $\psi_1$ | $\psi_2$ |
|------|-------|----------|---------|----------|----------|----------|
| 1    | 2     | Z        | -14.000 |          |          |          |
| 2    | 4     | Z        | -34.000 |          |          |          |
| 3    | 2     | Z        | -29.000 |          |          |          |

## BELASTINGEN

B.G:2 Wind van links

onderdruk A



## KNOOPBELASTINGEN

B.G:2 Wind van links

onderdruk A

| Last | Knoop | Richting | waarde | $\psi_0$ | $\psi_1$ | $\psi_2$ | Opm. |
|------|-------|----------|--------|----------|----------|----------|------|
| 1    | 5     | X        | 12.500 | 0.00     | 0.20     | 0.00     | *    |

Opmerkingen

[\*] Deze belasting is handmatig toegevoegd of gewijzigd.

## STAAFBELASTINGEN

B.G:2 Wind van links

onderdruk A

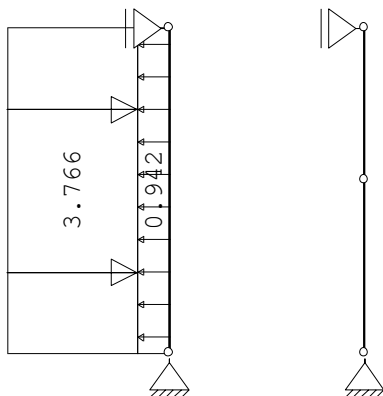
| Staat    | Type       | Index | $q_1/p/m$ | $q_2$ | A     | B     | $\psi_0$ |
|----------|------------|-------|-----------|-------|-------|-------|----------|
| $\psi_1$ | $\psi_2$   |       |           |       |       |       |          |
| 1        | 1:QZLokaal | Qw1   | -1.41     | -1.41 | 0.000 | 0.000 | 0.00     |
| 0.20     | 0.00       |       |           |       |       |       |          |
| 1        | 1:QZLokaal | Qw2   | -3.77     | -3.77 | 0.000 | 0.000 | 0.00     |
| 0.20     | 0.00       |       |           |       |       |       |          |

Project.....: SGU021041 - Uitbreiding zwembad de Meerkant te Amstelveen  
Onderdeel.....: TR kolom

## BELASTINGEN

B.G:3 Wind van links

overdruk A



## STAAFBELASTINGEN

B.G:3 Wind van links

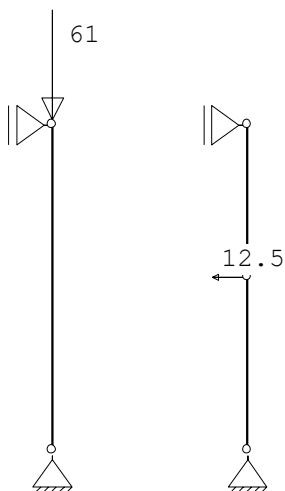
overdruk A

| Staat    | Type       | Index | q1/p/m | q2    | A     | B     | $\psi_0$ |
|----------|------------|-------|--------|-------|-------|-------|----------|
| $\psi_1$ | $\psi_2$   |       |        |       |       |       |          |
| 1        | 1:QZLokaal | Qw3   | 0.94   | 0.94  | 0.000 | 0.000 | 0.00     |
| 0.20     | 0.00       |       |        |       |       |       |          |
| 1        | 1:QZLokaal | Qw2   | -3.77  | -3.77 | 0.000 | 0.000 | 0.00     |
| 0.20     | 0.00       |       |        |       |       |       |          |

## BELASTINGEN

B.G:4 Wind

druk



## KNOOPBELASTINGEN

B.G:4 Wind

druk

| Last | Knoop | Richting | waarde  | $\psi_0$ | $\psi_1$ | $\psi_2$ |
|------|-------|----------|---------|----------|----------|----------|
| 1    | 2     | Z        | -61.000 | 0.00     | 0.20     | 0.00     |



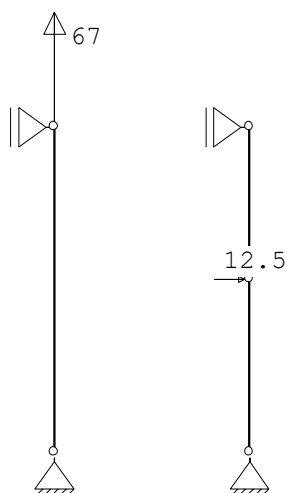
2 5 x -12.500 0.00 0.20 0.00

Project.....: SGU021041 - Uitbreiding zwembad de Meerkant te Amstelveen  
Onderdeel.....: TR kolom

## BELASTINGEN

B.G:5 Wind

trek



## KNOOPBELASTINGEN

B.G:5 Wind

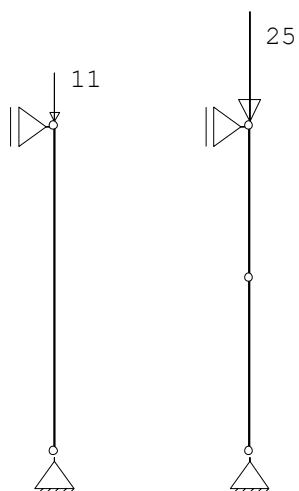
trek

| Last | Knoop | Richting | waarde | $\psi_0$ | $\psi_1$ | $\psi_2$ |
|------|-------|----------|--------|----------|----------|----------|
| 1    | 2     | Z        | 67.000 | 0.00     | 0.20     | 0.00     |
| 2    | 5     | X        | 12.500 | 0.00     | 0.20     | 0.00     |

## BELASTINGEN

B.G:6

Sneeuw



Project.....: SGU021041 - Uitbreiding zwembad de Meerkant te Amstelveen  
Onderdeel.....: TR kolom

## KNOOPBELASTINGEN

B.G:6

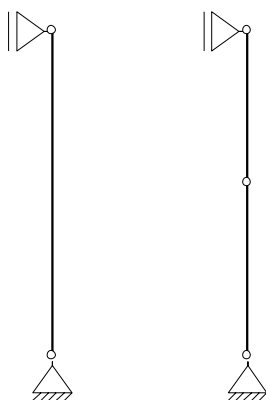
Sneeuw

| Last | Knoop | Richting | waarde  | $\psi_0$ | $\psi_1$ | $\psi_2$ |
|------|-------|----------|---------|----------|----------|----------|
| 1    | 2     | Z        | -11.000 | 0.00     | 0.20     | 0.00     |
| 2    | 4     | Z        | -25.000 | 0.00     | 0.20     | 0.00     |

## BELASTINGEN

B.G:7

Knik



## REACTIES

| Kn. | B.G. | X      | Z      | M |
|-----|------|--------|--------|---|
| 1   | 1    | 0.00   | 44.23  |   |
| 1   | 2    | -12.95 | 0.00   |   |
| 1   | 3    | -7.06  | 0.00   |   |
| 1   | 4    | 0.00   | 61.00  |   |
| 1   | 5    | 0.00   | -67.00 |   |
| 1   | 6    | 0.00   | 11.00  |   |
| 1   | 7    | 0.00   | 0.00   |   |
| 2   | 1    | 0.00   |        |   |
| 2   | 2    | -12.95 |        |   |
| 2   | 3    | -7.06  |        |   |
| 2   | 4    | 0.00   |        |   |
| 2   | 5    | 0.00   |        |   |
| 2   | 6    | 0.00   |        |   |
| 2   | 7    | 0.00   |        |   |
| 3   | 1    | 0.00   | 35.23  |   |
| 3   | 2    | -5.85  | 0.00   |   |
| 3   | 3    | 0.00   | 0.00   |   |
| 3   | 4    | 5.85   | 0.00   |   |
| 3   | 5    | -5.85  | 0.00   |   |
| 3   | 6    | 0.00   | 25.00  |   |
| 3   | 7    | 0.00   | 0.00   |   |



Project.....: SGU021041 - Uitbreiding zwembad de Meerkant te Amstelveen  
Onderdeel.....: TR kolom

## REACTIES

| Kn. | B.G. | X     | Z | M |
|-----|------|-------|---|---|
| 4   | 1    | 0.00  |   |   |
| 4   | 2    | -6.65 |   |   |
| 4   | 3    | 0.00  |   |   |
| 4   | 4    | 6.65  |   |   |
| 4   | 5    | -6.65 |   |   |
| 4   | 6    | 0.00  |   |   |
| 4   | 7    | 0.00  |   |   |

## BELASTINGCOMBINATIES

| BC Type |       |      |           |   |                       |
|---------|-------|------|-----------|---|-----------------------|
| 1       | Fund. | 1.35 | $G_{k,1}$ |   |                       |
| 2       | Fund. | 0.90 | $G_{k,1}$ |   |                       |
| 3       | Fund. | 1.20 | $G_{k,1}$ | + | 1.50 $Q_{k,2}$        |
| 4       | Fund. | 1.20 | $G_{k,1}$ | + | 1.50 $Q_{k,3}$        |
| 5       | Fund. | 1.20 | $G_{k,1}$ | + | 1.50 $Q_{k,4}$        |
| 6       | Fund. | 1.20 | $G_{k,1}$ | + | 1.50 $Q_{k,5}$        |
| 7       | Fund. | 1.20 | $G_{k,1}$ | + | 1.50 $Q_{k,6}$        |
| 8       | Fund. | 0.90 | $G_{k,1}$ | + | 1.50 $Q_{k,2}$        |
| 9       | Fund. | 0.90 | $G_{k,1}$ | + | 1.50 $Q_{k,3}$        |
| 10      | Fund. | 0.90 | $G_{k,1}$ | + | 1.50 $Q_{k,4}$        |
| 11      | Fund. | 0.90 | $G_{k,1}$ | + | 1.50 $Q_{k,5}$        |
| 12      | Fund. | 0.90 | $G_{k,1}$ | + | 1.50 $Q_{k,6}$        |
| 13      | Kar.  | 1.00 | $G_{k,1}$ | + | 1.00 $Q_{k,2}$        |
| 14      | Kar.  | 1.00 | $G_{k,1}$ | + | 1.00 $Q_{k,3}$        |
| 15      | Kar.  | 1.00 | $G_{k,1}$ | + | 1.00 $Q_{k,4}$        |
| 16      | Kar.  | 1.00 | $G_{k,1}$ | + | 1.00 $Q_{k,5}$        |
| 17      | Kar.  | 1.00 | $G_{k,1}$ | + | 1.00 $Q_{k,6}$        |
| 18      | Quas. | 1.00 | $G_{k,1}$ |   |                       |
| 19      | Freq. | 1.00 | $G_{k,1}$ |   |                       |
| 20      | Freq. | 1.00 | $G_{k,1}$ | + | 1.00 $\psi_1 Q_{k,2}$ |
| 21      | Freq. | 1.00 | $G_{k,1}$ | + | 1.00 $\psi_1 Q_{k,3}$ |
| 22      | Freq. | 1.00 | $G_{k,1}$ | + | 1.00 $\psi_1 Q_{k,4}$ |
| 23      | Freq. | 1.00 | $G_{k,1}$ | + | 1.00 $\psi_1 Q_{k,5}$ |
| 24      | Freq. | 1.00 | $G_{k,1}$ | + | 1.00 $\psi_1 Q_{k,6}$ |
| 25      | Blij. | 1.00 | $G_{k,1}$ |   |                       |

Project.....: SGU021041 - Uitbreiding zwembad de Meerkant te Amstelveen  
Onderdeel.....: TR kolom

## GUNSTIGE WERKING PERMANENTE BELASTINGEN

BC Staven met gunstige werking

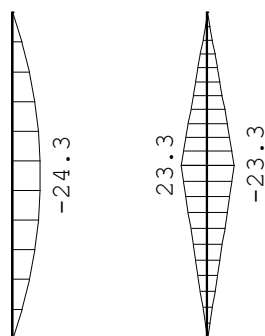
- 1 Geen
- 2 Alle staven de factor:0.90
- 3 Geen
- 4 Geen
- 5 Geen
- 6 Geen
- 7 Geen
- 8 Alle staven de factor:0.90
- 9 Alle staven de factor:0.90
- 10 Alle staven de factor:0.90
- 11 Alle staven de factor:0.90
- 12 Alle staven de factor:0.90

## OMHULLENDE VAN DE FUNDAMENTELE COMBINATIES

### MOMENTEN

Fundamentele

combinatie



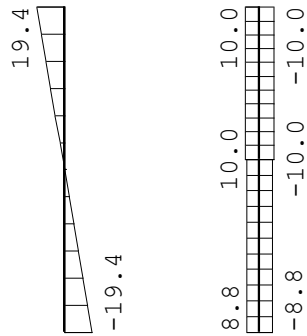


Project.....: SGU021041 - Uitbreiding zwembad de Meerkant te Amstelveen  
Onderdeel.....: TR kolom

## DWARSKRACHTEN

combinatie

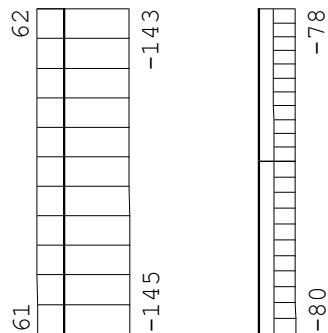
Fundamentele



## NORMAALKRACHTEN

combinatie

Fundamentele



## REACTIES

combinatie

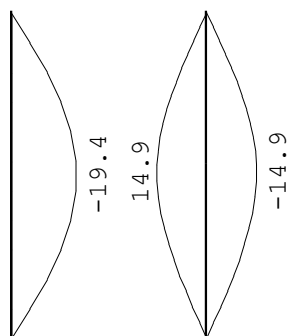
Fundamentele

| Kn.   | X-min  | X-max | Z-min  | Z-max  | M-min |
|-------|--------|-------|--------|--------|-------|
| M-max |        |       |        |        |       |
| 1     | -19.42 | 0.00  | -60.69 | 144.58 |       |
| 2     | -19.42 | 0.00  |        |        |       |
| 3     | -8.78  | 8.78  | 31.71  | 79.78  |       |
| 4     | -9.97  | 9.97  |        |        |       |

Project.....: SGU021041 - Uitbreiding zwembad de Meerkant te Amstelveen  
Onderdeel.....: TR kolom

## OMHULLENDE VAN DE KARAKTERISTIEKE COMBINATIES

**VERPLAATSINGEN** [mm] Karakteristieke combinatie



## STAALPROFIELEN - ALGEMENE GEGEVENS

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

## PROFIEL/MATERIAAL

| P/M drsn.<br>nr.<br>klasse | Profielnaam | Vloeisp.<br>[N/mm <sup>2</sup> ] | Productie<br>methode | Min. |
|----------------------------|-------------|----------------------------------|----------------------|------|
|----------------------------|-------------|----------------------------------|----------------------|------|

|   |        |     |         |  |
|---|--------|-----|---------|--|
| 1 | HEA140 | 235 | Gewalst |  |
|---|--------|-----|---------|--|

1

Partiële veiligheidsfactoren:

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

1.00

## KNIKSTABILITEIT

Extra

Extra

| Staaft<br>aanp. z | $l_{sys}$<br>[m] | Classif. y<br>sterke as | $l_{knik,y}$<br>[m] | aanp. y<br>[kN] | Classif. z<br>zwakke as | $l_{knik,z}$<br>[m] |
|-------------------|------------------|-------------------------|---------------------|-----------------|-------------------------|---------------------|
|-------------------|------------------|-------------------------|---------------------|-----------------|-------------------------|---------------------|

|   |       |           |       |     |           |       |
|---|-------|-----------|-------|-----|-----------|-------|
| 1 | 5.000 | Geschoord | 5.000 | 0.0 | Geschoord | 5.000 |
|---|-------|-----------|-------|-----|-----------|-------|

0.0

|     |       |           |       |     |           |       |
|-----|-------|-----------|-------|-----|-----------|-------|
| 2-3 | 5.000 | Geschoord | 5.000 | 0.0 | Geschoord | 5.000 |
|-----|-------|-----------|-------|-----|-----------|-------|

0.0

## KIPSTABILITEIT

| Staaft | Plts. | l gaffel | Kipsteunafstanden |
|--------|-------|----------|-------------------|
|--------|-------|----------|-------------------|



|     | aangr. |        | [m]  | [m]   |
|-----|--------|--------|------|-------|
| 1   | 1.0*h  | boven: | 5.00 | 5.000 |
|     |        | onder: | 5.00 | 5.000 |
| 2-3 | 1.0*h  | boven: | 5.00 | 5.000 |
|     |        | onder: | 5.00 | 5.000 |

Project.....: SGU021041 - Uitbreiding zwembad de Meerkant te Amstelveen  
Onderdeel.....: TR kolom

## TOETSING SPANNINGEN

Staal P/M BC Sit Kl Plaats Norm Artikel Formule Hoogste toetsing Opm.

| nr.   |   |   |   |   |       |         |       |        | U.C. [N/mm <sup>2</sup> ] |
|-------|---|---|---|---|-------|---------|-------|--------|---------------------------|
| 1     | 1 | 3 | 1 | 1 | Staal | EN3-1-1 | 6.3.3 | (6.62) | 0.987 232                 |
| 47    |   |   |   |   |       |         |       |        |                           |
| 2-3   | 1 | 3 | 1 | 1 | Staal | EN3-1-1 | 6.3.3 | (6.62) | 0.916 215                 |
| 46,47 |   |   |   |   |       |         |       |        |                           |

Opmerkingen:

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

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

## TOETSING HORIZONTALE VERPLAATSING

| Staal | BC | Sit | Lengte [m] | $u_{eind}$ [mm] | Toelaatbaar [mm] | Maatgevend [h/] |
|-------|----|-----|------------|-----------------|------------------|-----------------|
| 1     | 13 | 1   | 5.000      | -19.4           | 16.7             | 300 doorbuiging |
| 2-3   | 13 | 1   | 5.000      | -14.9           | 16.7             | 300 doorbuiging |

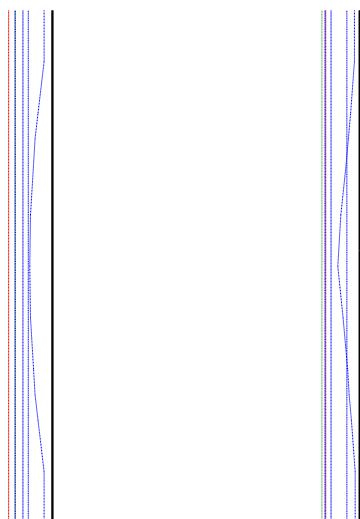
## TOETSING HOR. VERPLAATSING GLOBAAL

Er is een maximale horizontale verplaatsing van 0.0149 [m] gevonden bij knoop 5 en combinatie 13; belastingsituatie 1 (combinatietype 2). Bij een hoogte van 2.660 [m] levert dit  $h / 179$  (toel.:  $h / 300$ ).

## UNITY-CHECK'S

OMHULLENDE VAN

ALLES





|       |                                              |
|-------|----------------------------------------------|
| ----- | Toelaatbare unity-check (1.0)                |
| ----- | Hoogste unity-check i.v.m. knikstabiliteit   |
| ----- | Unity-check i.v.m. kipstabiliteit            |
| ----- | Unity-check i.v.m. kip- en knikstabiliteit   |
| ----- | Hoogste unity-check i.v.m. doorsnedecontrole |
| ----- | Hoogste unity-check i.v.m. doorbuiging       |
| ----- | Unity-check te hoog (> 1.0)                  |

## Bijlage H Uitvoer TR randliggers tegen wind

**Technosoft Liggers release 6.73a**  
**2023**

**26 jan**

Project.....: SGU021041 - Uitbreiding zwembad de Meerkant te Amstelveen  
Onderdeel.....: TR dakligger wind  
Dimensies.....: kN/m/rad  
Datum.....: 23/11/2022  
Bestand.....: H:\SGU021041\BEREKENINGEN\04\_DO\TR dakligger wind.dlw

Betrouwbaarheidsklasse : 2 Referentieperiode : 50

### Toegepaste normen volgens Eurocode (CEN)

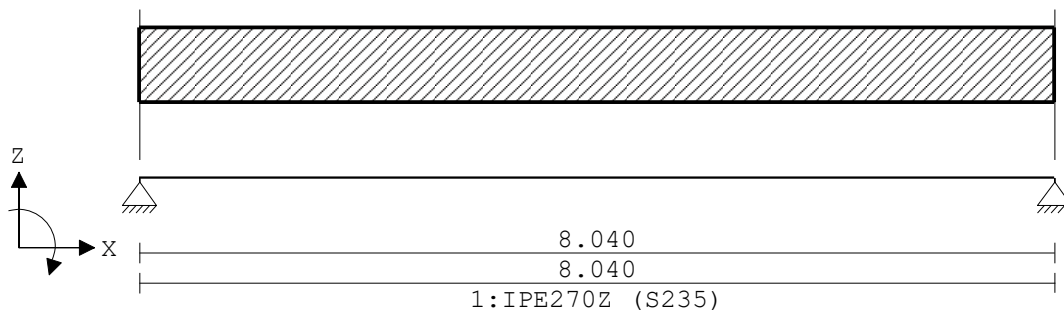
|             |                  |                 |
|-------------|------------------|-----------------|
| Belastingen | EN 1990:2002     | C2:2010,A1:2019 |
|             | EN 1991-1-1:2002 | C1/C11:2019     |
| Staal       | EN 1993-1-1:2006 | C2:2011,A1:2016 |

### LIGGER:1

Profiel : IPE270Z

### GEOMETRIE

Ligger:1



### VELDLENGTEN

Ligger:1

| Veld | Vanaf | Tot   | Lengte |
|------|-------|-------|--------|
| 1    | 0.000 | 8.040 | 8.040  |

### MATERIALEN

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

### PROFIELEN [mm]

| Prof.      | Omschrijving | Materiaal | Oppervlak  |
|------------|--------------|-----------|------------|
| Traagheid  | Vormf.       |           |            |
| 1          | IPE270Z      | 1:S235    | 4.5900e+03 |
| 4.2000e+06 | 0.00         |           |            |
| 2          | HEA140Z      | 1:S235    | 3.1420e+03 |
| 3.8900e+06 | 0.00         |           |            |

Project.....: SGU021041 - Uitbreiding zwembad de Meerkant te Amstelveen  
Onderdeel.....: TR dakligger wind

### PROFIELEN vervolg [mm]

| Prof. | Staaftype | Breedte | Hoogte | e    | Type | b1 | h1 | b2 |
|-------|-----------|---------|--------|------|------|----|----|----|
| h2    |           |         |        |      |      |    |    |    |
| 1     | 0:Normaal | 135     | 270    | 67.5 |      |    |    |    |
| 2     | 0:Normaal | 140     | 133    | 70.0 |      |    |    |    |

### PROFIELVORMEN [mm]

|   |         |                                                                                   |
|---|---------|-----------------------------------------------------------------------------------|
| 1 | IPE270Z |  |
| 2 | HEA140Z |  |

### 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 | 0.60     | 0.20     | 0.00     |
| 0.00  |              |                     |          |          |          |

### BELASTINGGEVALLEN

| B.G. | Omschrijving | Type                       |
|------|--------------|----------------------------|
| 1    | Permanent    | 1 Permanente belasting     |
| 2    | Veranderlijk | 7 Wind van links onderdruk |

A

### VELDBELASTINGEN

Ligger:1 B.G:1

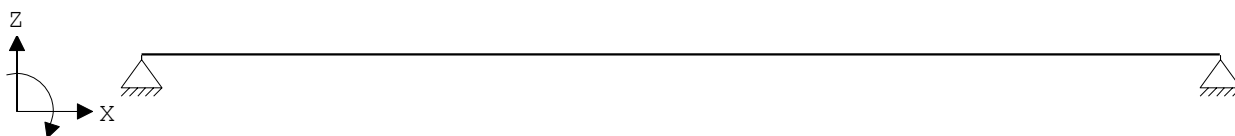
Permanent



### VELDBELASTINGEN

Ligger:1 B.G:2

Veranderlijk



### BELASTINGCOMBINATIES

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



|   |       |   |      |      |
|---|-------|---|------|------|
| 1 | Fund. | 1 | Perm | 1.35 |
| 2 | Fund. | 1 | Perm | 1.00 |
| 3 | Kar.  | 1 | Perm | 1.00 |
| 4 | Freq. | 1 | Perm | 1.00 |
| 5 | Quas. | 1 | Perm | 1.00 |
| 6 | Blij. | 1 | Perm | 1.00 |

Project.....: SGU021041 - Uitbreiding zwembad de Meerkant te Amstelveen  
Onderdeel.....: TR dakliger wind

## GUNSTIGE WERKING PERMANENTE BELASTINGEN

BC Velden met gunstige werking

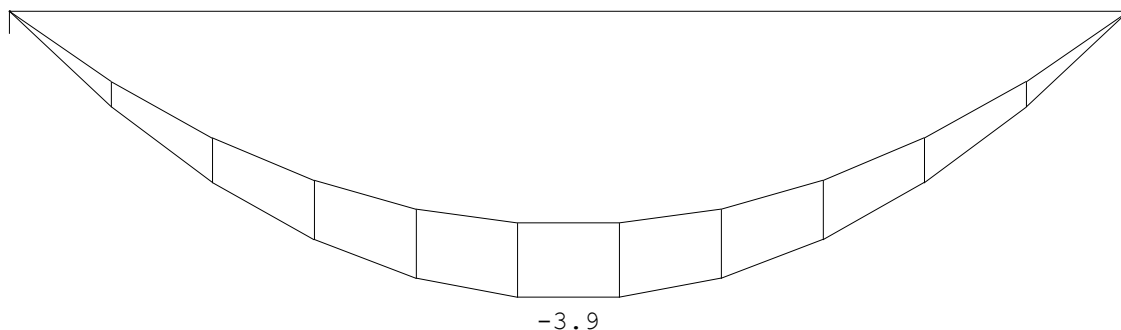
- 1 Geen
- 2 Alle velden de factor:1.00

## OMHULLENDE VAN DE FUNDAMENTELE COMBINATIES

### MOMENTEN

Ligger:1 Fundamentele

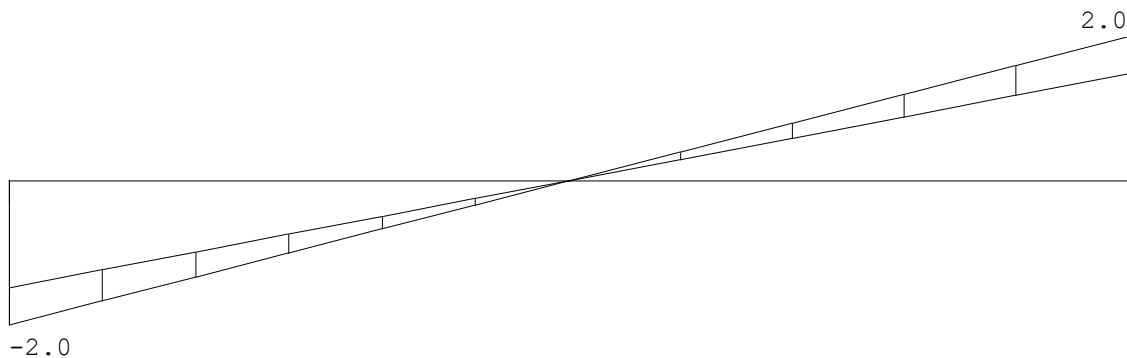
combinatie



### DWARSKRACHTEN

Ligger:1 Fundamentele

combinatie



Fmin:1.45

1.45

Fmax:1.96

1.96

### REACTIES

Ligger:1 Fundamentele

combinatie

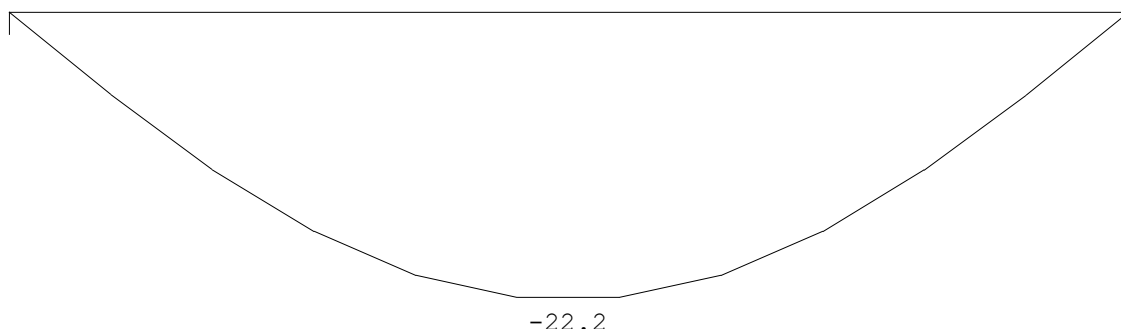
| Stp | Fmin | Fmax | Mmin | Mmax |
|-----|------|------|------|------|
| 1   | 1.45 | 1.96 | 0.00 | 0.00 |
| 2   | 1.45 | 1.96 | 0.00 | 0.00 |

Project.....: SGU021041 - Uitbreiding zwembad de Meerkant te Amstelveen  
Onderdeel.....: TR dakligger wind

## OMHULLENDE VAN DE KARAKTERISTIEKE COMBINATIES

**VERPLAATSINGEN** [mm]  
combinatie

Ligger:1 Karakteristieke



## STAALPROFIELEN - ALGEMENE GEGEVENS

Ligger:1

Stabiliteit: Classificatie gehele constructie: Geschoord

### PROFIEL/MATERIAAL

| P/M drsn.<br>nr.<br>klasse | Profielnaam | Vloeisp.<br>[N/mm <sup>2</sup> ] | Productie<br>methode | Min. |
|----------------------------|-------------|----------------------------------|----------------------|------|
|----------------------------|-------------|----------------------------------|----------------------|------|

|   |           |     |         |  |
|---|-----------|-----|---------|--|
| 1 | IPE270Z   | 235 | Gewalst |  |
| 1 | 2 HEA140Z | 235 | Gewalst |  |

Partiële veiligheidsfactoren:

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

### KIPSTABILITEIT

Ligger:1

| Staaf | Plts.<br>aanr. | l gaffel<br>[m]            | Kipsteunafstanden<br>[m] |
|-------|----------------|----------------------------|--------------------------|
| 1     | 1.0*h          | boven: 8.04<br>onder: 8.04 | 8.040<br>8.040           |

### KRACHTEN UIT HET VLAK

| Staaf | Mbegin | Mmidden | Meinde | Vbegin | Vtpv | Mmax | Veinde |
|-------|--------|---------|--------|--------|------|------|--------|
|-------|--------|---------|--------|--------|------|------|--------|

|            |       |       |       |      |      |      |       |
|------------|-------|-------|-------|------|------|------|-------|
| Ligger:1Mx | [kNm] | [kNm] | [kNm] | [kN] | [kN] | [kN] | [kNm] |
| 1          | 0.0   | 30.3  | 0.0   | 0.0  | 0.0  | 0.0  | 0.0   |

### TOETSING SPANNINGEN

Ligger:1

| Staaf | P/M | BC | Sit | Kl | Plaats | Norm | Artikel | Formule | Hoogste toetsing |
|-------|-----|----|-----|----|--------|------|---------|---------|------------------|
|-------|-----|----|-----|----|--------|------|---------|---------|------------------|



Opm.

| nr. |   |   |   |   |      |         |       |        | U.C. [N/mm <sup>2</sup> ] |     |
|-----|---|---|---|---|------|---------|-------|--------|---------------------------|-----|
| 1   | 1 | 1 | 1 | 1 | Staa | EN3-1-1 | 6.3.3 | (6.62) | 0.703                     | 165 |

156

Opmerkingen:

[156] In afwijking van de ingestelde norm is het elastisch kipmoment

M<sub>cr</sub>

berekend volgens de Nederlandse Nationale Bijlage.

Project.....: SGU021041 - Uitbreiding zwembad de Meerkant te Amstelveen  
Onderdeel.....: TR dakligger wind

## TOETSING DOORBUIGING

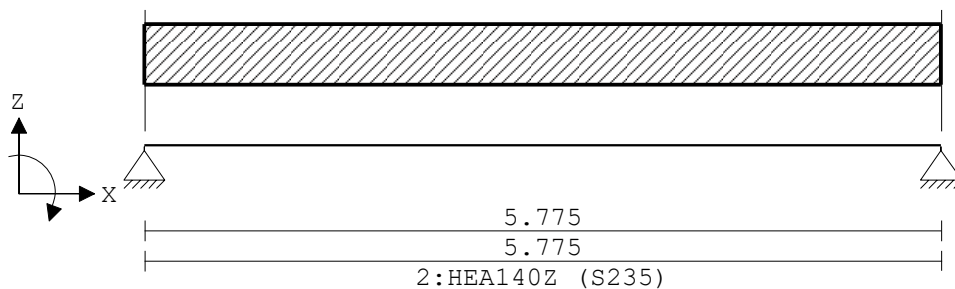
Ligger:1

| Staaft      | Soort Mtg | Lengte | Overst | Zeeg | $u_{tot}$ | BC   | Sit   | $u$  |        |       |       |
|-------------|-----------|--------|--------|------|-----------|------|-------|------|--------|-------|-------|
| Toelaatbaar |           | [m]    | I      | J    | [mm]      | [mm] |       | [mm] |        |       |       |
| *1          |           |        |        |      |           |      |       |      |        |       |       |
| 1           | Dak       | db     | 8.04   | N    | N         | 0.0  | -22.2 | 3    | 1 Eind | -22.2 | -32.2 |
| 0.004       |           |        |        |      |           |      |       |      |        |       |       |

## LIGGER:2

### GEOMETRIE

Ligger:2



### VELDLENGTEN

Ligger:2

| Veld | Vanaf | Tot   | Lengte |
|------|-------|-------|--------|
| 1    | 0.000 | 5.775 | 5.775  |

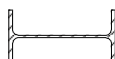
### DOORSNEDEN

Ligger:2

| sector | Vanaf | Tot   | Lengte | Profiel begin | z-begin | Profiel eind |
|--------|-------|-------|--------|---------------|---------|--------------|
| z-eind |       |       |        |               |         |              |
| 1      | 0.000 | 5.775 | 5.775  | 2:HEA140Z     | 0.000   | 2:HEA140Z    |
| 0.000  |       |       |        |               |         |              |
| sector | Vanaf | Tot   | Lengte | Eindcode      | Bedding | Br.[mm]      |
| 1      | 0.000 | 5.775 | 5.775  | 1:Vast        |         |              |

### PROFIELVORMEN [mm]

1 IPE270Z



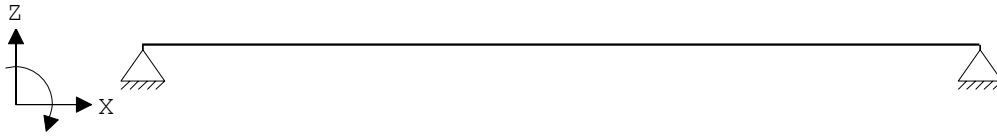
2 HEA140Z



### VELDBELASTINGEN

Ligger:2 B.G:1

Permanent

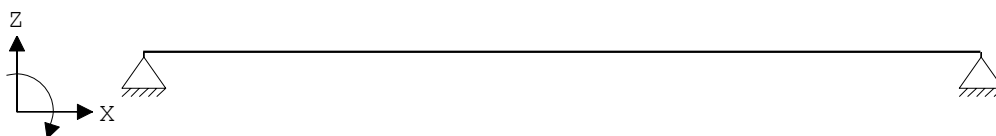


Project.....: SGU021041 - Uitbreiding zwembad de Meerkant te Amstelveen  
Onderdeel.....: TR dakliger wind

## VELDBELASTINGEN

Ligger:2 B.G:2

Veranderlijk

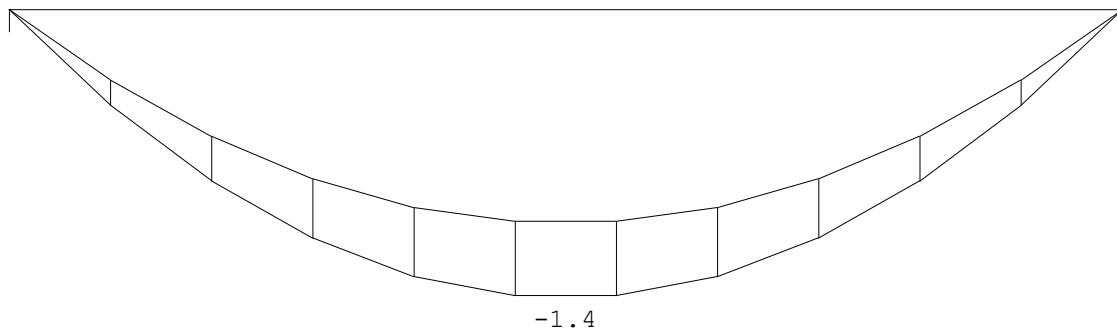


## OMHULLENDE VAN DE FUNDAMENTELE COMBINATIES

### MOMENTEN

Ligger:2 Fundamentele

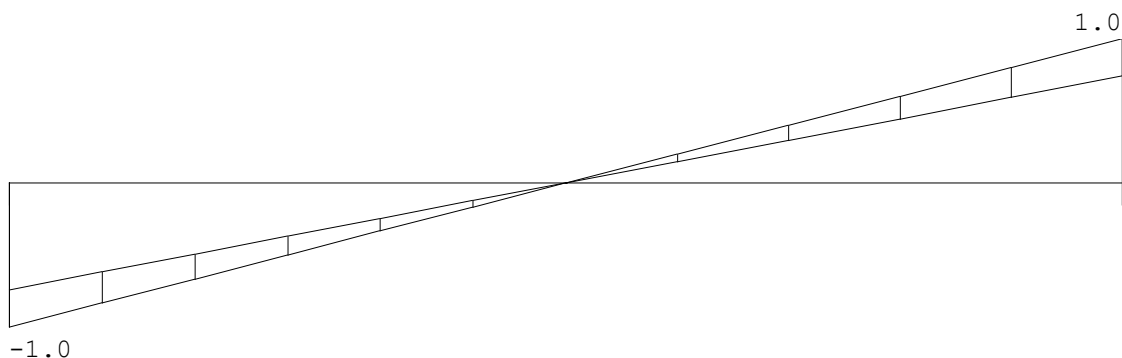
combinatie



### DWARSKRACHTEN

Ligger:2 Fundamentele

combinatie



Fmin:0.71

0.71

Fmax:0.96

0.96

### REACTIES

Ligger:2 Fundamentele

combinatie

| Stp | Fmin | Fmax | Mmin | Mmax |
|-----|------|------|------|------|
| 1   | 0.71 | 0.96 | 0.00 | 0.00 |
| 2   | 0.71 | 0.96 | 0.00 | 0.00 |

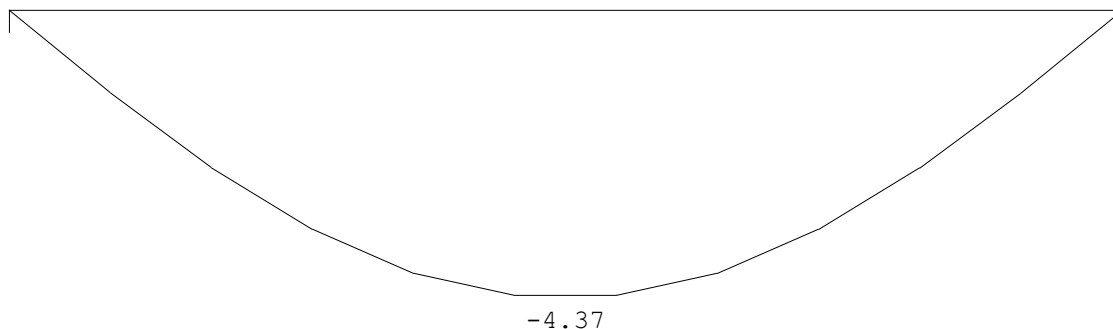


Project.....: SGU021041 - Uitbreiding zwembad de Meerkant te Amstelveen  
Onderdeel.....: TR dakligger wind

## OMHULLENDE VAN DE KARAKTERISTIEKE COMBINATIES

**VERPLAATSINGEN** [mm]  
combinatie

Ligger:2 Karakteristieke



## KIPSTABILITEIT

Ligger:2

| Staafl | Plts.<br>aangr. | l gaffel<br>[m] | Kipsteunafstanden<br>[m] |
|--------|-----------------|-----------------|--------------------------|
| 1      | 1.0*h           | boven:<br>5.78  | 5.775                    |
|        |                 | onder:<br>5.78  | 5.775                    |

## KRACHTEN UIT HET VLAK

| Staafl     | Mbegin | Mmidden | Meinde | Vbegin | Vtpv | Mmax | Veinde |
|------------|--------|---------|--------|--------|------|------|--------|
| Ligger:2Mx | [kNm]  | [kNm]   | [kNm]  | [kN]   | [kN] | [kN] | [kNm]  |
| 1          | 0.0    | 15.7    | 0.0    | 0.0    | 0.0  | 0.0  | 0.0    |

## TOETSING SPANNINGEN

Ligger:2

Staafl P/M BC Sit Kl Plaats Norm Artikel Formule Hoogste toetsing  
Opm.

| nr. | U.C. [N/mm <sup>2</sup> ] |   |   |   |        |         |        |
|-----|---------------------------|---|---|---|--------|---------|--------|
| 1   | 2                         | 1 | 1 | 1 | Staafl | EN3-1-1 | 6.3.3  |
| 156 |                           |   |   |   |        |         | (6.62) |
|     |                           |   |   |   |        |         | 0.550  |
|     |                           |   |   |   |        |         | 129    |

Opmerkingen:

[156] In afwijking van de ingestelde norm is het elastisch kipmoment  $M_{cr}$

berekend volgens de Nederlandse Nationale Bijlage.

## TOETSING DOORBUIGING

Ligger:2

| Staafl      | Soort | Mtg | Lengte | Overst | Zeeg | $u_{tot}$ | BC   | Sit  | u     |
|-------------|-------|-----|--------|--------|------|-----------|------|------|-------|
| Toelaatbaar |       |     | [m]    | I      | J    | [mm]      |      |      | [mm]  |
| *1          |       |     |        |        |      |           |      |      |       |
| 1           | Dak   | db  | 5.78   | N      | N    | 0.0       | -4.4 | 3    | 1     |
| 0.004       |       |     |        |        |      |           |      | Eind | -4.4  |
|             |       |     |        |        |      |           |      |      | -23.1 |



## Bijlage I Uitvoer Kleedruimte reacties optie 2

**Technosoft Liggers release 6.73a**  
**2023**

**26 jan**

Dimensies.....: kN/m/rad  
Datum.....: 21/11/2022  
Bestand.....: H:\SGU021041\BEREKENINGEN\04\_DO\Dakliggers kledruimte  
optie 2.dlw

Betrouwbaarheidsklasse : 2 Referentieperiode :  
50  
Herverdelen van momenten : nee Maximale deellengte :  
0.500  
Ouderdom bij belasten : 28 Relatieve vochtigheid :  
50%  
Doorbuigingen(beton) zijn dmv gecorrigeerde stijfheden berekend.

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

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

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

### **Toegepaste normen volgens Eurocode met Nederlandse NB**

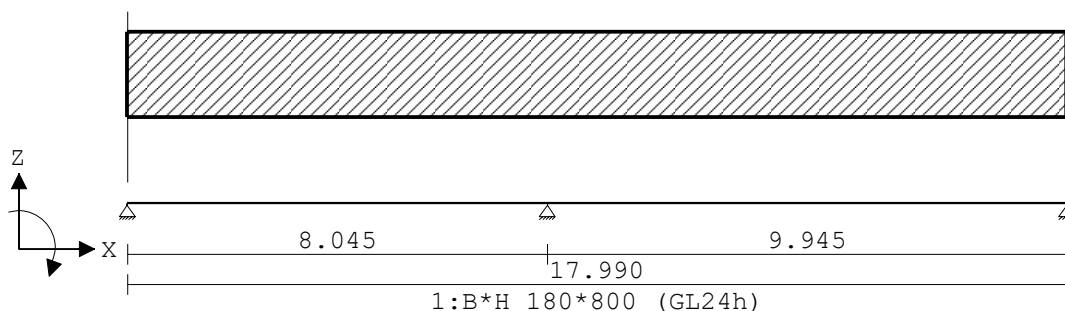
|             |                          |                 |
|-------------|--------------------------|-----------------|
| Belastingen | NEN-EN 1990:2002         | C2:2010,A1:2019 |
| NB:2019(nl) |                          |                 |
|             | NEN-EN 1991-1-1:2002     | C1/C11:2019  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

### **LIGGER:as N**

Profiel : B\*H 180\*800  
Toevallige inklemmingen begin : 15% Toevallige inklemming eind :  
15%  
Toevallige inklemmingen : 15% op tussensteunpunten met een  
scharnier.

### **GEOMETRIE**

Ligger:as N





## VELDLENGTEN

Ligger:as N

| Veld | Vanaf | Tot    | Lengte |
|------|-------|--------|--------|
| 1    | 0.000 | 8.045  | 8.045  |
| 2    | 8.045 | 17.990 | 9.945  |

## MATERIALEN

| Mt | Kwaliteit | E-modulus[N/mm <sup>2</sup> ] | S.G. | S.G.verhoogd | Pois. | Uitz. coëff |
|----|-----------|-------------------------------|------|--------------|-------|-------------|
|----|-----------|-------------------------------|------|--------------|-------|-------------|

|   |       |       |     |     |      |            |
|---|-------|-------|-----|-----|------|------------|
| 1 | GL24h | 11500 | 3.8 | 4.6 | 1.00 | 5.0000e-06 |
|---|-------|-------|-----|-----|------|------------|

Bij de bepaling v.h. e.g. van houten staven is de S.G.verhoogd toegepast.

## PROFIELEN [mm]

| Prof.     | Omschrijving | Materiaal | Oppervlak |
|-----------|--------------|-----------|-----------|
| Traagheid | Vormf.       |           |           |

|            |             |         |            |
|------------|-------------|---------|------------|
| 1          | B*H 180*800 | 1:GL24h | 1.4400e+05 |
| 7.6800e+09 | 0.00        |         |            |

## PROFIELEN vervolg [mm]

| Prof. | Staaftype | Breedte | Hoogte | e | Type | b1 | h1 | b2 | h2 |
|-------|-----------|---------|--------|---|------|----|----|----|----|
|-------|-----------|---------|--------|---|------|----|----|----|----|

|   |           |     |     |       |      |  |  |  |  |
|---|-----------|-----|-----|-------|------|--|--|--|--|
| 1 | 0:Normaal | 180 | 800 | 400.0 | 0:RH |  |  |  |  |
|---|-----------|-----|-----|-------|------|--|--|--|--|

## PROFIELVORMEN [mm]

|   |             |
|---|-------------|
| 1 | B*H 180*800 |
|---|-------------|



## BELASTINGGEVALLEN

| B.G. | Omschrijving | Belast/onbelast | $\Psi_0$ | $\Psi_1$ | $\Psi_2$ |
|------|--------------|-----------------|----------|----------|----------|
|------|--------------|-----------------|----------|----------|----------|

|       |           |                     |      |      |      |
|-------|-----------|---------------------|------|------|------|
| 1     | Permanent | 2:Permanent EN1991  |      |      |      |
| -1.00 |           |                     |      |      |      |
| 2     | Sneeuw    | 1:Schaakbord EN1991 | 0.00 | 0.20 | 0.00 |
| 0.00  |           |                     |      |      |      |

## BELASTINGGEVALLEN

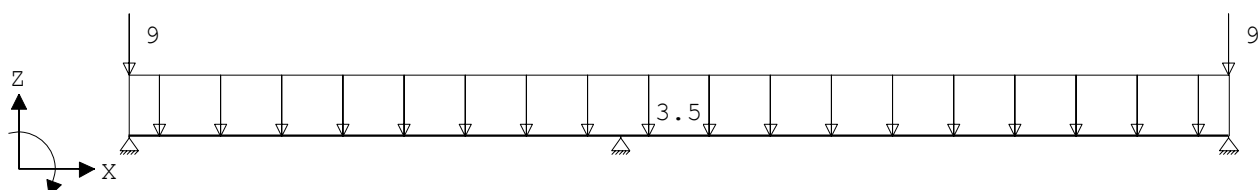
| B.G. | Omschrijving | Type |
|------|--------------|------|
|------|--------------|------|

|   |           |                        |
|---|-----------|------------------------|
| 1 | Permanent | 1 Permanente belasting |
| 2 | Sneeuw    | 22 Sneeuw A            |

## VELDBELASTINGEN

Ligger:as N B.G:1

Permanent



## VELDBELASTINGEN

Ligger:as N B.G:1

Permanent

| Last Ref. | Type   | Omschrijving | q1/p/m | q2 | psi |
|-----------|--------|--------------|--------|----|-----|
| Afstand   | Lengte |              |        |    |     |

|   |          |  |        |        |  |
|---|----------|--|--------|--------|--|
| 1 | 1:q-last |  | -3.500 | -3.500 |  |
|---|----------|--|--------|--------|--|

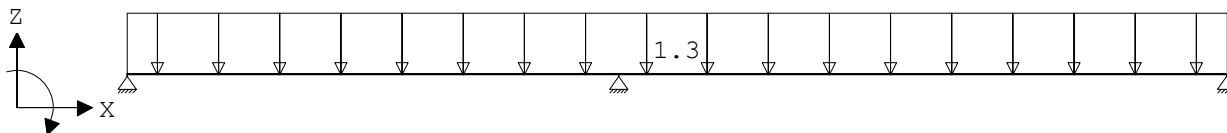


|        |            |  |        |
|--------|------------|--|--------|
| 0.000  | 17.990     |  |        |
| 2      | 8:Puntlast |  | -9.000 |
| 0.000  |            |  |        |
| 3      | 8:Puntlast |  | -9.000 |
| 17.990 |            |  |        |

## VELDBELASTINGEN

Ligger:as N B.G:2

Sneeuw



## VELDBELASTINGEN

Ligger:as N B.G:2

Sneeuw

| Last Ref. | Type     | Omschrijving | q1/p/m | q2     | psi |
|-----------|----------|--------------|--------|--------|-----|
| Afstand   | Lengte   |              |        |        |     |
| 1         | 1:q-last |              | -1.300 | -1.300 |     |
| 0.000     | 17.990   |              |        |        |     |

## BELASTINGCOMBINATIES

| BC Type | BG | Gen. | Factor | BG     | Gen. | Factor | BG | Gen. | Factor | BG | Gen. | Factor |
|---------|----|------|--------|--------|------|--------|----|------|--------|----|------|--------|
| Factor  |    |      |        |        |      |        |    |      |        |    |      |        |
| 1 Fund. | 1  | Perm | 1.35   |        |      |        |    |      |        |    |      |        |
| 2 Fund. | 1  | Perm | 1.20   | 2 Extr | 1.50 |        |    |      |        |    |      |        |
| 3 Fund. | 1  | Perm | 0.90   |        |      |        |    |      |        |    |      |        |
| 4 Fund. | 1  | Perm | 0.90   | 2 Extr | 1.50 |        |    |      |        |    |      |        |
| 5 Kar.  | 1  | Perm | 1.00   | 2 Extr | 1.00 |        |    |      |        |    |      |        |
| 6 Freq. | 1  | Perm | 1.00   |        |      |        |    |      |        |    |      |        |
| 7 Freq. | 1  | Perm | 1.00   | 2 psi1 | 1.00 |        |    |      |        |    |      |        |
| 8 Quas. | 1  | Perm | 1.00   |        |      |        |    |      |        |    |      |        |
| 9 Blij. | 1  | Perm | 1.00   |        |      |        |    |      |        |    |      |        |

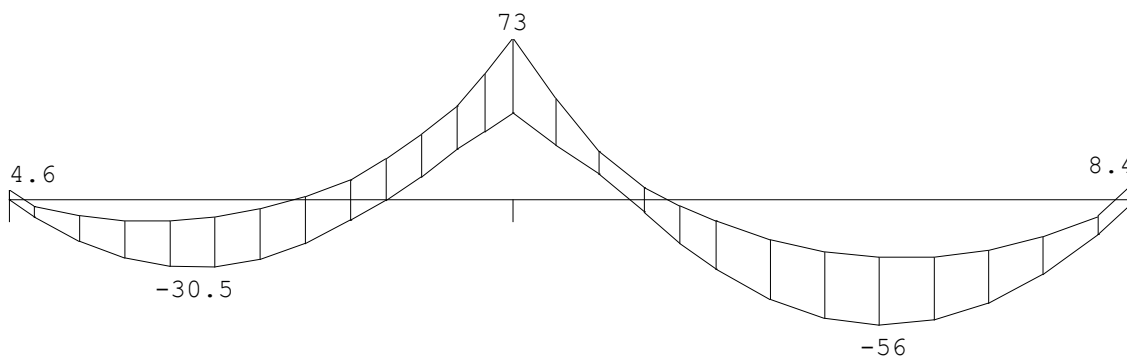
## GUNSTIGE WERKING PERMANENTE BELASTINGEN

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

## OMHULLENDE VAN DE FUNDAMENTELE COMBINATIES

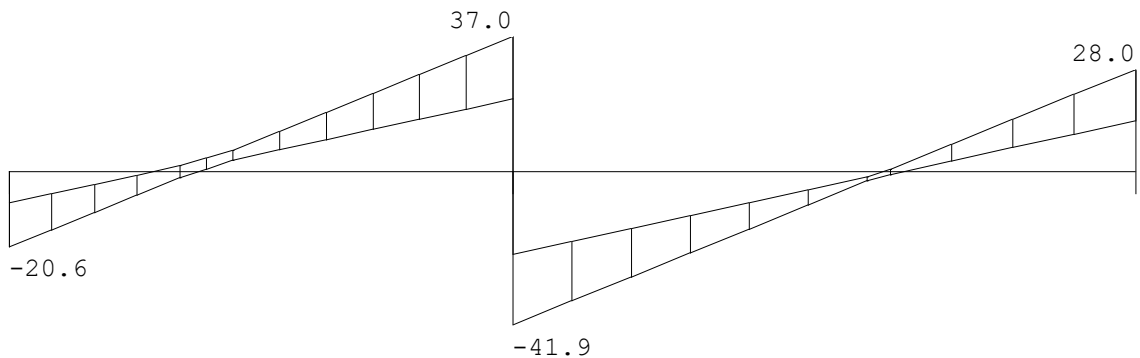
**MOMENTEN** Fysisch lineair  
combinatie

Ligger:as N Fundamentele



## DWARSKRACHTEN

Fysisch lineair Ligger:as N Fundamentele combinatie



Fmin:16.7 42.5 22.1  
Fmax:31.4 79 38.8

## REACTIES

Fysisch lineair Ligger:as N Fundamentele combinatie

| Stp | Fmin  | Fmax  | Mmin | Mmax |
|-----|-------|-------|------|------|
| 1   | 16.65 | 31.38 | 0.00 | 0.00 |
| 2   | 42.53 | 78.83 | 0.00 | 0.00 |
| 3   | 22.09 | 38.76 | 0.00 | 0.00 |

## LIGGER:as O-T

Profiel : B\*H 180\*800

Toevallige inklemmingen begin : 15% Toevallige inklemming eind : 15%

Toevallige inklemmingen : 15% op tussensteunpunten met een scharnier.

## GEOMETRIE

Ligger:as

O-T



## VELDLENGTEN

Ligger:as

O-T

| Veld | Vanaf | Tot    | Lengte |
|------|-------|--------|--------|
| 1    | 0.000 | 8.045  | 8.045  |
| 2    | 8.045 | 17.990 | 9.945  |

## PROFIELVORMEN [mm]

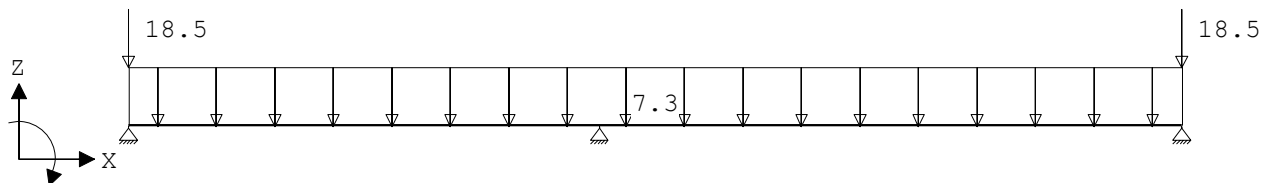
1 B\*H 180\*800



## VELDBELASTINGEN

Ligger:as O-T B.G:1

Permanent



## VELDBELASTINGEN

Ligger:as O-T B.G:1

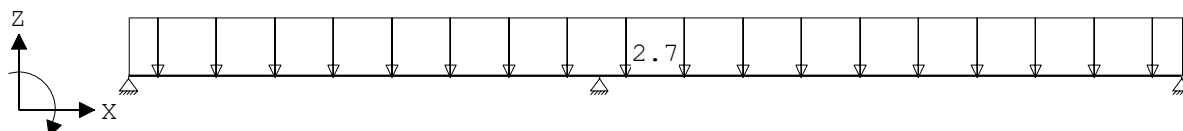
Permanent

| Last Ref. | Type       | Omschrijving | q1/p/m  | q2     | psi |
|-----------|------------|--------------|---------|--------|-----|
| Afstand   | Lengte     |              |         |        |     |
| 1         | 1:q-last   |              | -7.300  | -7.300 |     |
| 0.000     | 17.990     |              |         |        |     |
| 2         | 8:Puntlast |              | -18.500 |        |     |
| 0.000     |            |              |         |        |     |
| 3         | 8:Puntlast |              | -18.500 |        |     |
| 17.990    |            |              |         |        |     |

## VELDBELASTINGEN

Ligger:as O-T B.G:2

Sneeuw



## VELDBELASTINGEN

Ligger:as O-T B.G:2

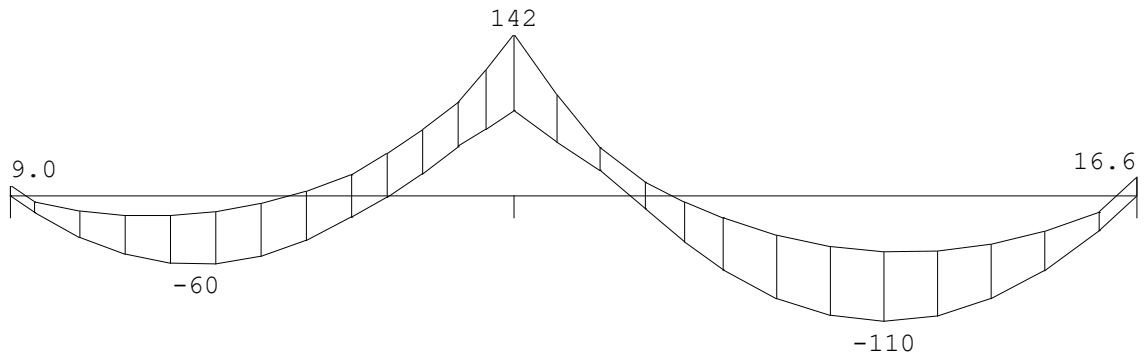
Sneeuw

| Last Ref. | Type     | Omschrijving | q1/p/m | q2     | psi |
|-----------|----------|--------------|--------|--------|-----|
| Afstand   | Lengte   |              |        |        |     |
| 1         | 1:q-last |              | -2.700 | -2.700 |     |
| 0.000     | 17.990   |              |        |        |     |

## OMHULLENDE VAN DE FUNDAMENTELE COMBINATIES

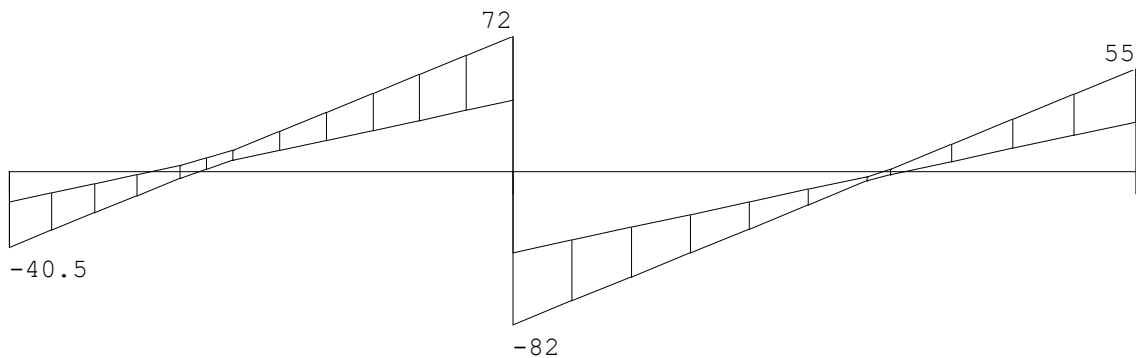
**MOMENTEN** Fysisch lineair  
combinatie

Ligger:as O-T Fundamentele



## DWARSKRACHTEN

Fysisch lineair Ligger:as O-T Fundamentele combinatie



Fmin:32.7  
Fmax:63

81  
154

43.3  
77

## REACTIES

Fysisch lineair Ligger:as O-T Fundamentele combinatie

| Stp | Fmin  | Fmax   | Mmin | Mmax |
|-----|-------|--------|------|------|
| 1   | 32.73 | 62.70  | 0.00 | 0.00 |
| 2   | 81.33 | 154.39 | 0.00 | 0.00 |
| 3   | 43.29 | 77.04  | 0.00 | 0.00 |

## LIGGER:as U

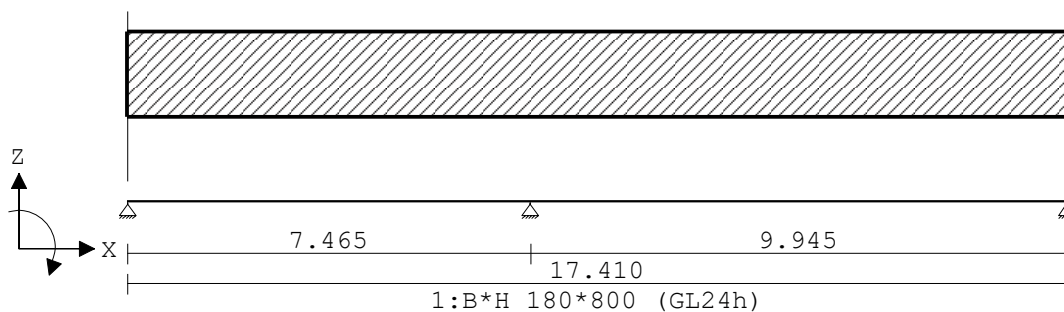
Profiel : B\*H 180\*800

Toevalige inklemmingen begin : 15% Toevalige inklemming eind : 15%

Toevalige inklemmingen : 15% op tussensteunpunten met een scharnier.

## GEOMETRIE

Ligger:as U



## VELDLENGTEN

Ligger:as U

| Veld | Vanaf | Tot    | Lengte |
|------|-------|--------|--------|
| 1    | 0.000 | 7.465  | 7.465  |
| 2    | 7.465 | 17.410 | 9.945  |

## PROFIELVORMEN [mm]

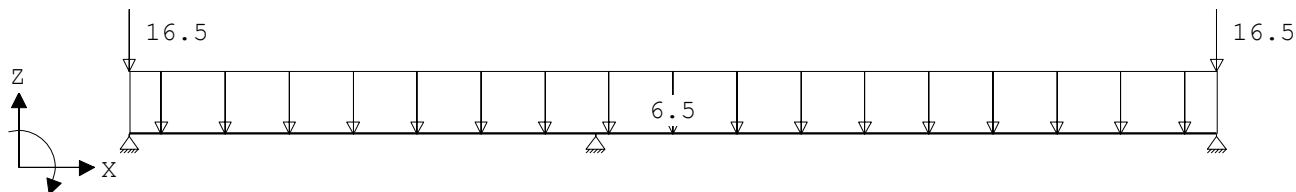
1 B\*H 180\*800



## VELDBELASTINGEN

Ligger:as U B.G:1

Permanent



## VELDBELASTINGEN

Ligger:as U B.G:1

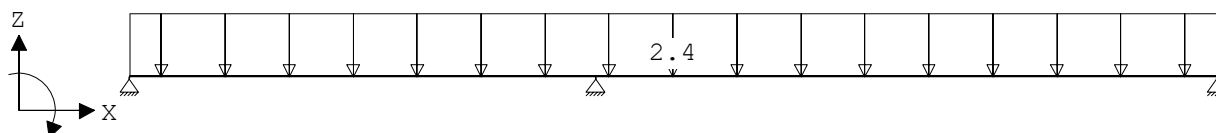
Permanent

| Last Ref. | Type       | Omschrijving | q1/p/m  | q2     | psi |
|-----------|------------|--------------|---------|--------|-----|
| Afstand   | Lengte     |              |         |        |     |
| 1         | 1:q-last   |              | -6.500  | -6.500 |     |
| 0.000     | 17.410     |              |         |        |     |
| 2         | 8:Puntlast |              | -16.500 |        |     |
| 0.000     |            |              |         |        |     |
| 3         | 8:Puntlast |              | -16.500 |        |     |
| 17.410    |            |              |         |        |     |

## VELDBELASTINGEN

Ligger:as U B.G:2

Sneeuw



## VELDBELASTINGEN

Ligger:as U B.G:2

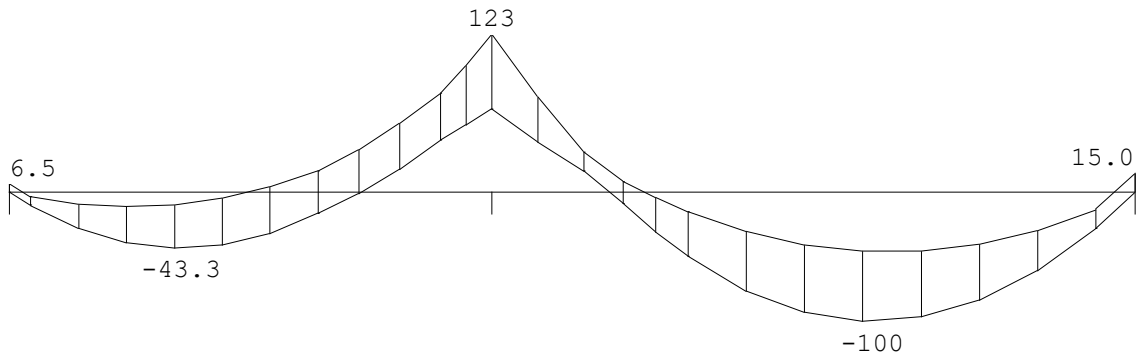
Sneeuw

| Last Ref. | Type     | Omschrijving | q1/p/m | q2     | psi |
|-----------|----------|--------------|--------|--------|-----|
| Afstand   | Lengte   |              |        |        |     |
| 1         | 1:q-last |              | -2.400 | -2.400 |     |
| 0.000     | 17.410   |              |        |        |     |

## OMHULLENDE VAN DE FUNDAMENTELE COMBINATIES

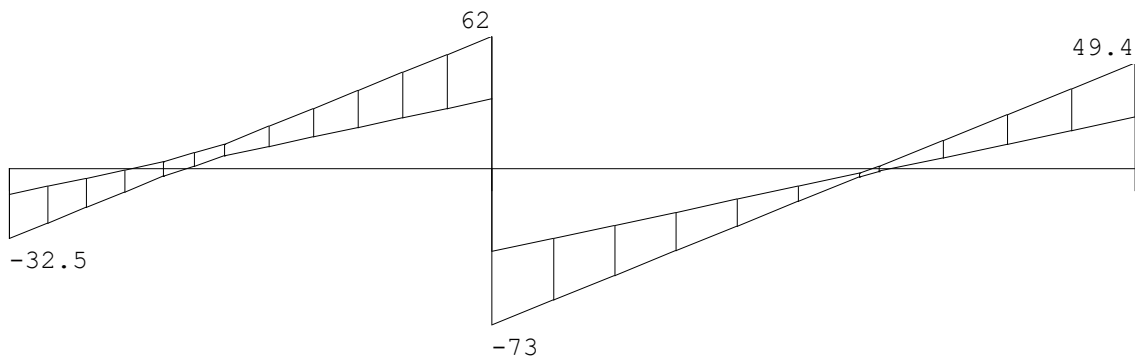
**MOMENTEN** Fysisch lineair  
combinatie

Ligger:as U Fundamentele



## DWARSKRACHTEN

Fysisch lineair Ligger:as U Fundamentele combinatie



Fmin:26.8 71 39.3  
Fmax:52 135 69

## REACTIES

Fysisch lineair Ligger:as U Fundamentele combinatie

| Stp | Fmin  | Fmax   | Mmin | Mmax |
|-----|-------|--------|------|------|
| 1   | 26.83 | 52.32  | 0.00 | 0.00 |
| 2   | 71.33 | 134.93 | 0.00 | 0.00 |
| 3   | 39.32 | 69.21  | 0.00 | 0.00 |

## LIGGER:as V

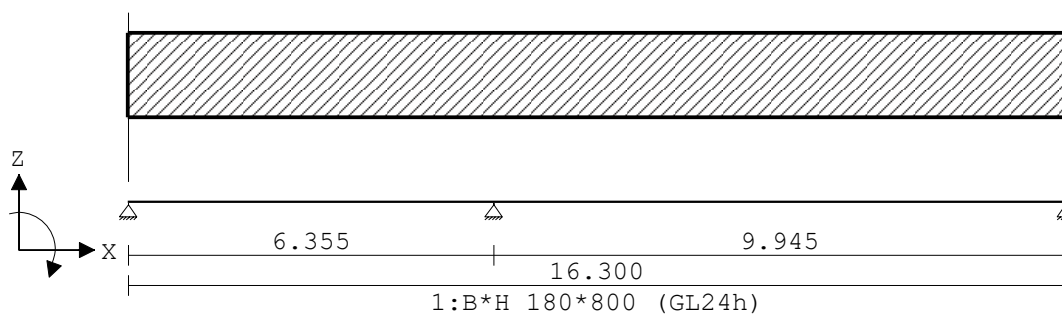
Profiel : B\*H 180\*800

Toevallige inklemmingen begin : 15% Toevallige inklemming eind : 15%

Toevallige inklemmingen : 15% op tussensteunpunten met een scharnier.

## GEOMETRIE

Ligger:as V



## VELDLENGTEN

Ligger:as V

| Veld | Vanaf | Tot    | Lengte |
|------|-------|--------|--------|
| 1    | 0.000 | 6.355  | 6.355  |
| 2    | 6.355 | 16.300 | 9.945  |

## PROFIELVORMEN [mm]

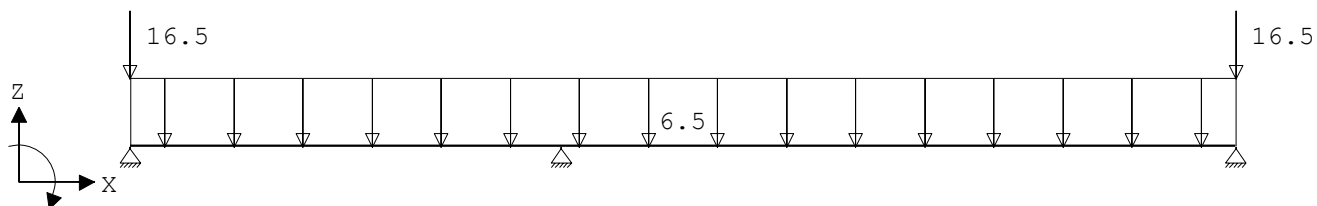
1 B\*H 180\*800



## VELDBELASTINGEN

Ligger:as V B.G:1

Permanent



## VELDBELASTINGEN

Ligger:as V B.G:1

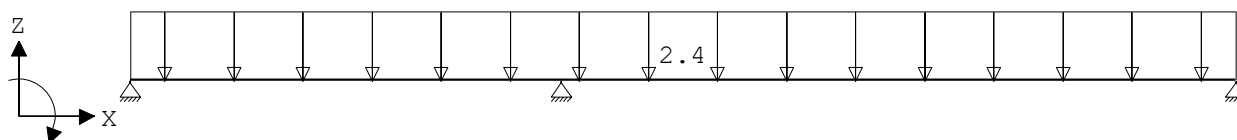
Permanent

| Last Ref. | Type       | Omschrijving | q1/p/m  | q2     | psi |
|-----------|------------|--------------|---------|--------|-----|
| Afstand   | Lengte     |              |         |        |     |
| 1         | 1:q-last   |              | -6.500  | -6.500 |     |
| 0.000     | 16.300     |              |         |        |     |
| 2         | 8:Puntlast |              | -16.500 |        |     |
| 0.000     |            |              |         |        |     |
| 3         | 8:Puntlast |              | -16.500 |        |     |
| 16.300    |            |              |         |        |     |

## VELDBELASTINGEN

Ligger:as V B.G:2

Sneeuw



## VELDBELASTINGEN

Ligger:as V B.G:2

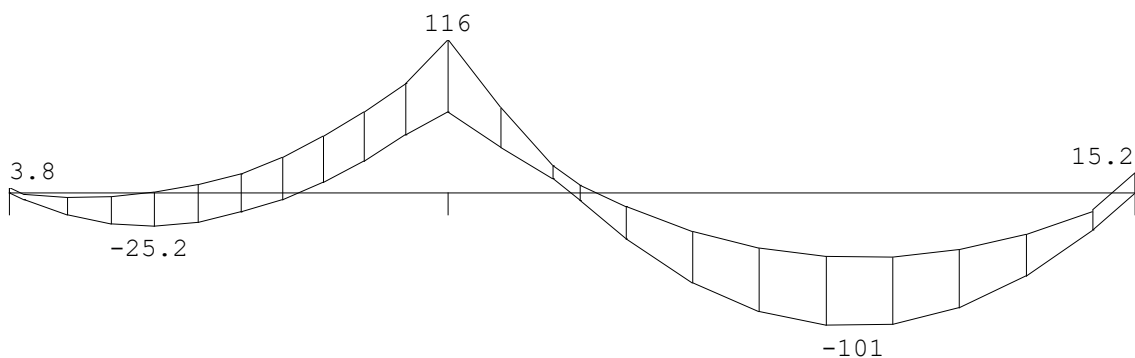
Sneeuw

| Last Ref. | Type     | Omschrijving | q1/p/m | q2     | psi |
|-----------|----------|--------------|--------|--------|-----|
| Afstand   | Lengte   |              |        |        |     |
| 1         | 1:q-last |              | -2.400 | -2.400 |     |
| 0.000     | 16.300   |              |        |        |     |

## OMHULLENDE VAN DE FUNDAMENTELE COMBINATIES

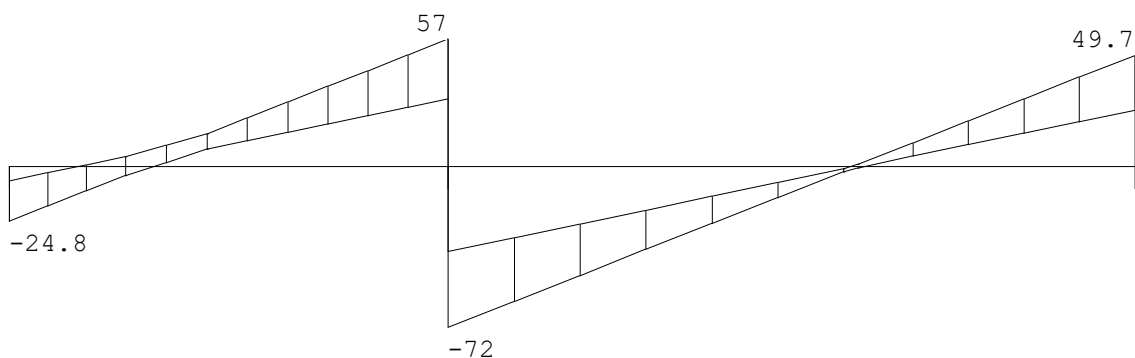
**MOMENTEN** Fysisch lineair  
combinatie

Ligger:as V Fundamentele



**DWARSKRACHTEN** Fysisch lineair  
combinatie

Ligger:as V Fundamentele



Fmin:21.4  
Fmax:44.6

68  
129

40.0  
70

**REACTIES** Fysisch lineair  
combinatie

Ligger:as V Fundamentele

| Stp | Fmin  | Fmax   | Mmin | Mmax |
|-----|-------|--------|------|------|
| 1   | 21.42 | 44.58  | 0.00 | 0.00 |
| 2   | 68.38 | 129.34 | 0.00 | 0.00 |
| 3   | 40.04 | 69.50  | 0.00 | 0.00 |

## LIGGER:as W

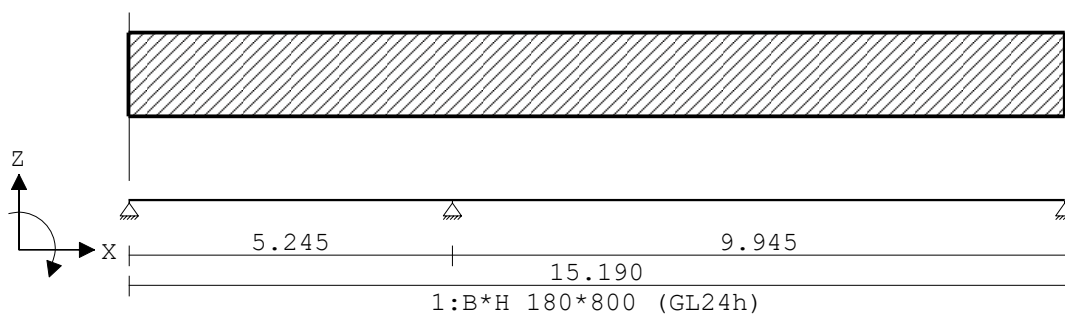
Profiel : B\*H 180\*800

Toevallige inklemmingen begin : 15% Toevallige inklemming eind : 15%

Toevallige inklemmingen : 15% op tussensteunpunten met een scharnier.

## GEOMETRIE

Ligger:as W



## VELDLENGTEN

Ligger:as W

| Veld | Vanaf | Tot    | Lengte |
|------|-------|--------|--------|
| 1    | 0.000 | 5.245  | 5.245  |
| 2    | 5.245 | 15.190 | 9.945  |

## PROFIELVORMEN [mm]

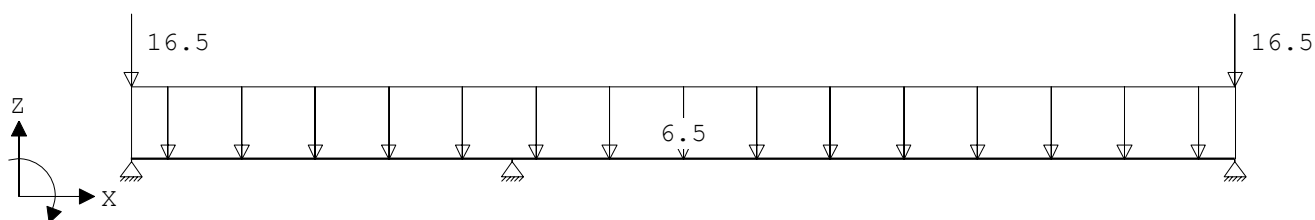
1 B\*H 180\*800



## VELDBELASTINGEN

Ligger:as W B.G:1

Permanent



## VELDBELASTINGEN

Ligger:as W B.G:1

Permanent

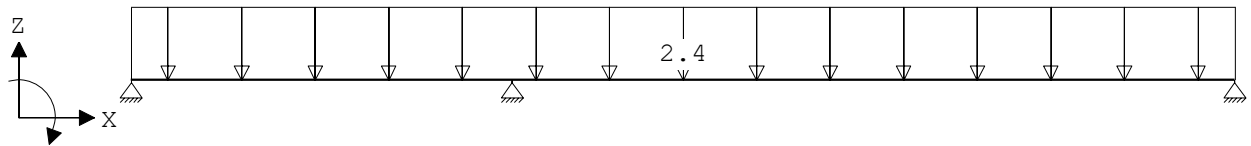
| Last Ref. | Type       | Omschrijving | q1/p/m  | q2     | psi |
|-----------|------------|--------------|---------|--------|-----|
| Afstand   | Lengte     |              |         |        |     |
| 1         | 1:q-last   |              | -6.500  | -6.500 |     |
| 0.000     | 15.190     |              |         |        |     |
| 2         | 8:Puntlast |              | -16.500 |        |     |
| 0.000     |            |              |         |        |     |
| 3         | 8:Puntlast |              | -16.500 |        |     |
| 15.190    |            |              |         |        |     |



## VELDBELASTINGEN

Ligger:as W B.G:2

Sneeuw



## VELDBELASTINGEN

Ligger:as W B.G:2

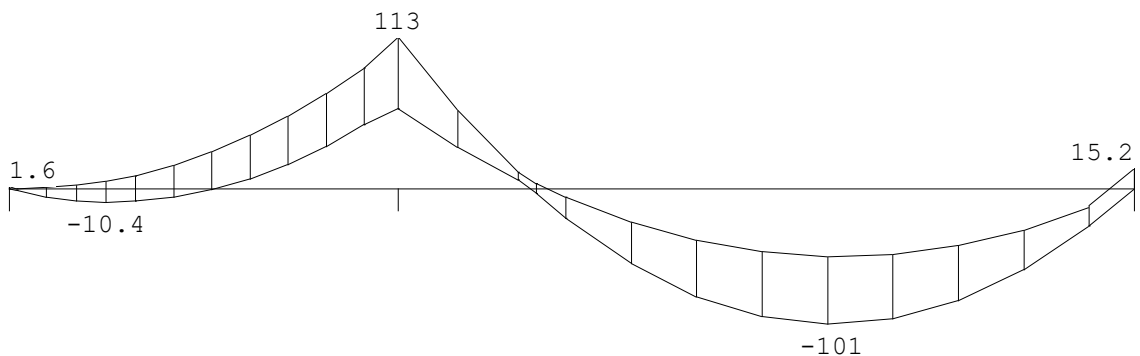
Sneeuw

| Last Ref. | Type     | Omschrijving | q1/p/m | q2     | psi |
|-----------|----------|--------------|--------|--------|-----|
| Afstand   | Lengte   |              |        |        |     |
| 1         | 1:q-last |              | -2.400 | -2.400 |     |
| 0.000     | 15.190   |              |        |        |     |

## OMHULLENDE VAN DE FUNDAMENTELE COMBINATIES

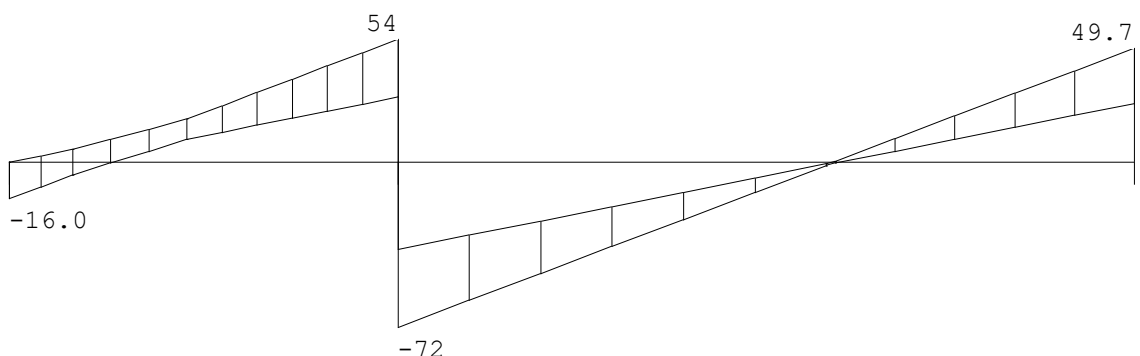
**MOMENTEN** Fysisch lineair  
combinatie

Ligger:as W Fundamentele



**DWARSKRACHTEN** Fysisch lineair  
combinatie

Ligger:as W Fundamentele



Fmin:14.8  
Fmax:35.8

66  
126

40.5  
70

## REACTIES

Fysisch lineair  
combinatie

Ligger:as W Fundamentele

| Stp | Fmin  | Fmax   | Mmin | Mmax |
|-----|-------|--------|------|------|
| 1   | 14.79 | 35.76  | 0.00 | 0.00 |
| 2   | 66.41 | 125.62 | 0.00 | 0.00 |
| 3   | 40.47 | 69.50  | 0.00 | 0.00 |

## LIGGER:as X

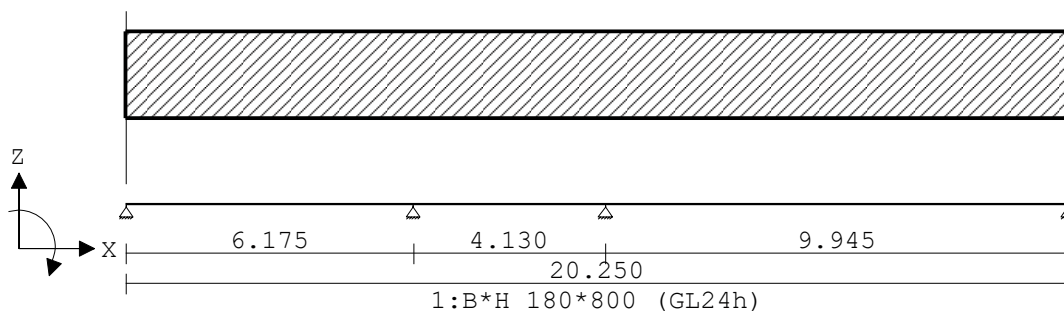
Profiel : B\*H 180\*800

Toevalige inklemmingen begin : 15%      Toevalige inklemming eind : 15%

Toevalige inklemmingen : 15% op tussensteunpunten met een scharnier.

## GEOMETRIE

Ligger:as X



## VELDLENGTEN

Ligger:as X

| Veld | Vanaf  | Tot    | Lengte |
|------|--------|--------|--------|
| 1    | 0.000  | 6.175  | 6.175  |
| 2    | 6.175  | 10.305 | 4.130  |
| 3    | 10.305 | 20.250 | 9.945  |

## PROFIELVORMEN [mm]

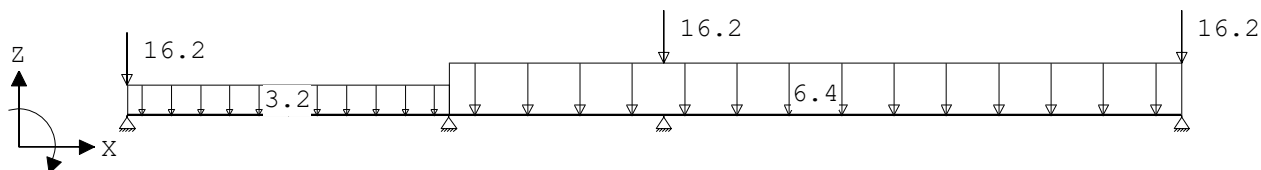
1 B\*H 180\*800



## VELDBELASTINGEN

Ligger:as X B.G:1

Permanent



## VELDBELASTINGEN

Ligger:as X B.G:1

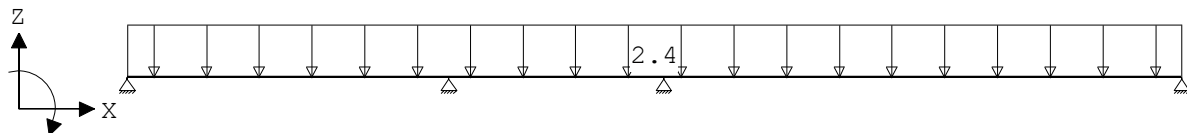
Permanent

| Last Ref. | Type       | Omschrijving | q1/p/m  | q2     | psi |
|-----------|------------|--------------|---------|--------|-----|
| Afstand   | Lengte     |              |         |        |     |
| 1         | 1:q-last   |              | -3.200  | -3.200 |     |
| 0.000     | 6.175      |              |         |        |     |
| 2         | 1:q-last   |              | -6.400  | -6.400 |     |
| 6.175     | 14.075     |              |         |        |     |
| 3         | 8:Puntlast |              | -16.200 |        |     |
| 0.000     |            |              |         |        |     |
| 4         | 8:Puntlast |              | -16.200 |        |     |
| 20.250    |            |              |         |        |     |
| 5         | 8:Puntlast |              | -16.200 |        |     |
| 10.305    |            |              |         |        |     |

## VELDBELASTINGEN

Ligger:as X B.G:2

Sneeuw



## VELDBELASTINGEN

Ligger:as X B.G:2

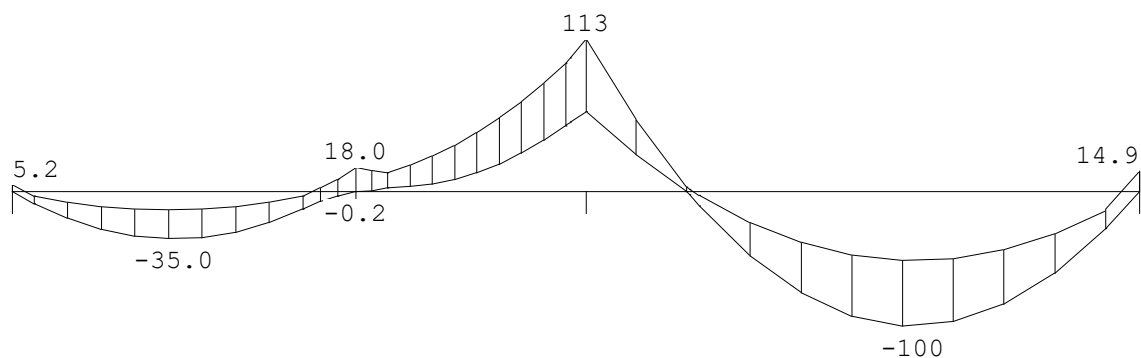
Sneeuw

| Last Ref. | Type     | Omschrijving | q1/p/m | q2     | psi |
|-----------|----------|--------------|--------|--------|-----|
| Afstand   | Lengte   |              |        |        |     |
| 1         | 1:q-last |              | -2.400 | -2.400 |     |
| 0.000     | 20.250   |              |        |        |     |

## OMHULLENDE VAN DE FUNDAMENTELE COMBINATIES

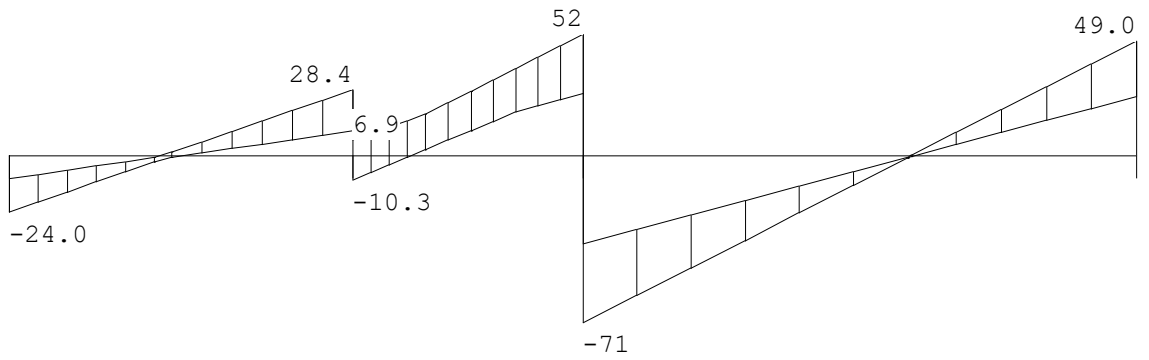
**MOMENTEN** Fysisch lineair  
combinatie

Ligger:as X Fundamentele



**DWARSKRACHTEN** Fysisch lineair  
combinatie

Ligger:as X Fundamentele



Fmin:24.3  
Fmax:43.4

8.6  
38.5

79  
143

40.1  
68

## REACTIES Fysisch lineair combinatie

Ligger:as X Fundamentele

| Stp | Fmin  | Fmax   | Mmin | Mmax |
|-----|-------|--------|------|------|
| 1   | 24.31 | 43.45  | 0.00 | 0.00 |
| 2   | 8.63  | 38.54  | 0.00 | 0.00 |
| 3   | 78.69 | 142.91 | 0.00 | 0.00 |
| 4   | 40.08 | 68.49  | 0.00 | 0.00 |

## LIGGER:as Y-A'

Profiel : B\*H 180\*800

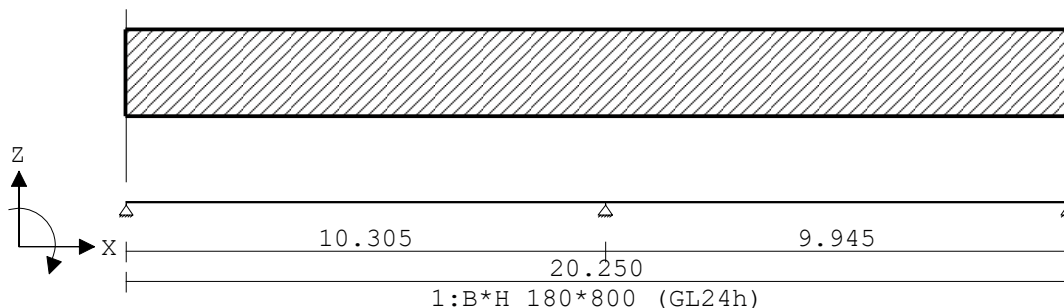
Toevallige inklemmingen begin : 15% Toevallige inklemming eind : 15%

Toevallige inklemmingen : 15% op tussensteunpunten met een scharnier.

## GEOMETRIE

Ligger:as

Y-A'



## VELDLENGTEN

Ligger:as

Y-A'

| Veld | Vanaf  | Tot    | Lengte |
|------|--------|--------|--------|
| 1    | 0.000  | 10.305 | 10.305 |
| 2    | 10.305 | 20.250 | 9.945  |

## PROFIELVORMEN [mm]

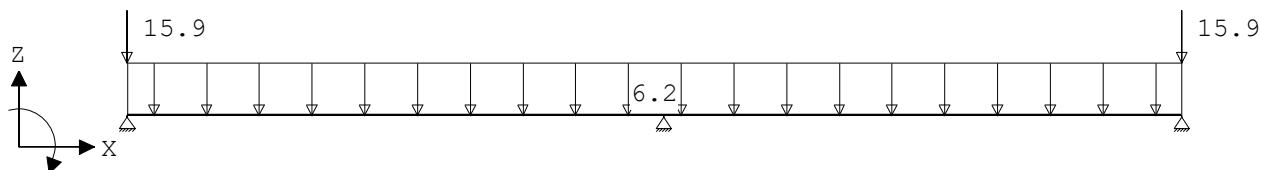
1 B\*H 180\*800



## VELDBELASTINGEN

Ligger:as Y-A' B.G:1

Permanent



## VELDBELASTINGEN

Ligger:as Y-A' B.G:1

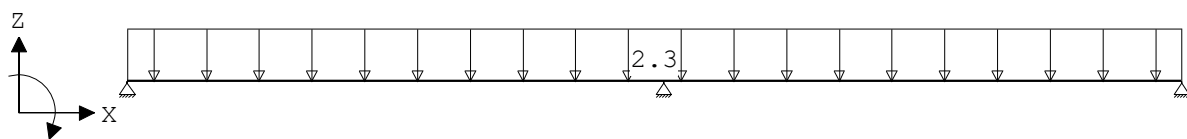
Permanent

| Last Ref. | Type       | Omschrijving | q1/p/m  | q2     | psi |
|-----------|------------|--------------|---------|--------|-----|
| Afstand   | Lengte     |              |         |        |     |
| 1         | 1:q-last   |              | -6.200  | -6.200 |     |
| 0.000     | 20.250     |              |         |        |     |
| 2         | 8:Puntlast |              | -15.900 |        |     |
| 0.000     |            |              |         |        |     |
| 3         | 8:Puntlast |              | -15.900 |        |     |
| 20.250    |            |              |         |        |     |

## VELDBELASTINGEN

Ligger:as Y-A' B.G:2

Sneeuw



## VELDBELASTINGEN

Ligger:as Y-A' B.G:2

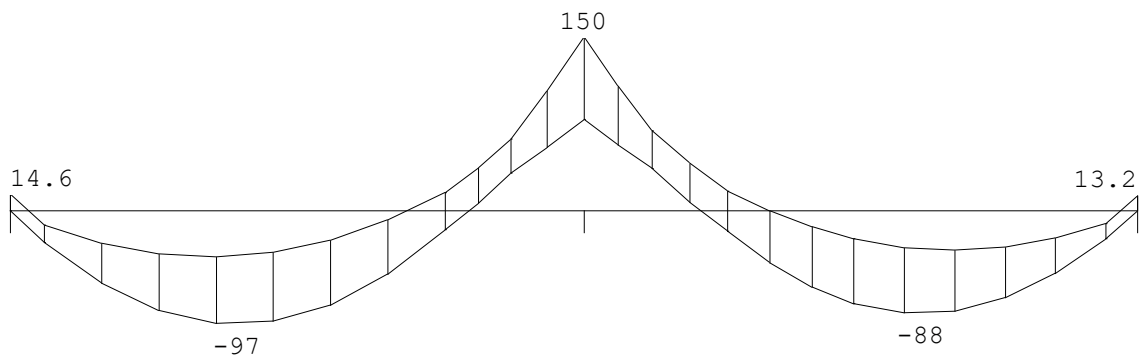
Sneeuw

| Last Ref. | Type     | Omschrijving | q1/p/m | q2     | psi |
|-----------|----------|--------------|--------|--------|-----|
| Afstand   | Lengte   |              |        |        |     |
| 1         | 1:q-last |              | -2.300 | -2.300 |     |
| 0.000     | 20.250   |              |        |        |     |

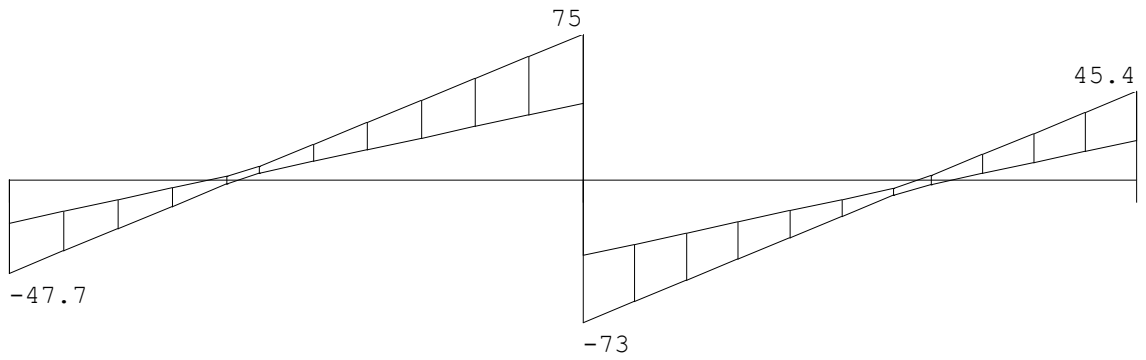
## OMHULLENDE VAN DE FUNDAMENTELE COMBINATIES

**MOMENTEN** Fysisch lineair combinatie

Ligger:as Y-A' Fundamentele



**DWARSKRACHTEN** Fysisch lineair Ligger:as Y-A' Fundamentele combinatie



Fmin: 36.4  
Fmax: 67

78  
148

34.7  
64

## REACTIES

Fysisch lineair  
combinatie

Ligger:as Y-A' Fundamentele

| Stp | Fmin  | Fmax   | Mmin | Mmax |
|-----|-------|--------|------|------|
| 1   | 36.42 | 66.79  | 0.00 | 0.00 |
| 2   | 78.22 | 147.97 | 0.00 | 0.00 |
| 3   | 34.72 | 64.47  | 0.00 | 0.00 |

## LIGGER:as B'

Profiel : B\*H 180\*800

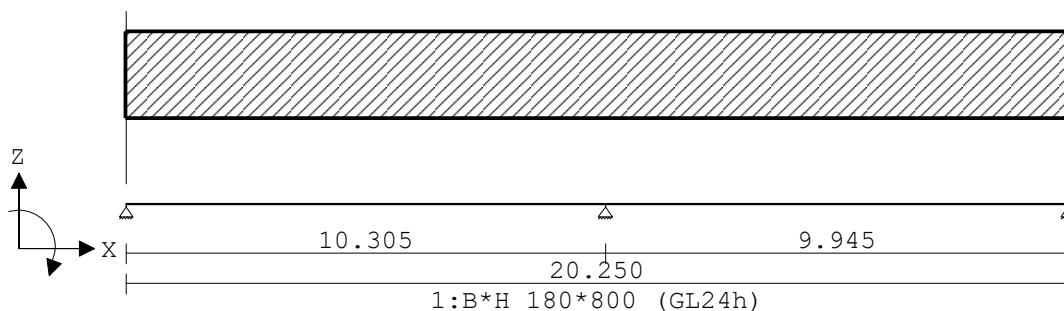
Toevalige inklemmingen begin : 15%      Toevalige inklemming eind : 15%

Toevalige inklemmingen : 15% op tussensteunpunten met een scharnier.

## GEOMETRIE

Ligger:as

B'



## VELDLENGTEN

Ligger:as

B'

| Veld | Vanaf  | Tot    | Lengte |
|------|--------|--------|--------|
| 1    | 0.000  | 10.305 | 10.305 |
| 2    | 10.305 | 20.250 | 9.945  |

## PROFIELVORMEN [mm]

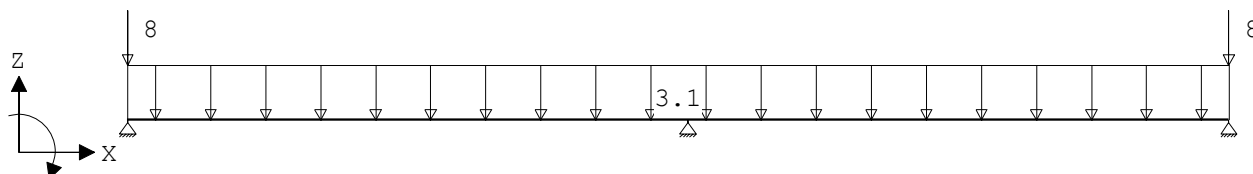
1 B\*H 180\*800



## VELDBELASTINGEN

Ligger:as B' B.G:1

Permanent



## VELDBELASTINGEN

Ligger:as B' B.G:1

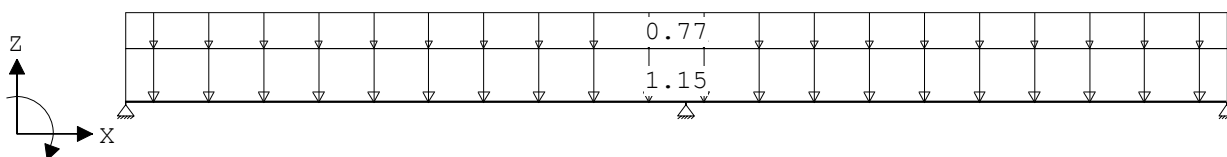
Permanent

| Last Ref. | Type       | Omschrijving | q1/p/m | q2     | psi |
|-----------|------------|--------------|--------|--------|-----|
| Afstand   | Lengte     |              |        |        |     |
| 1         | 1:q-last   |              | -3.100 | -3.100 |     |
| 0.000     | 20.250     |              |        |        |     |
| 2         | 8:Puntlast |              | -8.000 |        |     |
| 0.000     |            |              |        |        |     |
| 3         | 8:Puntlast |              | -8.000 |        |     |
| 20.250    |            |              |        |        |     |

## VELDBELASTINGEN

Ligger:as B' B.G:2

Sneeuw



## VELDBELASTINGEN

Ligger:as B' B.G:2

Sneeuw

| Last Ref. | Type     | Omschrijving | q1/p/m | q2     | psi |
|-----------|----------|--------------|--------|--------|-----|
| Afstand   | Lengte   |              |        |        |     |
| 1         | 1:q-last |              | -1.150 | -1.150 |     |
| 0.000     | 20.250   |              |        |        |     |
| 2         | 1:q-last |              | -0.770 | -0.770 |     |
| 0.000     | 20.250   |              |        |        |     |

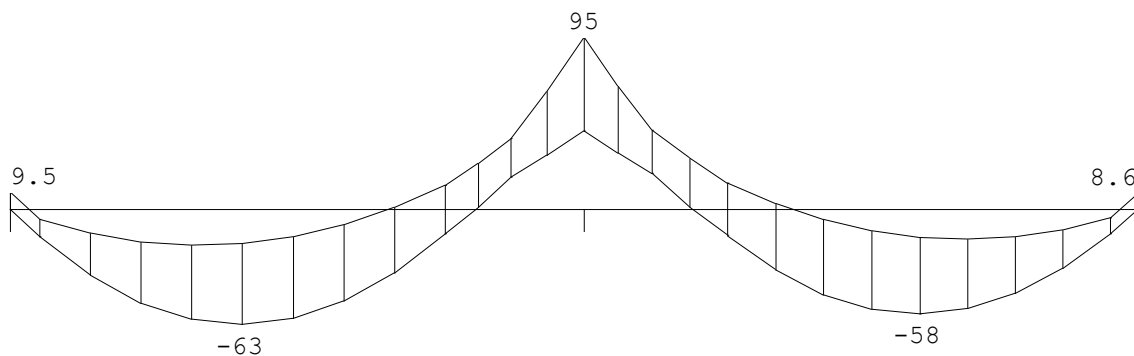
## OMHULLENDE VAN DE FUNDAMENTELE COMBINATIES

### MOMENTEN

Fysisch lineair

Ligger:as B' Fundamentele

combinatie

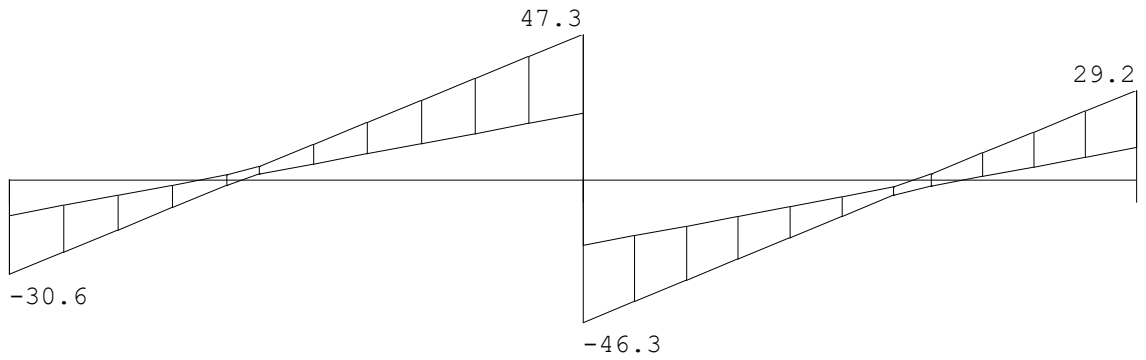


### DWARSKRACHTEN

Fysisch lineair

Ligger:as B' Fundamentele

combinatie



Fmin:18.7  
Fmax:40.2

42.9  
94

17.7  
38.8



**REACTIES** Fysisch lineair  
combinatie

Ligger:as B' Fundamentele

| Stp | Fmin  | Fmax  | Mmin | Mmax |
|-----|-------|-------|------|------|
| 1   | 18.75 | 40.21 | 0.00 | 0.00 |
| 2   | 42.90 | 93.66 | 0.00 | 0.00 |
| 3   | 17.72 | 38.80 | 0.00 | 0.00 |

## Bijlage J Uitvoer Kleedruimte ligger verdieping as 7

**Technosoft Liggers release 6.73a**  
**2023**

**26 jan**

Project.....: SGU021041 - Uitbreiding zwembad de Meerkant te Amstelveen  
Onderdeel.....: Kleedruimte verdieping as 7  
Dimensies.....: kN/m/rad  
Datum.....: 21/11/2022  
Bestand.....: H:\SGU021041\BEREKENINGEN\04\_DO\Kleedruimte verdieping as  
7.dlw

Betrouwbaarheidsklasse : 2 Referentieperiode :  
50

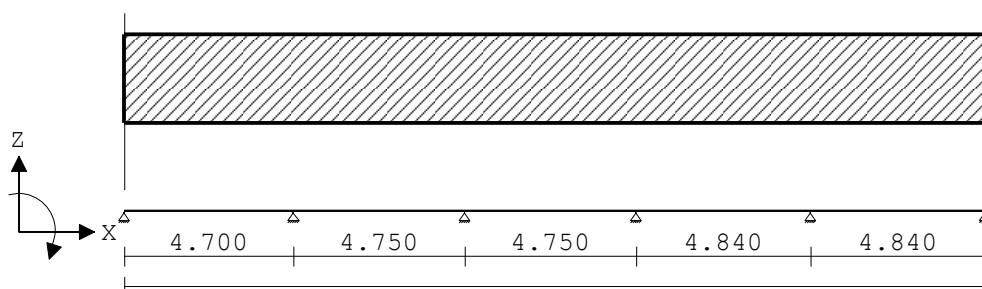
### **Toegepaste normen volgens Eurocode met Nederlandse NB**

|             |                      |                 |
|-------------|----------------------|-----------------|
| Belastingen | NEN-EN 1990:2002     | C2:2010,A1:2019 |
| NB:2019(nl) |                      |                 |
|             | NEN-EN 1991-1-1:2002 | C1/C11:2019     |
| NB:2019(nl) |                      |                 |
| Staal       | NEN-EN 1993-1-1:2006 | C2:2011,A1:2016 |
| NB:2016(nl) |                      |                 |

### **GEOMETRIE**

Ligger:1

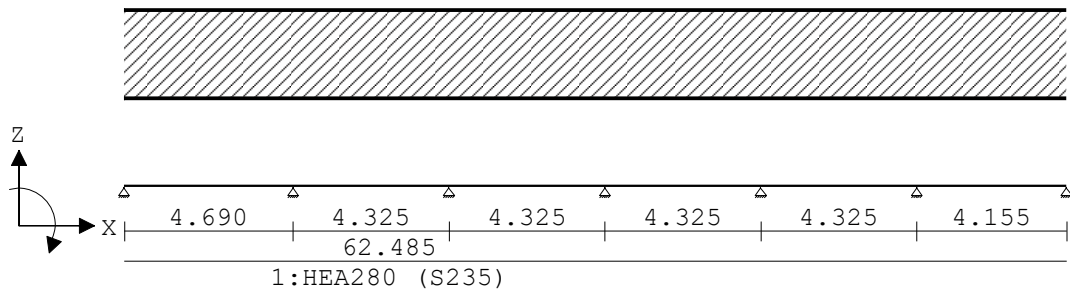
**Velden: 1 t/m 5**



### **GEOMETRIE**

Ligger:1

**Velden: 6 t/m 11**

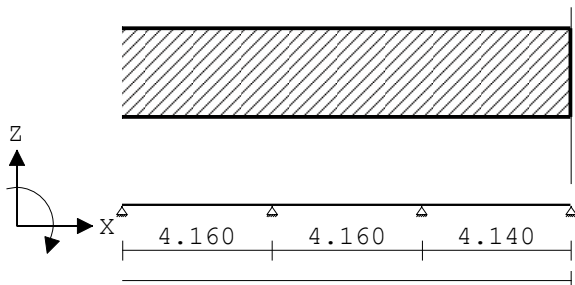


Project.....: SGU021041 - Uitbreiding zwembad de Meerkant te Amstelveen  
Onderdeel.....: Kledruimte verdieping as 7

## GEOMETRIE

Ligger:1

**Velden: 12 t/m 14**



## VELDLENGTEN

Ligger:1

| Veld | Vanaf  | Tot    | Lengte | Veld | Vanaf  | Tot    | Lengte |
|------|--------|--------|--------|------|--------|--------|--------|
| 1    | 0.000  | 4.700  | 4.700  | 6    | 23.880 | 28.570 | 4.690  |
| 2    | 4.700  | 9.450  | 4.750  | 7    | 28.570 | 32.895 | 4.325  |
| 3    | 9.450  | 14.200 | 4.750  | 8    | 32.895 | 37.220 | 4.325  |
| 4    | 14.200 | 19.040 | 4.840  | 9    | 37.220 | 41.545 | 4.325  |
| 5    | 19.040 | 23.880 | 4.840  | 10   | 41.545 | 45.870 | 4.325  |
| 11   | 45.870 | 50.025 | 4.155  |      |        |        |        |
| 12   | 50.025 | 54.185 | 4.160  |      |        |        |        |
| 13   | 54.185 | 58.345 | 4.160  |      |        |        |        |
| 14   | 58.345 | 62.485 | 4.140  |      |        |        |        |

## MATERIALEN

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

## PROFIELEN [mm]

| Prof. Omschrijving | Materiaal | Oppervlak  |
|--------------------|-----------|------------|
| 1 HEA280           | 1:S235    | 9.7300e+03 |
| 1.3670e+08         | 0.00      |            |

## PROFIELEN vervolg [mm]

| Prof. | Staaftype | Breedte | Hoogte | e     | Type | b1 | h1 | b2 | h2 |
|-------|-----------|---------|--------|-------|------|----|----|----|----|
| 1     | 0:Normaal | 280     | 270    | 135.0 |      |    |    |    |    |

## PROFIELVORMEN [mm]

|   |        |
|---|--------|
| 1 | HEA280 |
|---|--------|



Project.....: SGU021041 - Uitbreiding zwembad de Meerkant te Amstelveen  
Onderdeel.....: Kleedruimte verdieping as 7

### 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 | 0.50     | 0.50     | 0.30     |
| 0.00              |                     |          |          |          |

### BELASTINGGEVALLEN

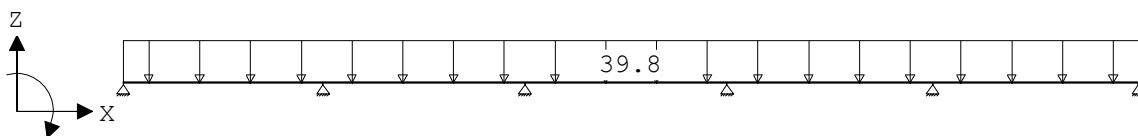
| B.G. Omschrijving | Type                   |
|-------------------|------------------------|
| 1 Permanent       | 1 Permanente belasting |
| 2 Veranderlijk    | 2 Ver. bel. pers. ed.  |
| (q <sub>k</sub> ) |                        |

### VELDBELASTINGEN

Ligger:1 B.G:1

Permanent

Velden: 1 t/m 5

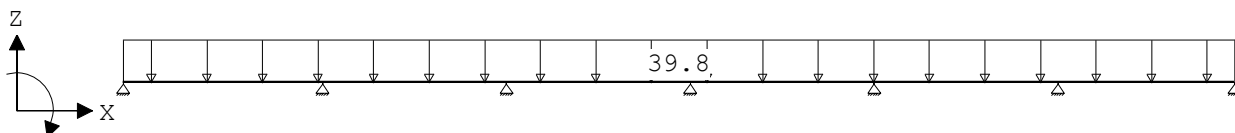


### VELDBELASTINGEN

Ligger:1 B.G:1

Permanent

Velden: 6 t/m 11

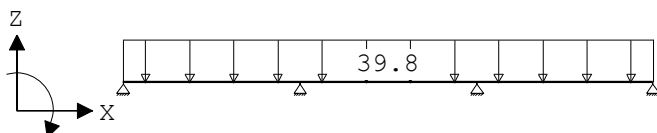


### VELDBELASTINGEN

Ligger:1 B.G:1

Permanent

Velden: 12 t/m 14



### VELDBELASTINGEN

Ligger:1 B.G:1

Permanent

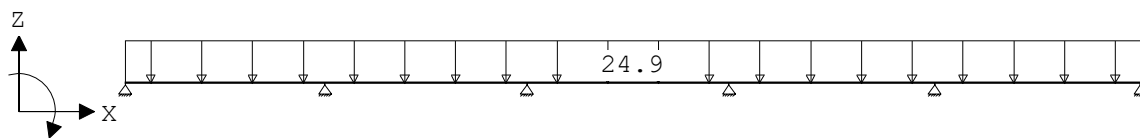
| Last Ref. | Type     | Omschrijving | q1/p/m  | q2      | psi |
|-----------|----------|--------------|---------|---------|-----|
| Afstand   | Lengte   |              |         |         |     |
| 1         | 1:q-last |              | -39.800 | -39.800 |     |
| 0.000     | 62.485   |              |         |         |     |

# VELDBELASTINGEN

Ligger:1 B.G:2

Veranderlijk

Velden: 1 t/m 5



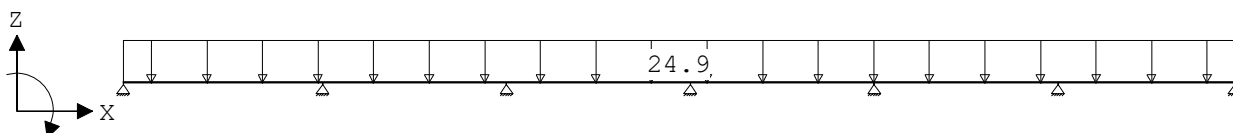
Project.....: SGU021041 - Uitbreiding zwembad de Meerkant te Amstelveen  
Onderdeel.....: Kleedruimte verdieping as 7

## VELDBELASTINGEN

Ligger:1 B.G:2

Veranderlijk

Velden: 6 t/m 11

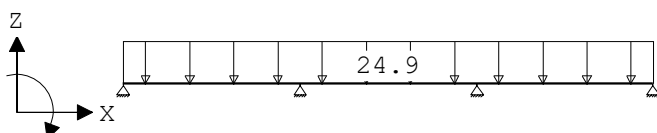


## VELDBELASTINGEN

Ligger:1 B.G:2

Veranderlijk

Velden: 12 t/m 14



## VELDBELASTINGEN

Ligger:1 B.G:2

Veranderlijk

| Last Ref. | Type     | Omschrijving | q1/p/m  | q2      | psi |
|-----------|----------|--------------|---------|---------|-----|
| Afstand   | Lengte   |              |         |         |     |
| 1         | 1:q-last |              | -24.900 | -24.900 |     |
| 0.000     | 62.485   |              |         |         |     |

## BELASTINGCOMBINATIES

| BC Type  | BG Gen. | Factor | BG Gen. | Factor | BG Gen. | Factor | BG Gen. |
|----------|---------|--------|---------|--------|---------|--------|---------|
| 1 Fund.  | 1 Perm  | 1.35   |         |        |         |        |         |
| 2 Fund.  | 1 Perm  | 1.35   | 2 psi0  | 1.50   |         |        |         |
| 3 Fund.  | 1 Perm  | 1.20   | 2 Extr  | 1.50   |         |        |         |
| 4 Fund.  | 1 Perm  | 0.90   |         |        |         |        |         |
| 5 Fund.  | 1 Perm  | 0.90   | 2 psi0  | 1.50   |         |        |         |
| 6 Fund.  | 1 Perm  | 0.90   | 2 Extr  | 1.50   |         |        |         |
| 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   |

Project.....: SGU021041 - Uitbreiding zwembad de Meerkant te Amstelveen  
Onderdeel.....: Kleedruimte verdieping as 7

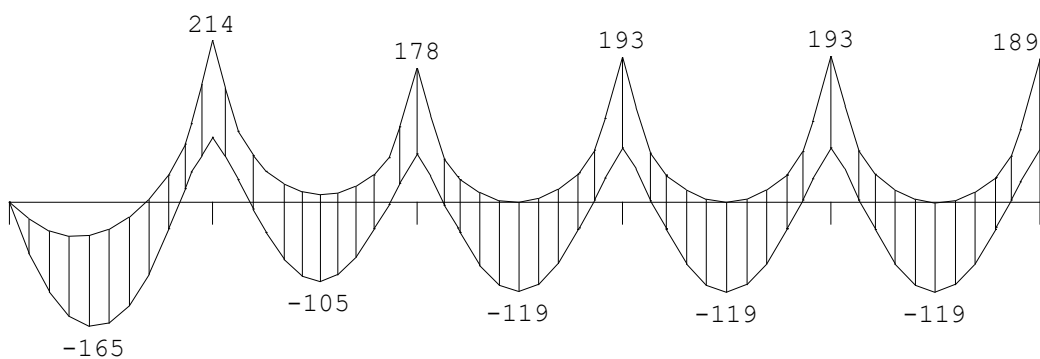
## OMHULLENDE VAN DE FUNDAMENTELE COMBINATIES

### MOMENTEN

Ligger:1 Fundamentele

combinatie

Velden: 1 t/m 5

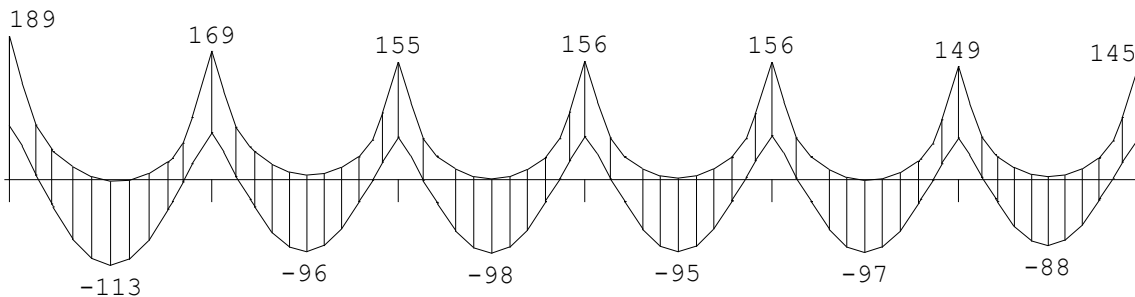


### MOMENTEN

Ligger:1 Fundamentele

combinatie

Velden: 6 t/m 11

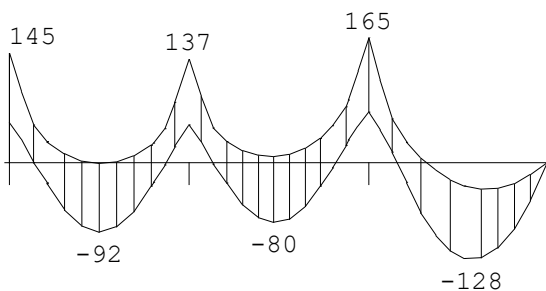


### MOMENTEN

Ligger:1 Fundamentele

combinatie

Velden: 12 t/m 14



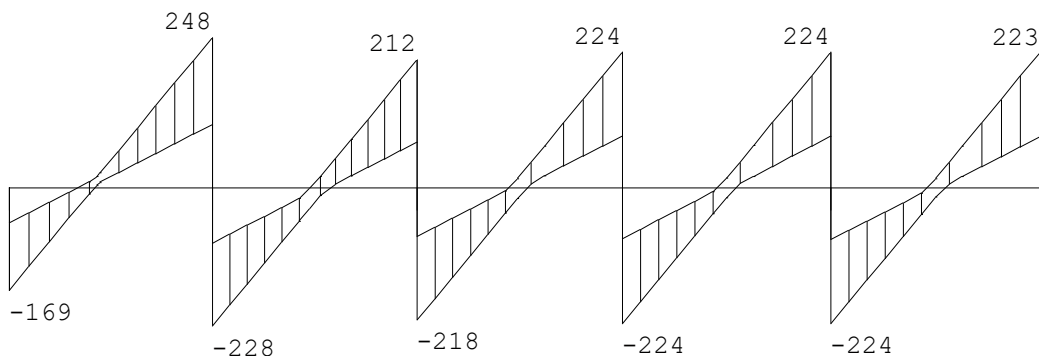
Project.....: SGU021041 - Uitbreiding zwembad de Meerkant te Amstelveen  
Onderdeel.....: Kleedruimte verdieping as 7

### DWARSKRACHTEN

Ligger:1 Fundamentele

combinatie

Velden: 1 t/m 5



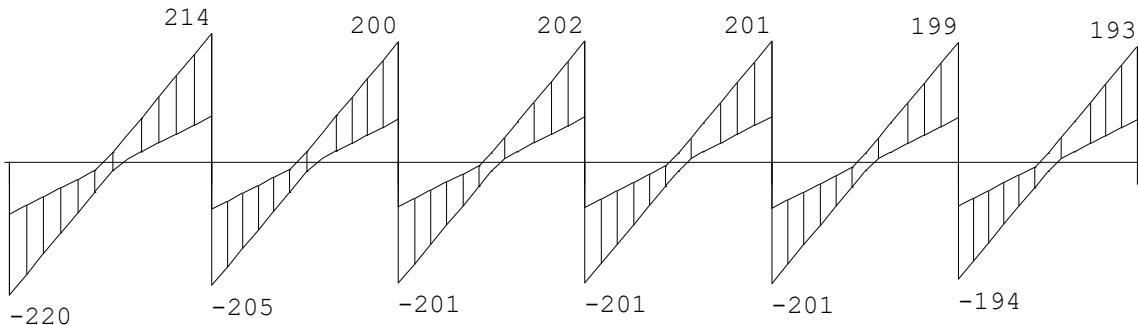
|          |     |     |     |     |     |
|----------|-----|-----|-----|-----|-----|
| Fmin:58  | 195 | 167 | 177 | 177 | 176 |
| Fmax:169 | 476 | 429 | 447 | 448 | 443 |

### DWARSKRACHTEN

Ligger:1 Fundamentele

combinatie

Velden: 6 t/m 11



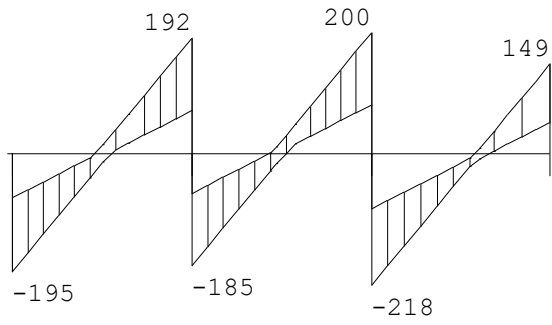
|          |     |     |     |     |     |     |
|----------|-----|-----|-----|-----|-----|-----|
| Fmin:176 | 164 | 156 | 158 | 159 | 154 | 152 |
| Fmax:443 | 419 | 401 | 402 | 402 | 393 | 388 |

### DWARSKRACHTEN

Ligger:1 Fundamentele

combinatie

Velden: 12 t/m 14



|          |     |     |     |
|----------|-----|-----|-----|
| Fmin:152 | 147 | 172 | 51  |
| Fmax:388 | 377 | 418 | 149 |

Project.....: SGU021041 - Uitbreiding zwembad de Meerkant te Amstelveen  
Onderdeel.....: Kleedruimte verdieping as 7

## REACTIES

Ligger:1 Fundamentele

combinatie

| Stp | Fmin   | Fmax   | Mmin | Mmax |
|-----|--------|--------|------|------|
| 1   | 57.97  | 168.66 | 0.00 | 0.00 |
| 2   | 195.44 | 475.72 | 0.00 | 0.00 |
| 3   | 167.18 | 429.36 | 0.00 | 0.00 |
| 4   | 176.53 | 447.50 | 0.00 | 0.00 |
| 5   | 177.01 | 448.04 | 0.00 | 0.00 |
| 6   | 175.62 | 443.40 | 0.00 | 0.00 |
| 7   | 163.99 | 418.62 | 0.00 | 0.00 |
| 8   | 156.25 | 401.06 | 0.00 | 0.00 |
| 9   | 158.11 | 402.47 | 0.00 | 0.00 |
| 10  | 158.67 | 402.28 | 0.00 | 0.00 |
| 11  | 154.48 | 393.28 | 0.00 | 0.00 |
| 12  | 152.32 | 388.06 | 0.00 | 0.00 |
| 13  | 146.85 | 376.85 | 0.00 | 0.00 |
| 14  | 171.63 | 417.75 | 0.00 | 0.00 |
| 15  | 51.29  | 148.63 | 0.00 | 0.00 |

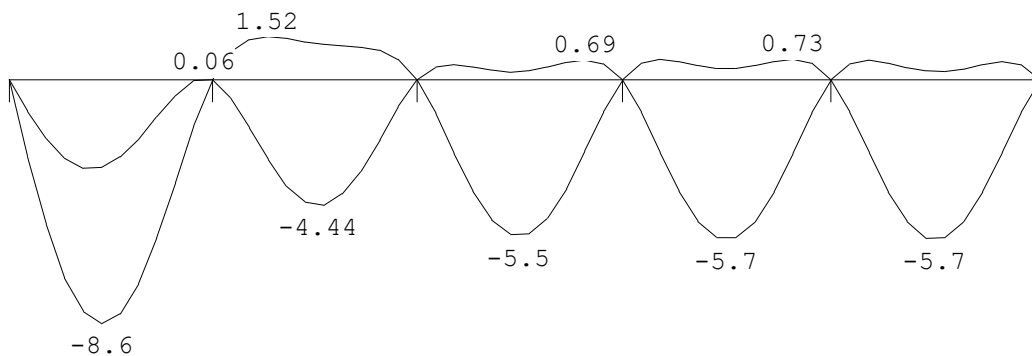
## OMHULLENDE VAN DE KARAKTERISTIEKE COMBINATIES

### VERPLAATSINGEN [mm]

Ligger:1 Karakteristieke

combinatie

Velden: 1 t/m 5

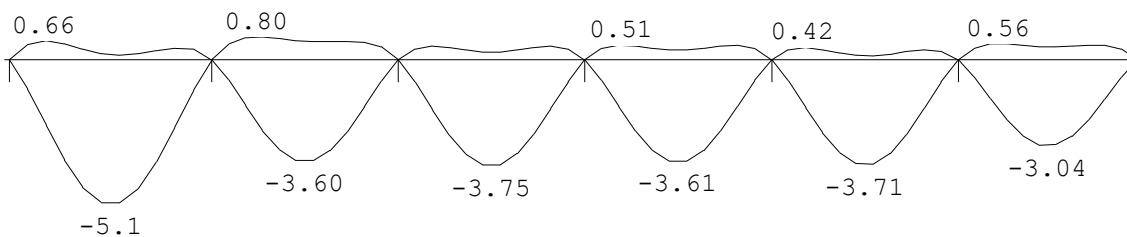


### VERPLAATSINGEN [mm]

Ligger:1 Karakteristieke

combinatie

Velden: 6 t/m 11





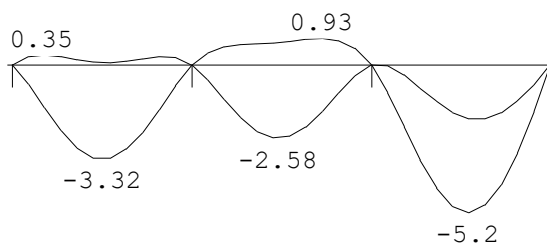
Project.....: SGU021041 - Uitbreiding zwembad de Meerkant te Amstelveen  
Onderdeel.....: Kledruimte verdieping as 7

## VERPLAATSINGEN [mm]

Ligger:1 Karakteristieke

combinatie

Velden: 12 t/m 14



## STAALPROFIELEN - ALGEMENE GEGEVENS

Ligger:1

Stabiliteit: Classificatie gehele constructie:

Geschoord

### PROFIEL/MATERIAAL

P/M Profielnaam  
drsn.  
nr.  
klasse

Vloeispl. Productie Min.  
[N/mm<sup>2</sup>] methode

1 HEA280

235 Gewalst

1

Partiële veiligheidsfactoren:

Gamma M;0

:

1.00

Gamma M;1

:

1.00

### KIPSTABILITEIT

Ligger:1

Staaf Plts. l gaffel Kipsteunafstanden  
aangr. [m] [m]

|   |       |        |      |               |
|---|-------|--------|------|---------------|
| 1 | 1.0*h | boven: | 4.70 | 2*1,567;1,566 |
|   |       | onder: | 4.70 | 4.700         |
| 2 | 1.0*h | boven: | 4.75 | 2*1,583;1,584 |
|   |       | onder: | 4.75 | 4.750         |
| 3 | 1.0*h | boven: | 4.75 | 2*1,583;1,584 |
|   |       | onder: | 4.75 | 4.750         |
| 4 | 1.0*h | boven: | 4.84 | 3*1,613       |
|   |       | onder: | 4.84 | 4.840         |
| 5 | 1.0*h | boven: | 4.84 | 3*1,613       |
|   |       | onder: | 4.84 | 4.840         |
| 6 | 1.0*h | boven: | 4.69 | 3*1,563       |
|   |       | onder: | 4.69 | 4.690         |
| 7 | 1.0*h | boven: | 4.32 | 2*1,442;1,441 |
|   |       | onder: | 4.32 | 4.325         |
| 8 | 1.0*h | boven: | 4.32 | 2*1,442;1,441 |
|   |       | onder: | 4.32 | 4.325         |
| 9 | 1.0*h | boven: | 4.32 | 2*1,442;1,441 |
|   |       | onder: | 4.32 | 4.325         |



|    |       |        |      |               |
|----|-------|--------|------|---------------|
| 10 | 1.0*h | boven: | 4.32 | 2*1,442;1,441 |
|    |       | onder: | 4.32 | 4.325         |
| 11 | 1.0*h | boven: | 4.16 | 3*1,385       |
|    |       | onder: | 4.16 | 4.155         |



Project.....: SGU021041 - Uitbreiding zwembad de Meerkant te Amstelveen  
Onderdeel.....: Kleedruimte verdieping as 7

## KIPSTABILITEIT

Ligger:1

| Staafl | Plts.<br>aanr. |        | l gaffel<br>[m] | Kipsteunafstanden<br>[m] |
|--------|----------------|--------|-----------------|--------------------------|
| 12     | 1.0*h          | boven: | 4.16            | 3*1,387                  |
|        |                | onder: | 4.16            | 4.160                    |
| 13     | 1.0*h          | boven: | 4.16            | 3*1,387                  |
|        |                | onder: | 4.16            | 4.160                    |
| 14     | 1.0*h          | boven: | 4.14            | 3*1,38                   |
|        |                | onder: | 4.14            | 4.140                    |

## TOETSING SPANNINGEN

Ligger:1

Staafl P/M BC Sit Kl Plaats Norm Artikel Formule Hoogste toetsing  
Opm.

| nr. | U.C. [N/mm <sup>2</sup> ] |   |    |   |       |         |       |        |       |     |
|-----|---------------------------|---|----|---|-------|---------|-------|--------|-------|-----|
| 1   | 1                         | 3 | 4  | 1 | Einde | EN3-1-1 | 6.2.8 | (6.30) | 0.822 | 193 |
| 2   | 1                         | 3 | 4  | 1 | Begin | EN3-1-1 | 6.2.8 | (6.30) | 0.821 | 193 |
| 3   | 1                         | 3 | 6  | 1 | Einde | EN3-1-1 | 6.2.8 | (6.30) | 0.738 | 173 |
| 4   | 1                         | 3 | 7  | 1 | Einde | EN3-1-1 | 6.2.8 | (6.30) | 0.741 | 174 |
| 5   | 1                         | 3 | 7  | 1 | Begin | EN3-1-1 | 6.2.8 | (6.30) | 0.741 | 174 |
| 6   | 1                         | 3 | 8  | 1 | Begin | EN3-1-1 | 6.2.8 | (6.30) | 0.725 | 170 |
| 7   | 1                         | 3 | 9  | 1 | Begin | EN3-1-1 | 6.2.8 | (6.30) | 0.647 | 152 |
| 8   | 1                         | 3 | 11 | 1 | Einde | EN3-1-1 | 6.2.8 | (6.30) | 0.597 | 140 |
| 9   | 1                         | 3 | 11 | 1 | Begin | EN3-1-1 | 6.2.8 | (6.30) | 0.597 | 140 |
| 10  | 1                         | 3 | 12 | 1 | Begin | EN3-1-1 | 6.2.8 | (6.30) | 0.597 | 140 |
| 11  | 1                         | 3 | 13 | 1 | Begin | EN3-1-1 | 6.2.8 | (6.30) | 0.571 | 134 |
| 12  | 1                         | 3 | 14 | 1 | Begin | EN3-1-1 | 6.2.8 | (6.30) | 0.555 | 130 |
| 13  | 1                         | 3 | 16 | 1 | Einde | EN3-1-1 | 6.2.8 | (6.30) | 0.633 | 149 |
| 14  | 1                         | 3 | 16 | 1 | Begin | EN3-1-1 | 6.2.8 | (6.30) | 0.633 | 149 |

## TOETSING DOORBUIGING

Ligger:1

| Staafl      | Soort | Mtg | Lengte | Overst | Zeeg | u <sub>tot</sub> | BC   | Sit      | u          |
|-------------|-------|-----|--------|--------|------|------------------|------|----------|------------|
| Toelaatbaar |       |     | [m]    | I      | J    | [mm]             |      |          | [mm]       |
| *1          |       |     |        |        |      |                  |      |          |            |
| 1           | Vloer | db  | 4.70   | N      | N    | 0.0              | -8.6 | 7 2 Eind | -8.6 ±18.8 |
| 0.004       |       | db  |        |        |      |                  |      | 7 2 Bijk | -4.1 ±14.1 |
| 0.003       |       |     |        |        |      |                  |      |          |            |
| 2           | Vloer | db  | 4.75   | N      | N    | 0.0              | -4.4 | 7 3 Eind | -4.4 ±19.0 |
| 0.004       |       | db  |        |        |      |                  |      | 7 3 Bijk | -3.2 ±14.2 |
| 0.003       |       |     |        |        |      |                  |      |          |            |
| 3           | Vloer | db  | 4.75   | N      | N    | 0.0              | -5.5 | 7 2 Eind | -5.5 ±19.0 |
| 0.004       |       | db  |        |        |      |                  |      | 7 2 Bijk | -3.5 ±14.2 |
| 0.003       |       |     |        |        |      |                  |      |          |            |
| 4           | Vloer | db  | 4.84   | N      | N    | 0.0              | -5.7 | 7 3 Eind | -5.7 ±19.4 |



|       |       |    |      |   |   |     |      |   |   |      |      |       |
|-------|-------|----|------|---|---|-----|------|---|---|------|------|-------|
| 0.004 |       | db |      |   |   |     |      | 7 | 3 | Bijk | -3.6 | ±14.5 |
| 0.003 |       |    |      |   |   |     |      |   |   |      |      |       |
| 5     | Vloer | db | 4.84 | N | N | 0.0 | -5.7 | 7 | 2 | Eind | -5.7 | ±19.4 |
| 0.004 |       | db |      |   |   |     |      | 7 | 2 | Bijk | -3.6 | ±14.5 |
| 0.003 |       |    |      |   |   |     |      |   |   |      |      |       |
| 6     | Vloer | db | 4.69 | N | N | 0.0 | -5.1 | 7 | 3 | Eind | -5.1 | ±18.8 |
| 0.004 |       | db |      |   |   |     |      | 7 | 3 | Bijk | -3.2 | ±14.1 |
| 0.003 |       |    |      |   |   |     |      |   |   |      |      |       |
| 7     | Vloer | db | 4.32 | N | N | 0.0 | -3.6 | 7 | 2 | Eind | -3.6 | ±17.3 |
| 0.004 |       | db |      |   |   |     |      | 7 | 2 | Bijk | -2.5 | ±13.0 |
| 0.003 |       |    |      |   |   |     |      |   |   |      |      |       |
| 8     | Vloer | db | 4.32 | N | N | 0.0 | -3.8 | 7 | 3 | Eind | -3.8 | ±17.3 |
| 0.004 |       | db |      |   |   |     |      | 7 | 3 | Bijk | -2.4 | ±13.0 |
| 0.003 |       |    |      |   |   |     |      |   |   |      |      |       |



Project.....: SGU021041 - Uitbreiding zwembad de Meerkant te Amstelveen  
 Onderdeel.....: Kleedruimte verdieping as 7

## TOETSING DOORBUIGING

Ligger:1

| Staaft<br>Toelaatbaar | Soort | Mtg | Lengte | Overst | Zeeg | $u_{tot}$ | BC   | Sit      | $u$  |       |
|-----------------------|-------|-----|--------|--------|------|-----------|------|----------|------|-------|
|                       |       |     | [m]    | I      | J    | [mm]      |      |          | [mm] | [mm]  |
| *1                    |       |     |        |        |      |           |      |          |      |       |
| 9<br>0.004            | Vloer | db  | 4.32   | N      | N    | 0.0       | -3.6 | 7 2 Eind | -3.6 | ±17.3 |
|                       |       | db  |        |        |      |           |      | 7 2 Bijk | -2.4 | ±13.0 |
| 0.003                 |       |     |        |        |      |           |      |          |      |       |
| 10<br>0.004           | Vloer | db  | 4.32   | N      | N    | 0.0       | -3.7 | 7 3 Eind | -3.7 | ±17.3 |
|                       |       | db  |        |        |      |           |      | 7 3 Bijk | -2.3 | ±13.0 |
| 0.003                 |       |     |        |        |      |           |      |          |      |       |
| 11<br>0.004           | Vloer | db  | 4.16   | N      | N    | 0.0       | -3.0 | 7 2 Eind | -3.0 | ±16.6 |
|                       |       | db  |        |        |      |           |      | 7 2 Bijk | -2.0 | ±12.5 |
| 0.003                 |       |     |        |        |      |           |      |          |      |       |
| 12<br>0.004           | Vloer | db  | 4.16   | N      | N    | 0.0       | -3.3 | 7 3 Eind | -3.3 | ±16.6 |
|                       |       | db  |        |        |      |           |      | 7 3 Bijk | -2.1 | ±12.5 |
| 0.003                 |       |     |        |        |      |           |      |          |      |       |
| 13<br>0.004           | Vloer | db  | 4.16   | N      | N    | 0.0       | -2.6 | 7 2 Eind | -2.6 | ±16.6 |
|                       |       | db  |        |        |      |           |      | 7 2 Bijk | -1.9 | ±12.5 |
| 0.003                 |       |     |        |        |      |           |      |          |      |       |
| 14<br>0.004           | Vloer | db  | 4.14   | N      | N    | 0.0       | -5.2 | 7 3 Eind | -5.2 | ±16.6 |
|                       |       | db  |        |        |      |           |      | 7 3 Bijk | -2.5 | ±12.4 |
| 0.003                 |       |     |        |        |      |           |      |          |      |       |

## Bijlage K Uitvoer Kleedruimte ligger verdieping as 9

**Technosoft Liggers release 6.73a**  
**2023**

**26 jan**

Project.....: SGU021041 - Uitbreiding zwembad de Meerkant te Amstelveen  
Onderdeel.....: Kleedruimte verdieping as 9  
Dimensies.....: kN/m/rad  
Datum.....: 21/11/2022  
Bestand.....: H:\SGU021041\BEREKENINGEN\04\_DO\Kleedruimte verdieping as  
9.dlw

Betrouwbaarheidsklasse : 2 Referentieperiode : 50

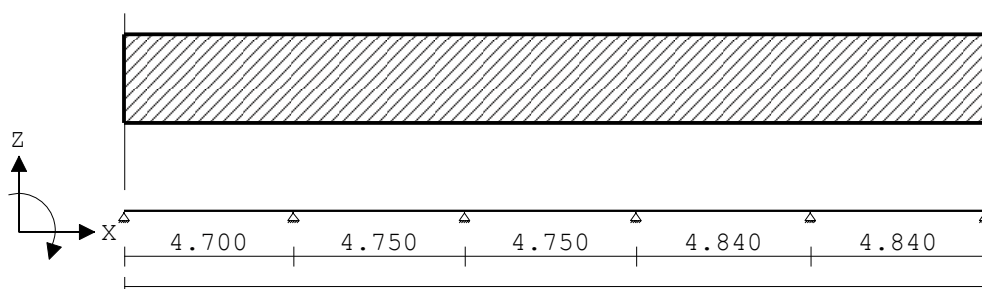
### Toegepaste normen volgens Eurocode met Nederlandse NB

|             |                      |                 |
|-------------|----------------------|-----------------|
| Belastingen | NEN-EN 1990:2002     | C2:2010,A1:2019 |
| NB:2019(nl) | NEN-EN 1991-1-1:2002 | C1/C11:2019     |
| NB:2019(nl) | NEN-EN 1993-1-1:2006 | C2:2011,A1:2016 |
| Staal       |                      |                 |
| NB:2016(nl) |                      |                 |

### GEOMETRIE

Ligger:1

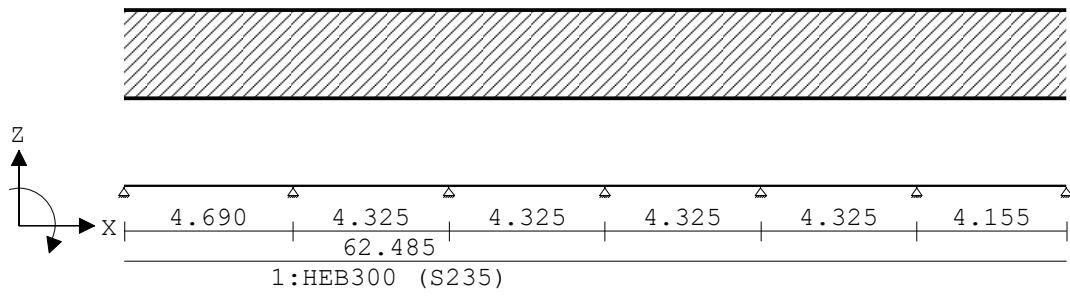
**Velden: 1 t/m 5**



### GEOMETRIE

Ligger:1

**Velden: 6 t/m 11**

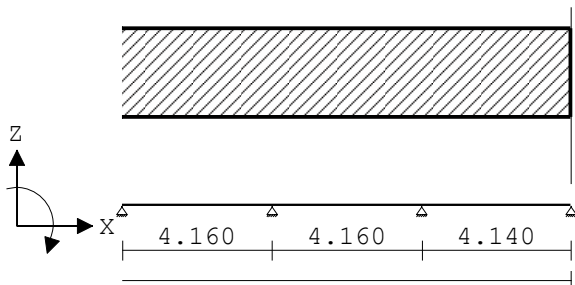


Project.....: SGU021041 - Uitbreiding zwembad de Meerkant te Amstelveen  
Onderdeel.....: Kledruimte verdieping as 9

## GEOMETRIE

Ligger:1

**Velden: 12 t/m 14**



## VELDLENGTEN

Ligger:1

| Veld | Vanaf  | Tot    | Lengte | Veld | Vanaf  | Tot    | Lengte |
|------|--------|--------|--------|------|--------|--------|--------|
| 1    | 0.000  | 4.700  | 4.700  | 6    | 23.880 | 28.570 | 4.690  |
| 2    | 4.700  | 9.450  | 4.750  | 7    | 28.570 | 32.895 | 4.325  |
| 3    | 9.450  | 14.200 | 4.750  | 8    | 32.895 | 37.220 | 4.325  |
| 4    | 14.200 | 19.040 | 4.840  | 9    | 37.220 | 41.545 | 4.325  |
| 5    | 19.040 | 23.880 | 4.840  | 10   | 41.545 | 45.870 | 4.325  |
| 11   | 45.870 | 50.025 | 4.155  |      |        |        |        |
| 12   | 50.025 | 54.185 | 4.160  |      |        |        |        |
| 13   | 54.185 | 58.345 | 4.160  |      |        |        |        |
| 14   | 58.345 | 62.485 | 4.140  |      |        |        |        |

## MATERIALEN

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

## PROFIELEN [mm]

| Prof. Omschrijving | Materiaal | Oppervlak  |
|--------------------|-----------|------------|
| 1 HEB300           | 1:S235    | 1.4910e+04 |
| 2.5170e+08         | 0.00      |            |

## PROFIELEN vervolg [mm]

| Prof. | Staaftype | Breedte | Hoogte | e     | Type | b1 | h1 | b2 | h2 |
|-------|-----------|---------|--------|-------|------|----|----|----|----|
| 1     | 0:Normaal | 300     | 300    | 150.0 |      |    |    |    |    |

## PROFIELVORMEN [mm]

1 HEB300



Project.....: SGU021041 - Uitbreiding zwembad de Meerkant te Amstelveen  
Onderdeel.....: Kleedruimte verdieping as 9

### 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 | 0.50     | 0.50     | 0.30     |
| 0.00              |                     |          |          |          |

### BELASTINGGEVALLEN

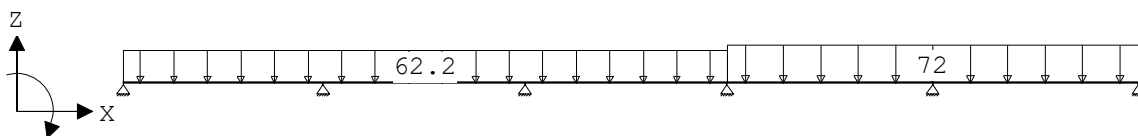
| B.G. Omschrijving | Type                   |
|-------------------|------------------------|
| 1 Permanent       | 1 Permanente belasting |
| 2 Veranderlijk    | 2 Ver. bel. pers. ed.  |
| (q <sub>k</sub> ) |                        |

### VELDBELASTINGEN

Ligger:1 B.G:1

Permanent

Velden: 1 t/m 5

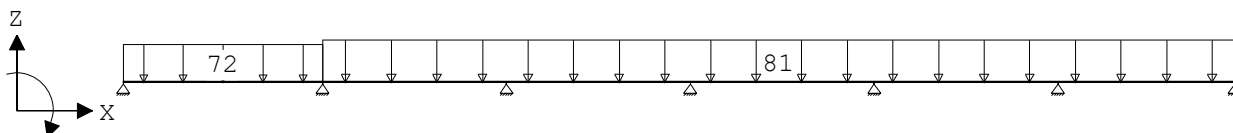


### VELDBELASTINGEN

Ligger:1 B.G:1

Permanent

Velden: 6 t/m 11

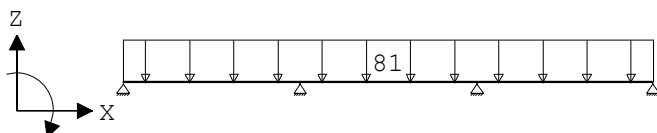


### VELDBELASTINGEN

Ligger:1 B.G:1

Permanent

Velden: 12 t/m 14



### VELDBELASTINGEN

Ligger:1 B.G:1

Permanent

| Last Ref. | Type     | Omschrijving | q1/p/m  | q2      | psi |
|-----------|----------|--------------|---------|---------|-----|
| Afstand   | Lengte   |              |         |         |     |
| 1         | 1:q-last |              | -62.200 | -62.200 |     |
| 0.000     | 14.200   |              |         |         |     |
| 2         | 1:q-last |              | -72.000 | -72.000 |     |



14.200 14.370  
3 1:q-last  
28.570 33.915

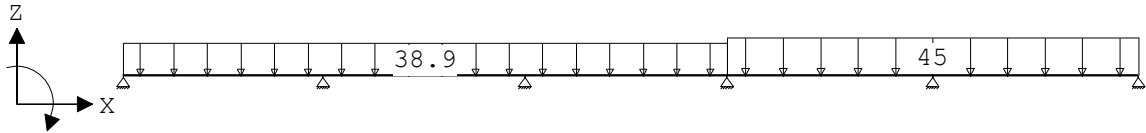
-81.000 -81.000

## VELDBELASTINGEN

Ligger:1 B.G:2

Veranderlijk

Velden: 1 t/m 5



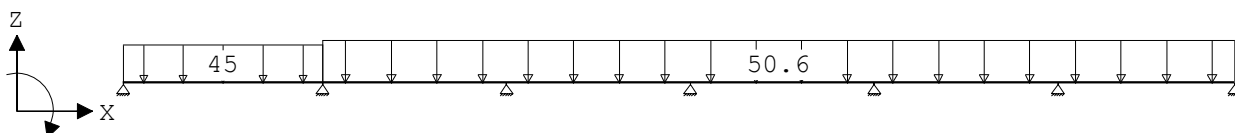
Project.....: SGU021041 - Uitbreiding zwembad de Meerkant te Amstelveen  
Onderdeel.....: Kleedruimte verdieping as 9

## VELDBELASTINGEN

Ligger:1 B.G:2

Veranderlijk

Velden: 6 t/m 11

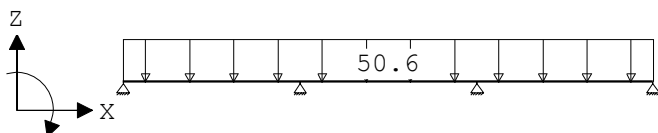


## VELDBELASTINGEN

Ligger:1 B.G:2

Veranderlijk

Velden: 12 t/m 14



## VELDBELASTINGEN

Ligger:1 B.G:2

Veranderlijk

| Last Ref. | Type     | Omschrijving | q1/p/m  | q2      | psi |
|-----------|----------|--------------|---------|---------|-----|
| Afstand   | Lengte   |              |         |         |     |
| 1         | 1:q-last |              | -38.900 | -38.900 |     |
| 0.000     | 14.200   |              |         |         |     |
| 2         | 1:q-last |              | -45.000 | -45.000 |     |
| 14.200    | 14.370   |              |         |         |     |
| 3         | 1:q-last |              | -50.600 | -50.600 |     |
| 28.570    | 33.915   |              |         |         |     |

## BELASTINGCOMBINATIES

| BC Type  | BG | Gen. | Factor | BG | Gen. | Factor | BG | Gen. | Factor | BG | Gen. | Factor |
|----------|----|------|--------|----|------|--------|----|------|--------|----|------|--------|
| Factor   |    |      |        |    |      |        |    |      |        |    |      |        |
| 1 Fund.  | 1  | Perm | 1.35   |    |      |        |    |      |        |    |      |        |
| 2 Fund.  | 1  | Perm | 1.35   | 2  | psi0 | 1.50   |    |      |        |    |      |        |
| 3 Fund.  | 1  | Perm | 1.20   | 2  | Extr | 1.50   |    |      |        |    |      |        |
| 4 Fund.  | 1  | Perm | 0.90   |    |      |        |    |      |        |    |      |        |
| 5 Fund.  | 1  | Perm | 0.90   | 2  | psi0 | 1.50   |    |      |        |    |      |        |
| 6 Fund.  | 1  | Perm | 0.90   | 2  | Extr | 1.50   |    |      |        |    |      |        |
| 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

Project.....: SGU021041 - Uitbreiding zwembad de Meerkant te Amstelveen  
Onderdeel.....: Kledruimte verdieping as 9

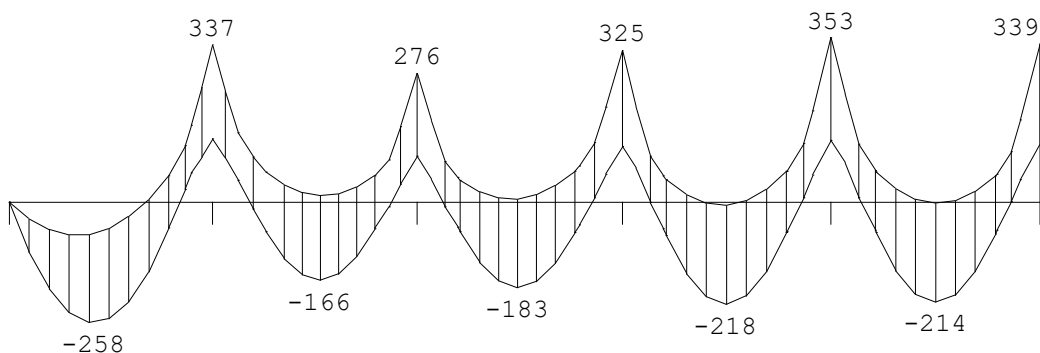
## OMHULLENDE VAN DE FUNDAMENTELE COMBINATIES

### MOMENTEN

Ligger:1 Fundamentele

combinatie

Velden: 1 t/m 5

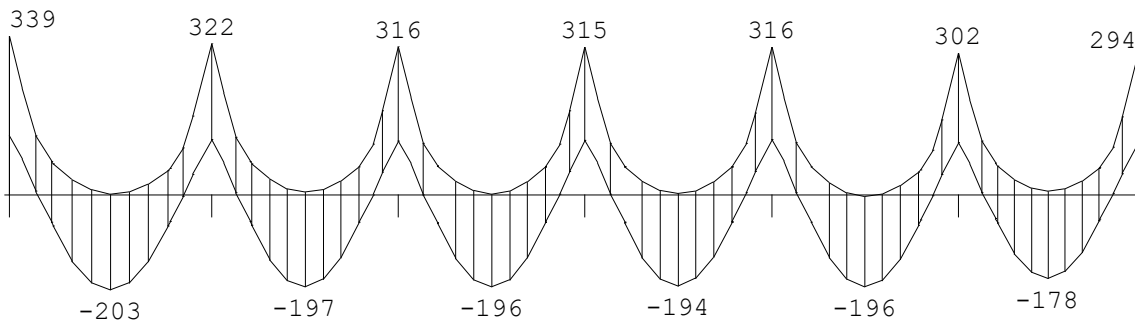


### MOMENTEN

Ligger:1 Fundamentele

combinatie

Velden: 6 t/m 11

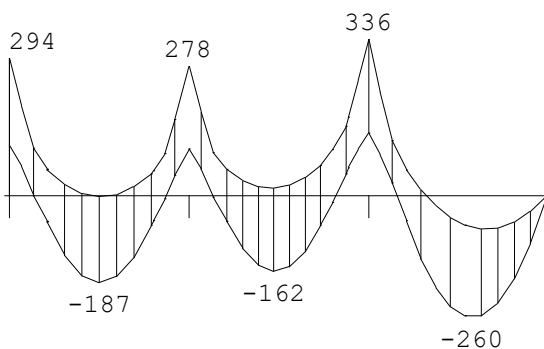


### MOMENTEN

Ligger:1 Fundamentele

combinatie

Velden: 12 t/m 14



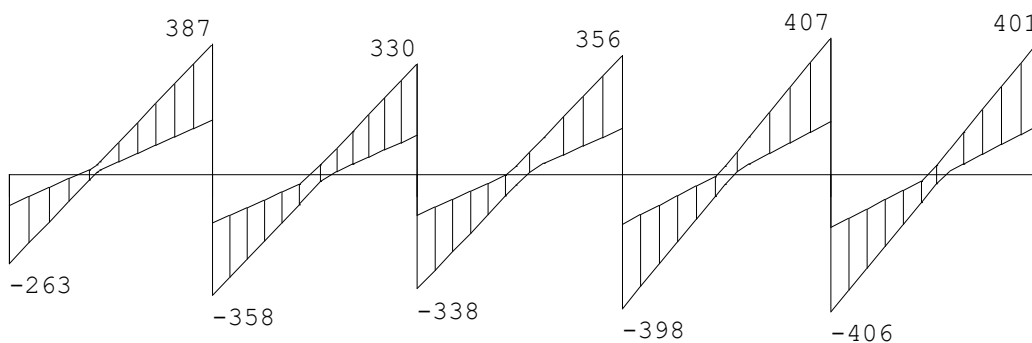
Project.....: SGU021041 - Uitbreiding zwembad de Meerkant te Amstelveen  
Onderdeel.....: Kledruimte verdieping as 9

## DWARSKRACHTEN

Ligger:1 Fundamentele

combinatie

Velden: 1 t/m 5



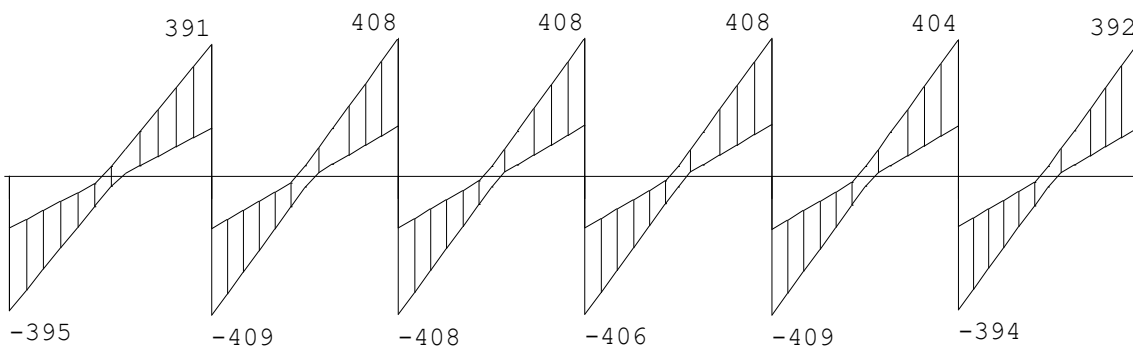
|          |     |     |     |     |     |
|----------|-----|-----|-----|-----|-----|
| Fmin:90  | 306 | 258 | 297 | 323 | 314 |
| Fmax:263 | 745 | 668 | 754 | 813 | 796 |

## DWARSKRACHTEN

Ligger:1 Fundamentele

combinatie

Velden: 6 t/m 11



|          |     |     |     |     |     |     |
|----------|-----|-----|-----|-----|-----|-----|
| Fmin:314 | 313 | 319 | 320 | 322 | 313 | 309 |
| Fmax:796 | 800 | 816 | 814 | 816 | 798 | 787 |



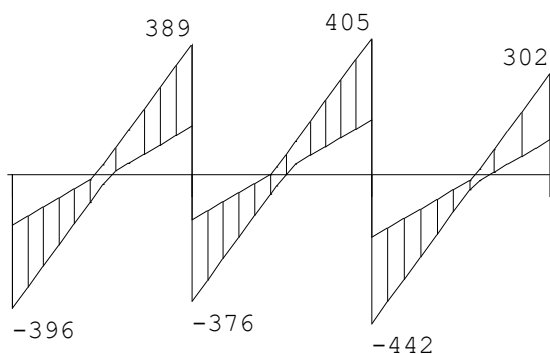
Project.....: SGU021041 - Uitbreiding zwembad de Meerkant te Amstelveen  
Onderdeel.....: Kledruimte verdieping as 9

## DWARSKRACHTEN

Ligger:1 Fundamentele

combinatie

Velden: 12 t/m 14



|          |     |     |     |
|----------|-----|-----|-----|
| Fmin:309 | 297 | 348 | 104 |
| Fmax:787 | 765 | 847 | 302 |

## REACTIES

Ligger:1 Fundamentele

combinatie

| Stp | Fmin   | Fmax   | Mmin | Mmax |
|-----|--------|--------|------|------|
| 1   | 90.26  | 263.38 | 0.00 | 0.00 |
| 2   | 306.04 | 745.19 | 0.00 | 0.00 |
| 3   | 258.30 | 668.07 | 0.00 | 0.00 |
| 4   | 297.05 | 753.70 | 0.00 | 0.00 |
| 5   | 322.66 | 813.16 | 0.00 | 0.00 |
| 6   | 313.98 | 796.49 | 0.00 | 0.00 |
| 7   | 313.25 | 800.03 | 0.00 | 0.00 |
| 8   | 319.28 | 816.09 | 0.00 | 0.00 |
| 9   | 319.55 | 814.43 | 0.00 | 0.00 |
| 10  | 321.62 | 816.31 | 0.00 | 0.00 |
| 11  | 312.88 | 797.72 | 0.00 | 0.00 |
| 12  | 308.57 | 787.30 | 0.00 | 0.00 |
| 13  | 297.46 | 764.53 | 0.00 | 0.00 |
| 14  | 347.67 | 847.45 | 0.00 | 0.00 |
| 15  | 103.84 | 301.52 | 0.00 | 0.00 |

Project.....: SGU021041 - Uitbreiding zwembad de Meerkant te Amstelveen  
Onderdeel.....: Kleedruimte verdieping as 9

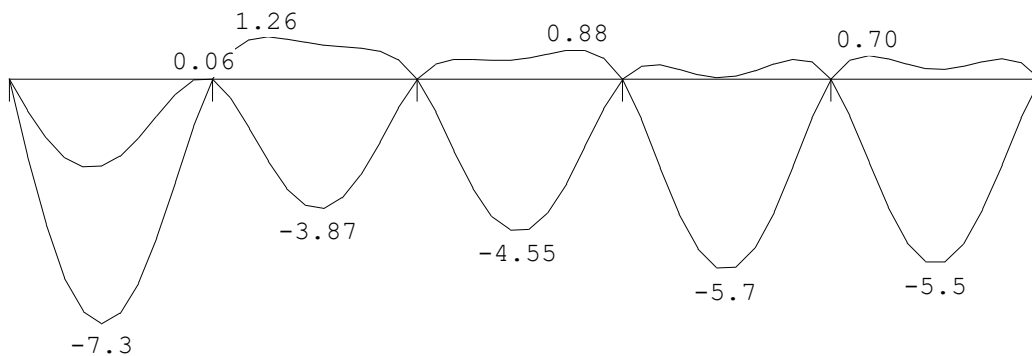
## OMHULLENDE VAN DE KARAKTERISTIEKE COMBINATIES

### VERPLAATSINGEN [mm]

Ligger:1 Karakteristieke

combinatie

Velden: 1 t/m 5

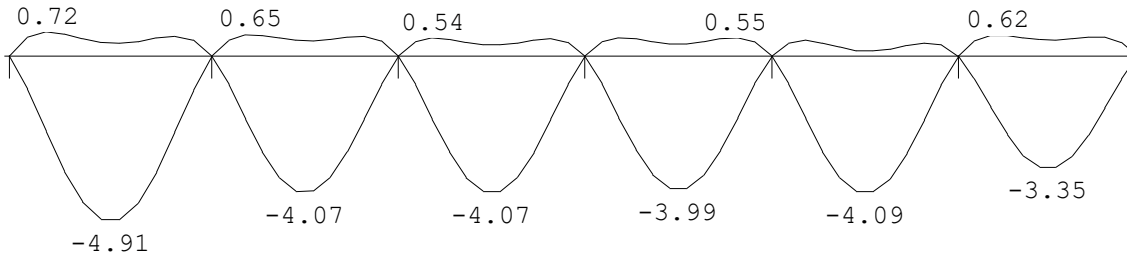


### VERPLAATSINGEN [mm]

Ligger:1 Karakteristieke

combinatie

Velden: 6 t/m 11

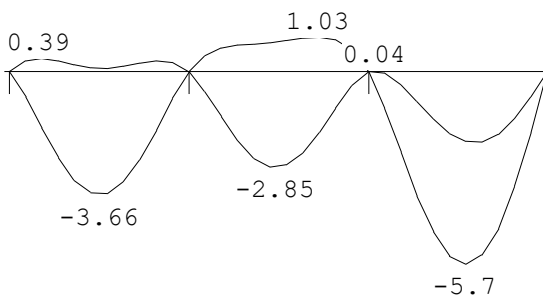


### VERPLAATSINGEN [mm]

Ligger:1 Karakteristieke

combinatie

Velden: 12 t/m 14





Project.....: SGU021041 - Uitbreiding zwembad de Meerkant te  
Amstelveen  
Onderdeel.....: Kleedruimte verdieping as 9

## STAALPROFIELEN - ALGEMENE GEGEVENS

Ligger:1

Stabiliteit: Classificatie gehele constructie: Geschoord

### PROFIEL/MATERIAAL

| P/M    | Profielnaam | Vloeisp.             | Productie | Min. |
|--------|-------------|----------------------|-----------|------|
| drsn.  |             |                      |           |      |
| nr.    |             | [N/mm <sup>2</sup> ] | methode   |      |
| klasse |             |                      |           |      |

|   |        |     |         |  |
|---|--------|-----|---------|--|
| 1 | HEB300 | 235 | Gewalst |  |
|---|--------|-----|---------|--|

1

Partiële veiligheidsfactoren:

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

### KIPSTABILITEIT

Ligger:1

| Staaft | Plts. | l gaffel | Kipsteunafstanden |
|--------|-------|----------|-------------------|
| aangr. |       | [m]      | [m]               |

|    |       |        |      |               |
|----|-------|--------|------|---------------|
| 1  | 1.0*h | boven: | 4.70 | 2*1,567;1,566 |
|    |       | onder: | 4.70 | 4.700         |
| 2  | 1.0*h | boven: | 4.75 | 2*1,583;1,584 |
|    |       | onder: | 4.75 | 4.750         |
| 3  | 1.0*h | boven: | 4.75 | 2*1,583;1,584 |
|    |       | onder: | 4.75 | 4.750         |
| 4  | 1.0*h | boven: | 4.84 | 3*1,613       |
|    |       | onder: | 4.84 | 4.840         |
| 5  | 1.0*h | boven: | 4.84 | 3*1,613       |
|    |       | onder: | 4.84 | 4.840         |
| 6  | 1.0*h | boven: | 4.69 | 3*1,563       |
|    |       | onder: | 4.69 | 4.690         |
| 7  | 1.0*h | boven: | 4.32 | 2*1,442;1,441 |
|    |       | onder: | 4.32 | 4.325         |
| 8  | 1.0*h | boven: | 4.32 | 2*1,442;1,441 |
|    |       | onder: | 4.32 | 4.325         |
| 9  | 1.0*h | boven: | 4.32 | 2*1,442;1,441 |
|    |       | onder: | 4.32 | 4.325         |
| 10 | 1.0*h | boven: | 4.32 | 2*1,442;1,441 |
|    |       | onder: | 4.32 | 4.325         |
| 11 | 1.0*h | boven: | 4.16 | 3*1,385       |
|    |       | onder: | 4.16 | 4.155         |
| 12 | 1.0*h | boven: | 4.16 | 3*1,387       |
|    |       | onder: | 4.16 | 4.160         |
| 13 | 1.0*h | boven: | 4.16 | 3*1,387       |
|    |       | onder: | 4.16 | 4.160         |
| 14 | 1.0*h | boven: | 4.14 | 3*1,38        |
|    |       | onder: | 4.14 | 4.140         |

### TOETSING SPANNINGEN



Ligger:1

Staaft P/M BC Sit Kl Plaats Norm Artikel Formule Hoogste toetsing  
Opm.

| nr. |   |   |   |   |       |         |       |        |       | U.C. [N/mm <sup>2</sup> ] |  |
|-----|---|---|---|---|-------|---------|-------|--------|-------|---------------------------|--|
| 1   | 1 | 3 | 4 | 1 | Einde | EN3-1-1 | 6.2.8 | (6.30) | 0.770 | 181                       |  |
| 2   | 1 | 3 | 4 | 1 | Begin | EN3-1-1 | 6.2.8 | (6.30) | 0.768 | 180                       |  |
| 3   | 1 | 3 | 6 | 1 | Einde | EN3-1-1 | 6.2.8 | (6.30) | 0.741 | 174                       |  |



Project.....: SGU021041 - Uitbreiding zwembad de Meerkant te Amstelveen  
Onderdeel.....: Kleedruimte verdieping as 9

## TOETSING SPANNINGEN

Ligger:1

Staaft P/M BC Sit Kl Plaats Norm Artikel Formule Hoogste toetsing  
Opm.

| nr. |   |   |    |   |       |         |       |        | U.C. [N/mm <sup>2</sup> ] |     |
|-----|---|---|----|---|-------|---------|-------|--------|---------------------------|-----|
| 4   | 1 | 3 | 7  | 1 | Einde | EN3-1-1 | 6.2.8 | (6.30) | 0.809                     | 190 |
| 5   | 1 | 3 | 7  | 1 | Begin | EN3-1-1 | 6.2.8 | (6.30) | 0.809                     | 190 |
| 6   | 1 | 3 | 8  | 1 | Begin | EN3-1-1 | 6.2.8 | (6.30) | 0.776                     | 182 |
| 7   | 1 | 3 | 9  | 1 | Begin | EN3-1-1 | 6.2.8 | (6.30) | 0.740                     | 174 |
| 8   | 1 | 3 | 10 | 1 | Begin | EN3-1-1 | 6.2.8 | (6.30) | 0.726                     | 171 |
| 9   | 1 | 3 | 12 | 1 | Einde | EN3-1-1 | 6.2.8 | (6.30) | 0.726                     | 171 |
| 10  | 1 | 3 | 12 | 1 | Begin | EN3-1-1 | 6.2.8 | (6.30) | 0.726                     | 171 |
| 11  | 1 | 3 | 13 | 1 | Begin | EN3-1-1 | 6.2.8 | (6.30) | 0.693                     | 163 |
| 12  | 1 | 3 | 14 | 1 | Begin | EN3-1-1 | 6.2.8 | (6.30) | 0.674                     | 158 |
| 13  | 1 | 3 | 16 | 1 | Einde | EN3-1-1 | 6.2.8 | (6.30) | 0.770                     | 181 |
| 14  | 1 | 3 | 16 | 1 | Begin | EN3-1-1 | 6.2.8 | (6.30) | 0.775                     | 182 |

## TOETSING DOORBUIGING

Ligger:1

Staaft Soort Mtg Lengte Overst Zeeg  $u_{tot}$  BC Sit  
Toelaatbaar

|       |       |    | [m]  | I | J | [mm] | [mm] |   |   |      | [mm] | [mm]  |
|-------|-------|----|------|---|---|------|------|---|---|------|------|-------|
| *1    |       |    |      |   |   |      |      |   |   |      |      |       |
| 1     | Vloer | db | 4.70 | N | N | 0.0  | -7.3 | 7 | 2 | Eind | -7.3 | ±18.8 |
| 0.004 |       | db |      |   |   |      |      | 7 | 2 | Bijk | -3.5 | ±14.1 |
| 0.003 |       |    |      |   |   |      |      |   |   |      |      |       |
| 2     | Vloer | db | 4.75 | N | N | 0.0  | -3.9 | 7 | 3 | Eind | -3.9 | ±19.0 |
| 0.004 |       | db |      |   |   |      |      | 7 | 3 | Bijk | -2.8 | ±14.2 |
| 0.003 |       |    |      |   |   |      |      |   |   |      |      |       |
| 3     | Vloer | db | 4.75 | N | N | 0.0  | -4.5 | 7 | 2 | Eind | -4.5 | ±19.0 |
| 0.004 |       | db |      |   |   |      |      | 7 | 2 | Bijk | -3.0 | ±14.2 |
| 0.003 |       |    |      |   |   |      |      |   |   |      |      |       |
| 4     | Vloer | db | 4.84 | N | N | 0.0  | -5.7 | 7 | 3 | Eind | -5.7 | ±19.4 |
| 0.004 |       | db |      |   |   |      |      | 7 | 3 | Bijk | -3.5 | ±14.5 |
| 0.003 |       |    |      |   |   |      |      |   |   |      |      |       |
| 5     | Vloer | db | 4.84 | N | N | 0.0  | -5.5 | 7 | 2 | Eind | -5.5 | ±19.4 |
| 0.004 |       | db |      |   |   |      |      | 7 | 2 | Bijk | -3.5 | ±14.5 |
| 0.003 |       |    |      |   |   |      |      |   |   |      |      |       |
| 6     | Vloer | db | 4.69 | N | N | 0.0  | -4.9 | 7 | 3 | Eind | -4.9 | ±18.8 |
| 0.004 |       | db |      |   |   |      |      | 7 | 3 | Bijk | -3.2 | ±14.1 |
| 0.003 |       |    |      |   |   |      |      |   |   |      |      |       |
| 7     | Vloer | db | 4.32 | N | N | 0.0  | -4.1 | 7 | 2 | Eind | -4.1 | ±17.3 |
| 0.004 |       |    |      |   |   |      |      |   |   |      |      |       |



|       |       |    |      |   |   |     |      |   |   |      |      |       |
|-------|-------|----|------|---|---|-----|------|---|---|------|------|-------|
| 0.003 |       | db |      |   |   |     |      | 7 | 2 | Bijk | -2.7 | ±13.0 |
| 8     | Vloer | db | 4.32 | N | N | 0.0 | -4.1 | 7 | 3 | Eind | -4.1 | ±17.3 |
| 0.004 |       | db |      |   |   |     |      | 7 | 3 | Bijk | -2.6 | ±13.0 |
| 0.003 |       | db |      |   |   |     |      | 7 | 2 | Eind | -4.0 | ±17.3 |
| 9     | Vloer | db | 4.32 | N | N | 0.0 | -4.0 | 7 | 2 | Eind | -4.0 | ±17.3 |
| 0.004 |       | db |      |   |   |     |      | 7 | 2 | Bijk | -2.6 | ±13.0 |
| 0.003 |       | db |      |   |   |     |      | 7 | 3 | Eind | -4.1 | ±17.3 |
| 10    | Vloer | db | 4.32 | N | N | 0.0 | -4.1 | 7 | 3 | Eind | -4.1 | ±17.3 |
| 0.004 |       | db |      |   |   |     |      | 7 | 3 | Bijk | -2.6 | ±13.0 |
| 0.003 |       |    |      |   |   |     |      |   |   |      |      |       |
| 11    | Vloer | db | 4.16 | N | N | 0.0 | -3.4 | 7 | 2 | Eind | -3.4 | ±16.6 |
| 0.004 |       | db |      |   |   |     |      | 7 | 2 | Bijk | -2.3 | ±12.5 |
| 0.003 |       | db |      |   |   |     |      | 7 | 2 | Bijk | -2.3 | ±12.5 |
| 12    | Vloer | db | 4.16 | N | N | 0.0 | -3.7 | 7 | 3 | Eind | -3.7 | ±16.6 |
| 0.004 |       | db |      |   |   |     |      | 7 | 3 | Bijk | -2.3 | ±12.5 |
| 0.003 |       | db |      |   |   |     |      | 7 | 2 | Eind | -2.8 | ±16.6 |
| 13    | Vloer | db | 4.16 | N | N | 0.0 | -2.8 | 7 | 2 | Eind | -2.8 | ±16.6 |
| 0.004 |       | db |      |   |   |     |      | 7 | 2 | Bijk | -2.1 | ±12.5 |
| 0.003 |       | db |      |   |   |     |      | 7 | 2 | Bijk | -2.1 | ±12.5 |
| 14    | Vloer | db | 4.14 | N | N | 0.0 | -5.7 | 7 | 3 | Eind | -5.7 | ±16.6 |
| 0.004 |       | db |      |   |   |     |      | 7 | 3 | Bijk | -2.7 | ±12.4 |
| 0.003 |       |    |      |   |   |     |      |   |   |      |      |       |

## Bijlage L Uitvoer Kleedruimte ligger verdieping as 10

**Technosoft Liggers release 6.73a**  
**2023**

**26 jan**

Project.....: SGU021041 - Uitbreiding zwembad de Meerkant te Amstelveen  
Onderdeel.....: Kleedruimte verdieping as 10 N-Q  
Dimensies.....: kN/m/rad  
Datum.....: 21/11/2022  
Bestand.....: H:\SGU021041\BEREKENINGEN\04\_DO\Kleedruimte verdieping as  
10.dlw

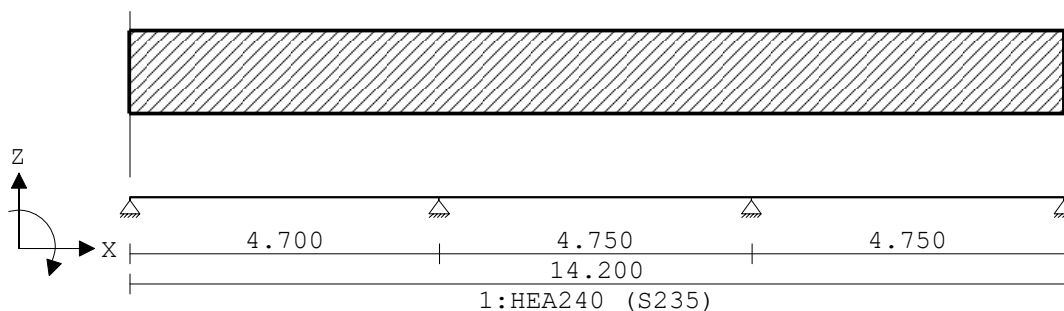
Betrouwbaarheidsklasse : 2 Referentieperiode : 50

### Toegepaste normen volgens Eurocode met Nederlandse NB

|             |                      |                 |
|-------------|----------------------|-----------------|
| Belastingen | NEN-EN 1990:2002     | C2:2010,A1:2019 |
| NB:2019(nl) |                      |                 |
|             | NEN-EN 1991-1-1:2002 | C1/C11:2019     |
| NB:2019(nl) |                      |                 |
| Staal       | NEN-EN 1993-1-1:2006 | C2:2011,A1:2016 |
| NB:2016(nl) |                      |                 |

### GEOMETRIE

Ligger:1



### VELDLENGTEN

Ligger:1

| Veld | Vanaf | Tot    | Lengte |
|------|-------|--------|--------|
| 1    | 0.000 | 4.700  | 4.700  |
| 2    | 4.700 | 9.450  | 4.750  |
| 3    | 9.450 | 14.200 | 4.750  |

### MATERIALEN

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

### PROFIELEN [mm]

| Prof. | Omschrijving | Materiaal | Oppervlak |
|-------|--------------|-----------|-----------|
|-------|--------------|-----------|-----------|



#### Traagheid Vormf.

|            |        |        |            |
|------------|--------|--------|------------|
| 1          | HEA240 | 1:S235 | 7.6800e+03 |
| 7.7630e+07 | 0.00   |        |            |

#### PROFIELEN vervolg [mm]

| Prof. | Staaftype | Breedte   | Hoogte | e   | Type  | b1 | h1 | b2 |
|-------|-----------|-----------|--------|-----|-------|----|----|----|
| h2    | 1         | 0:Normaal | 240    | 230 | 115.0 |    |    |    |

Project.....: SGU021041 - Uitbreiding zwembad de Meerkant te Amstelveen  
Onderdeel.....: Kleedruimte verdieping as 10 N-Q

## PROFIELVORMEN [mm]

1 HEA240



## 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 | 0.50     | 0.50     | 0.30     |
| 0.00  |              |                     |          |          |          |

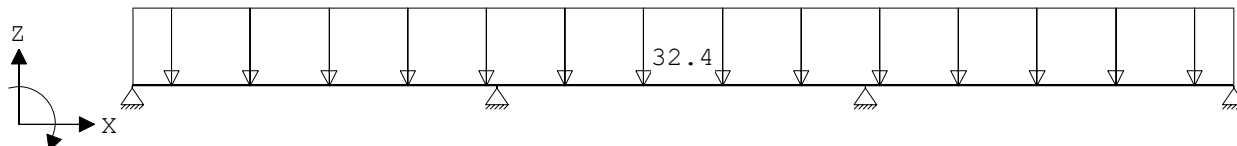
## BELASTINGGEVALLEN

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

## VELDBELASTINGEN

Ligger:1 B.G:1

Permanent



## VELDBELASTINGEN

Ligger:1 B.G:1

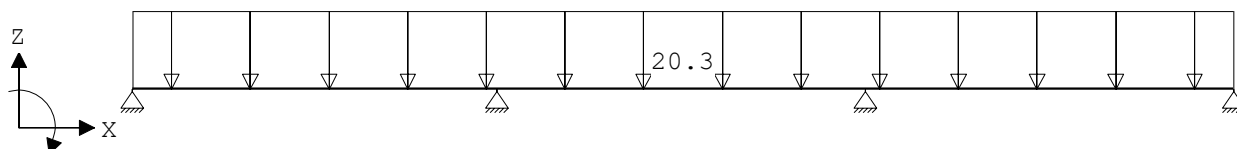
Permanent

| Last Ref. | Type     | Omschrijving | q1/p/m  | q2      | psi |
|-----------|----------|--------------|---------|---------|-----|
| Afstand   | Lengte   |              |         |         |     |
| 1         | 1:q-last |              | -32.400 | -32.400 |     |
| 0.000     | 14.200   |              |         |         |     |

## 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 |              | -20.300 | -20.300 |     |



0.000 14.200

### **BELASTINGCOMBINATIES**

| BC Type | BG Gen. | Factor | BG Gen. | Factor | BG Gen. | Factor | BG Gen. |
|---------|---------|--------|---------|--------|---------|--------|---------|
| Factor  |         |        |         |        |         |        |         |
| 1 Fund. | 1 Perm  | 1.35   |         |        |         |        |         |
| 2 Fund. | 1 Perm  | 1.35   | 2 psi0  | 1.50   |         |        |         |
| 3 Fund. | 1 Perm  | 1.20   | 2 Extr  | 1.50   |         |        |         |
| 4 Fund. | 1 Perm  | 0.90   |         |        |         |        |         |
| 5 Fund. | 1 Perm  | 0.90   | 2 psi0  | 1.50   |         |        |         |
| 6 Fund. | 1 Perm  | 0.90   | 2 Extr  | 1.50   |         |        |         |

Project.....: SGU021041 - Uitbreiding zwembad de Meerkant te Amstelveen  
Onderdeel.....: Kleedruimte verdieping as 10 N-Q

## BELASTINGCOMBINATIES

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

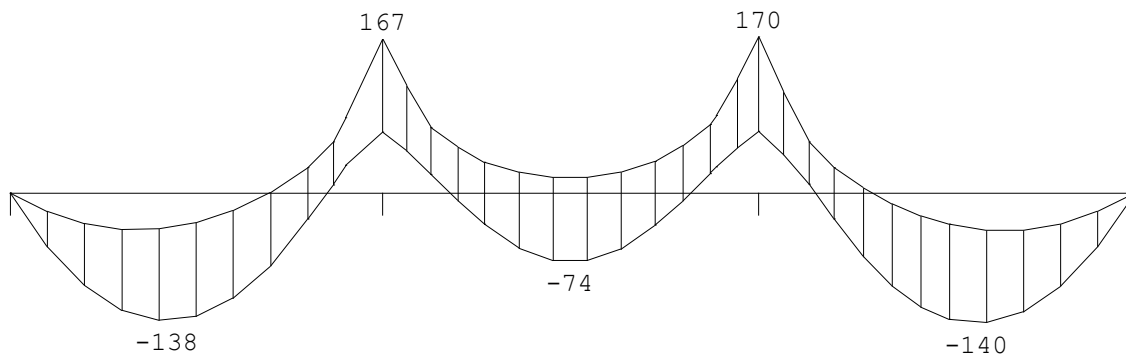
| BC Velden met gunstige werking |
|--------------------------------|
| 1 Geen                         |
| 2 Geen                         |
| 3 Geen                         |
| 4 Alle velden de factor:0.90   |
| 5 Alle velden de factor:0.90   |
| 6 Alle velden de factor:0.90   |

## OMHULLENDE VAN DE FUNDAMENTELE COMBINATIES

### MOMENTEN

Ligger:1 Fundamentele

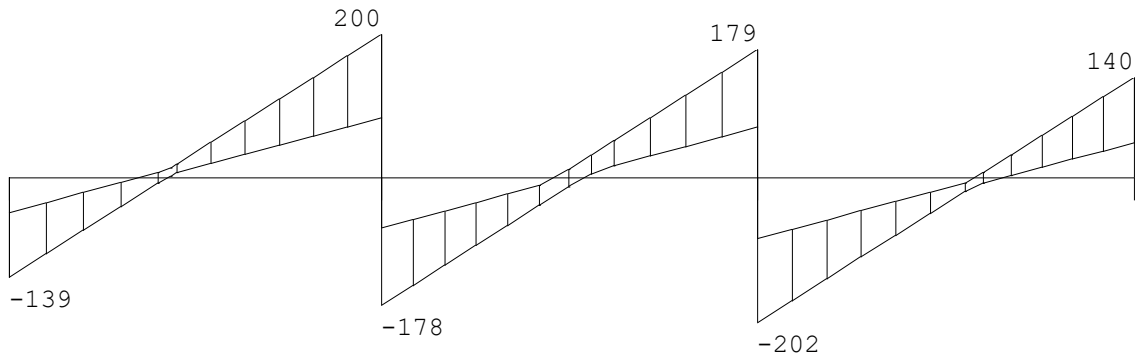
combinatie



### DWARSKRACHTEN

Ligger:1 Fundamentele

combinatie



Fmin:48.4  
Fmax:139

154  
378

156  
381

49.2  
140

Project.....: SGU021041 - Uitbreiding zwembad de Meerkant te Amstelveen  
Onderdeel.....: Kledruimte verdieping as 10 N-Q

## REACTIES

Ligger:1 Fundamentele

combinatie

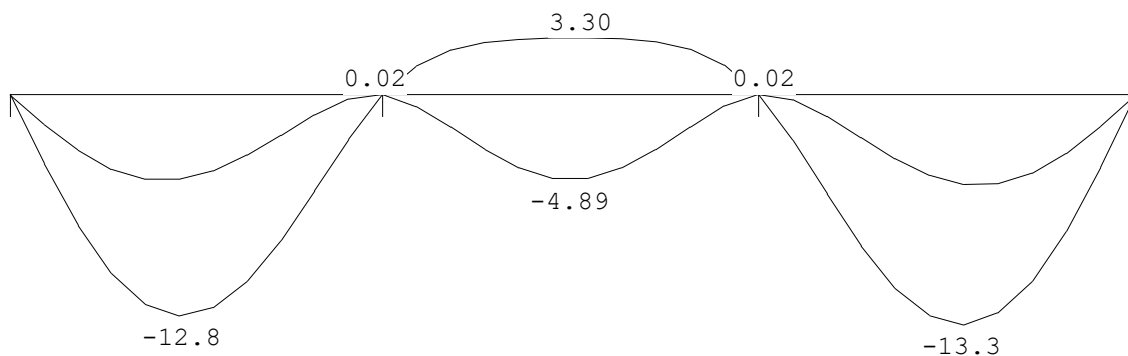
| Stp | Fmin   | Fmax   | Mmin | Mmax |
|-----|--------|--------|------|------|
| 1   | 48.41  | 138.86 | 0.00 | 0.00 |
| 2   | 154.12 | 378.00 | 0.00 | 0.00 |
| 3   | 155.52 | 380.88 | 0.00 | 0.00 |
| 4   | 49.16  | 140.20 | 0.00 | 0.00 |

## OMHULLENDE VAN DE KARAKTERISTIEKE COMBINATIES

### VERPLAATSINGEN [mm]

Ligger:1 Karakteristieke

combinatie



## STAALPROFIELEN - ALGEMENE GEGEVENS

Ligger:1

Stabiliteit: Classificatie gehele constructie: Geschoord

### PROFIEL/MATERIAAL

P/M Profielnaam Vloeisp. Productie Min.  
drsn.  
nr. [N/mm<sup>2</sup>] methode  
klasse

|   |        |     |         |
|---|--------|-----|---------|
| 1 | HEA240 | 235 | Gewalst |
|---|--------|-----|---------|

1

Partiële veiligheidsfactoren:

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

### KIPSTABILITEIT

Ligger:1

Staaf Plts. l gaffel Kipsteunafstanden  
aanr. [m] [m]

|   |       |        |      |               |
|---|-------|--------|------|---------------|
| 1 | 1.0*h | boven: | 4.70 | 2*1,567;1,566 |
|   |       | onder: | 4.70 | 4.700         |
| 2 | 1.0*h | boven: | 4.75 | 2*1,583;1,584 |
|   |       | onder: | 4.75 | 4.750         |
| 3 | 1.0*h | boven: | 4.75 | 2*1,583;1,584 |



onder: 4.75 4.750



Project.....: SGU021041 - Uitbreiding zwembad de Meerkant te Amstelveen  
 Onderdeel.....: Kleedruimte verdieping as 10 N-Q

## TOETSING SPANNINGEN

Ligger:1

Staaft P/M BC Sit Kl Plaats Norm Artikel Formule Hoogste toetsing  
 Opm.

| nr. |   | U.C. [N/mm <sup>2</sup> ] |   |   |       |         |       |        |           |
|-----|---|---------------------------|---|---|-------|---------|-------|--------|-----------|
| 1   | 1 | 3                         | 4 | 1 | Einde | EN3-1-1 | 6.2.8 | (6.30) | 0.959 225 |
| 2   | 1 | 3                         | 5 | 1 | Einde | EN3-1-1 | 6.2.8 | (6.30) | 0.972 228 |
| 3   | 1 | 3                         | 5 | 1 | Begin | EN3-1-1 | 6.2.8 | (6.30) | 0.975 229 |

## TOETSING DOORBUIGING

Ligger:1

Staaft Soort Mtg Lengte Overst Zeeg  $u_{tot}$  BC Sit  $u$   
 Toelaatbaar

|       |       |    |      | [m] | I | J   | [mm]  | [mm] |   |      | [mm]  | [mm]  |
|-------|-------|----|------|-----|---|-----|-------|------|---|------|-------|-------|
| *1    |       |    |      |     |   |     |       |      |   |      |       |       |
| 1     | Vloer | db | 4.70 | N   | N | 0.0 | -12.8 | 7    | 2 | Eind | -12.8 | ±18.8 |
| 0.004 |       |    |      |     |   |     |       |      |   |      |       |       |
|       |       | db |      |     |   |     |       | 7    | 2 | Bijk | -6.0  | ±14.1 |
| 0.003 |       |    |      |     |   |     |       |      |   |      |       |       |
| 2     | Vloer | db | 4.75 | N   | N | 0.0 | -4.9  | 7    | 3 | Eind | -4.9  | ±19.0 |
| 0.004 |       |    |      |     |   |     |       |      |   |      |       |       |
|       |       | db |      |     |   |     |       | 7    | 3 | Bijk | -4.3  | ±14.2 |
| 0.003 |       |    |      |     |   |     |       |      |   |      |       |       |
| 3     | Vloer | db | 4.75 | N   | N | 0.0 | -13.3 | 7    | 2 | Eind | -13.3 | ±19.0 |
| 0.004 |       |    |      |     |   |     |       |      |   |      |       |       |
|       |       | db |      |     |   |     |       | 7    | 2 | Bijk | -6.3  | ±14.2 |
| 0.003 |       |    |      |     |   |     |       |      |   |      |       |       |

## Bijlage M Uitvoer Kleedruimte ligger verdieping as 12

**Technosoft Liggers release 6.73a**  
**2023**

**26 jan**

Project.....: SGU021041 - Uitbreiding zwembad de Meerkant te Amstelveen  
Onderdeel.....: Kleedruimte verdieping as 12  
Dimensies.....: kN/m/rad  
Datum.....: 21/11/2022  
Bestand.....: H:\SGU021041\BEREKENINGEN\04\_DO\Kleedruimte verdieping as  
12.dlw

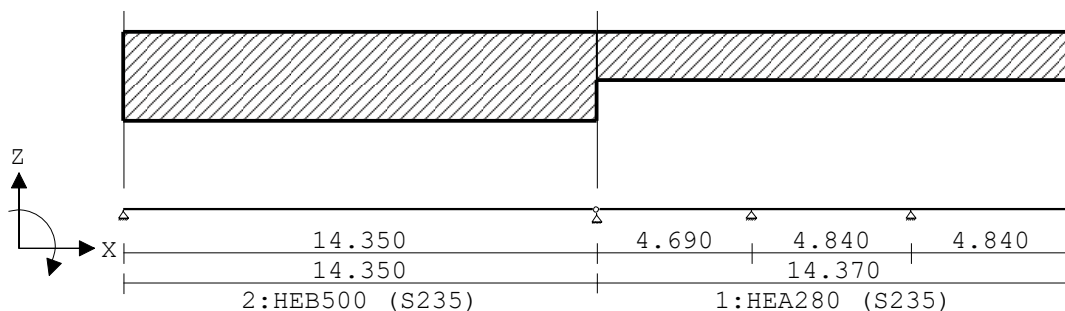
Betrouwbaarheidsklasse : 2 Referentieperiode :  
50

### Toegepaste normen volgens Eurocode met Nederlandse NB

|              |                      |                 |
|--------------|----------------------|-----------------|
| Belastingen  | NEN-EN 1990:2002     | C2:2010,A1:2019 |
| NB:2019 (nl) |                      |                 |
|              | NEN-EN 1991-1-1:2002 | C1/C11:2019     |
| NB:2019 (nl) |                      |                 |
| Staal        | NEN-EN 1993-1-1:2006 | C2:2011,A1:2016 |
| NB:2016 (nl) |                      |                 |

### GEOMETRIE

Ligger:1



### VELDLENGTEN

Ligger:1

| Veld | Vanaf  | Tot    | Lengte |
|------|--------|--------|--------|
| 1    | 0.000  | 14.350 | 14.350 |
| 2    | 14.350 | 19.040 | 4.690  |
| 3    | 19.040 | 23.880 | 4.840  |
| 4    | 23.880 | 28.720 | 4.840  |

### MATERIALEN

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

### PROFIELEN [mm]



| Prof. Omschrijving<br>Traagheid Vormf. |      | Materiaal | Oppervlak  |
|----------------------------------------|------|-----------|------------|
| 1 HEA280                               |      | 1:S235    | 9.7300e+03 |
| 1.3670e+08                             | 0.00 |           |            |
| 2 HEB500                               |      | 1:S235    | 2.3860e+04 |
| 1.0720e+09                             | 0.00 |           |            |

Project.....: SGU021041 - Uitbreiding zwembad de Meerkant te Amstelveen  
Onderdeel.....: Kleedruimte verdieping as 12

## PROFIELEN vervolg [mm]

| Prof. | Staaftype | Breedte | Hoogte | e     | Type | b1 | h1 | b2 |
|-------|-----------|---------|--------|-------|------|----|----|----|
| h2    |           |         |        |       |      |    |    |    |
| 1     | 0:Normaal | 280     | 270    | 135.0 |      |    |    |    |
| 2     | 0:Normaal | 300     | 500    | 250.0 |      |    |    |    |

## DOORSNEDEN

Ligger:1

| sector | Vanaf  | Tot    | Lengte | Profiel begin | z-begin | Profiel eind |
|--------|--------|--------|--------|---------------|---------|--------------|
| z-eind |        |        |        |               |         |              |
| 1      | 0.000  | 14.350 | 14.350 | 2:HEB500      | 0.000   | 2:HEB500     |
| 0.000  |        |        |        |               |         |              |
| 2      | 14.350 | 28.720 | 14.370 | 1:HEA280      | 0.000   | 1:HEA280     |
| 0.000  |        |        |        |               |         |              |
| sector | Vanaf  | Tot    | Lengte | Eindcode      | Bedding | Br.[mm]      |
| 1      | 0.000  | 14.350 | 14.350 | 0:Scharnier   |         |              |
| 2      | 14.350 | 28.720 | 14.370 | 1:Vast        |         |              |

## PROFIELVORMEN [mm]

1 HEA280



2 HEB500



## 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 | 0.50     | 0.50     | 0.30     |
| 0.00  |              |                     |          |          |          |
| 3     | Sneeuw       | 0:Alles tegelijk    | 0.00     | 0.20     | 0.00     |
| 0.00  |              |                     |          |          |          |

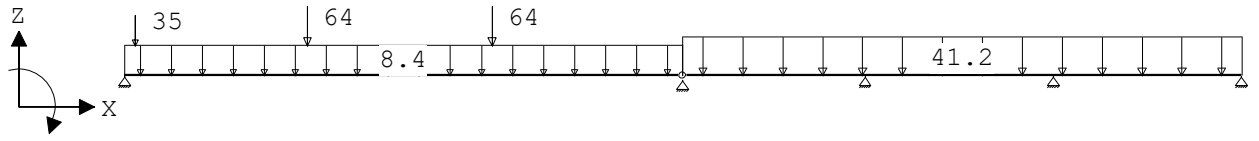
## BELASTINGGEVALLEN

| B.G.              | Omschrijving | Type                   |
|-------------------|--------------|------------------------|
| 1                 | Permanent    | 1 Permanente belasting |
| 2                 | Veranderlijk | 2 Ver. bel. pers. ed.  |
| (q <sub>k</sub> ) |              |                        |
| 3                 | Sneeuw       | 22 Sneeuw A            |

## VELDBELASTINGEN

Ligger:1 B.G:1

Permanent



Project.....: SGU021041 - Uitbreiding zwembad de Meerkant te Amstelveen  
Onderdeel.....: Kleedruimte verdieping as 12

## VELDBELASTINGEN

Ligger:1 B.G:1

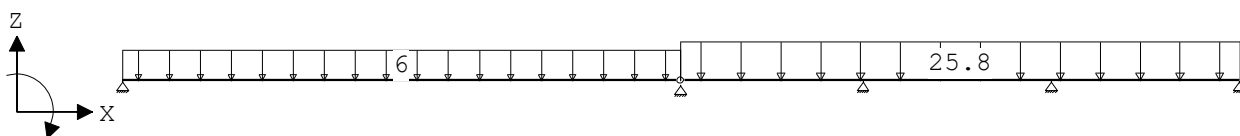
Permanent

| Last Ref. | Type       | Omschrijving | q1/p/m  | q2      | psi |
|-----------|------------|--------------|---------|---------|-----|
| Afstand   | Lengte     |              |         |         |     |
| 1         | 1:q-last   |              | -8.400  | -8.400  |     |
| 0.000     | 14.350     |              |         |         |     |
| 2         | 1:q-last   |              | -41.200 | -41.200 |     |
| 14.350    | 14.370     |              |         |         |     |
| 3         | 8:Puntlast |              | -64.000 |         |     |
| 4.700     |            |              |         |         |     |
| 4         | 8:Puntlast |              | -64.000 |         |     |
| 9.450     |            |              |         |         |     |
| 5         | 8:Puntlast |              | -35.000 |         |     |
| 0.285     |            |              |         |         |     |

## VELDBELASTINGEN

Ligger:1 B.G:2

Veranderlijk



## VELDBELASTINGEN

Ligger:1 B.G:2

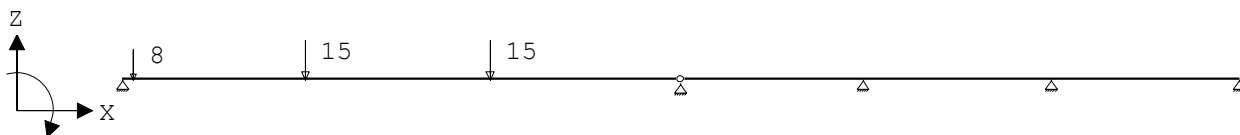
Veranderlijk

| Last Ref. | Type     | Omschrijving | q1/p/m  | q2      | psi |
|-----------|----------|--------------|---------|---------|-----|
| Afstand   | Lengte   |              |         |         |     |
| 1         | 1:q-last |              | -6.000  | -6.000  |     |
| 0.000     | 14.350   |              |         |         |     |
| 2         | 1:q-last |              | -25.800 | -25.800 |     |
| 14.350    | 14.370   |              |         |         |     |

## VELDBELASTINGEN

Ligger:1 B.G:3

Sneeuw



## VELDBELASTINGEN

Ligger:1 B.G:3

Sneeuw

| Last Ref. | Type       | Omschrijving | q1/p/m  | q2 | psi |
|-----------|------------|--------------|---------|----|-----|
| Afstand   | Lengte     |              |         |    |     |
| 1         | 8:Puntlast |              | -15.000 |    |     |
| 4.700     |            |              |         |    |     |
| 2         | 8:Puntlast |              | -15.000 |    |     |
| 9.450     |            |              |         |    |     |
| 3         | 8:Puntlast |              | -8.000  |    |     |



0.285

### **BELASTINGCOMBINATIES**

| BC Type  | BG Gen. | Factor | BG Gen. | Factor | BG Gen. | Factor | BG Gen. |
|----------|---------|--------|---------|--------|---------|--------|---------|
| Factor   |         |        |         |        |         |        |         |
| 1 Fund.  | 1 Perm  | 1.35   |         |        |         |        |         |
| 2 Fund.  | 1 Perm  | 1.35   | 2 psi0  | 1.50   |         |        |         |
| 3 Fund.  | 1 Perm  | 1.20   | 2 Extr  | 1.50   |         |        |         |
| 4 Fund.  | 1 Perm  | 1.20   | 3 Extr  | 1.50   |         |        |         |
| 5 Fund.  | 1 Perm  | 1.20   | 3 Extr  | 1.50   | 2 psi0  | 1.50   |         |
| 6 Fund.  | 1 Perm  | 0.90   |         |        |         |        |         |
| 7 Fund.  | 1 Perm  | 0.90   | 2 psi0  | 1.50   |         |        |         |
| 8 Fund.  | 1 Perm  | 0.90   | 2 Extr  | 1.50   |         |        |         |
| 9 Fund.  | 1 Perm  | 0.90   | 3 Extr  | 1.50   |         |        |         |
| 10 Fund. | 1 Perm  | 0.90   | 3 Extr  | 1.50   | 2 psi0  | 1.50   |         |
| 11 Kar.  | 1 Perm  | 1.00   | 2 Extr  | 1.00   |         |        |         |
| 12 Kar.  | 1 Perm  | 1.00   | 3 Extr  | 1.00   |         |        |         |

Project.....: SGU021041 - Uitbreiding zwembad de Meerkant te Amstelveen  
Onderdeel.....: Kleedruimte verdieping as 12

### BELASTINGCOMBINATIES

| BC Type  | BG | Gen. | Factor | BG     | Gen. | Factor | BG   | Gen. | Factor | BG | Gen. | Factor |
|----------|----|------|--------|--------|------|--------|------|------|--------|----|------|--------|
| 13 Kar.  | 1  | Perm | 1.00   | 3 Extr | 1.00 | 2 psi0 | 1.00 |      |        |    |      |        |
| 14 Freq. | 1  | Perm | 1.00   |        |      |        |      |      |        |    |      |        |
| 15 Freq. | 1  | Perm | 1.00   | 2 psi1 | 1.00 |        |      |      |        |    |      |        |
| 16 Freq. | 1  | Perm | 1.00   | 3 psi1 | 1.00 |        |      |      |        |    |      |        |
| 17 Freq. | 1  | Perm | 1.00   | 3 psi1 | 1.00 | 2 psi2 | 1.00 |      |        |    |      |        |
| 18 Quas. | 1  | Perm | 1.00   |        |      |        |      |      |        |    |      |        |
| 19 Quas. | 1  | Perm | 1.00   | 2 psi2 | 1.00 |        |      |      |        |    |      |        |
| 20 Blij. | 1  | Perm | 1.00   |        |      |        |      |      |        |    |      |        |

### GUNSTIGE WERKING PERMANENTE BELASTINGEN

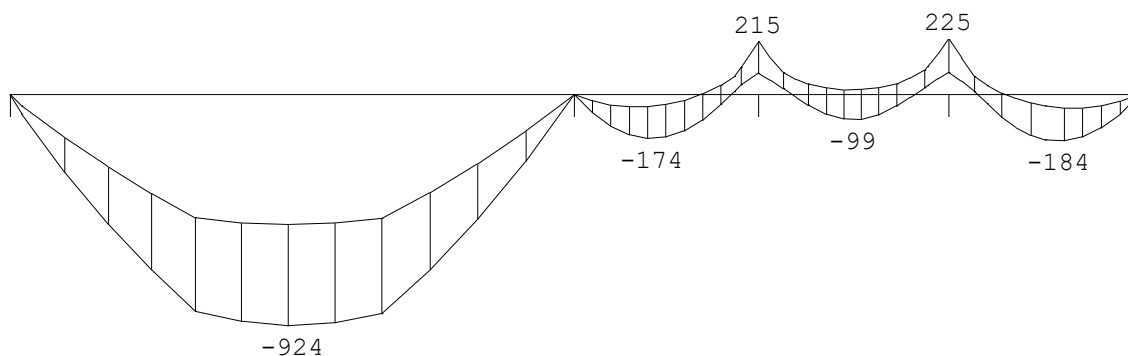
| BC Velden met gunstige werking |
|--------------------------------|
| 1 Geen                         |
| 2 Geen                         |
| 3 Geen                         |
| 4 Geen                         |
| 5 Geen                         |
| 6 Alle velden de factor:0.90   |
| 7 Alle velden de factor:0.90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

### OMHULLENDE VAN DE FUNDAMENTELE COMBINATIES

#### MOMENTEN

Ligger:1 Fundamentele

combinatie

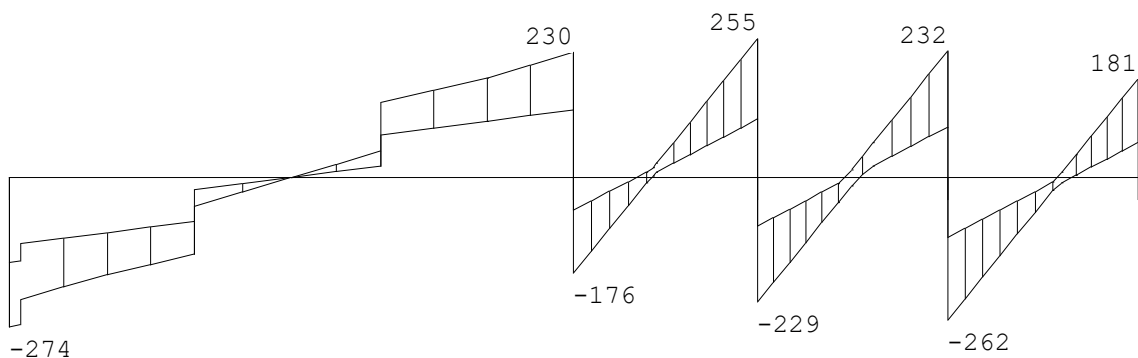


Project.....: SGU021041 - Uitbreiding zwembad de Meerkant te Amstelveen  
Onderdeel.....: Kledruimte verdieping as 12

## DWARSKRACHTEN

Ligger:1 Fundamentele

combinatie



Fmin:156  
Fmax:274

194 197 202 64  
406 483 494 181

## REACTIES

Ligger:1 Fundamentele

combinatie

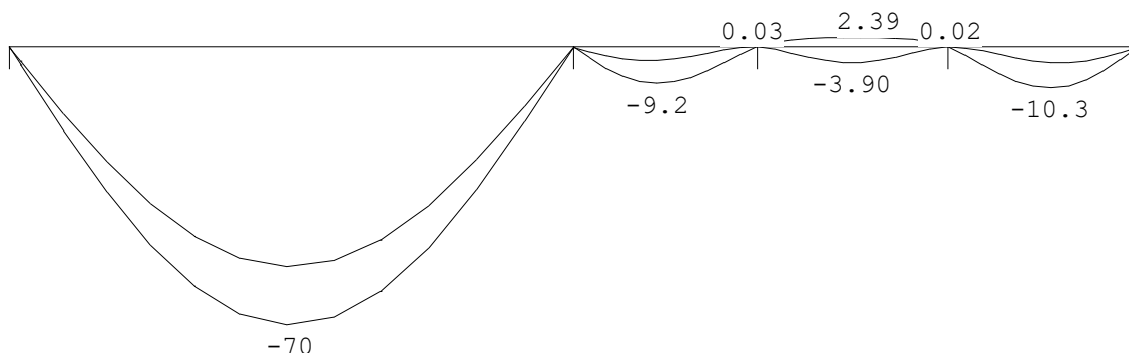
| Stp | Fmin   | Fmax   | Mmin | Mmax |
|-----|--------|--------|------|------|
| 1   | 155.62 | 274.35 | 0.00 | 0.00 |
| 2   | 194.30 | 405.74 | 0.00 | 0.00 |
| 3   | 196.98 | 483.43 | 0.00 | 0.00 |
| 4   | 202.29 | 494.33 | 0.00 | 0.00 |
| 5   | 63.59  | 181.26 | 0.00 | 0.00 |

## OMHULLENDE VAN DE KARAKTERISTIEKE COMBINATIES

### VERPLAATSINGEN [mm]

Ligger:1 Karakteristieke

combinatie





Project.....: SGU021041 - Uitbreiding zwembad de Meerkant te Amstelveen  
Onderdeel.....: Kleedruimte verdieping as 12

## STAALPROFIELEN - ALGEMENE GEGEVENS

Ligger:1

Stabiliteit: Classificatie gehele constructie: Geschoord

## PROFIEL/MATERIAAL

| P/M    | Profielnaam | Vloeisp.             | Productie | Min. |
|--------|-------------|----------------------|-----------|------|
| drsn.  |             |                      |           |      |
| nr.    |             | [N/mm <sup>2</sup> ] | methode   |      |
| klasse |             |                      |           |      |

|   |        |     |         |  |
|---|--------|-----|---------|--|
| 1 | HEA280 | 235 | Gewalst |  |
| 1 |        |     |         |  |
| 2 | HEB500 | 235 | Gewalst |  |
| 1 |        |     |         |  |

Partiële veiligheidsfactoren:

Gamma M;0 : 1.00 Gamma M;1 :

## KIPSTABILITEIT

Ligger:1

| Staafl | Plts. |        | l gaffel | Kipsteunafstanden |
|--------|-------|--------|----------|-------------------|
| aangr. |       |        | [m]      | [m]               |
| 1      | 1.0*h | boven: | 14.35    | 10*1,305;1,300    |
|        |       | onder: | 14.35    | 14.350            |
| 2      | 1.0*h | boven: | 4.69     | 3*1,563           |
|        |       | onder: | 4.69     | 4.690             |
| 3      | 1.0*h | boven: | 4.84     | 3*1,613           |
|        |       | onder: | 4.84     | 4.840             |
| 4      | 1.0*h | boven: | 4.84     | 3*1,613           |
|        |       | onder: | 4.84     | 4.840             |

## TOETSING SPANNINGEN

Ligger:1

Staafl P/M BC Sit Kl Plaats Norm Artikel Formule Hoogste toetsing  
Opm.

| nr. |   |   |   |   |        |         |       |         | U.C. [N/mm <sup>2</sup> ] |
|-----|---|---|---|---|--------|---------|-------|---------|---------------------------|
| 1   | 2 | 3 | 1 | 1 | My-max | EN3-1-1 | 6.2.5 | (6.12y) | 0.816 192                 |
| 2   | 1 | 3 | 5 | 1 | Einde  | EN3-1-1 | 6.2.8 | (6.30)  | 0.825 194                 |
| 3   | 1 | 3 | 6 | 1 | Einde  | EN3-1-1 | 6.2.8 | (6.30)  | 0.861 202                 |
| 4   | 1 | 3 | 6 | 1 | Begin  | EN3-1-1 | 6.2.8 | (6.30)  | 0.865 203                 |

## TOETSING DOORBUIGING

Ligger:1

| Staafl      | Soort | Mtg | Lengte | Overst | Zeeg | u <sub>tot</sub> | BC    | Sit | u      |             |
|-------------|-------|-----|--------|--------|------|------------------|-------|-----|--------|-------------|
| Toelaatbaar |       |     | [m]    | I      | J    | [mm]             |       |     | [mm]   |             |
|             |       |     |        |        |      |                  |       |     | [mm]   |             |
| *1          |       |     |        |        |      |                  |       |     |        |             |
| 1           | Vloer | db  | 14.35  | N      | N    | 60.0             | -70.4 | 11  | 1 Eind | -10.4 ±57.4 |
| 0.004       |       |     |        |        |      |                  |       |     |        |             |
|             |       | db  |        |        |      |                  |       | 11  | 1 Bijk | -14.7 ±43.0 |
| 0.003       |       |     |        |        |      |                  |       |     |        |             |
| 2           | Vloer | db  | 4.69   | N      | N    | 0.0              | -9.2  | 11  | 3 Eind | -9.2 ±18.8  |



|       |       |    |      |   |   |     |       |    |   |      |       |       |
|-------|-------|----|------|---|---|-----|-------|----|---|------|-------|-------|
| 0.004 |       |    |      |   |   |     |       |    |   |      |       |       |
|       |       | db |      |   |   |     |       | 11 | 3 | Bijk | -4.4  | ±14.1 |
| 0.003 |       |    |      |   |   |     |       |    |   |      |       |       |
| 3     | Vloer | db | 4.84 | N | N | 0.0 | -3.9  | 11 | 2 | Eind | -3.9  | ±19.4 |
| 0.004 |       |    |      |   |   |     |       |    |   |      |       |       |
|       |       | db |      |   |   |     |       | 11 | 2 | Bijk | -3.3  | ±14.5 |
| 0.003 |       |    |      |   |   |     |       |    |   |      |       |       |
| 4     | Vloer | db | 4.84 | N | N | 0.0 | -10.3 | 11 | 3 | Eind | -10.3 | ±19.4 |
| 0.004 |       |    |      |   |   |     |       |    |   |      |       |       |
|       |       | db |      |   |   |     |       | 11 | 3 | Bijk | -4.8  | ±14.5 |
| 0.003 |       |    |      |   |   |     |       |    |   |      |       |       |

## Bijlage N Uitvoer Kleedruimte ligger verdieping as 13

**Technosoft Liggers release 6.73a**  
**2023**

**26 jan**

Project.....: SGU021041 - Uitbreiding zwembad de Meerkant te Amstelveen  
Onderdeel.....: Kleedruimte verdieping as 13  
Dimensies.....: kN/m/rad  
Datum.....: 21/11/2022  
Bestand.....: H:\SGU021041\BEREKENINGEN\04\_DO\Kleedruimte verdieping as  
13.dlw

Betrouwbaarheidsklasse : 2 Referentieperiode :  
50

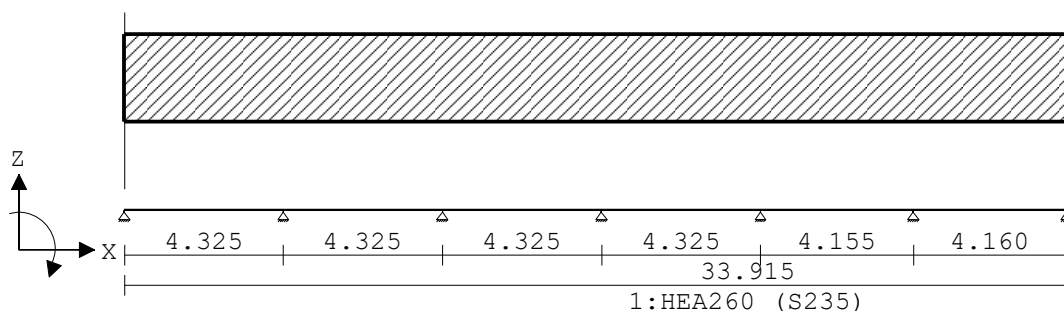
### Toegepaste normen volgens Eurocode met Nederlandse NB

|              |                      |                 |
|--------------|----------------------|-----------------|
| Belastingen  | NEN-EN 1990:2002     | C2:2010,A1:2019 |
| NB:2019 (nl) |                      |                 |
|              | NEN-EN 1991-1-1:2002 | C1/C11:2019     |
| NB:2019 (nl) |                      |                 |
| Staal        | NEN-EN 1993-1-1:2006 | C2:2011,A1:2016 |
| NB:2016 (nl) |                      |                 |

### GEOMETRIE

Ligger:1

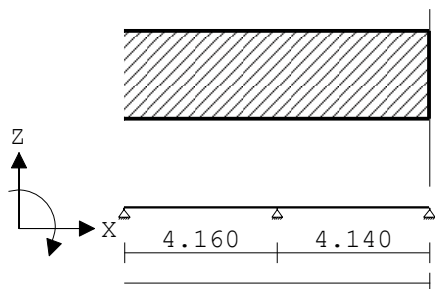
**Velden: 1 t/m 6**



### GEOMETRIE

Ligger:1

**Velden: 7 t/m 8**



## VELDLENGTEN

Ligger:1

| Veld | Vanaf  | Tot    | Lengte | Veld | Vanaf  | Tot    | Lengte |
|------|--------|--------|--------|------|--------|--------|--------|
| 1    | 0.000  | 4.325  | 4.325  | 6    | 21.455 | 25.615 | 4.160  |
| 2    | 4.325  | 8.650  | 4.325  | 7    | 25.615 | 29.775 | 4.160  |
| 3    | 8.650  | 12.975 | 4.325  | 8    | 29.775 | 33.915 | 4.140  |
| 4    | 12.975 | 17.300 | 4.325  |      |        |        |        |
| 5    | 17.300 | 21.455 | 4.155  |      |        |        |        |

Project.....: SGU021041 - Uitbreiding zwembad de Meerkant te Amstelveen  
Onderdeel.....: Kleedruimte verdieping as 13

## MATERIALEN

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

## PROFIELEN [mm]

| Prof.      | Omschrijving | Materiaal | Oppervlak  |
|------------|--------------|-----------|------------|
| Traagheid  | Vormf.       |           |            |
| 1          | HEA260       | 1:S235    | 8.6800e+03 |
| 1.0460e+08 | 0.00         |           |            |

## PROFIELEN vervolg [mm]

| Prof. | Staaftype | Breedte | Hoogte | e     | Type | b1 | h1 | b2 | h2 |
|-------|-----------|---------|--------|-------|------|----|----|----|----|
| 1     | 0:Normaal | 260     | 250    | 125.0 |      |    |    |    |    |

## PROFIELVORMEN [mm]

|   |        |
|---|--------|
| 1 | HEA260 |
|---|--------|



## 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 | 0.50     | 0.50     | 0.30     |
| 0.00  |              |                     |          |          |          |

## BELASTINGGEVALLEN

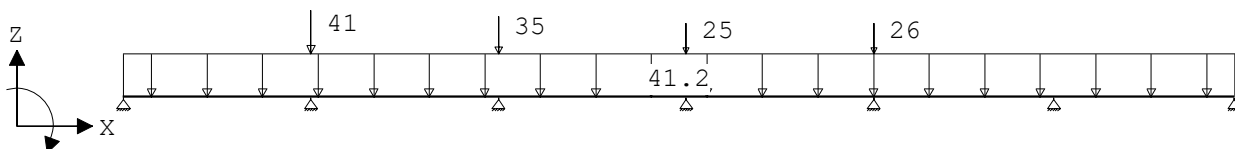
| B.G.              | Omschrijving | Type                   |
|-------------------|--------------|------------------------|
| 1                 | Permanent    | 1 Permanente belasting |
| 2                 | Veranderlijk | 2 Ver. bel. pers. ed.  |
| (q <sub>k</sub> ) |              |                        |

## VELDBELASTINGEN

Ligger:1 B.G:1

Permanent

Velden: 1 t/m 6

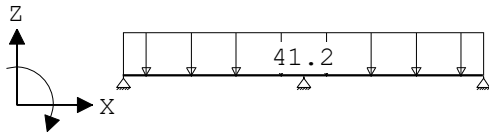


## VELDBELASTINGEN

Ligger:1 B.G:1

Permanent

Velden: 7 t/m 8



Project.....: SGU021041 - Uitbreiding zwembad de Meerkant te Amstelveen  
Onderdeel.....: Kleedruimte verdieping as 13

## VELDBELASTINGEN

Ligger:1 B.G:1

Permanent

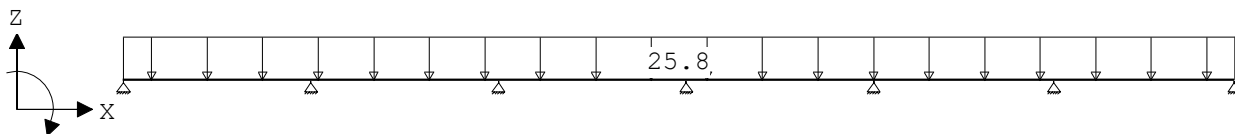
| Last Ref. | Type       | Omschrijving | q1/p/m  | q2      | psi |
|-----------|------------|--------------|---------|---------|-----|
| Afstand   | Lengte     |              |         |         |     |
| 1         | 1:q-last   |              | -41.200 | -41.200 |     |
| 0.000     | 33.915     |              |         |         |     |
| 2         | 8:Puntlast |              | -41.000 |         |     |
| 4.325     |            |              |         |         |     |
| 3         | 8:Puntlast |              | -35.000 |         |     |
| 8.650     |            |              |         |         |     |
| 4         | 8:Puntlast |              | -25.000 |         |     |
| 12.975    |            |              |         |         |     |
| 5         | 8:Puntlast |              | -26.000 |         |     |
| 17.300    |            |              |         |         |     |

## VELDBELASTINGEN

Ligger:1 B.G:2

Veranderlijk

Velden: 1 t/m 6

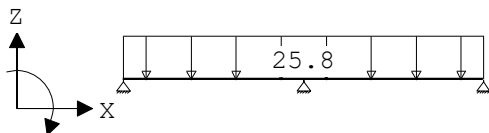


## VELDBELASTINGEN

Ligger:1 B.G:2

Veranderlijk

Velden: 7 t/m 8



## VELDBELASTINGEN

Ligger:1 B.G:2

Veranderlijk

| Last Ref. | Type     | Omschrijving | q1/p/m  | q2      | psi |
|-----------|----------|--------------|---------|---------|-----|
| Afstand   | Lengte   |              |         |         |     |
| 1         | 1:q-last |              | -25.800 | -25.800 |     |
| 0.000     | 33.915   |              |         |         |     |

## BELASTINGCOMBINATIES

| BC Type | BG | Gen. | Factor | BG     | Gen. | Factor | BG | Gen. | Factor | BG | Gen. | Factor |
|---------|----|------|--------|--------|------|--------|----|------|--------|----|------|--------|
| 1 Fund. | 1  | Perm | 1.35   |        |      |        |    |      |        |    |      |        |
| 2 Fund. | 1  | Perm | 1.35   | 2 psi0 |      | 1.50   |    |      |        |    |      |        |
| 3 Fund. | 1  | Perm | 1.20   | 2 Extr |      | 1.50   |    |      |        |    |      |        |
| 4 Fund. | 1  | Perm | 0.90   |        |      |        |    |      |        |    |      |        |
| 5 Fund. | 1  | Perm | 0.90   | 2 psi0 |      | 1.50   |    |      |        |    |      |        |
| 6 Fund. | 1  | Perm | 0.90   | 2 Extr |      | 1.50   |    |      |        |    |      |        |



|    |       |   |      |      |   |      |      |
|----|-------|---|------|------|---|------|------|
| 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 |   |      |      |

Project.....: SGU021041 - Uitbreiding zwembad de Meerkant te Amstelveen  
Onderdeel.....: Kledruimte verdieping as 13

## 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

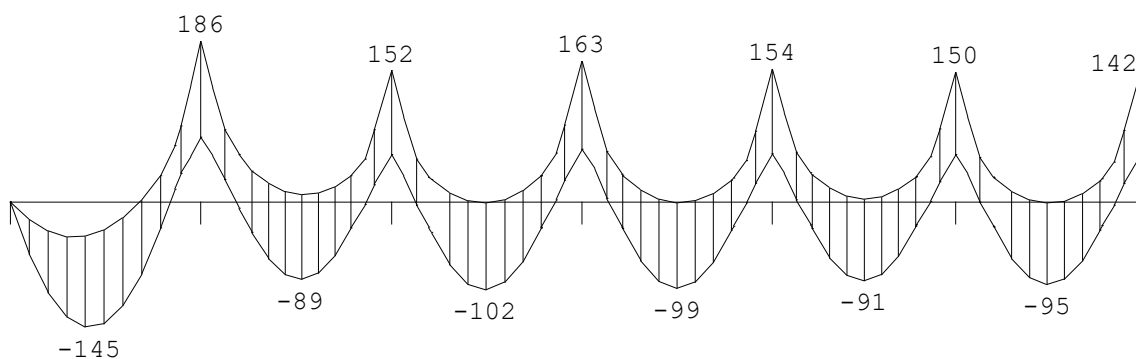
## OMHULLENDE VAN DE FUNDAMENTELE COMBINATIES

### MOMENTEN

Ligger:1 Fundamentele

combinatie

Velden: 1 t/m 6

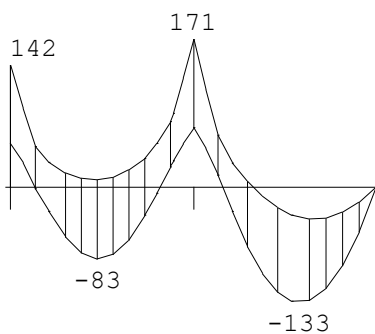


### MOMENTEN

Ligger:1 Fundamentele

combinatie

Velden: 7 t/m 8





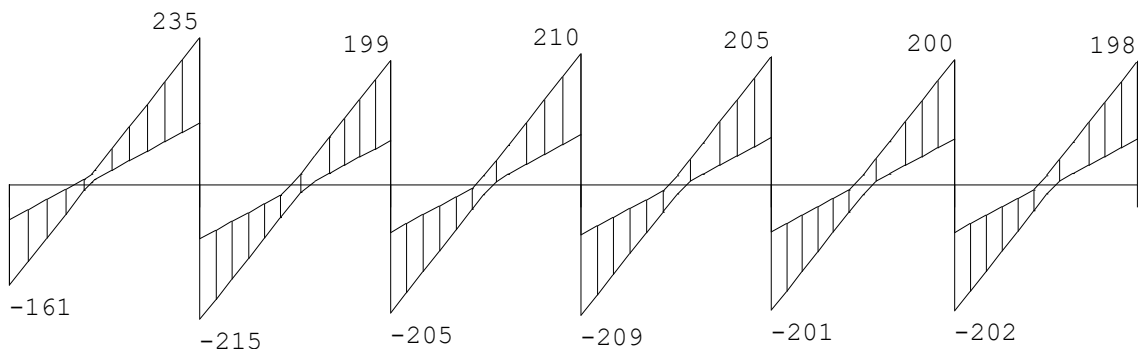
Project.....: SGU021041 - Uitbreiding zwembad de Meerkant te Amstelveen  
Onderdeel.....: Kleedruimte verdieping as 13

## DWARSKRACHTEN

Ligger:1 Fundamentele

combinatie

Velden: 1 t/m 6



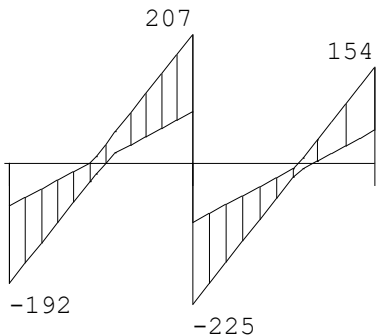
|          |     |     |     |     |     |     |
|----------|-----|-----|-----|-----|-----|-----|
| Fmin:55  | 222 | 188 | 188 | 182 | 157 | 152 |
| Fmax:161 | 500 | 445 | 449 | 437 | 402 | 390 |

## DWARSKRACHTEN

Ligger:1 Fundamentele

combinatie

Velden: 7 t/m 8



|          |     |     |
|----------|-----|-----|
| Fmin:152 | 177 | 53  |
| Fmax:390 | 432 | 154 |

## REACTIES

Ligger:1 Fundamentele

combinatie

| Stp | Fmin   | Fmax   | Mmin | Mmax |
|-----|--------|--------|------|------|
| 1   | 55.44  | 160.53 | 0.00 | 0.00 |
| 2   | 221.83 | 499.74 | 0.00 | 0.00 |
| 3   | 188.42 | 445.44 | 0.00 | 0.00 |
| 4   | 188.02 | 448.95 | 0.00 | 0.00 |
| 5   | 182.44 | 437.03 | 0.00 | 0.00 |
| 6   | 157.40 | 401.56 | 0.00 | 0.00 |
| 7   | 151.58 | 389.68 | 0.00 | 0.00 |
| 8   | 177.21 | 432.02 | 0.00 | 0.00 |
| 9   | 52.92  | 153.71 | 0.00 | 0.00 |

Project.....: SGU021041 - Uitbreiding zwembad de Meerkant te Amstelveen  
Onderdeel.....: Kledruimte verdieping as 13

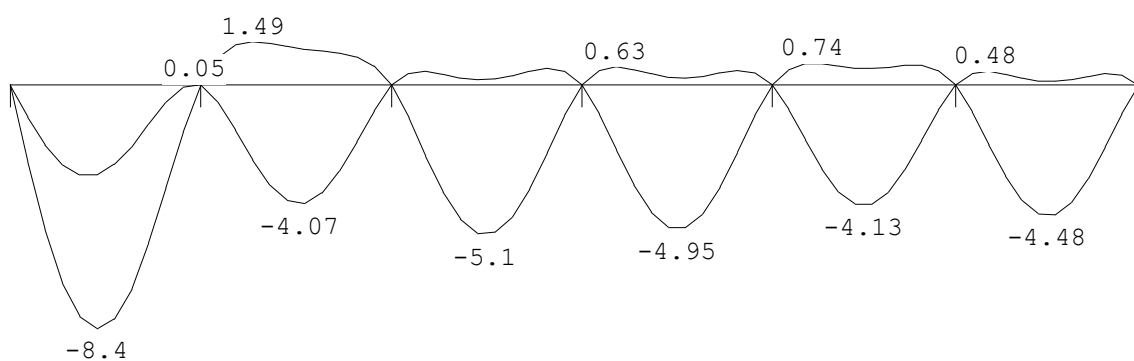
## OMHULLENDE VAN DE KARAKTERISTIEKE COMBINATIES

**VERPLAATSINGEN** [mm]

Ligger:1 Karakteristieke

combinatie

Velden: 1 t/m 6

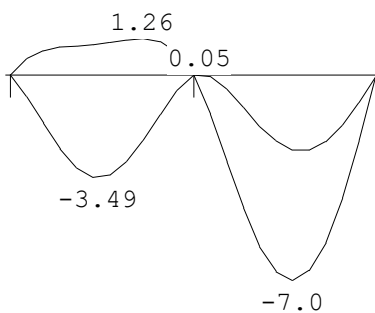


**VERPLAATSINGEN** [mm]

Ligger:1 Karakteristieke

combinatie

Velden: 7 t/m 8





Project.....: SGU021041 - Uitbreiding zwembad de Meerkant te Amstelveen  
Onderdeel.....: Kleedruimte verdieping as 13

## STAALPROFIELEN - ALGEMENE GEGEVENS

Ligger:1

Stabiliteit: Classificatie gehele constructie: Geschoord

## PROFIEL/MATERIAAL

| P/M    | Profielnaam | Vloeisp.             | Productie | Min. |
|--------|-------------|----------------------|-----------|------|
| drsn.  |             |                      |           |      |
| nr.    |             | [N/mm <sup>2</sup> ] | methode   |      |
| klasse |             |                      |           |      |

|   |        |     |         |  |
|---|--------|-----|---------|--|
| 1 | HEA260 | 235 | Gewalst |  |
|---|--------|-----|---------|--|

1

Partiële veiligheidsfactoren:

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

## KIPSTABILITEIT

Ligger:1

| Staafl | Plts. |        | l gaffel | Kipsteunafstanden |
|--------|-------|--------|----------|-------------------|
| aangr. |       |        | [m]      | [m]               |
| 1      | 1.0*h | boven: | 4.32     | 2*1,442;1,441     |
|        |       | onder: | 4.32     | 4.325             |
| 2      | 1.0*h | boven: | 4.32     | 2*1,442;1,441     |
|        |       | onder: | 4.32     | 4.325             |
| 3      | 1.0*h | boven: | 4.32     | 2*1,442;1,441     |
|        |       | onder: | 4.32     | 4.325             |
| 4      | 1.0*h | boven: | 4.32     | 2*1,442;1,441     |
|        |       | onder: | 4.32     | 4.325             |
| 5      | 1.0*h | boven: | 4.16     | 3*1,385           |
|        |       | onder: | 4.16     | 4.155             |
| 6      | 1.0*h | boven: | 4.16     | 3*1,387           |
|        |       | onder: | 4.16     | 4.160             |
| 7      | 1.0*h | boven: | 4.16     | 3*1,387           |
|        |       | onder: | 4.16     | 4.160             |
| 8      | 1.0*h | boven: | 4.14     | 3*1,38            |
|        |       | onder: | 4.14     | 4.140             |

## TOETSING SPANNINGEN

Ligger:1

Staafl P/M BC Sit Kl Plaats Norm Artikel Formule Hoogste toetsing  
Opm.

| nr. |   |   |    |   |       |         |       | U.C.   | [N/mm <sup>2</sup> ] |
|-----|---|---|----|---|-------|---------|-------|--------|----------------------|
| 1   | 1 | 3 | 4  | 1 | Einde | EN3-1-1 | 6.2.8 | (6.30) | 0.865 203            |
| 2   | 1 | 3 | 4  | 1 | Begin | EN3-1-1 | 6.2.8 | (6.30) | 0.862 203            |
| 3   | 1 | 3 | 6  | 1 | Einde | EN3-1-1 | 6.2.8 | (6.30) | 0.756 178            |
| 4   | 1 | 3 | 6  | 1 | Begin | EN3-1-1 | 6.2.8 | (6.30) | 0.756 178            |
| 5   | 1 | 3 | 7  | 1 | Begin | EN3-1-1 | 6.2.8 | (6.30) | 0.710 167            |
| 6   | 1 | 3 | 8  | 1 | Begin | EN3-1-1 | 6.2.8 | (6.30) | 0.694 163            |
| 7   | 1 | 3 | 10 | 1 | Einde | EN3-1-1 | 6.2.8 | (6.30) | 0.792 186            |
| 8   | 1 | 3 | 10 | 1 | Begin | EN3-1-1 | 6.2.8 | (6.30) | 0.793 186            |



## TOETSING DOORBUIGING

Ligger:1

Staaft Soort Mtg Lengte Overst Zeeg  $u_{tot}$  BC Sit

Toelaatbaar

u

[m]

I

J

[mm]

[mm]

[mm]

[mm]

\*1

|   |       |    |      |   |   |     |      |   |   |      |      |       |
|---|-------|----|------|---|---|-----|------|---|---|------|------|-------|
| 1 | Vloer | db | 4.32 | N | N | 0.0 | -8.4 | 7 | 2 | Eind | -8.4 | ±17.3 |
|---|-------|----|------|---|---|-----|------|---|---|------|------|-------|

0.004

db

|   |   |      |      |       |
|---|---|------|------|-------|
| 7 | 2 | Bijk | -4.0 | ±13.0 |
|---|---|------|------|-------|

0.003



Project.....: SGU021041 - Uitbreiding zwembad de Meerkant te Amstelveen  
Onderdeel.....: Kleedruimte verdieping as 13

## TOETSING DOORBUIGING

Ligger:1

| Staaft<br>Toelaatbaar | Soort | Mtg | Lengte | Overst |   | Zeeg | $u_{tot}$ | BC Sit |        | u    |       |
|-----------------------|-------|-----|--------|--------|---|------|-----------|--------|--------|------|-------|
|                       |       |     | [m]    | I      | J | [mm] | [mm]      |        |        | [mm] | [mm]  |
| *1                    |       |     |        |        |   |      |           |        |        |      |       |
| 2<br>0.004            | Vloer | db  | 4.32   | N      | N | 0.0  | -4.1      | 7      | 3 Eind | -4.1 | ±17.3 |
| 0.003                 |       | db  |        |        |   |      |           | 7      | 3 Bijk | -3.0 | ±13.0 |
| 3<br>0.004            | Vloer | db  | 4.32   | N      | N | 0.0  | -5.1      | 7      | 2 Eind | -5.1 | ±17.3 |
| 0.003                 |       | db  |        |        |   |      |           | 7      | 2 Bijk | -3.2 | ±13.0 |
| 4<br>0.004            | Vloer | db  | 4.32   | N      | N | 0.0  | -4.9      | 7      | 3 Eind | -4.9 | ±17.3 |
| 0.003                 |       | db  |        |        |   |      |           | 7      | 3 Bijk | -3.2 | ±13.0 |
| 5<br>0.004            | Vloer | db  | 4.16   | N      | N | 0.0  | -4.1      | 7      | 2 Eind | -4.1 | ±16.6 |
| 0.003                 |       | db  |        |        |   |      |           | 7      | 2 Bijk | -2.8 | ±12.5 |
| 6<br>0.004            | Vloer | db  | 4.16   | N      | N | 0.0  | -4.5      | 7      | 3 Eind | -4.5 | ±16.6 |
| 0.003                 |       | db  |        |        |   |      |           | 7      | 3 Bijk | -2.8 | ±12.5 |
| 7<br>0.004            | Vloer | db  | 4.16   | N      | N | 0.0  | -3.5      | 7      | 2 Eind | -3.5 | ±16.6 |
| 0.003                 |       | db  |        |        |   |      |           | 7      | 2 Bijk | -2.6 | ±12.5 |
| 8<br>0.004            | Vloer | db  | 4.14   | N      | N | 0.0  | -7.0      | 7      | 3 Eind | -7.0 | ±16.6 |
| 0.003                 |       | db  |        |        |   |      |           | 7      | 3 Bijk | -3.4 | ±12.4 |



## Bijlage O Uitvoer Kleedruimte luifel

**Technosoft Balkroosters release 6.74**  
**2023**

**26 jan**

---

Project.....: SGU021041 - Uitbreiding zwembad de Meerkant te  
Amstelveen  
Onderdeel.....: Luifel as 7  
Dimensies.....: kN/m/rad  
Datum.....: 25/11/2022  
Bestand.....: H:\SGU021041\BEREKENINGEN\04\_DO\Luifel as 7.grw  
Torsiefac.....: 20 %

Betrouwbaarheidsklasse : 2 Referentieperiode :  
50

### **Toegepaste normen volgens Eurocode met Nederlandse NB**

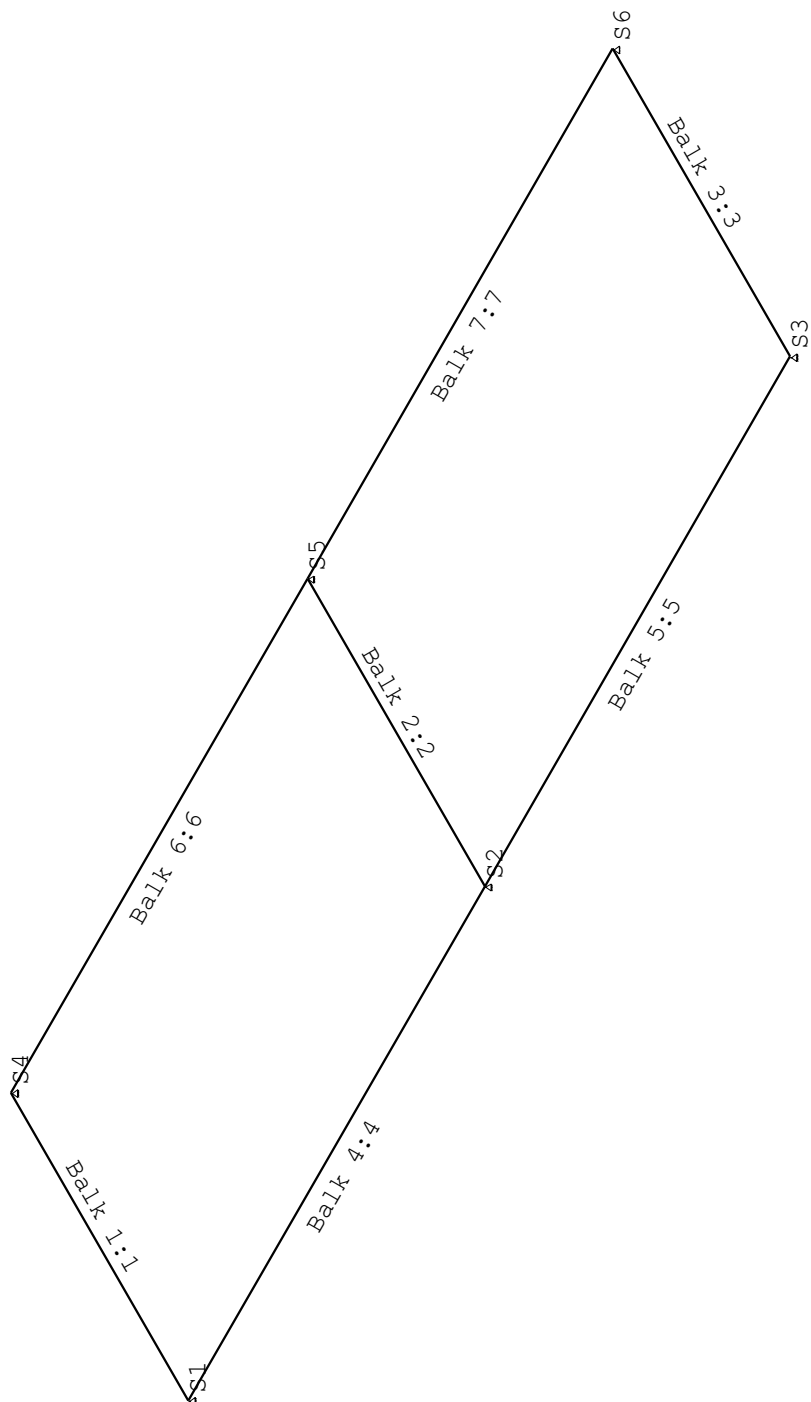
---

|             |                      |                 |
|-------------|----------------------|-----------------|
| Belastingen | NEN-EN 1990:2002     | C2:2010,A1:2019 |
| NB:2019(nl) |                      |                 |
|             | NEN-EN 1991-1-1:2002 | C1/C11:2019     |
| NB:2019(nl) |                      |                 |
| Staal       | NEN-EN 1993-1-1:2006 | C2:2011,A1:2016 |
| NB:2016(nl) |                      |                 |

Project.....: SGU021041 - Uitbreiding zwembad de Meerkant te Amstelveen  
 Onderdeel.....: Luifel as 7

## GEOMETRIE

---





Project.....: SGU021041 - Uitbreiding zwembad de Meerkant te Amstelveen  
Onderdeel.....: Luifel as 7

## MATERIALEN

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

## PROFIELEN [mm]

| Prof. | Omschrijving | Materiaal | Oppervlak | Torsietr. |
|-------|--------------|-----------|-----------|-----------|
|       | Traagheid    | Vormf.    |           |           |
| 1     | HEA140       | 1:S235    | 3.142e+03 | 8.100e+04 |
|       | 1.033e+07    | 0.00      |           |           |

## PROFIELEN vervolg [mm]

| Prof. | Staaftype | Breedte | Hoogte | Zs | Rek.As | Type | b1 | h1 |
|-------|-----------|---------|--------|----|--------|------|----|----|
|       | b2        | h2      |        |    |        |      |    |    |
| 1     | 0:Normaal | 140     | 133    | 67 | -0.00  |      |    |    |

## PROFIELVORMEN [mm]

|   |        |
|---|--------|
| 1 | HEA140 |
|---|--------|



## KNOPEN

| Knoop | X     | Y     | Knoop | X     | Y     |
|-------|-------|-------|-------|-------|-------|
| 1     | 0.000 | 0.000 | 6     | 9.950 | 2.935 |
| 2     | 0.000 | 2.935 |       |       |       |
| 3     | 4.900 | 0.000 |       |       |       |
| 4     | 4.900 | 2.935 |       |       |       |
| 5     | 9.950 | 0.000 |       |       |       |

## BALKEN

| Nr. | Naam | Begin | Eind | Profiel  |
|-----|------|-------|------|----------|
| 1   | 1    | 1     | 2    | 1:HEA140 |
| 2   | 2    | 3     | 4    | 1:HEA140 |
| 3   | 3    | 5     | 6    | 1:HEA140 |
| 4   | 4    | 1     | 3    | 1:HEA140 |
| 5   | 5    | 3     | 5    | 1:HEA140 |
| 6   | 6    | 2     | 4    | 1:HEA140 |
| 7   | 7    | 4     | 6    | 1:HEA140 |

## BALKEN vervolg

| Nr.   | Naam      | Aansl.begin | Aansl.eind | Excentr. | Pasm.begin |
|-------|-----------|-------------|------------|----------|------------|
|       | Pasm.eind | Opm.        |            |          |            |
| 1     | 1         | WDM         | WDM        | 0.000    | 0.000      |
| 0.000 |           |             |            |          |            |
| 2     | 2         | WDM         | WDM        | 0.000    | 0.000      |
| 0.000 |           |             |            |          |            |
| 3     | 3         | WDM         | WDM        | 0.000    | 0.000      |
| 0.000 |           |             |            |          |            |



|       |     |     |       |       |
|-------|-----|-----|-------|-------|
| 4 4   | WDM | WDM | 0.000 | 0.000 |
| 0.000 |     |     |       |       |
| 5 5   | WDM | WDM | 0.000 | 0.000 |
| 0.000 |     |     |       |       |
| 6 6   | WDM | WDM | 0.000 | 0.000 |
| 0.000 |     |     |       |       |
| 7 7   | WDM | WDM | 0.000 | 0.000 |
| 0.000 |     |     |       |       |

---

Opmerkingen:

De torsie traagheid van alle balken is tot 20% gereduceerd



Project.....: SGU021041 - Uitbreiding zwembad de Meerkant te Amstelveen  
Onderdeel.....: Luifel as 7

## BALKEN vervolg

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

## STEUNPUNTTYPEN

|            |   |         |                        |
|------------|---|---------|------------------------|
| Nr.        | : | 1       | Assenstelsel: Globaal  |
| Afmeting   | : | 200*200 | Rx:Vrij Z:Vast Ry:Vrij |
| Lengte     | : | 4.000   |                        |
| Min.afst.: | : | 0.500   |                        |
| Nr.        | : | 2       | Assenstelsel: Globaal  |
| Afmeting   | : | 200*200 | Rx:Vrij Z:Vast Ry:Vrij |
| Min.afst.: | : | 0.150   |                        |

## STEUNPUNTEN

| Nr.   | Steunpunttype | Balk     | Positie | Excentr. |
|-------|---------------|----------|---------|----------|
| Hoek  | Opm:          |          |         |          |
| 1     | 1:200*200     | Balk 1:1 | 0.000   | 0.000    |
| 0.000 |               |          |         |          |
| 2     | 1:200*200     | Balk 2:2 | 0.000   | 0.000    |
| 0.000 |               |          |         |          |
| 3     | 2:200*200     | Balk 3:3 | 0.000   | 0.000    |
| 0.000 |               |          |         |          |
| 4     | 1:200*200     | Balk 1:1 | 2.935   | 0.000    |
| 0.000 |               |          |         |          |
| 5     | 1:200*200     | Balk 6:6 | 4.900   | 0.000    |
| 0.000 |               |          |         |          |
| 6     | 1:200*200     | Balk 7:7 | 5.050   | 0.000    |
| 0.000 |               |          |         |          |

## BELASTINGGEVALLEN

| B.G.  | Omschrijving | Belast/onbelast     | $\Psi_0$ | $\Psi_1$ | $\Psi_2$ |
|-------|--------------|---------------------|----------|----------|----------|
| e.g.  |              |                     |          |          |          |
| 1     | Permanent    | 2:Permanent EN1991  |          |          |          |
| -1.00 |              |                     |          |          |          |
| 2     | Sneeuw       | 1:Schaakbord EN1991 | 0.00     | 0.20     | 0.00     |
| 0.00  |              |                     |          |          |          |

## BELASTINGGEVALLEN

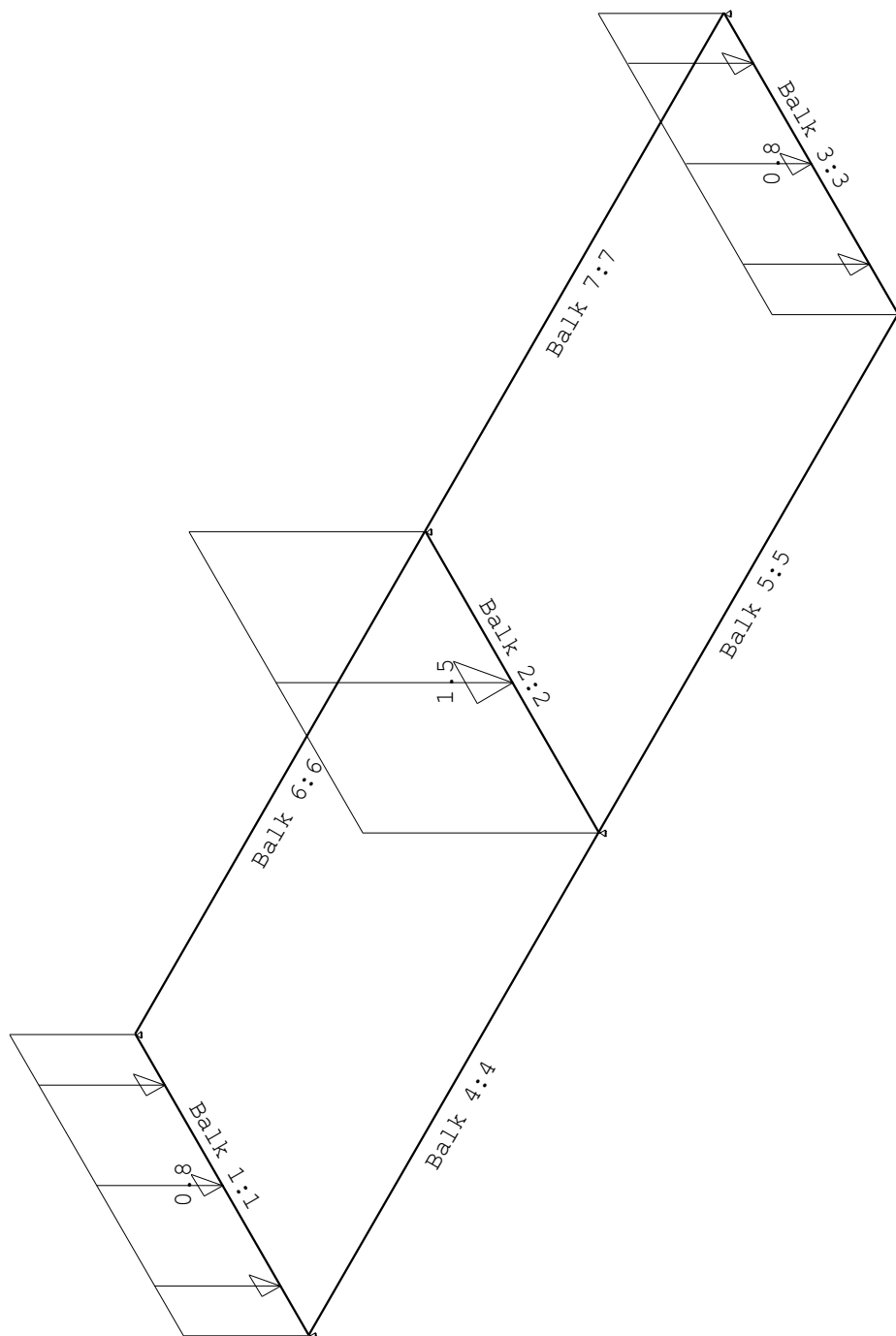
| B.G. | Omschrijving | Type                   |
|------|--------------|------------------------|
| 1    | Permanent    | 1 Permanente belasting |
| 2    | Sneeuw       | 22 Sneeuw A            |

Project.....: SGU021041 - Uitbreiding zwembad de Meerkant te Amstelveen  
Onderdeel.....: Luifel as 7

## VELDBELASTINGEN

B.G:1

Permanent





Project.....: SGU021041 - Uitbreiding zwembad de Meerkant te  
Amstelveen  
Onderdeel.....: Luifel as 7

## VELDBELASTINGEN

B.G:1

Permanent

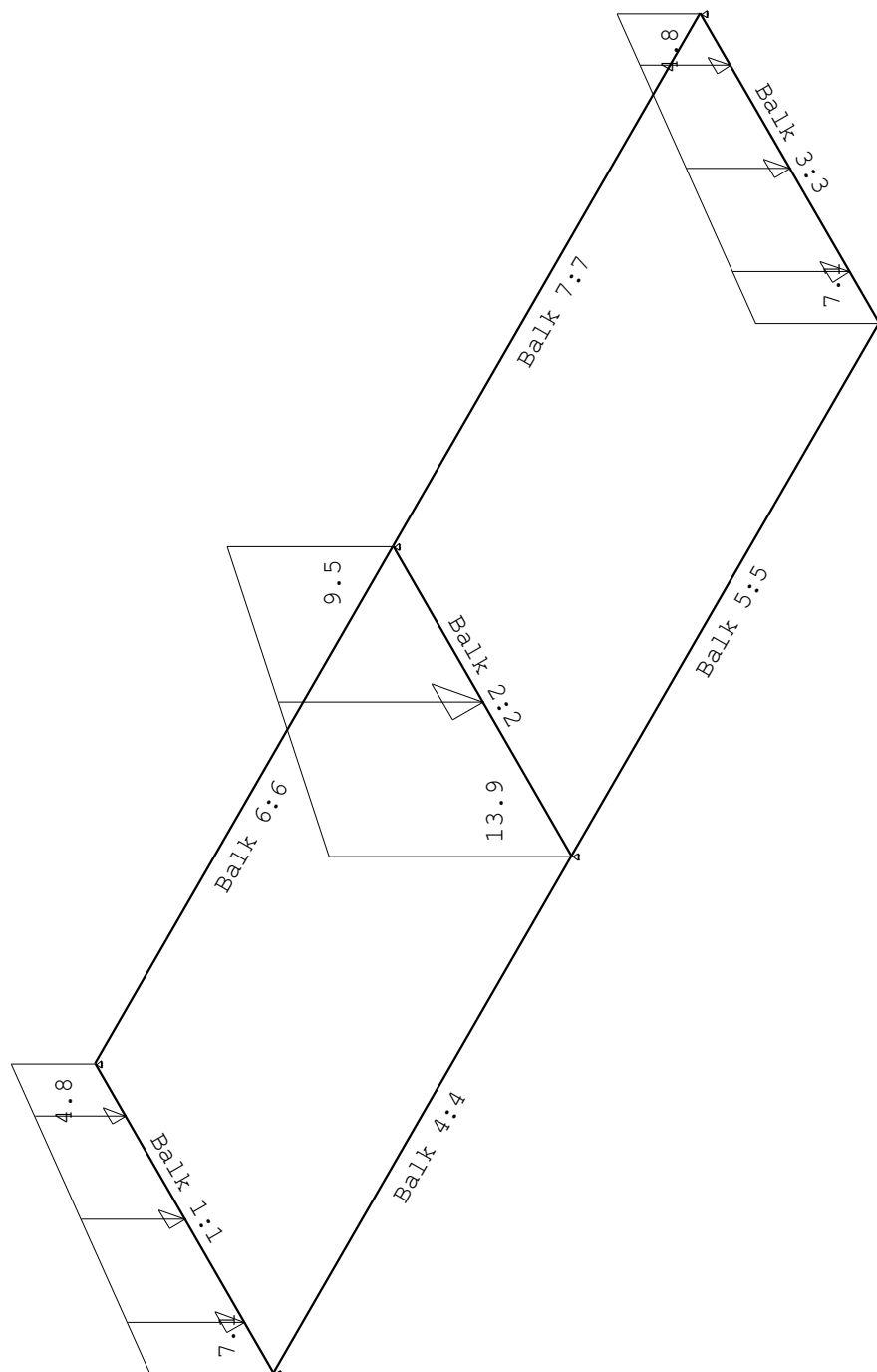
| Balk     | Last  | Type       | q1/p/m | q2     | Afstand |
|----------|-------|------------|--------|--------|---------|
| Lengte   | Exc.  |            |        |        |         |
| Balk 1:1 |       | 1 1:q-last | -0.800 | -0.800 | 0.000   |
| 2.935    | 0.000 |            |        |        |         |
| Balk 2:2 |       | 1 1:q-last | -1.500 | -1.500 | 0.000   |
| 2.935    | 0.000 |            |        |        |         |
| Balk 3:3 |       | 1 1:q-last | -0.800 | -0.800 | 0.000   |
| 2.935    | 0.000 |            |        |        |         |

Project.....: SGU021041 - Uitbreiding zwembad de Meerkant te Amstelveen  
Onderdeel.....: Luifel as 7

## VELDBELASTINGEN

B.G:2

Sneeuw





Project.....: SGU021041 - Uitbreiding zwembad de Meerkant te  
Amstelveen  
Onderdeel.....: Luifel as 7

## VELDBELASTINGEN

B.G:2

Sneeuw

| Balk     | Last  | Type       | q1/p/m  | q2     | Afstand |
|----------|-------|------------|---------|--------|---------|
| Lengte   | Exc.  |            |         |        |         |
| Balk 1:1 |       | 1 1:q-last | -7.100  | -4.800 | 0.000   |
| 2.935    | 0.000 |            |         |        |         |
| Balk 2:2 |       | 1 1:q-last | -13.900 | -9.500 | 0.000   |
| 2.935    | 0.000 |            |         |        |         |
| Balk 3:3 |       | 1 1:q-last | -7.100  | -4.800 | 0.000   |
| 2.935    | 0.000 |            |         |        |         |

## BELASTINGCOMBINATIES

| BC Type | BG Gen. | Factor | BG Gen. | Factor | BG Gen. | Factor |
|---------|---------|--------|---------|--------|---------|--------|
| Factor  |         |        |         |        |         |        |
| 1 Fund. | 1 Perm  | 1.35   |         |        |         |        |
| 2 Fund. | 1 Perm  | 1.20   | 2 Extr  | 1.50   |         |        |
| 3 Fund. | 1 Perm  | 0.90   |         |        |         |        |
| 4 Fund. | 1 Perm  | 0.90   | 2 Extr  | 1.50   |         |        |
| 5 Kar.  | 1 Perm  | 1.00   | 2 Extr  | 1.00   |         |        |
| 6 Freq. | 1 Perm  | 1.00   |         |        |         |        |
| 7 Freq. | 1 Perm  | 1.00   | 2 psil  | 1.00   |         |        |
| 8 Quas. | 1 Perm  | 1.00   |         |        |         |        |
| 9 Blij. | 1 Perm  | 1.00   |         |        |         |        |



Project.....: SGU021041 - Uitbreiding zwembad de Meerkant te  
Amstelveen  
Onderdeel.....: Luifel as 7

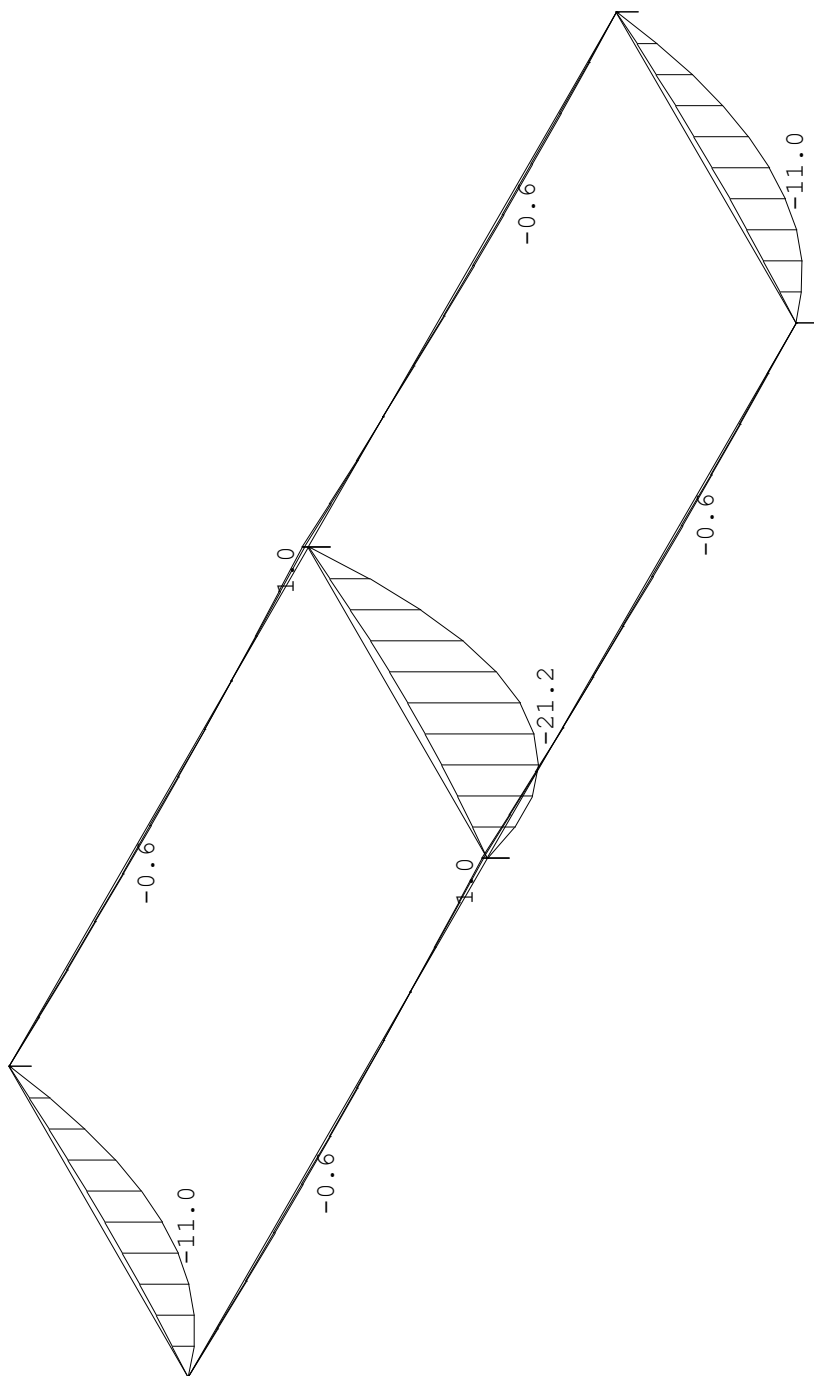
## **OMHULLENDE VAN DE FUNDAMENTELE COMBINATIES**

---

Project.....: SGU021041 - Uitbreiding zwembad de Meerkant te  
Amstelveen  
Onderdeel.....: Luifel as 7

**MOMENTEN**  
combinatie

Fundamentele

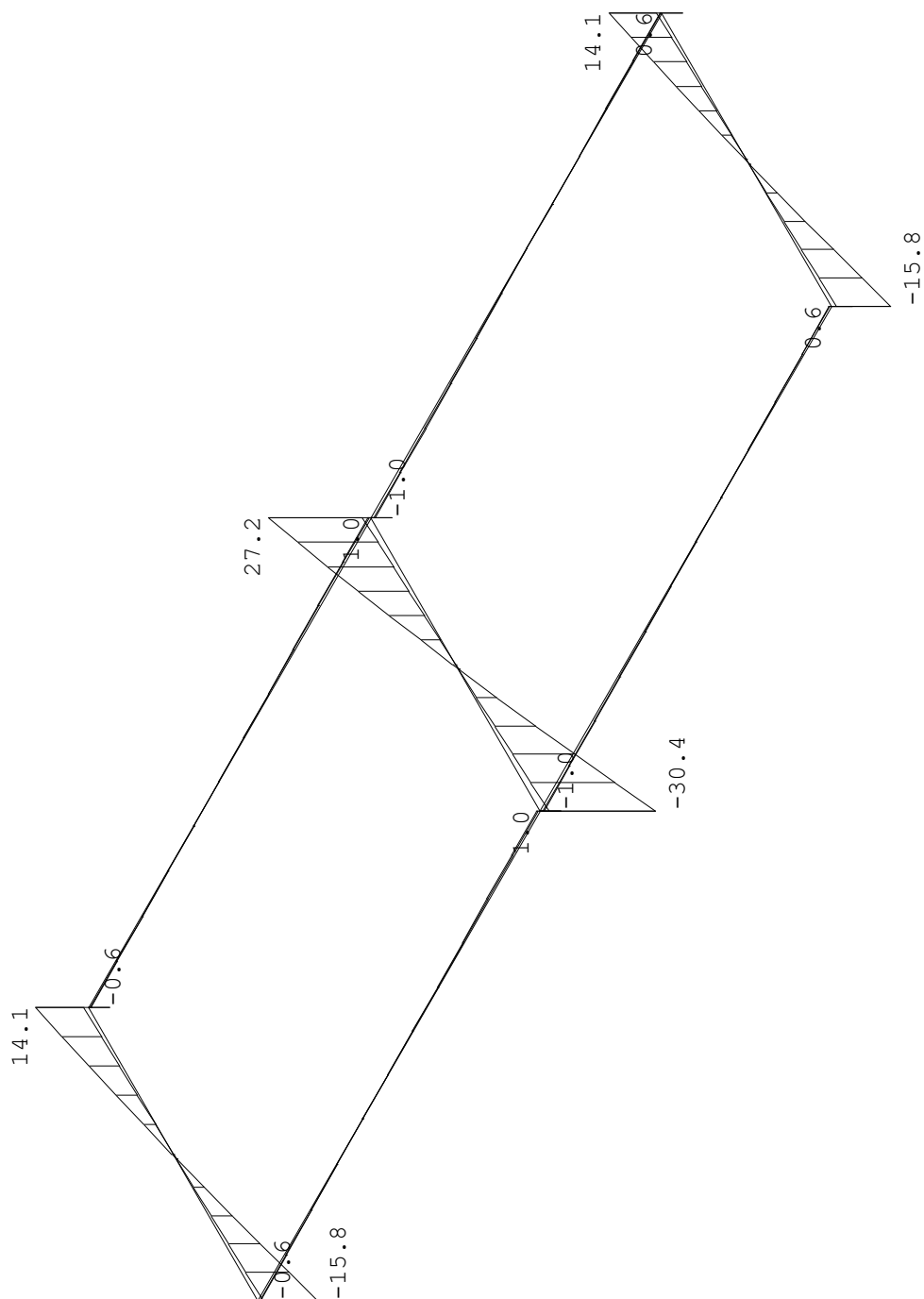


Project.....: SGU021041 - Uitbreiding zwembad de Meerkant te  
Amstelveen  
Onderdeel.....: Luifel as 7

## DWARSKRACHTEN

combinatie

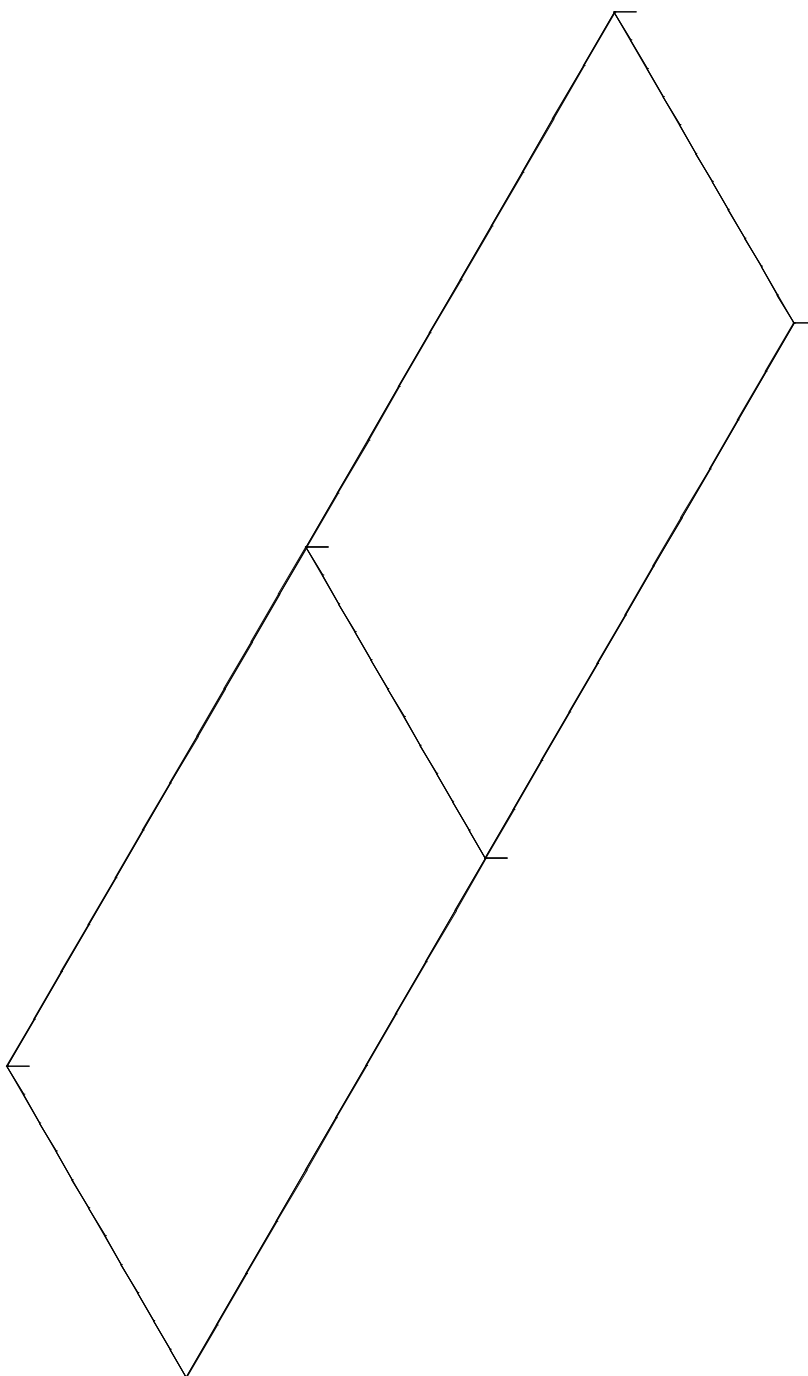
Fundamentele



Project.....: SGU021041 - Uitbreiding zwembad de Meerkant te  
Amstelveen  
Onderdeel.....: Luifel as 7

**WRINGMOMENTEN**  
combinatie

Fundamentele



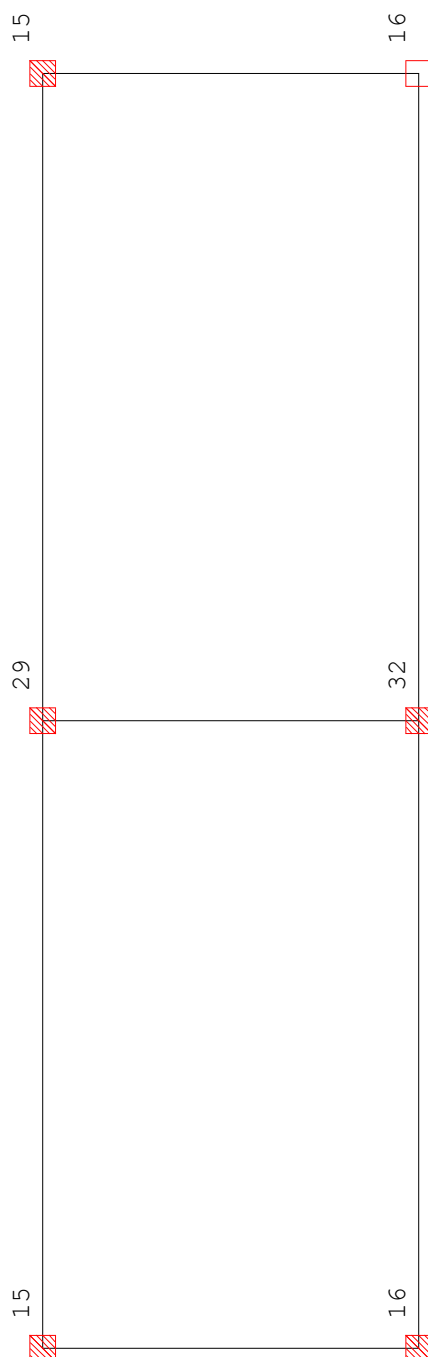


Project.....: SGU021041 - Uitbreiding zwembad de Meerkant te  
Amstelveen  
Onderdeel.....: Luifel as 7

## REACTIES

combinatie

Fundamentele





Project.....: SGU021041 - Uitbreiding zwembad de Meerkant te  
Amstelveen  
Onderdeel.....: Luifel as 7

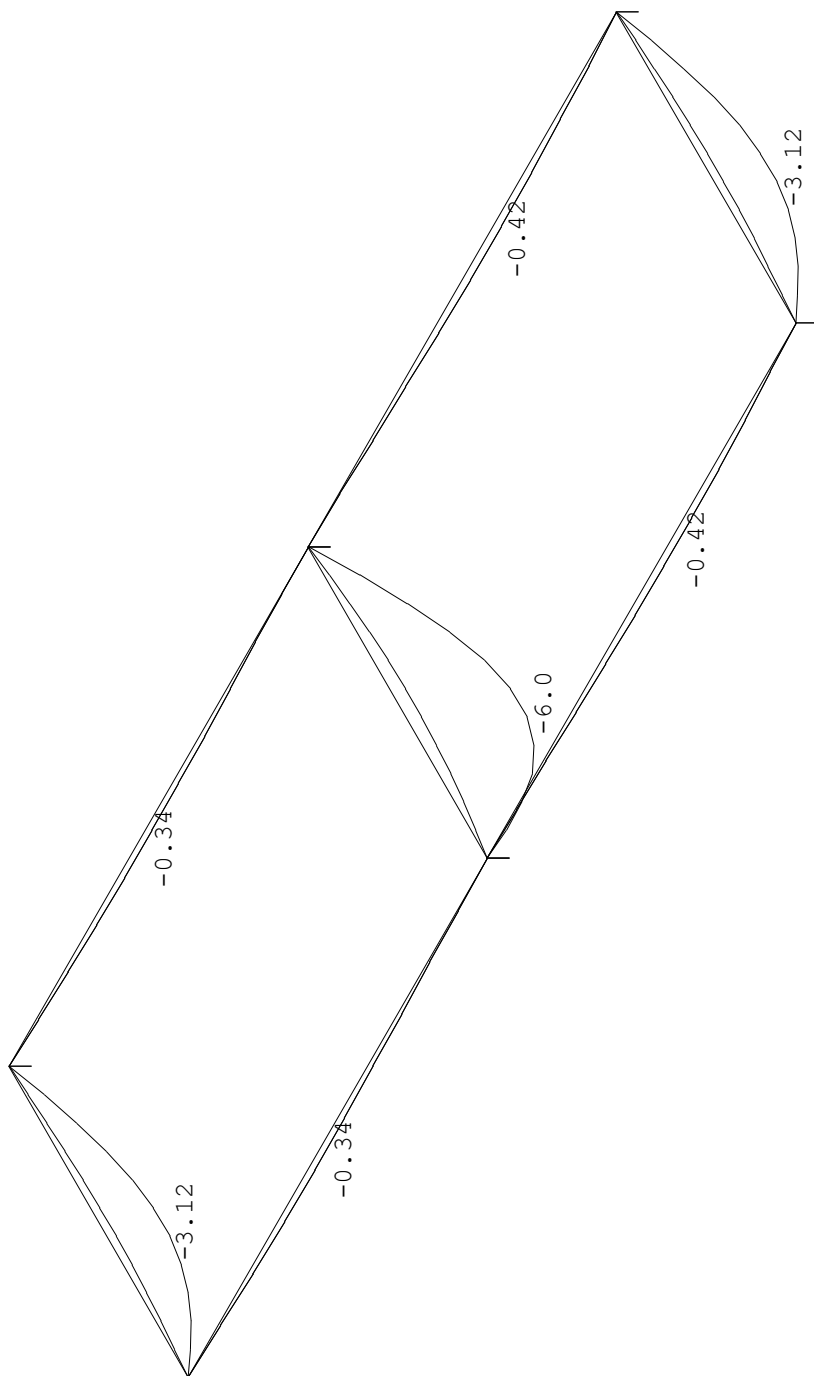
## **OMHULLENDE VAN DE KARAKTERISTIEKE COMBINATIES**

---

Project.....: SGU021041 - Uitbreiding zwembad de Meerkant te  
Amstelveen  
Onderdeel.....: Luifel as 7

**VERPLAATSINGEN** [mm]  
combinatie

Karakteristieke





Project.....: SGU021041 - Uitbreiding zwembad de Meerkant te Amstelveen  
Onderdeel.....: Luifel as 7

## STAALPROFIELEN - ALGEMENE GEGEVENS

Stabiliteit: Classificatie gehele constructie: Geschoord

### PROFIEL/MATERIAAL

| P/M    | Profielnaam | Vloeisp.             | Productie | Min. |
|--------|-------------|----------------------|-----------|------|
| drsn.  |             |                      |           |      |
| nr.    |             | [N/mm <sup>2</sup> ] | methode   |      |
| klasse |             |                      |           |      |

|   |        |     |         |  |
|---|--------|-----|---------|--|
| 1 | HEA140 | 235 | Gewalst |  |
|---|--------|-----|---------|--|

1

Partiële veiligheidsfactoren:

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

### KIPSTABILITEIT

| Staaf  | Plts. | l gaffel | Kipsteunafstanden |
|--------|-------|----------|-------------------|
| aangr. |       | [m]      | [m]               |

#### Balk 1:1

|    |       |        |      |       |
|----|-------|--------|------|-------|
| V1 | 1.0*h | boven: | 2.93 | 2.935 |
|    |       | onder: | 2.93 | 2.935 |

#### Balk 2:2

|    |       |        |      |       |
|----|-------|--------|------|-------|
| V2 | 1.0*h | boven: | 2.93 | 2.935 |
|    |       | onder: | 2.93 | 2.935 |

#### Balk 3:3

|    |       |        |      |       |
|----|-------|--------|------|-------|
| V3 | 1.0*h | boven: | 2.93 | 2.935 |
|    |       | onder: | 2.93 | 2.935 |

#### Balk 4:4

|    |       |        |      |       |
|----|-------|--------|------|-------|
| V4 | 1.0*h | boven: | 4.90 | 4.900 |
|    |       | onder: | 4.90 | 4.900 |

#### Balk 5:5

|    |       |        |      |       |
|----|-------|--------|------|-------|
| V5 | 1.0*h | boven: | 5.05 | 5.050 |
|    |       | onder: | 5.05 | 5.050 |

#### Balk 6:6

|    |       |        |      |       |
|----|-------|--------|------|-------|
| V6 | 1.0*h | boven: | 4.90 | 4.900 |
|    |       | onder: | 4.90 | 4.900 |

#### Balk 7:7

|    |       |        |      |       |
|----|-------|--------|------|-------|
| V7 | 1.0*h | boven: | 5.05 | 5.050 |
|    |       | onder: | 5.05 | 5.050 |

### TOETSING SPANNINGEN

| Staaf | P/M | BC | Sit | Kl | Plaats | Norm | Artikel | Formule | Hoogste toetsing          |
|-------|-----|----|-----|----|--------|------|---------|---------|---------------------------|
| Opm.  |     |    |     |    |        |      |         |         |                           |
| nr.   |     |    |     |    |        |      |         |         | U.C. [N/mm <sup>2</sup> ] |

#### Balk 1:1

|    |   |   |   |   |        |         |       |         |          |
|----|---|---|---|---|--------|---------|-------|---------|----------|
| V1 | 1 | 2 | 1 | 1 | My-max | EN3-1-1 | 6.2.5 | (6.12y) | 0.269 63 |
|----|---|---|---|---|--------|---------|-------|---------|----------|

#### Balk 2:2

|    |   |   |   |   |       |         |       |        |           |
|----|---|---|---|---|-------|---------|-------|--------|-----------|
| V2 | 1 | 2 | 1 | 1 | Staaf | EN3-1-1 | 6.3.2 | (6.54) | 0.578 136 |
| 46 |   |   |   |   |       |         |       |        |           |

Project.....: SGU021041 - Uitbreiding zwembad de Meerkant te Amstelveen  
Onderdeel.....: Luifel as 7

## TOETSING SPANNINGEN

| Staaf | P/M | BC | Sit | Kl | Plaats | Norm | Artikel | Formule | Hoogste toetsing          |
|-------|-----|----|-----|----|--------|------|---------|---------|---------------------------|
| Opm.  |     |    |     |    |        |      |         |         |                           |
| nr.   |     |    |     |    |        |      |         |         | U.C. [N/mm <sup>2</sup> ] |

### Balk 3:3

|    |   |   |   |   |        |         |       |         |       |    |
|----|---|---|---|---|--------|---------|-------|---------|-------|----|
| V3 | 1 | 2 | 1 | 1 | My-max | EN3-1-1 | 6.2.5 | (6.12y) | 0.269 | 63 |
|----|---|---|---|---|--------|---------|-------|---------|-------|----|

### Balk 4:4

|    |   |   |   |   |       |         |       |        |       |   |
|----|---|---|---|---|-------|---------|-------|--------|-------|---|
| V4 | 1 | 1 | 1 | 1 | Einde | EN3-1-1 | 6.2.8 | (6.30) | 0.025 | 6 |
|----|---|---|---|---|-------|---------|-------|--------|-------|---|

### Balk 5:5

|    |   |   |   |   |       |         |       |        |       |   |
|----|---|---|---|---|-------|---------|-------|--------|-------|---|
| V5 | 1 | 1 | 1 | 1 | Begin | EN3-1-1 | 6.2.8 | (6.30) | 0.025 | 6 |
|----|---|---|---|---|-------|---------|-------|--------|-------|---|

### Balk 6:6

|    |   |   |   |   |       |         |       |        |       |   |
|----|---|---|---|---|-------|---------|-------|--------|-------|---|
| V6 | 1 | 1 | 1 | 1 | Einde | EN3-1-1 | 6.2.8 | (6.30) | 0.025 | 6 |
|----|---|---|---|---|-------|---------|-------|--------|-------|---|

### Balk 7:7

|    |   |   |   |   |       |         |       |        |       |   |
|----|---|---|---|---|-------|---------|-------|--------|-------|---|
| V7 | 1 | 1 | 1 | 1 | Begin | EN3-1-1 | 6.2.8 | (6.30) | 0.025 | 6 |
|----|---|---|---|---|-------|---------|-------|--------|-------|---|

Opmerkingen:

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

## TOETSING DOORBUIGING

| Staaf       | Soort | Mtg | Lengte | Overst | Zeeg | $u_{tot}$ | BC | Sit | $u$  |
|-------------|-------|-----|--------|--------|------|-----------|----|-----|------|
| Toelaatbaar |       |     | [m]    | I      | J    | [mm]      |    |     | [mm] |

\*1

### Balk 1:1

|       |     |    |      |   |   |     |      |   |   |      |      |       |
|-------|-----|----|------|---|---|-----|------|---|---|------|------|-------|
| V1    | Dak | db | 2.93 | N | N | 0.0 | -3.1 | 5 | 1 | Eind | -3.1 | -11.7 |
| 0.004 |     | db |      |   |   |     |      | 5 | 1 | Bijk | -2.7 | -11.7 |
| 0.004 |     |    |      |   |   |     |      |   |   |      |      |       |

### Balk 2:2

|       |     |    |      |   |   |     |      |   |   |      |      |       |
|-------|-----|----|------|---|---|-----|------|---|---|------|------|-------|
| V2    | Dak | db | 2.93 | N | N | 0.0 | -6.0 | 5 | 1 | Eind | -6.0 | -11.7 |
| 0.004 |     | db |      |   |   |     |      | 5 | 1 | Bijk | -5.2 | -11.7 |
| 0.004 |     |    |      |   |   |     |      |   |   |      |      |       |

### Balk 3:3

|       |     |    |      |   |   |     |      |   |   |      |      |       |
|-------|-----|----|------|---|---|-----|------|---|---|------|------|-------|
| V3    | Dak | db | 2.93 | N | N | 0.0 | -3.1 | 5 | 1 | Eind | -3.1 | -11.7 |
| 0.004 |     | db |      |   |   |     |      | 5 | 1 | Bijk | -2.7 | -11.7 |
| 0.004 |     |    |      |   |   |     |      |   |   |      |      |       |

### Balk 4:4

|       |     |    |      |   |   |     |      |   |   |      |      |       |
|-------|-----|----|------|---|---|-----|------|---|---|------|------|-------|
| V4    | Dak | db | 4.90 | N | N | 0.0 | -0.3 | 5 | 1 | Eind | -0.3 | -19.6 |
| 0.004 |     |    |      |   |   |     |      |   |   |      |      |       |

### Balk 5:5

|       |     |    |      |   |   |     |      |   |   |      |      |       |
|-------|-----|----|------|---|---|-----|------|---|---|------|------|-------|
| V5    | Dak | db | 5.05 | N | N | 0.0 | -0.4 | 5 | 1 | Eind | -0.4 | -20.2 |
| 0.004 |     |    |      |   |   |     |      |   |   |      |      |       |

### Balk 6:6

|       |     |    |      |   |   |     |      |   |   |      |      |       |
|-------|-----|----|------|---|---|-----|------|---|---|------|------|-------|
| V6    | Dak | db | 4.90 | N | N | 0.0 | -0.3 | 5 | 2 | Eind | -0.3 | -19.6 |
| 0.004 |     |    |      |   |   |     |      |   |   |      |      |       |

### Balk 7:7

|    |     |    |      |   |   |     |      |   |   |      |      |       |
|----|-----|----|------|---|---|-----|------|---|---|------|------|-------|
| V7 | Dak | db | 5.05 | N | N | 0.0 | -0.4 | 5 | 2 | Eind | -0.4 | -20.2 |
|----|-----|----|------|---|---|-----|------|---|---|------|------|-------|



0.004

Project.....: SGU021041 - Uitbreiding zwembad de Meerkant te Amstelveen  
Onderdeel.....: Luifel kolom  
Dimensies.....: kN;m;rad (tenzij anders aangegeven)  
Datum.....: 16/11/2022  
Bestand.....: H:\SGU021041\BEREKENINGEN\04\_DO\luifel kolom.rww

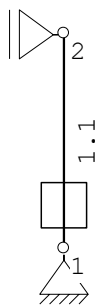
Belastingbreedte.: 5.750  
Rekenmodel.....: 1e-orde-elastisch.  
Theorie voor de bepaling van de krachtsverdeling:  
Geometrisch lineair.  
Fysisch lineair.

Gunstige werking van de permanente belasting wordt automatisch verwerkt.

## **Toegepaste normen volgens Eurocode met Nederlandse NB**

|             |                      |                 |
|-------------|----------------------|-----------------|
| Belastingen | NEN-EN 1990:2002     | C2:2010,A1:2019 |
| NB:2019(nl) |                      |                 |
|             | NEN-EN 1991-1-1:2002 | C1/C11:2019     |
| NB:2019(nl) |                      |                 |
|             | NEN-EN 1991-1-4:2005 | C2:2011         |
| NB:2011(nl) |                      |                 |
| Staal       | NEN-EN 1993-1-1:2006 | C2:2011,A1:2016 |
| NB:2016(nl) |                      |                 |

## **GEOMETRIE**



## **MATERIALEN**

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

## **PROFIELEN [mm]**

| Prof.      | Omschrijving | Materiaal | Oppervlak  |
|------------|--------------|-----------|------------|
| Traagheid  | Vormf.       |           |            |
| 1          | K70/70/5CF   | 1:S235    | 1.2356e+03 |
| 8.4629e+05 | 0.00         |           |            |



## PROFIELEN vervolg [mm]

| Prof. | Staaftype | Breedte | Hoogte | e    | Type | b1 | h1 | b2 |
|-------|-----------|---------|--------|------|------|----|----|----|
| h2    |           |         |        |      |      |    |    |    |
| 1     | 0:Normaal | 70      | 70     | 35.0 |      |    |    |    |

Project.....: SGU021041 - Uitbreiding zwembad de Meerkant te Amstelveen  
Onderdeel.....: Luifel kolom

## PROFIELVORMEN [mm]

1 K70/70/5CF



## KNOPEN

| Knoop | X     | Z     |
|-------|-------|-------|
| 1     | 0.000 | 0.000 |
| 2     | 0.000 | 2.650 |

## STAVEN

| St.    | ki   | kj | Profiel      | Aansl.i | Aansl.j |
|--------|------|----|--------------|---------|---------|
| Lengte | Opm. |    |              |         |         |
| 1      | 1    | 2  | 1:K70/70/5CF | NDM     | NDM     |
| 2.650  |      |    |              |         |         |

## VASTE STEUNPUNTEN

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

## BELASTINGGENERATIE ALGEMEEN.

|                              |       |                         |      |
|------------------------------|-------|-------------------------|------|
| Betrouwbaarheidsklasse.....: | 2     | Referentieperiode.....: | 50   |
| Gebouwdiepte.....:           | 34.45 | Gebouwhoogte.....:      | 2.65 |
| Niveau aansl.terrein.....:   | 0.00  | E.g. scheid.w. [kN/m2]: | 1.20 |

## WIND

|                                    |                                |
|------------------------------------|--------------------------------|
| Terrein categorie ...[4.3.2]....:  | Onbebouwd                      |
| Windgebied .....                   | 2 Vb,0 ..[4.2].....:           |
| 27.000                             |                                |
| Positie spant in het gebouw.....:  | 0.000 Kr ....[4.3.2].....:     |
| 0.209                              |                                |
| z0 .....[4.3.2]....:               | 0.200 Zmin ..[4.3.2].....:     |
| 4.000                              |                                |
| Co wind van links ..[4.3.3]....:   | 1.000 Co wind van rechts.....: |
| 1.000                              |                                |
| Co wind loodrecht ..[4.3.3]....:   | 1.000                          |
| Cpi wind van links ..[7.2.9]....:  | 0.200 -0.300                   |
| Cpi windloodrecht ...[7.2.9]....:  | 0.200 -0.300                   |
| Cpi wind van rechts ..[7.2.9]....: | 0.200 -0.300                   |
| Cfr windwrijving ....[7.5].....:   | 0.040                          |

## STAFTYPEN

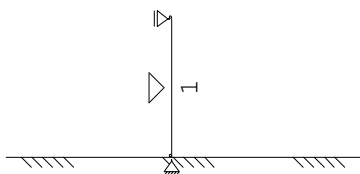
| Type            | staven |
|-----------------|--------|
| 5:Linker gevel. | : 1    |

Project.....: SGU021041 - Uitbreiding zwembad de Meerkant te Amstelveen  
Onderdeel.....: Luifel kolom

## LASTVELDEN

Wind staven

Sneeuw staven



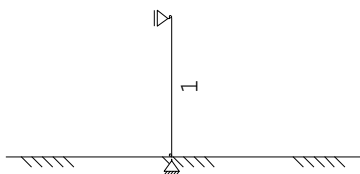
## WIND DAKTYPES

| Nr. | Staaf Type | reductie bij<br>wind van links | reductie bij<br>wind van rechts | Cpe   |
|-----|------------|--------------------------------|---------------------------------|-------|
| 1   | 1 Gevel    | 1.000                          | 1.000                           | 7.2.2 |

## WIND ZONES

Wind van links

Wind van rechts



## WIND VAN LINKS ZONES

| Nr. | Staaf | Positie | Lengte | Zone |
|-----|-------|---------|--------|------|
| 1   | 1     | 0.000   | 2.650  | D    |

## Wind indexen

| Index    | CsCd | Cpe/Cpi | qp    | breedte | reductie | Qw     | Zone |
|----------|------|---------|-------|---------|----------|--------|------|
| Hoek(en) |      |         |       |         |          |        |      |
| Qw1      |      | 0.300   | 0.596 | 5.750   |          | -1.028 | -i   |
| Qw2      | 1.00 | 0.800   | 0.596 | 5.750   |          | -2.741 | D    |
| Qw3      |      | -0.200  | 0.596 | 5.750   |          | 0.685  | +i   |

## BELASTINGGEVALLEN

| B.G. | Omschrijving                   | Type        |
|------|--------------------------------|-------------|
| 1    | Permanente belasting EGZ=-1.00 | 1           |
| g    | 2 Wind van links onderdruk A   | 7           |
| g    | 3 Wind van links overdruk A    | 8           |
|      | 4 Sneeuw                       | 22 Sneeuw A |
|      | 5 Knik                         | 0 Onbekend  |

g = gegenereerd belastinggeval

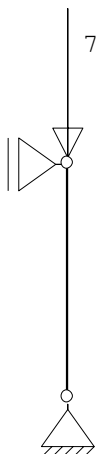
Project.....: SGU021041 - Uitbreiding zwembad de Meerkant te Amstelveen  
Onderdeel.....: Luifel kolom

## BELASTINGEN

B.G:1 Permanente

belasting

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



## KNOOPBELASTINGEN

B.G:1 Permanente

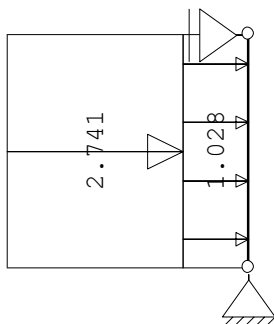
belasting

| Last | Knoop | Richting | waarde | $\psi_0$ | $\psi_1$ | $\psi_2$ |
|------|-------|----------|--------|----------|----------|----------|
| 1    | 2     | Z        | -7.000 |          |          |          |

## BELASTINGEN

B.G:2 Wind van links

onderdruk A



## STAAFBELASTINGEN

B.G:2 Wind van links

onderdruk A

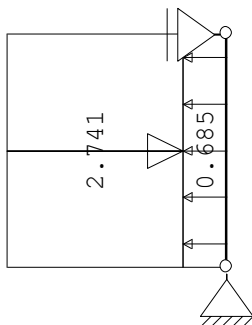
| Staat    | Type       | Index | q1/p/m | q2    | A     | B     | $\psi_0$ |
|----------|------------|-------|--------|-------|-------|-------|----------|
| $\psi_1$ | $\psi_2$   |       |        |       |       |       |          |
| 1        | 1:QZLokaal | Qw1   | -1.03  | -1.03 | 0.000 | 0.000 | 0.00     |
| 0.20     | 0.00       |       |        |       |       |       |          |
| 1        | 1:QZLokaal | Qw2   | -2.74  | -2.74 | 0.000 | 0.000 | 0.00     |
| 0.20     | 0.00       |       |        |       |       |       |          |

Project.....: SGU021041 - Uitbreiding zwembad de Meerkant te Amstelveen  
Onderdeel.....: Luifel kolom

## BELASTINGEN

B.G:3 Wind van links

overdruk A



## STAAFBELASTINGEN

B.G:3 Wind van links

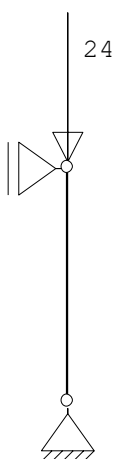
overdruk A

| Staat    | Type       | Index | q1/p/m | q2    | A     | B     | $\psi_0$ |
|----------|------------|-------|--------|-------|-------|-------|----------|
| $\psi_1$ | $\psi_2$   |       |        |       |       |       |          |
| 1        | 1:QZLokaal | Qw3   | 0.69   | 0.69  | 0.000 | 0.000 | 0.00     |
| 0.20     | 0.00       |       |        |       |       |       |          |
| 1        | 1:QZLokaal | Qw2   | -2.74  | -2.74 | 0.000 | 0.000 | 0.00     |
| 0.20     | 0.00       |       |        |       |       |       |          |

## BELASTINGEN

B.G:4

Sneeuw



## KNOOPBELASTINGEN

B.G:4

Sneeuw

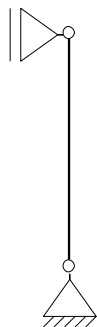
| Last | Knoop | Richting | waarde  | $\psi_0$ | $\psi_1$ | $\psi_2$ |
|------|-------|----------|---------|----------|----------|----------|
| 1    | 2     | Z        | -24.000 | 0.00     | 0.20     | 0.00     |

Project.....: SGU021041 - Uitbreiding zwembad de Meerkant te Amstelveen  
Onderdeel.....: Luifel kolom

## BELASTINGEN

B.G:5

Knik



## REACTIES

| Kn. | B.G. | X     | Z     | M |
|-----|------|-------|-------|---|
| 1   | 1    | 0.00  | 7.26  |   |
| 1   | 2    | -4.99 | 0.00  |   |
| 1   | 3    | -2.72 | 0.00  |   |
| 1   | 4    | 0.00  | 24.00 |   |
| 1   | 5    | 0.00  | 0.00  |   |
| 2   | 1    | 0.00  |       |   |
| 2   | 2    | -4.99 |       |   |
| 2   | 3    | -2.72 |       |   |
| 2   | 4    | 0.00  |       |   |
| 2   | 5    | 0.00  |       |   |

## BELASTINGCOMBINATIES

| BC | Type  |      |           |   |                       |
|----|-------|------|-----------|---|-----------------------|
| 1  | Fund. | 1.35 | $G_{k,1}$ |   |                       |
| 2  | Fund. | 0.90 | $G_{k,1}$ |   |                       |
| 3  | Fund. | 1.20 | $G_{k,1}$ | + | 1.50 $Q_{k,2}$        |
| 4  | Fund. | 1.20 | $G_{k,1}$ | + | 1.50 $Q_{k,3}$        |
| 5  | Fund. | 1.20 | $G_{k,1}$ | + | 1.50 $Q_{k,4}$        |
| 6  | Fund. | 0.90 | $G_{k,1}$ | + | 1.50 $Q_{k,2}$        |
| 7  | Fund. | 0.90 | $G_{k,1}$ | + | 1.50 $Q_{k,3}$        |
| 8  | Fund. | 0.90 | $G_{k,1}$ | + | 1.50 $Q_{k,4}$        |
| 9  | Kar.  | 1.00 | $G_{k,1}$ | + | 1.00 $Q_{k,2}$        |
| 10 | Kar.  | 1.00 | $G_{k,1}$ | + | 1.00 $Q_{k,3}$        |
| 11 | Kar.  | 1.00 | $G_{k,1}$ | + | 1.00 $Q_{k,4}$        |
| 12 | Quas. | 1.00 | $G_{k,1}$ |   |                       |
| 13 | Freq. | 1.00 | $G_{k,1}$ |   |                       |
| 14 | Freq. | 1.00 | $G_{k,1}$ | + | 1.00 $\psi_1 Q_{k,2}$ |
| 15 | Freq. | 1.00 | $G_{k,1}$ | + | 1.00 $\psi_1 Q_{k,3}$ |
| 16 | Freq. | 1.00 | $G_{k,1}$ | + | 1.00 $\psi_1 Q_{k,4}$ |
| 17 | Blij. | 1.00 | $G_{k,1}$ |   |                       |

Project.....: SGU021041 - Uitbreiding zwembad de Meerkant te Amstelveen  
Onderdeel.....: Luifel kolom

## GUNSTIGE WERKING PERMANENTE BELASTINGEN

BC Staven met gunstige werking

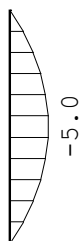
- 1 Geen
- 2 Alle staven de factor:0.90
- 3 Geen
- 4 Geen
- 5 Geen
- 6 Alle staven de factor:0.90
- 7 Alle staven de factor:0.90
- 8 Alle staven de factor:0.90

## OMHULLENDE VAN DE FUNDAMENTELE COMBINATIES

### MOMENTEN

Fundamentele

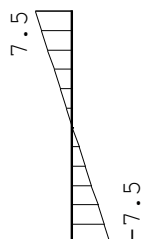
combinatie



### DWARSKRACHTEN

Fundamentele

combinatie

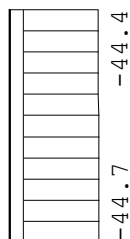


Project.....: SGU021041 - Uitbreiding zwembad de Meerkant te Amstelveen  
Onderdeel.....: Luifel kolom

## NORMAALKRACHTEN

Fundamentele

combinatie



## REACTIES

Fundamentele

combinatie

| Kn.   | X-min | X-max | Z-min | Z-max | M-min |
|-------|-------|-------|-------|-------|-------|
| M-max |       |       |       |       |       |
| 1     | -7.49 | 0.00  | 6.53  | 44.71 |       |
| 2     | -7.49 | 0.00  |       |       |       |

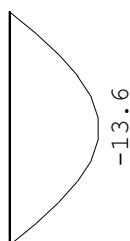
## OMHULLENDE VAN DE KARAKTERISTIEKE COMBINATIES

### VERPLAATSINGEN

[mm]

Karakteristieke

combinatie





Project.....: SGU021041 - Uitbreiding zwembad de Meerkant te Amstelveen  
Onderdeel.....: Luifel kolom

## STAALPROFIELEN - ALGEMENE GEGEVENS

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

## PROFIEL/MATERIAAL

| P/M                           | Profielnaam | Vloeisp.             | Productie    | Min. |
|-------------------------------|-------------|----------------------|--------------|------|
| drsn.                         |             | [N/mm <sup>2</sup> ] | methode      |      |
| nr.                           |             |                      |              |      |
| klasse                        |             |                      |              |      |
| 1                             | K70/70/5CF  | 235                  | Koudgevoormd |      |
| 1                             |             |                      |              |      |
| Partiële veiligheidsfactoren: |             |                      |              |      |
| Gamma M;0                     | :           | 1.00                 | Gamma M;1    | :    |
| 1.00                          |             |                      |              |      |

## KNIKSTABILITEIT

Extra

|         |           |            |              |         |            |              |
|---------|-----------|------------|--------------|---------|------------|--------------|
| Extra   |           |            |              |         |            |              |
| Staafl  | $l_{sys}$ | Classif. y | $l_{knik;y}$ | aanp. y | Classif. z | $l_{knik;z}$ |
| aanp. z |           |            |              |         |            |              |
|         | [m]       | sterke as  | [m]          | [kN]    | zwakke as  | [m]          |
| [kN]    |           |            |              |         |            |              |
| 1       | 2.650     | Geschoord  | 2.650        | 0.0     | Geschoord  | 2.650        |
| 0.0     |           |            |              |         |            |              |

## KIPSTABILITEIT

|        |       |        |          |                   |
|--------|-------|--------|----------|-------------------|
| Staafl | Plts. |        | l gaffel | Kipsteunafstanden |
| aanp.  | aanp. |        | [m]      | [m]               |
| 1      | 1.0*h | boven: | 2.65     | 2,65              |
|        |       | onder: | 2.65     | 2,65              |

## TOETSING SPANNINGEN

|        |     |    |     |    |        |         |         |         |                           |
|--------|-----|----|-----|----|--------|---------|---------|---------|---------------------------|
| Staafl | P/M | BC | Sit | Kl | Plaats | Norm    | Artikel | Formule | Hoogste toetsing          |
| Opm.   |     |    |     |    |        |         |         |         |                           |
| nr.    |     |    |     |    |        |         |         |         | U.C. [N/mm <sup>2</sup> ] |
| 1      | 1   | 3  | 1   | 1  | Staafl | EN3-1-1 | 6.3.3   | (6.61)  | 0.772 181                 |



## Bijlage P Uitvoer Kleedruimte kolommen

**Technosoft Raamwerken release 6.75b**  
**2023**

**26 jan**

Project.....: SGU021041 - Uitbreiding zwembad de Meerkant te Amstelveen  
Onderdeel.....: kleedruimte kolom  
Dimensies.....: kN;m;rad (tenzij anders aangegeven)  
Datum.....: 16/11/2022  
Bestand.....: H:\SGU021041\BEREKENINGEN\04\_DO\Kleedruimte kolom.rww

Belastingbreedte.: 4.840  
Rekenmodel.....: 2e-orde-elastisch.  
Theorieën voor de bepaling van de krachtsverdeling:  
1) Losse belastinggevallen:  
Lineaire-elasticiteitstheorie  
2) Uiterste grenstoestand:  
Geometrisch niet lineair alle staven.  
Fysisch lineair alle staven.  
3) Gebruiksgrenstoestand:  
Lineaire-elasticiteitstheorie

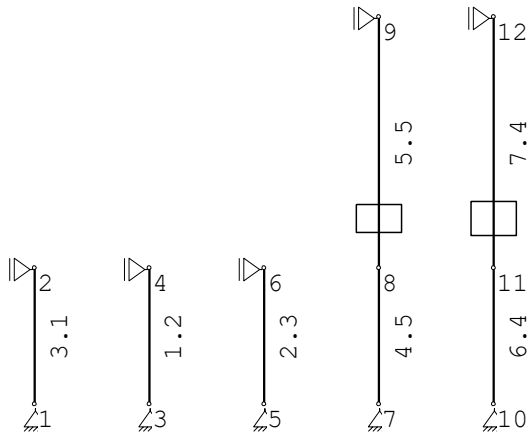
Maximum aantal iteraties.....: 50  
Max.deellengte kolommen/wanden: 0.500 Max.deellengte balken/vloeren:  
0.500  
Max. X-verplaatsing in UGT.....: 0.500 Max. Z-verplaatsing in UGT....:  
0.250

Gunstige werking van de permanente belasting wordt automatisch verwerkt.

### **Toegepaste normen volgens Eurocode met Nederlandse NB**

|             |                      |                 |
|-------------|----------------------|-----------------|
| Belastingen | NEN-EN 1990:2002     | C2:2010,A1:2019 |
| NB:2019(nl) | NEN-EN 1991-1-1:2002 | C1/C11:2019     |
| NB:2019(nl) | NEN-EN 1991-1-4:2005 | C2:2011         |
| NB:2011(nl) | NEN-EN 1995-1-1:2005 | A1:2011,C1:2006 |
| Hout        |                      |                 |
| NB:2013(nl) | NEN-EN 14080:2013    |                 |

### **GEOMETRIE**



Project.....: SGU021041 - Uitbreiding zwembad de Meerkant te Amstelveen  
Onderdeel.....: kleedruimte kolom

## MATERIALEN

| Mt | Kwaliteit | E-modulus[N/mm <sup>2</sup> ] | S.G. | S.G.verhoogd | Pois. | Uitz. coëff |
|----|-----------|-------------------------------|------|--------------|-------|-------------|
| 1  | GL24h     | 11500                         | 3.8  | 4.6          | 1.00  | 5.0000e-06  |

Bij de bepaling v.h. e.g. van houten staven is de S.G.verhoogd toegepast.

## PROFIELEN [mm]

| Prof.      | Omschrijving | Materiaal | Oppervlak  |
|------------|--------------|-----------|------------|
| Traagheid  | Vormf.       |           |            |
| 1          | B*H 300*300  | 1:GL24h   | 9.0000e+04 |
| 6.7500e+08 | 0.00         |           |            |
| 2          | B*H 300*700  | 1:GL24h   | 2.1000e+05 |
| 8.5750e+09 | 0.00         |           |            |
| 3          | B*H 300*400  | 1:GL24h   | 1.2000e+05 |
| 1.6000e+09 | 0.00         |           |            |
| 4          | B*H 300*400  | 1:GL24h   | 1.2000e+05 |
| 1.6000e+09 | 0.00         |           |            |
| 5          | B*H 300*480  | 1:GL24h   | 1.4400e+05 |
| 2.7648e+09 | 0.00         |           |            |

## PROFIELEN vervolg [mm]

| Prof. | Staaftype | Breedte | Hoogte | e     | Type | b1 | h1 | b2 |
|-------|-----------|---------|--------|-------|------|----|----|----|
| h2    |           |         |        |       |      |    |    |    |
| 1     | 0:Normaal | 300     | 300    | 150.0 | 0:RH |    |    |    |
| 2     | 0:Normaal | 300     | 700    | 350.0 | 0:RH |    |    |    |
| 3     | 0:Normaal | 300     | 400    | 200.0 | 0:RH |    |    |    |
| 4     | 0:Normaal | 300     | 400    | 200.0 | 0:RH |    |    |    |
| 5     | 0:Normaal | 300     | 480    | 240.0 | 0:RH |    |    |    |

## PROFIELVORMEN [mm]

|   |             |                                                                                     |
|---|-------------|-------------------------------------------------------------------------------------|
| 1 | B*H 300*300 |  |
| 2 | B*H 300*700 |  |
| 3 | B*H 300*400 |  |
| 4 | B*H 300*400 |  |
| 5 | B*H 300*480 |  |





Project.....: SGU021041 - Uitbreiding zwembad de Meerkant te Amstelveen  
Onderdeel.....: kledruimte kolom

## KNOPEN

| Knoop | X      | Z      | Knoop | X      | Z      |
|-------|--------|--------|-------|--------|--------|
| 1     | 0.000  | 0.000  | 6     | 6.000  | 3.550  |
| 2     | 0.000  | 3.550  | 7     | 9.000  | 0.000  |
| 3     | 3.000  | 0.000  | 8     | 9.000  | 3.550  |
| 4     | 3.000  | 3.550  | 9     | 9.000  | 10.110 |
| 5     | 6.000  | 0.000  | 10    | 12.000 | 0.000  |
| 11    | 12.000 | 3.550  |       |        |        |
| 12    | 12.000 | 10.110 |       |        |        |

## STAVEN

| St.    | ki   | kj | Profiel       | Aansl.i | Aansl.j |
|--------|------|----|---------------|---------|---------|
| Lengte | Opm. |    |               |         |         |
| 1      | 3    | 4  | 2:B*H 300*700 | NDM     | NDM     |
| 3.550  |      |    |               |         |         |
| 2      | 5    | 6  | 3:B*H 300*400 | NDM     | NDM     |
| 3.550  |      |    |               |         |         |
| 3      | 1    | 2  | 1:B*H 300*300 | NDM     | NDM     |
| 3.550  |      |    |               |         |         |
| 4      | 7    | 8  | 5:B*H 300*480 | NDM     | NDM     |
| 3.550  |      |    |               |         |         |
| 5      | 8    | 9  | 5:B*H 300*480 | NDM     | NDM     |
| 6.560  |      |    |               |         |         |
| 6      | 10   | 11 | 4:B*H 300*400 | NDM     | NDM     |
| 3.550  |      |    |               |         |         |
| 7      | 11   | 12 | 4:B*H 300*400 | NDM     | NDM     |
| 6.560  |      |    |               |         |         |

## VASTE STEUNPUNTEN

| Nr. | knoop | Kode | XZR 1=vast 0=vrij | Hoek |
|-----|-------|------|-------------------|------|
| 1   | 1     | 110  |                   | 0.00 |
| 2   | 2     | 100  |                   | 0.00 |
| 3   | 3     | 110  |                   | 0.00 |
| 4   | 4     | 100  |                   | 0.00 |
| 5   | 5     | 110  |                   | 0.00 |
| 6   | 6     | 100  |                   | 0.00 |
| 7   | 7     | 110  |                   | 0.00 |
| 8   | 9     | 100  |                   | 0.00 |
| 9   | 10    | 110  |                   | 0.00 |
| 10  | 12    | 100  |                   | 0.00 |

## BELASTINGGENERATIE ALGEMEEN.

|                              |       |                         |       |
|------------------------------|-------|-------------------------|-------|
| Betrouwbaarheidsklasse.....: | 2     | Referentieperiode.....: | 50    |
| Gebouwdiepte.....:           | 34.45 | Gebouwhoogte.....:      | 10.10 |
| Niveau aansl.terrein.....:   | 0.00  | E.g. scheid.w. [kN/m2]: | 1.20  |

Project.....: SGU021041 - Uitbreiding zwembad de Meerkant te Amstelveen  
Onderdeel.....: kleedruimte kolom

## WIND

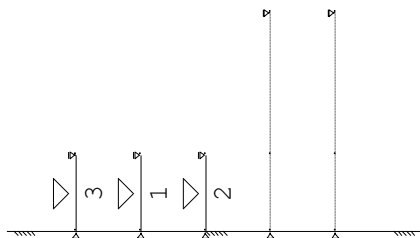
Terrein categorie ...[4.3.2]....: Onbebouwd  
Windgebied .....: 2  $V_{b,0}$  ..[4.2].....: 27.000  
Positie spant in het gebouw....: 0.000 Kr ....[4.3.2].....: 0.209  
 $z_0$  .....[4.3.2]....: 0.200  $z_{min}$  ..[4.3.2].....: 4.000  
Co wind van links ..[4.3.3]....: 1.000 Co wind van rechts....: 1.000  
Co wind loodrecht ..[4.3.3]....: 1.000  
Cpi wind van links ..[7.2.9]....: 0.200 -0.300  
Cpi windloodrecht ...[7.2.9]....: 0.200 -0.300  
Cpi wind van rechts .[7.2.9]....: 0.200 -0.300  
Cfr windwrijving ....[7.5].....: 0.040

## STAFTYPEN

| Type            | staven |
|-----------------|--------|
| 4:Wand / kolom. | : 4-7  |
| 5:Linker gevel. | : 1-3  |

## LASTVELDEN

Wind staven Sneeuw staven

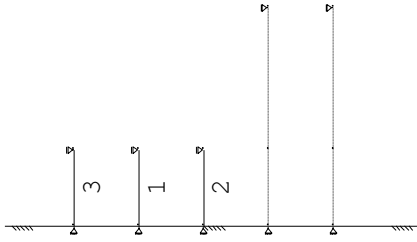


## WIND DAKTYPES

| Nr.          | Staaf Type | reductie bij<br>wind van links | reductie bij<br>wind van rechts | Cpe   |
|--------------|------------|--------------------------------|---------------------------------|-------|
| volgens art: |            |                                |                                 |       |
| 1            | 3 Gevel    | 1.000                          | 1.000                           | 7.2.2 |
| 2            | 1 Gevel    | 1.000                          | 1.000                           | 7.2.2 |
| 3            | 2 Gevel    | 1.000                          | 1.000                           | 7.2.2 |

## WIND ZONES

Wind van links Wind van rechts





Project.....: SGU021041 - Uitbreiding zwembad de Meerkant te Amstelveen  
Onderdeel.....: kledruimte kolom

#### WIND VAN LINKS ZONES

| Nr. | Staaft | Positie | Lengte | Zone |
|-----|--------|---------|--------|------|
| 1   | 3      | 0.000   | 3.550  | D    |
| 2   | 1      | 0.000   | 3.550  | D    |
| 3   | 2      | 0.000   | 3.550  | D    |

#### Wind indexen

| Index    | CsCd | Cpe/Cpi | qp    | breedte | reductie | Qw     | Zone |
|----------|------|---------|-------|---------|----------|--------|------|
| Hoek(en) |      |         |       |         |          |        |      |
| Qw1      |      | 0.300   | 0.853 | 4.840   |          | -1.238 | -i   |
| Qw2      | 1.00 | 0.800   | 0.853 | 4.840   |          | -3.301 | D    |
| Qw3      |      | -0.200  | 0.853 | 4.840   |          | 0.825  | +i   |

#### BELASTINGGEVALLEN

| B.G.              | Omschrijving                 | Type                  |
|-------------------|------------------------------|-----------------------|
| 1                 | Permanente belasting         | EGZ=-1.00             |
| 2                 | Veranderlijk verd            | 3 Ver. bel. pers. ed. |
| (Q <sub>k</sub> ) |                              |                       |
| g*                | 3 Wind van links onderdruk A | 7                     |
| g                 | 4 Wind van links overdruk A  | 8                     |
| 5 WIND            |                              | 11 Wind van rechts    |
| onderdruk A       |                              |                       |
| 6 Sneeuw          |                              | 22 Sneeuw A           |
| 7 Knik            |                              | 0 Onbekend            |

g = gegenereerd belastinggeval

\* = belastinggeval bevat 1 of meer handmatig toegevoegde en/of gewijzigde lasten

#### BELASTINGGEVALLEN vervolg

| B.G.     | Omschrijving               | Belastingduurklasse |
|----------|----------------------------|---------------------|
| 1        | Permanente belasting       | Blijvend            |
| 2        | Veranderlijk verd          | Middellang          |
| 3        | Wind van links onderdruk A | Kort                |
| 4        | Wind van links overdruk A  | Kort                |
| 5 WIND   |                            | Kort                |
| 6 Sneeuw |                            | Blijvend            |
| 7 Knik   |                            | Blijvend            |

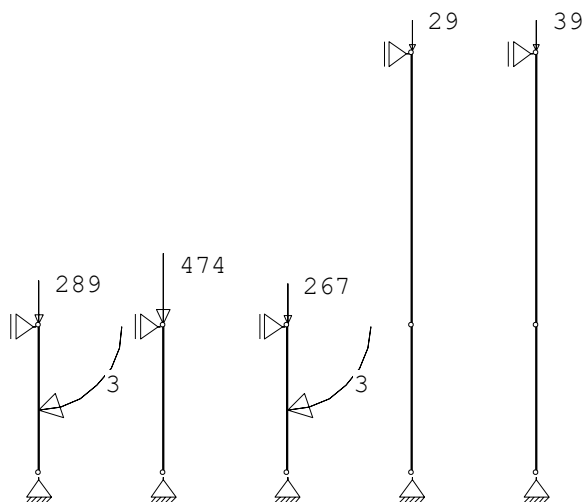
Project.....: SGU021041 - Uitbreiding zwembad de Meerkant te Amstelveen  
Onderdeel.....: kleedruimte kolom

## BELASTINGEN

B.G:1 Permanente

belasting

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



## KNOOPBELASTINGEN

B.G:1 Permanente

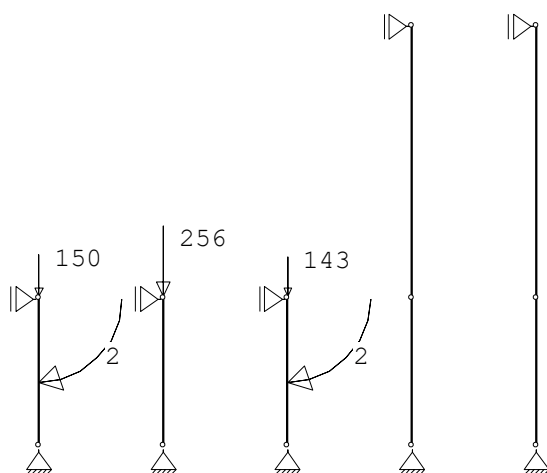
belasting

| Last | Knoop | Richting  | waarde   | $\psi_0$ | $\psi_1$ | $\psi_2$ |
|------|-------|-----------|----------|----------|----------|----------|
| 1    | 2     | Z         | -289.000 |          |          |          |
| 2    | 4     | Z         | -474.000 |          |          |          |
| 3    | 6     | Z         | -267.000 |          |          |          |
| 4    | 2     | Rotatie Y | 3.000    |          |          |          |
| 5    | 6     | Rotatie Y | 3.000    |          |          |          |
| 6    | 9     | Z         | -29.000  |          |          |          |
| 7    | 12    | Z         | -39.000  |          |          |          |

## BELASTINGEN

B.G:2 Veranderlijk

verd





Project.....: SGU021041 - Uitbreiding zwembad de Meerkant te Amstelveen  
Onderdeel.....: kleedruimte kolom

## KNOOPBELASTINGEN

B.G:2 Veranderlijk

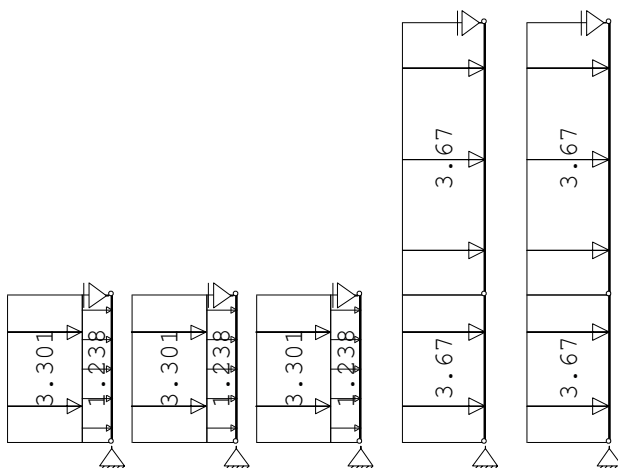
verd

| Last | Knoop | Richting  | waarde   | $\psi_0$ | $\psi_1$ | $\psi_2$ |
|------|-------|-----------|----------|----------|----------|----------|
| 1    | 2     | Z         | -150.000 | 0.50     | 0.50     | 0.30     |
| 2    | 4     | Z         | -256.000 | 0.50     | 0.50     | 0.30     |
| 3    | 6     | Z         | -143.000 | 0.50     | 0.50     | 0.30     |
| 4    | 2     | Rotatie Y | 2.000    | 0.50     | 0.50     | 0.30     |
| 5    | 6     | Rotatie Y | 2.000    | 0.50     | 0.50     | 0.30     |

## BELASTINGEN

B.G:3 Wind van links

onderdruk A



## STAAFBELASTINGEN

B.G:3 Wind van links

onderdruk A

| Staat    | Type       | Index | $q_1/p/m$ | $q_2$ | A     | B     | $\psi_0$ |
|----------|------------|-------|-----------|-------|-------|-------|----------|
| $\psi_1$ | $\psi_2$   |       |           |       |       |       |          |
| 4        | 1:QZLokaal | *     | -3.67     | -3.67 | 0.000 | 0.000 | 0.00     |
| 0.20     | 0.00       |       |           |       |       |       |          |
| 5        | 1:QZLokaal | *     | -3.67     | -3.67 | 0.000 | 0.000 | 0.00     |
| 0.20     | 0.00       |       |           |       |       |       |          |
| 6        | 1:QZLokaal | *     | -3.67     | -3.67 | 0.000 | 0.000 | 0.00     |
| 0.20     | 0.00       |       |           |       |       |       |          |
| 7        | 1:QZLokaal | *     | -3.67     | -3.67 | 0.000 | 0.000 | 0.00     |
| 0.20     | 0.00       |       |           |       |       |       |          |
| 3        | 1:QZLokaal | Qw1   | -1.24     | -1.24 | 0.000 | 0.000 | 0.00     |
| 0.20     | 0.00       |       |           |       |       |       |          |
| 1        | 1:QZLokaal | Qw1   | -1.24     | -1.24 | 0.000 | 0.000 | 0.00     |
| 0.20     | 0.00       |       |           |       |       |       |          |
| 2        | 1:QZLokaal | Qw1   | -1.24     | -1.24 | 0.000 | 0.000 | 0.00     |
| 0.20     | 0.00       |       |           |       |       |       |          |
| 3        | 1:QZLokaal | Qw2   | -3.30     | -3.30 | 0.000 | 0.000 | 0.00     |
| 0.20     | 0.00       |       |           |       |       |       |          |
| 1        | 1:QZLokaal | Qw2   | -3.30     | -3.30 | 0.000 | 0.000 | 0.00     |
| 0.20     | 0.00       |       |           |       |       |       |          |
| 2        | 1:QZLokaal | Qw2   | -3.30     | -3.30 | 0.000 | 0.000 | 0.00     |



0.20 0.00

---

Opmerkingen

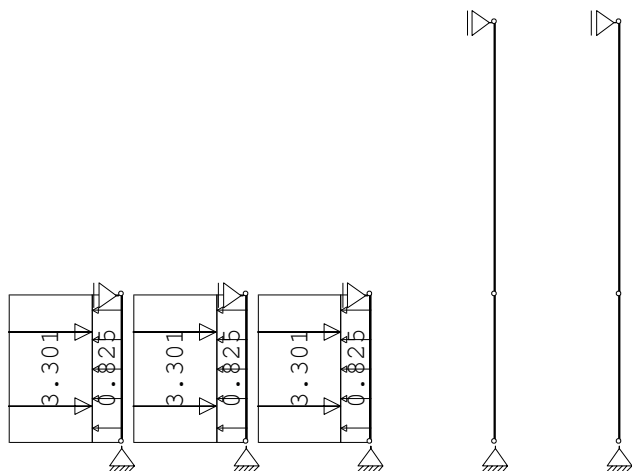
[\*] Deze belasting is handmatig toegevoegd of gewijzigd.

Project.....: SGU021041 - Uitbreiding zwembad de Meerkant te Amstelveen  
Onderdeel.....: kleedruimte kolom

## BELASTINGEN

B.G:4 Wind van links

overdruk A



## STAAFBELASTINGEN

B.G:4 Wind van links

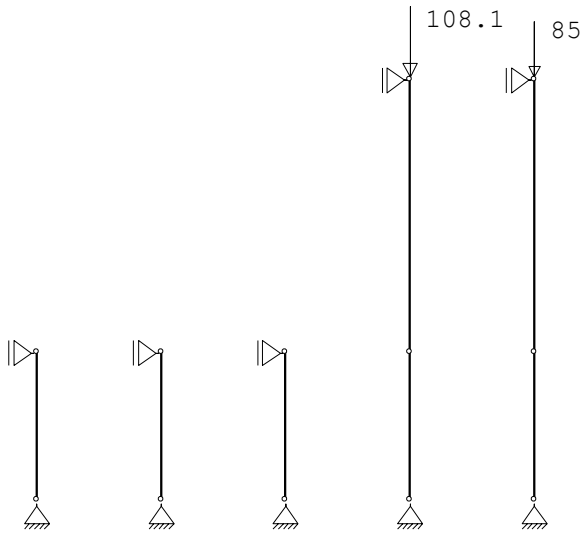
overdruk A

| Staaf    | Type       | Index | q1/p/m | q2    | A     | B     | $\psi_0$ |
|----------|------------|-------|--------|-------|-------|-------|----------|
| $\psi_1$ | $\psi_2$   |       |        |       |       |       |          |
| 3        | 1:QZLokaal | Qw3   | 0.83   | 0.83  | 0.000 | 0.000 | 0.00     |
| 0.20     | 0.00       |       |        |       |       |       |          |
| 1        | 1:QZLokaal | Qw3   | 0.83   | 0.83  | 0.000 | 0.000 | 0.00     |
| 0.20     | 0.00       |       |        |       |       |       |          |
| 2        | 1:QZLokaal | Qw3   | 0.83   | 0.83  | 0.000 | 0.000 | 0.00     |
| 0.20     | 0.00       |       |        |       |       |       |          |
| 3        | 1:QZLokaal | Qw2   | -3.30  | -3.30 | 0.000 | 0.000 | 0.00     |
| 0.20     | 0.00       |       |        |       |       |       |          |
| 1        | 1:QZLokaal | Qw2   | -3.30  | -3.30 | 0.000 | 0.000 | 0.00     |
| 0.20     | 0.00       |       |        |       |       |       |          |
| 2        | 1:QZLokaal | Qw2   | -3.30  | -3.30 | 0.000 | 0.000 | 0.00     |
| 0.20     | 0.00       |       |        |       |       |       |          |

## BELASTINGEN

B.G:5

WIND





Project.....: SGU021041 - Uitbreiding zwembad de Meerkant te Amstelveen  
Onderdeel.....: kleedruimte kolom

## KNOOPBELASTINGEN

B.G:5

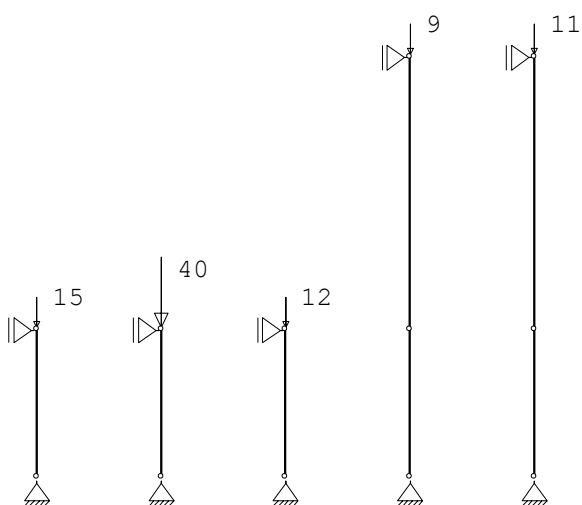
WIND

| Last | Knoop | Richting | waarde   | $\psi_0$ | $\psi_1$ | $\psi_2$ |
|------|-------|----------|----------|----------|----------|----------|
| 1    | 9     | Z        | -108.100 | 0.00     | 0.20     | 0.00     |
| 2    | 12    | Z        | -85.000  | 0.00     | 0.20     | 0.00     |

## BELASTINGEN

B.G:6

Sneeuw



## KNOOPBELASTINGEN

B.G:6

Sneeuw

| Last | Knoop | Richting | waarde  | $\psi_0$ | $\psi_1$ | $\psi_2$ |
|------|-------|----------|---------|----------|----------|----------|
| 1    | 2     | Z        | -15.000 | 0.00     | 0.20     | 0.00     |
| 2    | 4     | Z        | -40.000 | 0.00     | 0.20     | 0.00     |
| 3    | 6     | Z        | -12.000 | 0.00     | 0.20     | 0.00     |
| 4    | 9     | Z        | -9.000  | 0.00     | 0.20     | 0.00     |
| 5    | 12    | Z        | -11.000 | 0.00     | 0.20     | 0.00     |

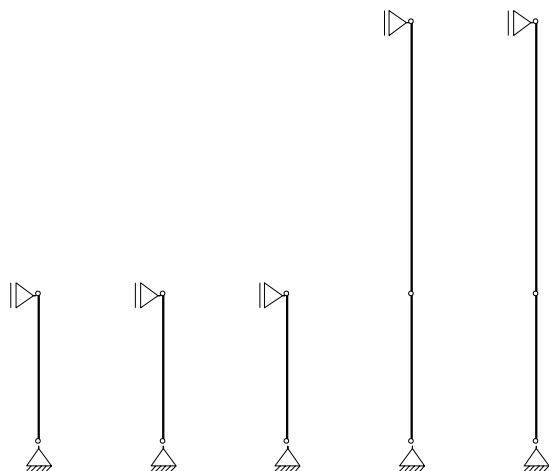


Project.....: SGU021041 - Uitbreiding zwembad de Meerkant te  
Amstelveen  
Onderdeel.....: kleedruimte kolom

## BELASTINGEN

B.G.:7

Knik



## REACTIES

1e orde

| Kn. | B.G. | X     | Z      | M |
|-----|------|-------|--------|---|
| 1   | 1    | 0.85  | 290.48 |   |
| 1   | 2    | 0.56  | 150.00 |   |
| 1   | 3    | -8.06 | 0.00   |   |
| 1   | 4    | -4.39 | 0.00   |   |
| 1   | 5    | 0.00  | 0.00   |   |
| 1   | 6    | 0.00  | 15.00  |   |
| 1   | 7    | 0.00  | 0.00   |   |
| 2   | 1    | -0.85 |        |   |
| 2   | 2    | -0.56 |        |   |
| 2   | 3    | -8.06 |        |   |
| 2   | 4    | -4.39 |        |   |
| 2   | 5    | 0.00  |        |   |
| 2   | 6    | 0.00  |        |   |
| 2   | 7    | 0.00  |        |   |
| 3   | 1    | 0.00  | 477.44 |   |
| 3   | 2    | 0.00  | 256.00 |   |
| 3   | 3    | -8.06 | 0.00   |   |
| 3   | 4    | -4.39 | 0.00   |   |
| 3   | 5    | 0.00  | 0.00   |   |
| 3   | 6    | 0.00  | 40.00  |   |
| 3   | 7    | 0.00  | 0.00   |   |



Project.....: SGU021041 - Uitbreiding zwembad de Meerkant te  
Amstelveen  
Onderdeel.....: kledruimte kolom

## REACTIES

1e orde

| Kn. | B.G. | X      | Z      | M |
|-----|------|--------|--------|---|
| 4   | 1    | 0.00   |        |   |
| 4   | 2    | 0.00   |        |   |
| 4   | 3    | -8.06  |        |   |
| 4   | 4    | -4.39  |        |   |
| 4   | 5    | 0.00   |        |   |
| 4   | 6    | 0.00   |        |   |
| 4   | 7    | 0.00   |        |   |
| 5   | 1    | 0.85   | 268.97 |   |
| 5   | 2    | 0.56   | 143.00 |   |
| 5   | 3    | -8.06  | 0.00   |   |
| 5   | 4    | -4.39  | 0.00   |   |
| 5   | 5    | 0.00   | 0.00   |   |
| 5   | 6    | 0.00   | 12.00  |   |
| 5   | 7    | 0.00   | 0.00   |   |
| 6   | 1    | -0.85  |        |   |
| 6   | 2    | -0.56  |        |   |
| 6   | 3    | -8.06  |        |   |
| 6   | 4    | -4.39  |        |   |
| 6   | 5    | 0.00   |        |   |
| 6   | 6    | 0.00   |        |   |
| 6   | 7    | 0.00   |        |   |
| 7   | 1    | 0.00   | 35.73  |   |
| 7   | 2    | 0.00   | 0.00   |   |
| 7   | 3    | -18.55 | 0.00   |   |
| 7   | 4    | 0.00   | 0.00   |   |
| 7   | 5    | 0.00   | 108.10 |   |
| 7   | 6    | 0.00   | 9.00   |   |
| 7   | 7    | 0.00   | 0.00   |   |
| 9   | 1    | 0.00   |        |   |
| 9   | 2    | 0.00   |        |   |
| 9   | 3    | -18.55 |        |   |
| 9   | 4    | 0.00   |        |   |
| 9   | 5    | 0.00   |        |   |
| 9   | 6    | 0.00   |        |   |
| 9   | 7    | 0.00   |        |   |
| 10  | 1    | 0.00   | 44.60  |   |
| 10  | 2    | 0.00   | 0.00   |   |
| 10  | 3    | -18.55 | 0.00   |   |
| 10  | 4    | 0.00   | 0.00   |   |
| 10  | 5    | 0.00   | 85.00  |   |
| 10  | 6    | 0.00   | 11.00  |   |
| 10  | 7    | 0.00   | 0.00   |   |



Project.....: SGU021041 - Uitbreiding zwembad de Meerkant te  
Amstelveen  
Onderdeel.....: kledruimte kolom

## REACTIES

1e orde

| Kn. | B.G. | X      | Z | M |
|-----|------|--------|---|---|
| 12  | 1    | 0.00   |   |   |
| 12  | 2    | 0.00   |   |   |
| 12  | 3    | -18.55 |   |   |
| 12  | 4    | 0.00   |   |   |
| 12  | 5    | 0.00   |   |   |
| 12  | 6    | 0.00   |   |   |
| 12  | 7    | 0.00   |   |   |

## BEREKENINGSTATUS

| B.C. | Iteratie | Status                 |
|------|----------|------------------------|
| 1    | 3        | Nauwkeurigheid bereikt |
| 2    | 3        | Nauwkeurigheid bereikt |
| 3    | 3        | Nauwkeurigheid bereikt |
| 4    | 3        | Nauwkeurigheid bereikt |
| 5    | 3        | Nauwkeurigheid bereikt |
| 6    | 3        | Nauwkeurigheid bereikt |
| 7    | 3        | Nauwkeurigheid bereikt |
| 8    | 3        | Nauwkeurigheid bereikt |
| 9    | 3        | Nauwkeurigheid bereikt |
| 10   | 3        | Nauwkeurigheid bereikt |
| 11   | 3        | Nauwkeurigheid bereikt |
| 12   | 3        | Nauwkeurigheid bereikt |
| 13   | 3        | Nauwkeurigheid bereikt |
| 14   | 3        | Nauwkeurigheid bereikt |
| 15   | 3        | Nauwkeurigheid bereikt |
| 16   | 3        | Nauwkeurigheid bereikt |
| 17   | 3        | Nauwkeurigheid bereikt |
| 18   | 3        | Nauwkeurigheid bereikt |
| 19   | 3        | Nauwkeurigheid bereikt |
| 20   | 3        | Nauwkeurigheid bereikt |
| 21   | 3        | Nauwkeurigheid bereikt |
| 22   | 3        | Nauwkeurigheid bereikt |
| 23   | 1        | Lineaire berekening    |
| 24   | 1        | Lineaire berekening    |
| 25   | 1        | Lineaire berekening    |
| 26   | 1        | Lineaire berekening    |
| 27   | 1        | Lineaire berekening    |
| 28   | 1        | Lineaire berekening    |
| 29   | 1        | Lineaire berekening    |
| 30   | 1        | Lineaire berekening    |
| 31   | 1        | Lineaire berekening    |
| 32   | 1        | Lineaire berekening    |
| 33   | 1        | Lineaire berekening    |
| 34   | 1        | Lineaire berekening    |
| 35   | 1        | Lineaire berekening    |





Project.....: SGU021041 - Uitbreiding zwembad de Meerkant te Amstelveen  
Onderdeel.....: kleedruimte kolom

## BELASTINGCOMBINATIES

| BC Type  |      |           |   |      |                  |                         |
|----------|------|-----------|---|------|------------------|-------------------------|
| 31 Kar.  | 1.00 | $G_{k,1}$ | + | 1.00 | $Q_{k,6}$        | + 1.00 $\psi_0 Q_{k,2}$ |
| 32 Quas. | 1.00 | $G_{k,1}$ |   |      |                  |                         |
| 33 Quas. | 1.00 | $G_{k,1}$ | + | 1.00 | $\psi_2 Q_{k,2}$ |                         |
| 34 Freq. | 1.00 | $G_{k,1}$ |   |      |                  |                         |
| 35 Freq. | 1.00 | $G_{k,1}$ | + | 1.00 | $\psi_1 Q_{k,2}$ |                         |
| 36 Freq. | 1.00 | $G_{k,1}$ | + | 1.00 | $\psi_1 Q_{k,3}$ |                         |
| 37 Freq. | 1.00 | $G_{k,1}$ | + | 1.00 | $\psi_1 Q_{k,4}$ |                         |
| 38 Freq. | 1.00 | $G_{k,1}$ | + | 1.00 | $\psi_1 Q_{k,5}$ |                         |
| 39 Freq. | 1.00 | $G_{k,1}$ | + | 1.00 | $\psi_1 Q_{k,6}$ |                         |
| 40 Freq. | 1.00 | $G_{k,1}$ | + | 1.00 | $\psi_1 Q_{k,3}$ | + 1.00 $\psi_2 Q_{k,2}$ |
| 41 Freq. | 1.00 | $G_{k,1}$ | + | 1.00 | $\psi_1 Q_{k,4}$ | + 1.00 $\psi_2 Q_{k,2}$ |
| 42 Freq. | 1.00 | $G_{k,1}$ | + | 1.00 | $\psi_1 Q_{k,5}$ | + 1.00 $\psi_2 Q_{k,2}$ |
| 43 Freq. | 1.00 | $G_{k,1}$ | + | 1.00 | $\psi_1 Q_{k,6}$ | + 1.00 $\psi_2 Q_{k,2}$ |
| 44 Blij. | 1.00 | $G_{k,1}$ |   |      |                  |                         |

## GUNSTIGE WERKING PERMANENTE BELASTINGEN

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



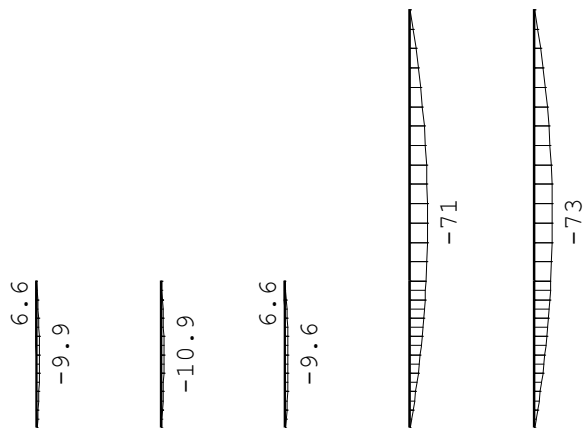
Project.....: SGU021041 - Uitbreiding zwembad de Meerkant te Amstelveen  
Onderdeel.....: kleedruimte kolom

## OMHULLENDE VAN DE FUNDAMENTELE COMBINATIES

**MOMENTEN**  
combinatie

2e orde

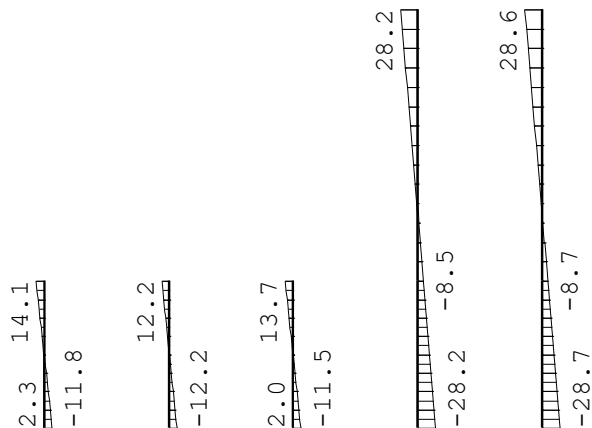
Fundamentele



**DWARSKRACHTEN**  
combinatie

2e orde

Fundamentele



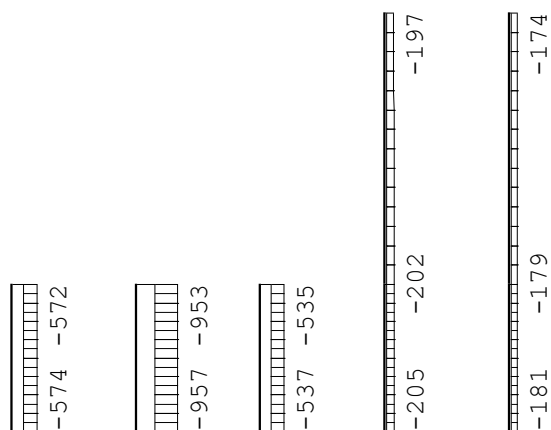


Project.....: SGU021041 - Uitbreiding zwembad de Meerkant te Amstelveen  
Onderdeel.....: kleedruimte kolom

**NORMAALKRACHTEN**  
combinatie

2e orde

Fundamentele



**REACTIES**  
combinatie

2e orde

Fundamentele

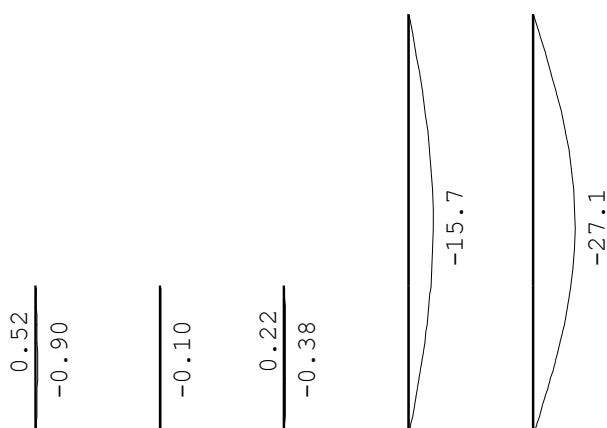
| Kn.   | X-min  | X-max | Z-min  | Z-max  | M-min |
|-------|--------|-------|--------|--------|-------|
| M-max |        |       |        |        |       |
| 1     | -11.32 | 1.86  | 261.43 | 573.57 |       |
| 2     | -13.52 | -0.76 |        |        |       |
| 3     | -12.08 | 0.00  | 429.70 | 956.93 |       |
| 4     | -12.08 | 0.00  |        |        |       |
| 5     | -11.32 | 1.86  | 242.07 | 537.26 |       |
| 6     | -13.52 | -0.76 |        |        |       |
| 7     | -27.82 | 0.00  | 32.15  | 205.02 |       |
| 9     | -27.84 | 0.00  |        |        |       |
| 10    | -27.81 | 0.00  | 40.14  | 181.03 |       |
| 12    | -27.85 | 0.00  |        |        |       |



Project.....: SGU021041 - Uitbreiding zwembad de Meerkant te Amstelveen  
Onderdeel.....: kleedruimte kolom

## OMHULLENDE VAN DE KARAKTERISTIEKE COMBINATIES

**VERPLAATSINGEN** 1e orde [mm] Karakteristieke combinatie



## MATERIAALGEGEVENS

| Mt  | Kwaliteit    | $f_{m,y,k}$ | $\rho_k$             | $\rho_{mean}$        | $f_{t,0,k}$          | $f_{t,90,k}$         | $f_{c,0,k}$          |
|-----|--------------|-------------|----------------------|----------------------|----------------------|----------------------|----------------------|
|     | $f_{c,90,k}$ | $f_{v,k}$   |                      |                      |                      |                      |                      |
|     |              |             | [N/mm <sup>2</sup> ] | [kg/m <sup>3</sup> ] | [kg/m <sup>3</sup> ] | [N/mm <sup>2</sup> ] | [N/mm <sup>2</sup> ] |
|     |              |             |                      |                      |                      |                      |                      |
| 1   | GL24h        | 24          | 385                  | 462                  | 19.2                 | 0.5                  | 24.0                 |
| 2.5 | 3.5          |             |                      |                      |                      |                      |                      |

## MATERIAALGEGEVENS (vervolg)

| Mt   | Kwaliteit       | $G_{mean}$           | $E_{0,05}$           | $E_{90mean}$         | $E_{0,mean}$         | Klimaatklasse | $k_{def}$ |
|------|-----------------|----------------------|----------------------|----------------------|----------------------|---------------|-----------|
|      | $E_{0mean,fin}$ |                      |                      |                      |                      |               |           |
|      |                 | [N/mm <sup>2</sup> ] | [N/mm <sup>2</sup> ] | [N/mm <sup>2</sup> ] | [N/mm <sup>2</sup> ] |               |           |
|      |                 |                      |                      |                      |                      |               |           |
| 1    | GL24h           | 650                  | 9600                 | 300                  | 11500                | I             | 0.60      |
| 7188 |                 |                      |                      |                      |                      |               |           |

## KIPSTABILITEIT

| Staaf | Plts.<br>aangr. | l sys.<br>[m]    | Kipsteunafstanden<br>[m]         |
|-------|-----------------|------------------|----------------------------------|
| 1     | 1.0*h           | boven:<br>onder: | 3.55 0;3.550<br>3.55 0;3.550     |
| 2     | 1.0*h           | boven:<br>onder: | 3.55 0;3.550<br>3.55 0;3.550     |
| 3     | 1.0*h           | boven:<br>onder: | 3.55 0;3.550<br>3.55 0;3.550     |
| 4-5   | 1.0*h           | boven:<br>onder: | 10.11 0;10.110<br>10.11 0;10.110 |
| 6-7   | 1.0*h           | boven:           | 10.11 0;10.110                   |



onder: 10.11 0;10.110

Project.....: SGU021041 - Uitbreiding zwembad de Meerkant te Amstelveen  
Onderdeel.....: kleedruimte kolom

## STABILITEIT

| Stf        | $b_{gem}$  | $h_{gem}$ | $l_{sys}$ | $l_{buc, y/z}$ | $\lambda_y$ | $\lambda_z$ | $\lambda_{rel, y/z}$ | $\beta_c$ | $k_y$ | $k_z$ |       |       |
|------------|------------|-----------|-----------|----------------|-------------|-------------|----------------------|-----------|-------|-------|-------|-------|
| $k_{c, y}$ | $k_{c, z}$ |           |           |                |             |             |                      |           |       |       |       |       |
|            | [mm]       | [mm]      | [mm]      | [mm]           | [mm]        |             |                      |           |       |       |       |       |
| 1          | 300        | 700       | 3550      | nvt            | 3550        | 17.6        | 41.0                 | 0.280     | 0.652 | 0.1   | 0.538 | 0.730 |
| 1.002      | 0.944      |           |           |                |             |             |                      |           |       |       |       |       |
| 2          | 300        | 400       | 3550      | nvt            | 3550        | 30.7        | 41.0                 | 0.489     | 0.652 | 0.1   | 0.629 | 0.730 |
| 0.976      | 0.944      |           |           |                |             |             |                      |           |       |       |       |       |
| 3          | 300        | 300       | 3550      | nvt            | 3550        | 41.0        | 41.0                 | 0.652     | 0.652 | 0.1   | 0.730 | 0.730 |
| 0.944      | 0.944      |           |           |                |             |             |                      |           |       |       |       |       |
| 4          | 300        | 480       | 3550      | nvt            | 6620        | 73.0        | 76.4                 | 1.161     | 1.217 | 0.1   | 1.217 | 1.286 |
| 0.632      | 0.587      |           |           |                |             |             |                      |           |       |       |       |       |
| 5          | 300        | 480       | 6560      | nvt            | 6620        | 73.0        | 76.4                 | 1.161     | 1.217 | 0.1   | 1.217 | 1.286 |
| 0.632      | 0.587      |           |           |                |             |             |                      |           |       |       |       |       |
| 6          | 300        | 400       | 3550      | nvt            | 6620        | 87.6        | 76.4                 | 1.393     | 1.217 | 0.1   | 1.526 | 1.286 |
| 0.466      | 0.587      |           |           |                |             |             |                      |           |       |       |       |       |
| 7          | 300        | 400       | 6560      | nvt            | 6620        | 87.6        | 76.4                 | 1.393     | 1.217 | 0.1   | 1.526 | 1.286 |
| 0.466      | 0.587      |           |           |                |             |             |                      |           |       |       |       |       |

## TOETSING SPANNINGEN

**Staaft 1 BC / Sit. 4 / 1 UC frm(6.24) 0.31**

Maatg. is norm.drukker. + buiging (EN 1995-1-1 art. 6.3.2(3)) aan onderzijde staaft

Belastingduurklasse Middellang

Positie 1775 [mm]

Breedte 300.00 [mm]

1:GL24h

Hoogte 700.00 [mm]

Materiaal

$k_{mod}$  0.80 [-]

1.00 [-]

$k_h (f_{tok})$

1.00 [-]

$k_h (f_{mk})$

$f_{m, y, d}$  15.36 [N/mm<sup>2</sup>]

12.29 [N/mm<sup>2</sup>]

$f_{c, 0, d}$

15.36 [N/mm<sup>2</sup>]

$f_{t, 0, d}$

$f_{v, d}$  2.24 [N/mm<sup>2</sup>]

0.32 [N/mm<sup>2</sup>]

$f_{c, 90, d}$

1.60 [N/mm<sup>2</sup>]

$f_{t, 90, d}$

N -954.87 [kN]

0.00 [kNm]

D

0.00 [kN]

M

$\sigma_{c, 0, d}$  4.55 [N/mm<sup>2</sup>]

0.00 [N/mm<sup>2</sup>]

$\tau_d$

0.00 [N/mm<sup>2</sup>]

$\sigma_{m, y, d}$

-

$k_{c, z}$  0.94 [-]

3200.00 [mm]

$k_m$

0.70 [-]

$l_{ef, y}$

$\sigma_{m, y, crit}$  300.86 [N/mm<sup>2</sup>]

1.00 [-]

$\lambda_{rel, my}$

0.28 [-]

$k_{crit, y}$

**Staaft 2 BC / Sit. 4 / 1 UC frm(6.23)**  
**0.35**

Maatg. is norm.drukk. + buiging (EN 1995-1-1 art. 6.3.2(3)) aan  
 onderzijde staaft

Belastingduurklasse Middellang

Positie 3550 [mm]

Breedte 300.00 [mm]

1:GL24h

Hoogte 400.00 [mm]

Materiaal

$k_{mod}$  0.80 [-]

1.04 [-]

$k_{h(f t o k)}$

1.04 [-]

$k_{h(f m k)}$

$f_{m, y, d}$  16.00 [N/mm<sup>2</sup>]

12.80 [N/mm<sup>2</sup>]

$f_{c, 0, d}$

15.36 [N/mm<sup>2</sup>]

$f_{t, 0, d}$

$f_{v, d}$  2.24 [N/mm<sup>2</sup>]

0.32 [N/mm<sup>2</sup>]

$f_{c, 90, d}$

1.60 [N/mm<sup>2</sup>]

$f_{t, 90, d}$

N -534.90 [kN]

6.60 [kNm]

D

1.62 [kN]

M

$\sigma_{c, 0, d}$  4.46 [N/mm<sup>2</sup>]

0.82 [N/mm<sup>2</sup>]

$\tau_d$

0.02 [N/mm<sup>2</sup>]

$\sigma_{m, y, d}$

-

$k_{c, z}$  1.00 [-]

2995.00 [mm]

$k_m$

0.70 [-]

$l_{ef, y}$

$\sigma_{m, y, crit}$  562.54 [N/mm<sup>2</sup>]

1.00 [-]

$\lambda_{rel, my}$

0.21 [-]

$k_{crit, y}$

Project.....: SGU021041 - Uitbreiding zwembad de Meerkant te Amstelveen  
Onderdeel.....: kleedruimte kolom

# TOETSING SPANNINGEN

**Staaft**                    **3**                    **BC / Sit.**                    **4 / 1**                    **UC frm(6.23)**  
**0.53**

Maatg. is norm.drukk. + buiging (EN 1995-1-1 art. 6.3.2(3)) aan onderzijde staaft

Belastingduurklasse                    Middellang

Positie                    3550                    [mm]

Breedte                    300.00                    [mm]                    Hoogte                    300.00                    [mm]                    Materiaal  
1:GL24h

$k_{mod}$                     0.80                    [-]                     $k_h(f_{tok})$                     1.07                    [-]                     $k_h(f_{mk})$   
1.07                    [-]

$f_{m,y,d}$                     16.46                    [N/mm<sup>2</sup>]                     $f_{c,0,d}$                     15.36                    [N/mm<sup>2</sup>]                     $f_{t,0,d}$   
13.17                    [N/mm<sup>2</sup>]

$f_{v,d}$                     2.24                    [N/mm<sup>2</sup>]                     $f_{c,90,d}$                     1.60                    [N/mm<sup>2</sup>]                     $f_{t,90,d}$   
0.32                    [N/mm<sup>2</sup>]

N                    -571.80                    [kN]                    D                    1.21                    [kN]                    M  
6.60                    [kNm]

$\sigma_{c,0,d}$                     6.35                    [N/mm<sup>2</sup>]                     $\tau_d$                     0.02                    [N/mm<sup>2</sup>]                     $\sigma_{m,y,d}$                     -  
1.47                    [N/mm<sup>2</sup>]

$k_{c,z}$                     1.00                    [-]                     $k_m$                     0.70                    [-]                     $l_{ef,y}$   
3045.00                    [mm]

$\sigma_{m,y,crit}$                     737.73                    [N/mm<sup>2</sup>]                     $\lambda_{rel,m,y}$                     0.18                    [-]                     $k_{crit,y}$   
1.00                    [-]

**Staaft**                    **4**                    **BC / Sit.**                    **5 / 1**                    **UC frm(6.23)**  
**0.35**

Maatg. is norm.drukk. + buiging (EN 1995-1-1 art. 6.3.2(3)) aan bovenzijde staaft

Belastingduurklasse                    Kort

Positie                    3550                    [mm]

Breedte                    300.00                    [mm]                    Hoogte                    480.00                    [mm]                    Materiaal  
1:GL24h

$k_{mod}$                     0.90                    [-]                     $k_h(f_{tok})$                     1.02                    [-]                     $k_h(f_{mk})$   
1.02                    [-]

$f_{m,y,d}$                     17.67                    [N/mm<sup>2</sup>]                     $f_{c,0,d}$                     17.28                    [N/mm<sup>2</sup>]                     $f_{t,0,d}$   
14.14                    [N/mm<sup>2</sup>]

$f_{v,d}$                     2.52                    [N/mm<sup>2</sup>]                     $f_{c,90,d}$                     1.80                    [N/mm<sup>2</sup>]                     $f_{t,90,d}$   
0.36                    [N/mm<sup>2</sup>]

N                    -39.85                    [kN]                    D                    -8.46                    [kN]                    M                    -  
65.16                    [kNm]

$\sigma_{c,0,d}$                     0.28                    [N/mm<sup>2</sup>]                     $\tau_d$                     0.09                    [N/mm<sup>2</sup>]                     $\sigma_{m,y,d}$                     -  
5.66                    [N/mm<sup>2</sup>]



|                      |                             |                     |          |               |
|----------------------|-----------------------------|---------------------|----------|---------------|
| $k_{c,z}$            | 1.00 [-]                    | $k_m$               | 0.70 [-] | $l_{ef,y}$    |
| 10059.00 [mm]        |                             |                     |          |               |
| $\sigma_{m y, crit}$ | 139.58 [N/mm <sup>2</sup> ] | $\lambda_{rel, my}$ | 0.41 [-] | $k_{crit, y}$ |
| 1.00 [-]             |                             |                     |          |               |

Project.....: SGU021041 - Uitbreiding zwembad de Meerkant te Amstelveen  
Onderdeel.....: kleedruimte kolom

**Staaft 5 BC / Sit. 5 / 1 UC frm(6.23)**  
**0.38**

Maatg. is norm.drukkkr. + buiging (EN 1995-1-1 art. 6.3.2(3)) aan bovenzijde staaft

|                            |                             |                     |                            |                    |
|----------------------------|-----------------------------|---------------------|----------------------------|--------------------|
| Belastingduurklasse        |                             | Kort                |                            |                    |
| Positie                    | 1405 [mm]                   |                     |                            |                    |
| Breedte                    | 300.00 [mm]                 | Hoogte              | 480.00 [mm]                | Materiaal          |
| 1:GL24h                    |                             |                     |                            |                    |
| $k_{mod}$                  | 0.90 [-]                    | $k_{h(f t o k)}$    | 1.02 [-]                   | $k_{h(f m k)}$     |
| 1.02 [-]                   |                             |                     |                            |                    |
| $f_{m, y, d}$              | 17.67 [N/mm <sup>2</sup> ]  | $f_{c, 0, d}$       | 17.28 [N/mm <sup>2</sup> ] | $f_{t, 0, d}$      |
| 14.14 [N/mm <sup>2</sup> ] |                             |                     |                            |                    |
| $f_{v, d}$                 | 2.52 [N/mm <sup>2</sup> ]   | $f_{c, 90, d}$      | 1.80 [N/mm <sup>2</sup> ]  | $f_{t, 90, d}$     |
| 0.36 [N/mm <sup>2</sup> ]  |                             |                     |                            |                    |
| N                          | -38.75 [kN]                 | D                   | -0.52 [kN]                 | M                  |
| 71.46 [kNm]                |                             |                     |                            | -                  |
| $\sigma_{c, 0, d}$         | 0.27 [N/mm <sup>2</sup> ]   | $\tau_d$            | 0.01 [N/mm <sup>2</sup> ]  | $\sigma_{m, y, d}$ |
| 6.20 [N/mm <sup>2</sup> ]  |                             |                     |                            | -                  |
| $k_{c, z}$                 | 0.72 [-]                    | $k_m$               | 0.70 [-]                   | $l_{ef, y}$        |
| 10059.00 [mm]              |                             |                     |                            |                    |
| $\sigma_{m, y, crit}$      | 139.58 [N/mm <sup>2</sup> ] | $\lambda_{rel, my}$ | 0.41 [-]                   | $k_{crit, y}$      |
| 1.00 [-]                   |                             |                     |                            |                    |

**Staaft 6 BC / Sit. 5 / 1 UC frm(6.23)**  
**0.51**

Maatg. is norm.drukkkr. + buiging (EN 1995-1-1 art. 6.3.2(3)) aan bovenzijde staaft

|                            |                             |                     |                            |                    |
|----------------------------|-----------------------------|---------------------|----------------------------|--------------------|
| Belastingduurklasse        |                             | Kort                |                            |                    |
| Positie                    | 3550 [mm]                   |                     |                            |                    |
| Breedte                    | 300.00 [mm]                 | Hoogte              | 400.00 [mm]                | Materiaal          |
| 1:GL24h                    |                             |                     |                            |                    |
| $k_{mod}$                  | 0.90 [-]                    | $k_{h(f t o k)}$    | 1.04 [-]                   | $k_{h(f m k)}$     |
| 1.04 [-]                   |                             |                     |                            |                    |
| $f_{m, y, d}$              | 18.00 [N/mm <sup>2</sup> ]  | $f_{c, 0, d}$       | 17.28 [N/mm <sup>2</sup> ] | $f_{t, 0, d}$      |
| 14.40 [N/mm <sup>2</sup> ] |                             |                     |                            |                    |
| $f_{v, d}$                 | 2.52 [N/mm <sup>2</sup> ]   | $f_{c, 90, d}$      | 1.80 [N/mm <sup>2</sup> ]  | $f_{t, 90, d}$     |
| 0.36 [N/mm <sup>2</sup> ]  |                             |                     |                            |                    |
| N                          | -50.83 [kN]                 | D                   | -8.68 [kN]                 | M                  |
| 66.48 [kNm]                |                             |                     |                            | -                  |
| $\sigma_{c, 0, d}$         | 0.42 [N/mm <sup>2</sup> ]   | $\tau_d$            | 0.11 [N/mm <sup>2</sup> ]  | $\sigma_{m, y, d}$ |
| 8.31 [N/mm <sup>2</sup> ]  |                             |                     |                            | -                  |
| $k_{c, z}$                 | 1.00 [-]                    | $k_m$               | 0.70 [-]                   | $l_{ef, y}$        |
| 9899.00 [mm]               |                             |                     |                            |                    |
| $\sigma_{m, y, crit}$      | 170.20 [N/mm <sup>2</sup> ] | $\lambda_{rel, my}$ | 0.38 [-]                   | $k_{crit, y}$      |
|                            |                             |                     |                            |                    |

1.00 [-]

**Staaft**                    **7**                    **BC / Sit.**                    **5 / 1**                    **UC frm(6.23)**  
**0.56**

Maatg. is norm.drukkkr. + buiging (EN 1995-1-1 art. 6.3.2(3)) aan  
bovenzijde staaft

|                            |                             |                        |                            |                    |   |
|----------------------------|-----------------------------|------------------------|----------------------------|--------------------|---|
| Belastingduurklasse        |                             | Kort                   |                            |                    |   |
| Positie                    | 1405 [mm]                   |                        |                            |                    |   |
| Breedte                    | 300.00 [mm]                 | Hoogte                 | 400.00 [mm]                | Materiaal          |   |
| 1:GL24h                    |                             |                        |                            |                    |   |
| $k_{m o d}$                | 0.90 [-]                    | $k_h (f t o k)$        | 1.04 [-]                   | $k_h (f m k)$      |   |
| 1.04 [-]                   |                             |                        |                            |                    |   |
| $f_{m, y, d}$              | 18.00 [N/mm <sup>2</sup> ]  | $f_{c, 0, d}$          | 17.28 [N/mm <sup>2</sup> ] | $f_{t, 0, d}$      |   |
| 14.40 [N/mm <sup>2</sup> ] |                             |                        |                            |                    |   |
| $f_{v, d}$                 | 2.52 [N/mm <sup>2</sup> ]   | $f_{c, 90, d}$         | 1.80 [N/mm <sup>2</sup> ]  | $f_{t, 90, d}$     |   |
| 0.36 [N/mm <sup>2</sup> ]  |                             |                        |                            |                    |   |
| N                          | -49.94 [kN]                 | D                      | -0.49 [kN]                 | M                  | - |
| 72.94 [kNm]                |                             |                        |                            |                    |   |
| $\sigma_{c, 0, d}$         | 0.42 [N/mm <sup>2</sup> ]   | $\tau_d$               | 0.01 [N/mm <sup>2</sup> ]  | $\sigma_{m, y, d}$ | - |
| 9.12 [N/mm <sup>2</sup> ]  |                             |                        |                            |                    |   |
| $k_{c, z}$                 | 0.72 [-]                    | $k_m$                  | 0.70 [-]                   | $l_{e f, y}$       |   |
| 9899.00 [mm]               |                             |                        |                            |                    |   |
| $\sigma_{m y, c r i t}$    | 170.20 [N/mm <sup>2</sup> ] | $\lambda_{r e l, m y}$ | 0.38 [-]                   | $k_{c r i t, y}$   |   |
| 1.00 [-]                   |                             |                        |                            |                    |   |



Project.....: SGU021041 - Uitbreiding zwembad de Meerkant te Amstelveen  
Onderdeel.....: kleedruimte kolom

### TOETSING HORIZONTALE VERPLAATSING

| Staafl | Mtg | $l_{sys}$<br>[mm] | BC | Sit | $w_{tot}$<br>[mm] | Toelaatbaar<br>[mm] [h/ ] |     |
|--------|-----|-------------------|----|-----|-------------------|---------------------------|-----|
| 1      | db  | 3550              | 24 | 1   | -0.1              | -11.8                     | 300 |
| 2      | db  | 3550              | 24 | 1   | -0.4              | -11.8                     | 300 |
| 3      | db  | 3550              | 24 | 1   | -0.9              | -11.8                     | 300 |
| 4      | db  | 10110             | 24 | 1   | -14.1             | -33.7                     | 300 |
| 5      | db  | 10110             | 24 | 1   | -15.7             | -33.7                     | 300 |
| 6      | db  | 10110             | 24 | 1   | -24.3             | -33.7                     | 300 |
| 7      | db  | 10110             | 24 | 1   | -27.1             | -33.7                     | 300 |

### VERVORMINGEN w1

Blijvende

combinatie

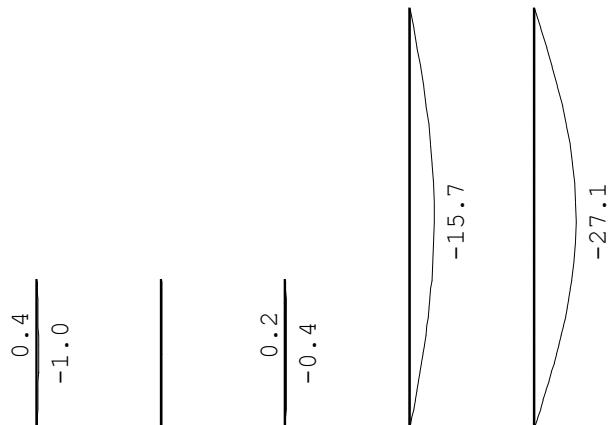




Project.....: SGU021041 - Uitbreiding zwembad de Meerkant te Amstelveen  
Onderdeel.....: kleedruimte kolom

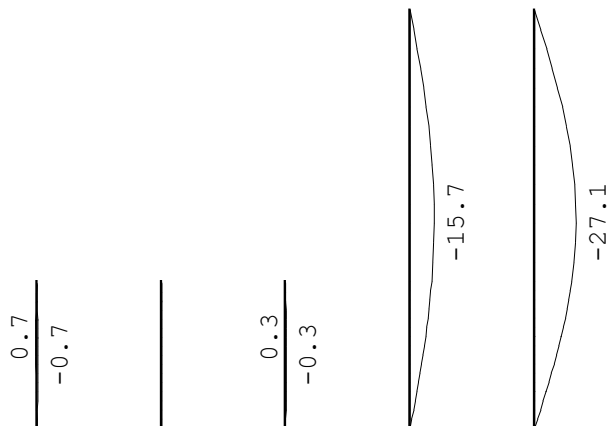
**VERVORMINGEN  $W_{bij}$**   
combinatie

Karakteristieke



**VERVORMINGEN  $W_{max}$**   
combinatie

Karakteristieke



# Kolommen as 7

| BEREKENING KOLOM OP 2 STEUNPUNTEN                          |        |                     |                                                                                                                                |                                    |                                                                                                            |                   |                       |                                       |                         | V2.0                                                      |
|------------------------------------------------------------|--------|---------------------|--------------------------------------------------------------------------------------------------------------------------------|------------------------------------|------------------------------------------------------------------------------------------------------------|-------------------|-----------------------|---------------------------------------|-------------------------|-----------------------------------------------------------|
| b (kolom):                                                 | 300    | mm                  | A                                                                                                                              | =                                  | 900                                                                                                        | cm <sup>2</sup>   | Hout kw:              | GL 24h                                | keuze                   |                                                           |
| h (kolom):                                                 | 300    | mm                  | W <sub>y</sub>                                                                                                                 | =                                  | 4500                                                                                                       | cm <sup>3</sup>   | Gevolg Klasse :       | CC2                                   | keuze                   |                                                           |
| L <sub>y</sub> :                                           | 4,00   | m                   | l <sub>y</sub>                                                                                                                 | =                                  | 6,75E+04                                                                                                   | cm <sup>4</sup>   | Klim.kl :             | 1                                     | keuze                   |                                                           |
| L <sub>z</sub> :                                           | 4,00   | m                   | k <sub>h</sub>                                                                                                                 | =                                  | 1,07                                                                                                       | fac               | Belasting:            | boven                                 | keuze                   |                                                           |
|                                                            |        |                     | k <sub>def</sub>                                                                                                               | =                                  | 0,6                                                                                                        | fac               | Steunen:              | boven                                 | keuze                   |                                                           |
| N <sub>eg,k</sub> :                                        | 289,00 | kN                  | k <sub>mod</sub>                                                                                                               | =                                  | 0,8                                                                                                        | fac               | ψ <sub>0</sub>        | =                                     | 0,4                     |                                                           |
| N <sub>vb,k</sub> :                                        | 150,00 | kN                  | Y <sub>g</sub>                                                                                                                 | =                                  | 1,35                                                                                                       | fac (6.10.a)      | ψ <sub>1</sub>        | =                                     | 0,7 (t.b.v. brand)      |                                                           |
| M <sub>eg,k</sub> :                                        | 3,00   | kN                  | Y <sub>g</sub>                                                                                                                 | =                                  | 1,20                                                                                                       | fac (6.10.b)      | ψ <sub>t,vb</sub>     | =                                     | 1,00 fac 1990: bijl.A11 |                                                           |
| M <sub>vb,k</sub> :                                        | 5,00   | kN                  | Y <sub>q</sub>                                                                                                                 | =                                  | 1,50                                                                                                       | fac (6.10.b)      | Ref.per :             | 50                                    | jaar                    |                                                           |
| Krachstwerking:                                            |        |                     |                                                                                                                                |                                    |                                                                                                            |                   | UC <sub>max,uls</sub> | =                                     | 0,77 (incl.brand)       |                                                           |
| Controle Uiterste grenstoestand: NEN 1995-1-1:2005+C1:2006 |        |                     |                                                                                                                                |                                    |                                                                                                            |                   |                       |                                       |                         |                                                           |
| 10.6.b:druk+buiging:                                       |        |                     | σ <sub>c;0;d</sub>                                                                                                             | =                                  | 6,35                                                                                                       | N/mm <sup>2</sup> | <                     | f <sub>c;0;u;d</sub>                  | =                       | 15,36 N/mm <sup>2</sup> UC : 0,41                         |
| (k <sub>mod</sub> = 0,80)                                  |        | art 6.3.2. vgl.6.23 | σ <sub>c;0;d</sub> / (k <sub>cy</sub> * f <sub>c;0;d</sub> ) + σ <sub>m;y;d</sub> / f <sub>m;y;d</sub>                         |                                    |                                                                                                            |                   | =                     | 6,35/(0,920*15,36)+2,47/15,36=        |                         | UC : 0,61                                                 |
|                                                            |        | art 6.3.2. vgl.6.24 | σ <sub>c;0;d</sub> / (k <sub>cz</sub> * f <sub>c;0;d</sub> ) + k <sub>m</sub> * (σ <sub>m;y;d</sub> / f <sub>m;y;d</sub> )     |                                    |                                                                                                            |                   | =                     | 6,35/(0,920*15,36)+(0,7*2,47)/15,36=  |                         | UC : 0,56                                                 |
|                                                            |        | art 6.3.3. vgl.6.33 | (lef = 4200mm ; σ <sub>m;crit</sub> = 534,86 N/mm2 ; λ <sub>rel</sub> = 0,21 ; k <sub>crit</sub> = 1,000)                      |                                    |                                                                                                            |                   |                       |                                       |                         |                                                           |
| M <sub>d(6.10.b)</sub> =                                   | 11,10  | kNm                 | σ <sub>m;d</sub>                                                                                                               | =                                  | 2,47                                                                                                       | N/mm <sup>2</sup> | <                     | k <sub>crit</sub> x f <sub>m;d</sub>  | =                       | 15,36 N/mm <sup>2</sup> UC : 0,16                         |
| N <sub>d</sub>                                             | =      | 571,80              | kN                                                                                                                             | art 6.3.3. vgl.6.35 0,03 (buiging) |                                                                                                            |                   | +                     | 0,45 (druk)                           | =                       | UC : 0,48                                                 |
| 10.6.a:druk+buiging:                                       |        |                     | σ <sub>c;0;d</sub>                                                                                                             | =                                  | 5,34                                                                                                       | N/mm <sup>2</sup> | <                     | f <sub>c;0;u;d</sub>                  | =                       | 13,44 N/mm <sup>2</sup> UC : 0,40                         |
| (k <sub>mod</sub> = 0,70)                                  |        | art 6.3.2. vgl.6.23 | σ <sub>c;0;d</sub> / (k <sub>cy</sub> * f <sub>c;0;d</sub> ) + σ <sub>m;y;d</sub> / f <sub>m;y;d</sub>                         |                                    |                                                                                                            |                   | =                     | 5,34/(0,920*13,44)+1,57/13,44=        |                         | UC : 0,55                                                 |
|                                                            |        | art 6.3.2. vgl.6.24 | σ <sub>c;0;d</sub> / (k <sub>cz</sub> * f <sub>c;0;d</sub> ) + k <sub>m</sub> * (σ <sub>m;y;d</sub> / f <sub>m;y;d</sub> )     |                                    |                                                                                                            |                   | =                     | 5,34/(0,920*13,44)+(0,7*1,57)/13,44=  |                         | UC : 0,51                                                 |
|                                                            |        | art 6.3.3. vgl.6.33 | (lef = 4200mm ; σ <sub>m;crit</sub> = 534,86 N/mm2 ; λ <sub>rel</sub> = 0,21 ; k <sub>crit</sub> = 1,000)                      |                                    |                                                                                                            |                   |                       |                                       |                         |                                                           |
| M <sub>d(6.10.a)</sub> =                                   | 7,05   | kNm                 | σ <sub>m;d</sub>                                                                                                               | =                                  | 1,57                                                                                                       | N/mm <sup>2</sup> | <                     | k <sub>crit</sub> x f <sub>m;d</sub>  | =                       | 13,44 N/mm <sup>2</sup> UC : 0,12                         |
| N <sub>d</sub>                                             | =      | 480,15              | kN                                                                                                                             | art 6.3.3. vgl.6.35 0,01 (buiging) |                                                                                                            |                   | +                     | 0,38 (druk)                           | =                       | UC : 0,39                                                 |
| Controle Brandwerendheid: NEN 1995-1-2                     |        |                     | 4 zijden (2b+2h)                                                                                                               |                                    |                                                                                                            |                   | Brandwerendheid:      |                                       | 60                      | min.                                                      |
| d <sub>char</sub>                                          | =      | 39,0                | mm                                                                                                                             | b <sub>ef</sub>                    | =                                                                                                          | 208               | mm                    | k <sub>mod,fi</sub>                   | =                       | 1,00 fac                                                  |
| d <sub>ef</sub>                                            | =      | 46,0                | mm                                                                                                                             | h <sub>ef</sub>                    | =                                                                                                          | 189               | mm                    | A <sub>fi</sub>                       | =                       | 392 cm <sup>2</sup>                                       |
| β                                                          | =      | 0,65                | mm/min                                                                                                                         | b <sub>min</sub>                   | =                                                                                                          | 158               | mm                    | W <sub>y,fi</sub>                     | =                       | 1232 cm <sup>3</sup>                                      |
| M <sub>fi</sub>                                            | =      | 6,50                | kNm                                                                                                                            | art 6.16 vgl.6.11                  | σ <sub>m;fi;d</sub>                                                                                        | =                 | 5,28                  | N/mm <sup>2</sup>                     | <                       | f <sub>m;0;fi;d</sub> = 27,60 N/mm <sup>2</sup> UC : 0,19 |
| N <sub>fi</sub>                                            | =      | 394,00              | kN                                                                                                                             | art 6.3.2. vgl.6.23                | σ <sub>c;0;fi</sub> / (k <sub>cy</sub> * f <sub>c;0;fi</sub> ) + σ <sub>m;y;fi</sub> / f <sub>m;y;fi</sub> |                   |                       |                                       | =                       | 10,05/(0,625*27,60)+5,28/27,60 = UC : 0,77                |
| (k <sub>mod</sub> = 1,0)                                   |        | art 6.3.2. vgl.6.24 | σ <sub>c;0;fi</sub> / (k <sub>cz</sub> * f <sub>c;0;fi</sub> ) + k <sub>m</sub> * (σ <sub>m;y;fi</sub> / f <sub>m;y;fi</sub> ) |                                    |                                                                                                            |                   | =                     | 10,05/(0,718*27,60)+(0,7*5,28)/27,60= |                         | UC : 0,64                                                 |
|                                                            |        | art 6.3.3. vgl.6.33 | (lef,fi = 3977mm ; σ <sub>m;crit,fi</sub> = 432,14 N/mm2 ; λ <sub>rel</sub> = 0,24 ; k <sub>crit</sub> = 1,000)                |                                    |                                                                                                            |                   |                       |                                       |                         |                                                           |
|                                                            |        |                     | σ <sub>m;d</sub>                                                                                                               | =                                  | 5,28                                                                                                       | N/mm <sup>2</sup> | <                     | k <sub>crit</sub> x f <sub>m;d</sub>  | =                       | 27,60 N/mm <sup>2</sup> UC : 0,19                         |

# Kolommen as 9

| BEREKENING KOLOM OP 2 STEUNPUNTEN                          |        |                     |                                                                                                                            |                                                                                                                                |                                                                                                            |                                                |                                           |                                      |                                                             | V2.0 |
|------------------------------------------------------------|--------|---------------------|----------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------|------------------------------------------------|-------------------------------------------|--------------------------------------|-------------------------------------------------------------|------|
| b (kolom):                                                 | 300    | mm                  | A                                                                                                                          | =                                                                                                                              | 2100                                                                                                       | cm <sup>2</sup>                                | Hout kw:                                  | GL 24h                               | keuze                                                       |      |
| h (kolom):                                                 | 700    | mm                  | W <sub>y</sub>                                                                                                             | =                                                                                                                              | 24500                                                                                                      | cm <sup>3</sup>                                | Gevolg Klasse :                           | CC2                                  | keuze                                                       |      |
| L <sub>y</sub> :                                           | 4,00   | m                   | I <sub>y</sub>                                                                                                             | =                                                                                                                              | 8,58E+05                                                                                                   | cm <sup>4</sup>                                | Klim.kl :                                 | 1                                    | keuze                                                       |      |
| L <sub>z</sub> :                                           | 4,00   | m                   | k <sub>h</sub>                                                                                                             | =                                                                                                                              | 1,00                                                                                                       | fac                                            | Belasting:                                | boven                                | keuze                                                       |      |
|                                                            |        |                     | k <sub>def</sub>                                                                                                           | =                                                                                                                              | 0,6                                                                                                        | fac                                            | Steunen:                                  | boven                                | keuze                                                       |      |
| N <sub>eg,k</sub> :                                        | 474,00 | kN                  | k <sub>mod</sub>                                                                                                           | =                                                                                                                              | 0,8                                                                                                        | fac                                            | ψ <sub>0</sub>                            | =                                    | 0,4                                                         |      |
| N <sub>vb,k</sub> :                                        | 256,00 | kN                  | Y <sub>g</sub>                                                                                                             | =                                                                                                                              | 1,35                                                                                                       | fac (6.10.a)                                   | ψ <sub>1</sub>                            | =                                    | 0,7 (t.b.v. brand)                                          |      |
| M <sub>eg,k</sub> :                                        | 0,00   | kN                  | Y <sub>g</sub>                                                                                                             | =                                                                                                                              | 1,20                                                                                                       | fac (6.10.b)                                   | ψ <sub>t,vb</sub>                         | =                                    | 1,00 fac 1990: bijl.A11                                     |      |
| M <sub>vb,k</sub> :                                        | 0,00   | kN                  | Y <sub>q</sub>                                                                                                             | =                                                                                                                              | 1,50                                                                                                       | fac (6.10.b)                                   | Ref.per :                                 | 50                                   | jaar                                                        |      |
| Krachstwerking:                                            |        |                     |                                                                                                                            |                                                                                                                                |                                                                                                            |                                                | UC <sub>max,uls</sub>                     | =                                    | 0,32 (incl.brand)                                           |      |
| Controle Uiterste grenstoestand: NEN 1995-1-1:2005+C1:2006 |        |                     |                                                                                                                            |                                                                                                                                |                                                                                                            |                                                |                                           |                                      |                                                             |      |
| 10.6.b:druk+buiging:                                       |        |                     | σ <sub>c;0;d</sub>                                                                                                         | =                                                                                                                              | 4,54                                                                                                       | N/mm <sup>2</sup>                              | <                                         | f <sub>c;0;u;d</sub>                 | = 15,36 N/mm <sup>2</sup> UC : 0,30                         |      |
| (kmod = 0,80)                                              |        | art 6.3.2. vgl.6.23 | σ <sub>c;0;d</sub> / (k <sub>cy</sub> * f <sub>c;0;d</sub> ) + σ <sub>m;y;d</sub> / f <sub>m;y;d</sub>                     | =                                                                                                                              | 4,54/(0,998*15,36)+0,00/15,36=                                                                             |                                                |                                           |                                      | UC : 0,30                                                   |      |
|                                                            |        | art 6.3.2. vgl.6.24 | σ <sub>c;0;d</sub> / (k <sub>cz</sub> * f <sub>c;0;d</sub> ) + k <sub>m</sub> * (σ <sub>m;y;d</sub> / f <sub>m;y;d</sub> ) | =                                                                                                                              | 4,54/(0,920*15,36)+(0,7*0,00)/15,36=                                                                       |                                                |                                           |                                      | UC : 0,32                                                   |      |
|                                                            |        | art 6.3.3. vgl.6.33 | (lef = 5000mm ; σ <sub>m;crit</sub> = 192,55 N/mm2 ; λ <sub>rel</sub> = 0,35 ; k <sub>crit</sub> = 1,000)                  |                                                                                                                                |                                                                                                            |                                                |                                           |                                      |                                                             |      |
| M <sub>d(6.10.b)</sub> =                                   | 0,00   | kNm                 | σ <sub>m;d</sub>                                                                                                           | =                                                                                                                              | 0,00                                                                                                       | N/mm <sup>2</sup>                              | <                                         | k <sub>crit</sub> x f <sub>m;d</sub> | = 15,36 N/mm <sup>2</sup> UC : 0,00                         |      |
| N <sub>d</sub> =                                           | 952,80 | kN                  | 0,00 (buiging)                                                                                                             |                                                                                                                                |                                                                                                            |                                                | +                                         | 0,32 (druk)                          | = UC : 0,32                                                 |      |
| 10.6.a:druk+buiging:                                       |        |                     | σ <sub>c;0;d</sub>                                                                                                         | =                                                                                                                              | 3,78                                                                                                       | N/mm <sup>2</sup>                              | <                                         | f <sub>c;0;u;d</sub>                 | = 13,44 N/mm <sup>2</sup> UC : 0,28                         |      |
| (kmod = 0,70)                                              |        | art 6.3.2. vgl.6.23 | σ <sub>c;0;d</sub> / (k <sub>cy</sub> * f <sub>c;0;d</sub> ) + σ <sub>m;y;d</sub> / f <sub>m;y;d</sub>                     | =                                                                                                                              | 3,78/(0,998*13,44)+0,00/13,44=                                                                             |                                                |                                           |                                      | UC : 0,28                                                   |      |
|                                                            |        | art 6.3.2. vgl.6.24 | σ <sub>c;0;d</sub> / (k <sub>cz</sub> * f <sub>c;0;d</sub> ) + k <sub>m</sub> * (σ <sub>m;y;d</sub> / f <sub>m;y;d</sub> ) | =                                                                                                                              | 3,78/(0,920*13,44)+(0,7*0,00)/13,44=                                                                       |                                                |                                           |                                      | UC : 0,31                                                   |      |
|                                                            |        | art 6.3.3. vgl.6.33 | (lef = 5000mm ; σ <sub>m;crit</sub> = 192,55 N/mm2 ; λ <sub>rel</sub> = 0,35 ; k <sub>crit</sub> = 1,000)                  |                                                                                                                                |                                                                                                            |                                                |                                           |                                      |                                                             |      |
| M <sub>d(6.10.a)</sub> =                                   | 0,00   | kNm                 | σ <sub>m;d</sub>                                                                                                           | =                                                                                                                              | 0,00                                                                                                       | N/mm <sup>2</sup>                              | <                                         | k <sub>crit</sub> x f <sub>m;d</sub> | = 13,44 N/mm <sup>2</sup> UC : 0,00                         |      |
| N <sub>d</sub> =                                           | 793,50 | kN                  | 0,00 (buiging)                                                                                                             |                                                                                                                                |                                                                                                            |                                                | +                                         | 0,27 (druk)                          | = UC : 0,27                                                 |      |
| Controle Brandwerendheid: NEN 1995-1-2                     |        |                     | 4 zijden (2b+2h)                                                                                                           |                                                                                                                                |                                                                                                            | Brandwerendheid: 60 min.                       |                                           |                                      |                                                             |      |
| d <sub>char</sub>                                          | =      | 39,0                | mm                                                                                                                         | b <sub>ef</sub>                                                                                                                | =                                                                                                          | 208                                            | mm                                        | k <sub>mod,fi</sub>                  | = 1,00 fac                                                  |      |
| d <sub>ef</sub>                                            | =      | 46,0                | mm                                                                                                                         | h <sub>ef</sub>                                                                                                                | =                                                                                                          | 589                                            | mm                                        | A <sub>fi</sub>                      | = 1224 cm <sup>2</sup>                                      |      |
| β                                                          | =      | 0,65                | mm/min                                                                                                                     | b <sub>min</sub>                                                                                                               | =                                                                                                          | 158                                            | mm                                        | W <sub>y,fi</sub>                    | = 12006 cm <sup>3</sup>                                     |      |
| M <sub>fi</sub>                                            | =      | 0,00                | kNm                                                                                                                        | art 6.16.vgl.6.11                                                                                                              | σ <sub>m;fi;d</sub>                                                                                        | =                                              | 0,00                                      | N/mm <sup>2</sup>                    | < f <sub>m;0;fi;d</sub> = 27,60 N/mm <sup>2</sup> UC : 0,00 |      |
| N <sub>fi</sub>                                            | =      | 653,20              | kN                                                                                                                         | art 6.3.2. vgl.6.23                                                                                                            | σ <sub>c;0;fi</sub> / (k <sub>cy</sub> * f <sub>c;0;fi</sub> ) + σ <sub>m;y;fi</sub> / f <sub>m;y;fi</sub> | =                                              | 5,34/(0,991*27,60)+0,00/27,60 = UC : 0,20 |                                      |                                                             |      |
| (kmod = 1,0)                                               |        |                     | art 6.3.2. vgl.6.24                                                                                                        | σ <sub>c;0;fi</sub> / (k <sub>cz</sub> * f <sub>c;0;fi</sub> ) + k <sub>m</sub> * (σ <sub>m;y;fi</sub> / f <sub>m;y;fi</sub> ) | =                                                                                                          | 5,34/(0,718*27,60)+(0,7*0,00)/27,60= UC : 0,27 |                                           |                                      |                                                             |      |
|                                                            |        |                     | art 6.3.3. vgl.6.33                                                                                                        | (lef,fi = 4777mm ; σ <sub>m;crit,fi</sub> = 115,24 N/mm2 ; λ <sub>rel</sub> = 0,46 ; k <sub>crit</sub> = 1,000)                |                                                                                                            |                                                |                                           |                                      |                                                             |      |
|                                                            |        |                     | σ <sub>m;d</sub>                                                                                                           | =                                                                                                                              | 0,00                                                                                                       | N/mm <sup>2</sup>                              | <                                         | k <sub>crit</sub> x f <sub>m;d</sub> | = 27,60 N/mm <sup>2</sup> UC : 0,00                         |      |

# Kolommen as 9-W

| BEREKENING KOLOM OP 2 STEUNPUNTEN                          |          |        |                     |                                                                                                                                 |   |          |                          |                       |                                                  | V2.0                                |
|------------------------------------------------------------|----------|--------|---------------------|---------------------------------------------------------------------------------------------------------------------------------|---|----------|--------------------------|-----------------------|--------------------------------------------------|-------------------------------------|
| b (kolom):                                                 | 300      | mm     |                     | A                                                                                                                               | = | 1680     | cm <sup>2</sup>          | Hout kw:              | GL 24h ▾                                         | keuze                               |
| h (kolom):                                                 | 560      | mm     |                     | W <sub>y</sub>                                                                                                                  | = | 15680    | cm <sup>3</sup>          | Gevolg Klasse :       | CC2 ▾                                            | keuze                               |
| L <sub>y</sub> :                                           | 4,00     | m      |                     | l <sub>y</sub>                                                                                                                  | = | 4,39E+05 | cm <sup>4</sup>          | Klim.kl :             | 1 ▾                                              | keuze                               |
| L <sub>z</sub> :                                           | 4,00     | m      |                     | k <sub>h</sub>                                                                                                                  | = | 1,01     | fac                      | Belasting:            | boven ▾                                          | keuze                               |
|                                                            |          |        |                     | k <sub>def</sub>                                                                                                                | = | 0,6      | fac                      | Steunen:              | boven ▾                                          | keuze                               |
| N <sub>eg,k</sub> :                                        | 474,00   | kN     |                     | k <sub>mod</sub>                                                                                                                | = | 0,8      | fac                      | ψ <sub>0</sub>        | =                                                | 0,4                                 |
| N <sub>vb,k</sub> :                                        | 256,00   | kN     |                     | Y <sub>g</sub>                                                                                                                  | = | 1,35     | fac (6.10.a)             | ψ <sub>1</sub>        | =                                                | 0,7 (t.b.v. brand)                  |
| M <sub>eg,k</sub> :                                        | 0,00     | kN     |                     | Y <sub>g</sub>                                                                                                                  | = | 1,20     | fac (6.10.b)             | ψ <sub>t,vb</sub>     | =                                                | 1,00 fac 1990: bijl.A11             |
| M <sub>vb,k</sub> :                                        | 0,00     | kN     |                     | Y <sub>q</sub>                                                                                                                  | = | 1,50     | fac (6.10.b)             | Ref.per :             | 50                                               | jaar                                |
| Krachstwerking:                                            |          |        |                     |                                                                                                                                 |   |          |                          | UC <sub>max,uls</sub> | =                                                | 0,40 (incl.brand)                   |
| Controle Uiterste grenstoestand: NEN 1995-1-1:2005+C1:2006 |          |        |                     |                                                                                                                                 |   |          |                          |                       |                                                  |                                     |
| 10.6.b:druk+buiging:                                       |          |        |                     | σ <sub>c,0;d</sub>                                                                                                              | = | 5,67     | N/mm <sup>2</sup>        | <                     | f <sub>c,0,u;d</sub>                             | = 15,36 N/mm <sup>2</sup> UC : 0,37 |
| (k <sub>mod</sub> = 0,80)                                  |          |        | art 6.3.2. vgl.6.23 | σ <sub>c,0;d</sub> / ((k <sub>cy</sub> * f <sub>c,0;d</sub> ) + σ <sub>m,y;d</sub> /f <sub>m,y;d</sub> )                        |   |          |                          | =                     | 5,67/((0,989*15,36)+0,00/15,36)= UC : 0,37       |                                     |
|                                                            |          |        | art 6.3.2. vgl.6.24 | σ <sub>c,0;d</sub> / ((k <sub>cz</sub> * f <sub>c,0;d</sub> ) + k <sub>m</sub> * (σ <sub>m,y;d</sub> /f <sub>m,y;d</sub> ))     |   |          |                          | =                     | 5,67/((0,920*15,36)+(0,7*0,00)/15,36)= UC : 0,40 |                                     |
|                                                            |          |        | art 6.3.3. vgl.6.33 | (lef = 4720mm ; σ <sub>m,crit</sub> = 254,96 N/mm2 ; λ <sub>rel</sub> = 0,31 ; k <sub>crit</sub> = 1,000)                       |   |          |                          |                       |                                                  |                                     |
| M <sub>d(6.10.b)</sub> =                                   | 0,00     | kNm    |                     | σ <sub>m;d</sub>                                                                                                                | = | 0,00     | N/mm <sup>2</sup>        | <                     | k <sub>crit</sub> x f <sub>m,d</sub>             | = 15,36 N/mm <sup>2</sup> UC : 0,00 |
| N <sub>d</sub>                                             | = 952,80 | kN     | art 6.3.3. vgl.6.35 | 0,00 (buiging)                                                                                                                  |   |          |                          | +                     | 0,40 (druk)                                      | = UC : 0,40                         |
| 10.6.a:druk+buiging:                                       |          |        |                     | σ <sub>c,0;d</sub>                                                                                                              | = | 4,72     | N/mm <sup>2</sup>        | <                     | f <sub>c,0,u;d</sub>                             | = 13,44 N/mm <sup>2</sup> UC : 0,35 |
| (k <sub>mod</sub> = 0,70)                                  |          |        | art 6.3.2. vgl.6.23 | σ <sub>c,0;d</sub> / ((k <sub>cy</sub> * f <sub>c,0;d</sub> ) + σ <sub>m,y;d</sub> /f <sub>m,y;d</sub> )                        |   |          |                          | =                     | 4,72/((0,989*13,44)+0,00/13,44)= UC : 0,36       |                                     |
|                                                            |          |        | art 6.3.2. vgl.6.24 | σ <sub>c,0;d</sub> / ((k <sub>cz</sub> * f <sub>c,0;d</sub> ) + k <sub>m</sub> * (σ <sub>m,y;d</sub> /f <sub>m,y;d</sub> ))     |   |          |                          | =                     | 4,72/((0,920*13,44)+(0,7*0,00)/13,44)= UC : 0,38 |                                     |
|                                                            |          |        | art 6.3.3. vgl.6.33 | (lef = 4720mm ; σ <sub>m,crit</sub> = 254,96 N/mm2 ; λ <sub>rel</sub> = 0,31 ; k <sub>crit</sub> = 1,000)                       |   |          |                          |                       |                                                  |                                     |
| M <sub>d(6.10.a)</sub> =                                   | 0,00     | kNm    |                     | σ <sub>m;d</sub>                                                                                                                | = | 0,00     | N/mm <sup>2</sup>        | <                     | k <sub>crit</sub> x f <sub>m,d</sub>             | = 13,44 N/mm <sup>2</sup> UC : 0,00 |
| N <sub>d</sub>                                             | = 793,50 | kN     | art 6.3.3. vgl.6.35 | 0,00 (buiging)                                                                                                                  |   |          |                          | +                     | 0,33 (druk)                                      | = UC : 0,33                         |
| Controle Brandwerendheid: NEN 1995-1-2                     |          |        |                     | 4 zijden (2b+2h) ▾                                                                                                              |   |          | Brandwerendheid: 60 min. |                       |                                                  |                                     |
| d <sub>char</sub>                                          | = 39,0   | mm     |                     | b <sub>ef</sub>                                                                                                                 | = | 208      | mm                       | k <sub>mod,fi</sub>   | =                                                | 1,00 fac                            |
| d <sub>ef</sub>                                            | = 46,0   | mm     |                     | h <sub>ef</sub>                                                                                                                 | = | 449      | mm                       | A <sub>fi</sub>       | =                                                | 933 cm <sup>2</sup>                 |
| β                                                          | = 0,65   | mm/min |                     | b <sub>min</sub>                                                                                                                | = | 158      | mm                       | W <sub>y,fi</sub>     | =                                                | 6973 cm <sup>3</sup>                |
| M <sub>fi</sub>                                            | = 0,00   | kNm    | art 6.16.vgl.6.11   | σ <sub>m,fi;d</sub>                                                                                                             | = | 0,00     | N/mm <sup>2</sup>        | <                     | f <sub>m,0,fi;d</sub>                            | = 27,60 N/mm <sup>2</sup> UC : 0,00 |
| N <sub>fi</sub>                                            | = 653,20 | kN     | art 6.3.2. vgl.6.23 | σ <sub>c,0,fi</sub> / ((k <sub>cy</sub> * f <sub>c,0,fi</sub> ) + σ <sub>m,y,fi</sub> /f <sub>m,y,fi</sub> )                    |   |          |                          | =                     | 7,00/((0,976*27,60)+0,00/27,60) = UC : 0,26      |                                     |
| (k <sub>mod</sub> = 1,0)                                   |          |        | art 6.3.2. vgl.6.24 | σ <sub>c,0,fi</sub> / ((k <sub>cz</sub> * f <sub>c,0,fi</sub> ) + k <sub>m</sub> * (σ <sub>m,y,fi</sub> /f <sub>m,y,fi</sub> )) |   |          |                          | =                     | 7,00/((0,718*27,60)+(0,7*0,00)/27,60)= UC : 0,35 |                                     |
|                                                            |          |        | art 6.3.3. vgl.6.33 | (lef,fi = 4497mm ; σ <sub>m,crit,fi</sub> = 160,62 N/mm2 ; λ <sub>rel</sub> = 0,39 ; k <sub>crit</sub> = 1,000)                 |   |          |                          |                       |                                                  |                                     |
|                                                            |          |        |                     | σ <sub>m,d</sub>                                                                                                                | = | 0,00     | N/mm <sup>2</sup>        | <                     | k <sub>crit</sub> x f <sub>m,d</sub>             | = 27,60 N/mm <sup>2</sup> UC : 0,00 |

# Kolommen as 11

| BEREKENING KOLOM OP 2 STEUNPUNTEN                          |       |             |                     |                                                                                                                                  |          |                                              |                          |                                      |                       | V2.0                                |
|------------------------------------------------------------|-------|-------------|---------------------|----------------------------------------------------------------------------------------------------------------------------------|----------|----------------------------------------------|--------------------------|--------------------------------------|-----------------------|-------------------------------------|
| b (kolom):                                                 | 300   | mm          | A                   | =                                                                                                                                | 1200     | cm <sup>2</sup>                              | Hout kw:                 | GL 24h                               | keuze                 |                                     |
| h (kolom):                                                 | 400   | mm          | W <sub>y</sub>      | =                                                                                                                                | 8000     | cm <sup>3</sup>                              | Gevolg Klasse :          | CC2                                  | keuze                 |                                     |
| L <sub>y</sub> :                                           | 10,11 | m           | l <sub>y</sub>      | =                                                                                                                                | 1,60E+05 | cm <sup>4</sup>                              | Klim.kl :                | 1                                    | keuze                 |                                     |
| L <sub>z</sub> :                                           | 6,62  | m           | k <sub>h</sub>      | =                                                                                                                                | 1,04     | fac                                          | Belasting:               | boven                                | keuze                 |                                     |
|                                                            |       |             | k <sub>def</sub>    | =                                                                                                                                | 0,6      | fac                                          | Steunen:                 | boven                                | keuze                 |                                     |
| N <sub>eg;k</sub> :                                        | 29,00 | kN          | k <sub>mod</sub>    | =                                                                                                                                | 0,8      | fac                                          | ψ <sub>0</sub>           | =                                    | 0,4                   |                                     |
| N <sub>vb;k</sub> :                                        | 9,00  | kN          | Y <sub>g</sub>      | =                                                                                                                                | 1,35     | fac (6.10.a)                                 | ψ <sub>1</sub>           | =                                    | 0,7                   | (t.b.v. brand)                      |
| M <sub>eg;k</sub> :                                        | 0,00  | kNm         | Y <sub>g</sub>      | =                                                                                                                                | 1,20     | fac (6.10.b)                                 | ψ <sub>t,vb</sub>        | =                                    | 1,00                  | fac 1990: bijl.A11                  |
| M <sub>vb;k</sub> :                                        | 47,00 | kNm         | Y <sub>q</sub>      | =                                                                                                                                | 1,50     | fac (6.10.b)                                 | Ref.per :                | 50                                   | jaar                  |                                     |
| Krachswerking:                                             |       |             |                     |                                                                                                                                  |          |                                              | UC <sub>max,uls</sub>    | =                                    | 0,63                  | (incl.brand)                        |
| Controle Uiterste grenstoestand: NEN 1995-1-1:2005+C1:2006 |       |             |                     |                                                                                                                                  |          |                                              |                          |                                      |                       |                                     |
| 10.6.b.druk+buiging:                                       |       |             | σ <sub>c,0;d</sub>  | =                                                                                                                                | 0,40     | N/mm <sup>2</sup>                            | <                        | f <sub>c,0,u;d</sub>                 | =                     | 15,36 N/mm <sup>2</sup> UC : 0,03   |
| (k <sub>mod</sub> = 0,80)                                  |       |             | art 6.3.2. vgl.6.23 | σ <sub>c,0;d</sub> / (k <sub>cy</sub> * f <sub>c,0;d</sub> ) + σ <sub>m,y;d</sub> / f <sub>m,y;d</sub>                           | =        | 0,40 / (0,466*15,36) + 8,81 / 15,36 =        |                          |                                      |                       | UC : 0,63                           |
|                                                            |       |             | art 6.3.2. vgl.6.24 | σ <sub>c,0;d</sub> / (k <sub>cz</sub> * f <sub>c,0;d</sub> ) + k <sub>m</sub> * (σ <sub>m,y;d</sub> / f <sub>m,y;d</sub> )       | =        | 0,40 / (0,587*15,36) + (0,7*8,81) / 15,36 =  |                          |                                      |                       | UC : 0,45                           |
|                                                            |       |             | art 6.3.3. vgl.6.33 | (lef = 6758mm ; σ <sub>m,crit</sub> = 249,30 N/mm <sup>2</sup> ; λ <sub>rel</sub> = 0,31 ; k <sub>crit</sub> = 1,000)            |          |                                              |                          |                                      |                       |                                     |
| M <sub>d(6.10.b)</sub>                                     | =     | 70,50 kNm   | σ <sub>m;d</sub>    | =                                                                                                                                | 8,81     | N/mm <sup>2</sup>                            | <                        | k <sub>crit</sub> * f <sub>m,d</sub> | =                     | 15,36 N/mm <sup>2</sup> UC : 0,57   |
| N <sub>d</sub>                                             | =     | 48,30 kN    | art 6.3.3. vgl.6.35 | 0,33 (buiging)                                                                                                                   |          |                                              | +                        | 0,04 (druk)                          | =                     | UC : 0,37                           |
| 10.6.a.druk+buiging:                                       |       |             | σ <sub>c,0;d</sub>  | =                                                                                                                                | 0,37     | N/mm <sup>2</sup>                            | <                        | f <sub>c,0,u;d</sub>                 | =                     | 13,44 N/mm <sup>2</sup> UC : 0,03   |
| (k <sub>mod</sub> = 0,70)                                  |       |             | art 6.3.2. vgl.6.23 | σ <sub>c,0;d</sub> / (k <sub>cy</sub> * f <sub>c,0;d</sub> ) + σ <sub>m,y;d</sub> / f <sub>m,y;d</sub>                           | =        | 0,37 / (0,466*13,44) + 3,53 / 13,44 =        |                          |                                      |                       | UC : 0,32                           |
|                                                            |       |             | art 6.3.2. vgl.6.24 | σ <sub>c,0;d</sub> / (k <sub>cz</sub> * f <sub>c,0;d</sub> ) + k <sub>m</sub> * (σ <sub>m,y;d</sub> / f <sub>m,y;d</sub> )       | =        | 0,37 / (0,587*13,44) + (0,7*3,53) / 13,44 =  |                          |                                      |                       | UC : 0,23                           |
|                                                            |       |             | art 6.3.3. vgl.6.33 | (lef = 6758mm ; σ <sub>m,crit</sub> = 249,30 N/mm <sup>2</sup> ; λ <sub>rel</sub> = 0,31 ; k <sub>crit</sub> = 1,000)            |          |                                              |                          |                                      |                       |                                     |
| M <sub>d(6.10.a)</sub>                                     | =     | 28,20 kNm   | σ <sub>m;d</sub>    | =                                                                                                                                | 3,53     | N/mm <sup>2</sup>                            | <                        | k <sub>crit</sub> * f <sub>m,d</sub> | =                     | 13,44 N/mm <sup>2</sup> UC : 0,26   |
| N <sub>d</sub>                                             | =     | 44,55 kN    | art 6.3.3. vgl.6.35 | 0,07 (buiging)                                                                                                                   |          |                                              | +                        | 0,04 (druk)                          | =                     | UC : 0,11                           |
| Controle Brandwerendheid: NEN 1995-1-2                     |       |             |                     | 4 zijden (2b+2h)                                                                                                                 |          |                                              | Brandwerendheid: 60 min. |                                      |                       |                                     |
| d <sub>char</sub>                                          | =     | 39,0 mm     | b <sub>ef</sub>     | =                                                                                                                                | 208 mm   | k <sub>mod,fi</sub>                          | =                        | 1,00                                 | fac                   |                                     |
| d <sub>ef</sub>                                            | =     | 46,0 mm     | h <sub>ef</sub>     | =                                                                                                                                | 289 mm   | A <sub>fi</sub>                              | =                        | 600                                  | cm <sup>2</sup>       |                                     |
| β                                                          | =     | 0,65 mm/min | b <sub>min</sub>    | =                                                                                                                                | 158 mm   | W <sub>y,fi</sub>                            | =                        | 2885                                 | cm <sup>3</sup>       |                                     |
| M <sub>fi</sub>                                            | =     | 32,90 kNm   | art 6.16.vgl.6.11   | σ <sub>m,fi;d</sub>                                                                                                              | =        | 11,40                                        | N/mm <sup>2</sup>        | <                                    | f <sub>m,0,fi;d</sub> | = 27,60 N/mm <sup>2</sup> UC : 0,41 |
| N <sub>fi</sub>                                            | =     | 35,30 kN    | art 6.3.2. vgl.6.23 | σ <sub>c,0,fi</sub> / (k <sub>cy</sub> * f <sub>c,0,fi</sub> ) + σ <sub>m,y,fi;d</sub> / f <sub>m,y,fi</sub>                     | =        | 0,59 / (0,253*27,60) + 11,40 / 27,60 =       |                          |                                      |                       | UC : 0,50                           |
| (k <sub>mod</sub> = 1,0)                                   |       |             | art 6.3.2. vgl.6.24 | σ <sub>c,0,fi</sub> / (k <sub>cz</sub> * f <sub>c,0,fi</sub> ) + k <sub>m</sub> * (σ <sub>m,y,fi;d</sub> / f <sub>m,y,fi</sub> ) | =        | 0,59 / (0,304*27,60) + (0,7*11,40) / 27,60 = |                          |                                      |                       | UC : 0,36                           |
|                                                            |       |             | art 6.3.3. vgl.6.33 | (lef,fi = 6535mm ; σ <sub>m,crit,fi</sub> = 171,83 N/mm <sup>2</sup> ; λ <sub>rel</sub> = 0,37 ; k <sub>crit</sub> = 1,000)      |          |                                              |                          |                                      |                       |                                     |
|                                                            |       |             | σ <sub>m,d</sub>    | =                                                                                                                                | 11,40    | N/mm <sup>2</sup>                            | <                        | k <sub>crit</sub> * f <sub>m,d</sub> | =                     | 27,60 N/mm <sup>2</sup> UC : 0,41   |

## Bijlage Q Uitvoer entree spanten

**Technosoft Raamwerken release 6.75b**  
**2023**

**26 jan**

Project.....: SGU021041 - Uitbreiding zwembad de Meerkamp te Amstelveen  
Onderdeel.....: Spanten entree  
Dimensies.....: kN;m;rad (tenzij anders aangegeven)  
Datum.....: 26/08/2022  
Bestand.....: H:\SGU021041\BEREKENINGEN\04\_DO\Entree spanten 7-9.rww

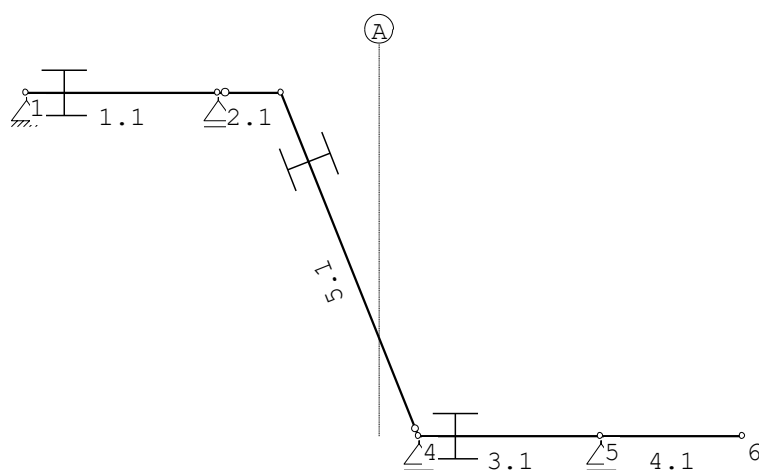
Rekenmodel.....: 1e-orde-elastisch.  
Theorie voor de bepaling van de krachtsverdeling:  
Geometrisch lineair.  
Fysisch lineair.

Gunstige werking van de permanente belasting wordt automatisch verwerkt.

## Toegepaste normen volgens Eurocode met Nederlandse NB

|             |                      |                 |
|-------------|----------------------|-----------------|
| Belastingen | NEN-EN 1990:2002     | C2:2010,A1:2019 |
| NB:2019(nl) |                      |                 |
|             | NEN-EN 1991-1-1:2002 | C1/C11:2019     |
| NB:2019(nl) |                      |                 |
| Staal       | NEN-EN 1993-1-1:2006 | C2:2011,A1:2016 |
| NB:2016(nl) |                      |                 |

## GEOMETRIE



## STRAMIENLIJNEN

| Nr. | Naam | X     | Z-min | Z-max  |
|-----|------|-------|-------|--------|
| 1   | A    | 7.200 | 3.500 | 10.500 |

## MATERIALEN

| Mt | Kwaliteit | E-modulus[N/mm <sup>2</sup> ] | S.G. Pois. | Uitz. coëff |
|----|-----------|-------------------------------|------------|-------------|
|----|-----------|-------------------------------|------------|-------------|



|   |      |        |      |      |            |
|---|------|--------|------|------|------------|
| 1 | S235 | 210000 | 78.5 | 0.30 | 1.2000e-05 |
|---|------|--------|------|------|------------|

Project.....: SGU021041 - Uitbreiding zwembad de Meerkamp te Amstelveen  
Onderdeel.....: Spanten entree

### PROFIELEN [mm]

| Prof. Omschrijving | Materiaal | Oppervlak  |
|--------------------|-----------|------------|
| Traagheid Vormf.   |           |            |
| 1 HEB180           | 1:S235    | 6.5300e+03 |
| 3.8310e+07 0.00    |           |            |

### PROFIELEN vervolg [mm]

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

### PROFIELVORMEN [mm]

|          |                                                                                   |
|----------|-----------------------------------------------------------------------------------|
| 1 HEB180 |                                                                                   |
|          |  |

### KNOPEN

| Knoop | X      | Z      | Knoop | X      | Z     |
|-------|--------|--------|-------|--------|-------|
| 1     | 0.000  | 10.500 | 6     | 14.600 | 3.500 |
| 2     | 3.910  | 10.500 |       |        |       |
| 3     | 5.200  | 10.500 |       |        |       |
| 4     | 8.000  | 3.500  |       |        |       |
| 5     | 11.710 | 3.500  |       |        |       |

### STAVEN

| St. ki | kj   | Profiel  | Aansl.i | Aansl.j |
|--------|------|----------|---------|---------|
| Lengte | Opm. |          |         |         |
| 1      | 1 2  | 1:HEB180 | NDM     | NDM     |
| 3.910  |      |          |         |         |
| 2      | 2 3  | 1:HEB180 | ND-     | NDM     |
| 1.290  |      |          |         |         |
| 3      | 4 5  | 1:HEB180 | NDM     | NDM     |
| 3.710  |      |          |         |         |
| 4      | 5 6  | 1:HEB180 | NDM     | NDM     |
| 2.890  |      |          |         |         |
| 5      | 3 4  | 1:HEB180 | NDM     | ND-     |
| 7.539  |      |          |         |         |

### VASTE STEUNPUNTEN

| Nr. | knoop | Kode | XZR 1=vast 0=vrij | Hoek |
|-----|-------|------|-------------------|------|
| 1   | 1     | 110  |                   | 0.00 |
| 2   | 2     | 010  |                   | 0.00 |
| 3   | 4     | 010  |                   | 0.00 |
| 4   | 5     | 010  |                   | 0.00 |

### BELASTINGGEVALLEN

| B.G. Omschrijving      | Type        |
|------------------------|-------------|
| 1 Permanente belasting | EGZ=-1.00 1 |



$q_k$  2 Veranderlijke belasting

2 Ver. bel. pers. ed.

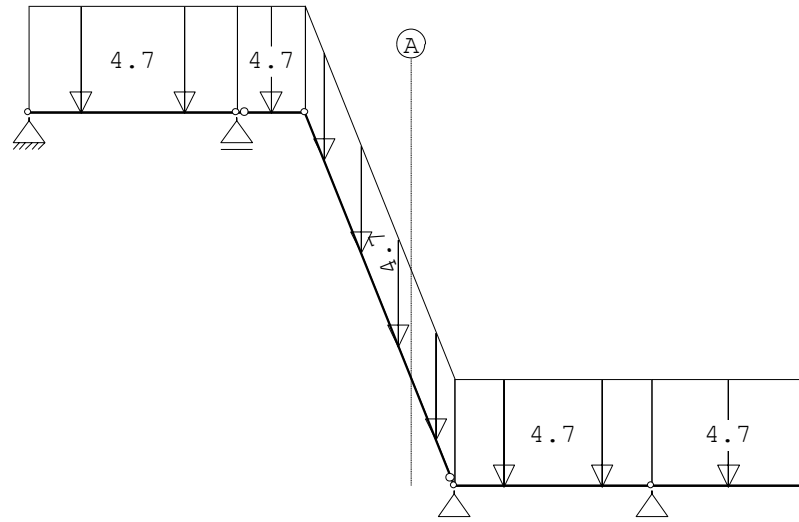
Project.....: SGU021041 - Uitbreiding zwembad de Meerkamp te Amstelveen  
Onderdeel.....: Spanten entree

## BELASTINGEN

B.G:1 Permanente

belasting

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



## STAAFBELASTINGEN

B.G:1 Permanente

belasting

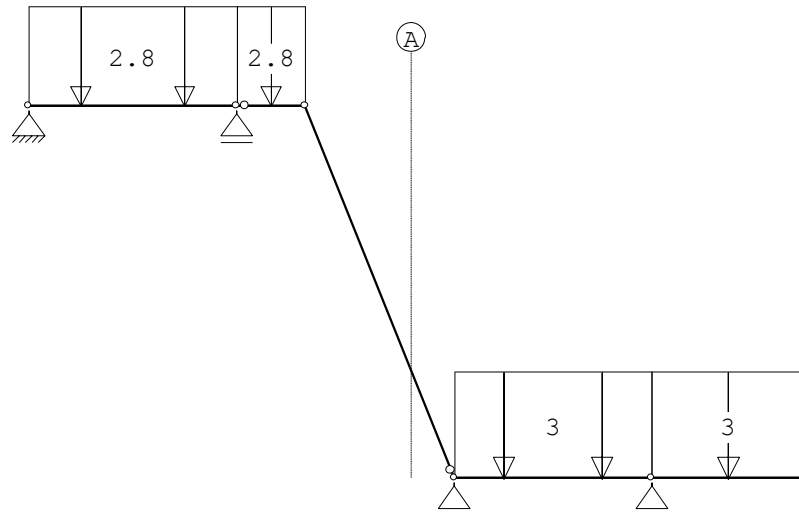
| Staaftype | Type        | q1/p/m | q2    | A     | B     | $\psi_0$ |
|-----------|-------------|--------|-------|-------|-------|----------|
| $\psi_1$  | $\psi_2$    |        |       |       |       |          |
| 1         | 1:QZLokaal  | -4.70  | -4.70 | 0.000 | 0.000 |          |
| 2         | 1:QZLokaal  | -4.70  | -4.70 | 0.000 | 0.000 |          |
| 3         | 1:QZLokaal  | -4.70  | -4.70 | 0.000 | 0.000 |          |
| 4         | 1:QZLokaal  | -4.70  | -4.70 | 0.000 | 0.000 |          |
| 5         | 5:QZGlobaal | -4.70  | -4.70 | 0.000 | 0.000 |          |

Project.....: SGU021041 - Uitbreiding zwembad de Meerkamp te Amstelveen  
Onderdeel.....: Spanten entree

## BELASTINGEN

B.G:2 Veranderlijke

belasting



## STAAFBELASTINGEN

B.G:2 Veranderlijke

belasting

| Staat    | Type       | $q_1/p/m$ | $q_2$ | A     | B     | $\psi_0$ |
|----------|------------|-----------|-------|-------|-------|----------|
| $\psi_1$ | $\psi_2$   |           |       |       |       |          |
| 1        | 1:QZLokaal | -2.80     | -2.80 | 0.000 | 0.000 | 0.00     |
| 0.00     | 0.00       |           |       |       |       |          |
| 2        | 1:QZLokaal | -2.80     | -2.80 | 0.000 | 0.000 | 0.00     |
| 0.00     | 0.00       |           |       |       |       |          |
| 3        | 1:QZLokaal | -3.00     | -3.00 | 0.000 | 0.000 | 0.00     |
| 0.00     | 0.00       |           |       |       |       |          |
| 4        | 1:QZLokaal | -3.00     | -3.00 | 0.000 | 0.000 | 0.00     |
| 0.00     | 0.00       |           |       |       |       |          |

## REACTIES

| Kn. | B.G. | X    | Z     | M |
|-----|------|------|-------|---|
| 1   | 1    | 0.00 | 10.19 |   |
| 1   | 2    | 0.00 | 5.47  |   |
| 2   | 1    |      | 29.31 |   |
| 2   | 2    |      | 8.52  |   |
| 4   | 1    |      | 30.71 |   |
| 4   | 2    |      | 2.76  |   |
| 5   | 1    |      | 30.60 |   |
| 5   | 2    |      | 17.61 |   |

## BELASTINGCOMBINATIES

| BC | Type  |      |           |   |                |
|----|-------|------|-----------|---|----------------|
| 1  | Fund. | 1.20 | $G_{k,1}$ | + | 1.50 $Q_{k,2}$ |



|         |      |           |   |                       |
|---------|------|-----------|---|-----------------------|
| 2 Fund. | 1.35 | $G_{k,1}$ |   |                       |
| 3 Kar.  | 1.00 | $G_{k,1}$ | + | 1.00 $Q_{k,2}$        |
| 4 Freq. | 1.00 | $G_{k,1}$ | + | 1.00 $\psi_1 Q_{k,2}$ |
| 5 Quas. | 1.00 | $G_{k,1}$ | + | 1.00 $\psi_2 Q_{k,2}$ |

Project.....: SGU021041 - Uitbreiding zwembad de Meerkamp te Amstelveen  
Onderdeel.....: Spanten entree

## BELASTINGCOMBINATIES

|                        |
|------------------------|
| BC Type                |
| 6 Blij. 1.00 $G_{k,1}$ |

## GUNSTIGE WERKING PERMANENTE BELASTINGEN

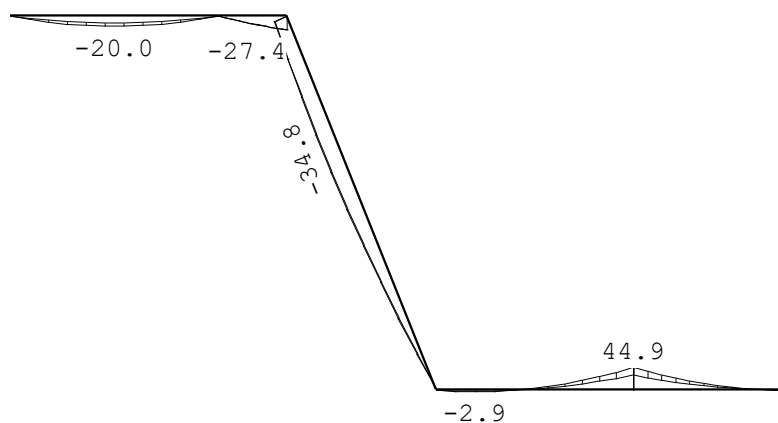
|                                |
|--------------------------------|
| BC Staven met gunstige werking |
| 1 Geen                         |
| 2 Geen                         |

## OMHULLENDE VAN DE FUNDAMENTELE COMBINATIES

### MOMENTEN

Fundamentele

combinatie

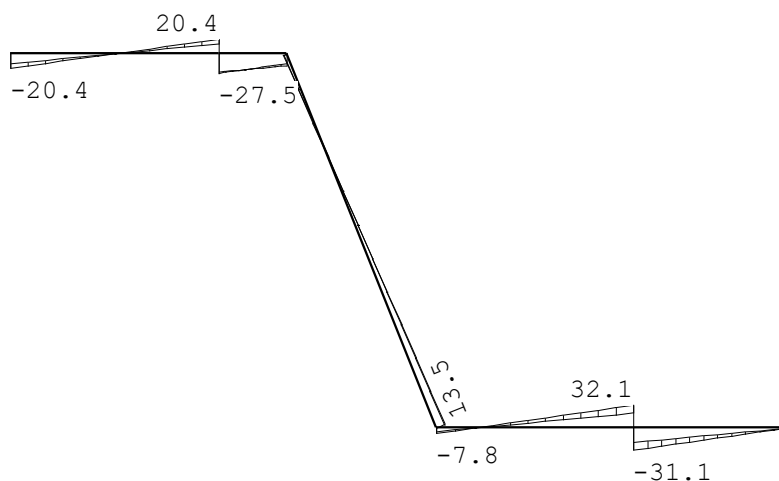


Project.....: SGU021041 - Uitbreiding zwembad de Meerkamp te Amstelveen  
Onderdeel.....: Spanten entree

## DWARSKRACHTEN

Fundamentele

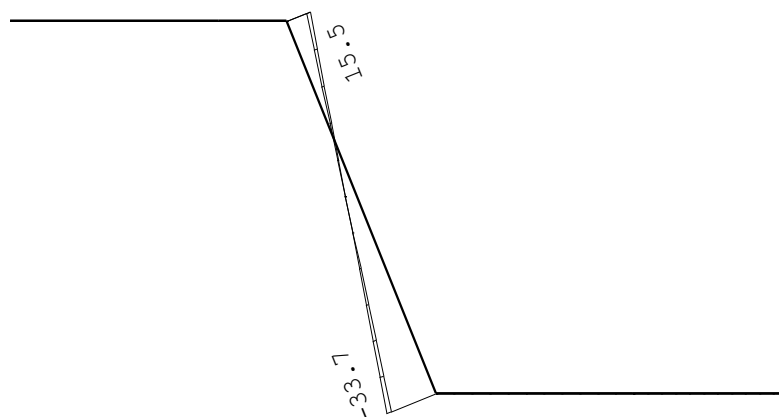
combinatie



## NORMAALKRACHTEN

Fundamentele

combinatie



## REACTIES

Fundamentele

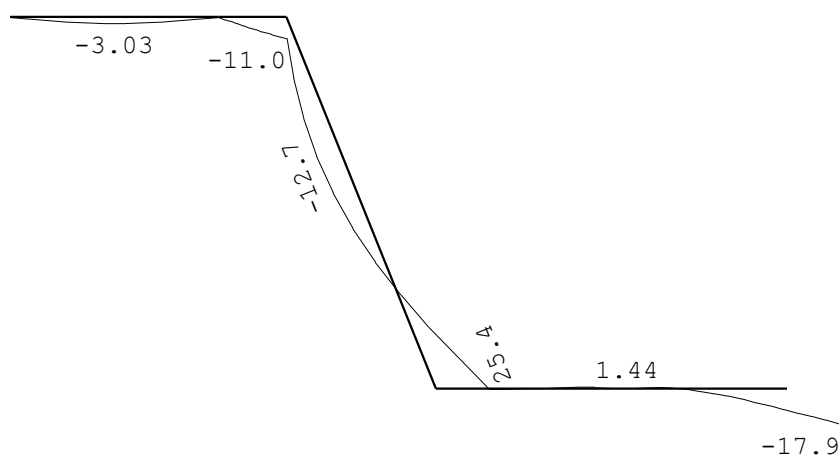
combinatie

| Kn.   | X-min | X-max | Z-min | Z-max | M-min |
|-------|-------|-------|-------|-------|-------|
| M-max |       |       |       |       |       |
| 1     | 0.00  | 0.00  | 13.76 | 20.44 |       |
| 2     |       |       | 39.56 | 47.94 |       |
| 4     |       |       | 40.99 | 41.46 |       |
| 5     |       |       | 41.31 | 63.14 |       |

Project.....: SGU021041 - Uitbreiding zwembad de Meerkamp te Amstelveen  
Onderdeel.....: Spanten entree

## OMHULLENDE VAN DE KARAKTERISTIEKE COMBINATIES

**VERPLAATSINGEN** [mm] Karakteristieke combinatie



## STAALPROFIELEN - ALGEMENE GEGEVENS

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

## PROFIEL/MATERIAAL

| P/M drsn.<br>nr.<br>klasse | Profielnaam | Vloeisp. [N/mm <sup>2</sup> ] | Productie methode | Min. |
|----------------------------|-------------|-------------------------------|-------------------|------|
|----------------------------|-------------|-------------------------------|-------------------|------|

|   |        |     |         |  |
|---|--------|-----|---------|--|
| 1 | HEB180 | 235 | Gewalst |  |
|---|--------|-----|---------|--|

1

Partiële veiligheidsfactoren:

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

## KNIKSTABILITEIT

Extra

Extra

| Staaftaanp. z | $l_{sys}$ [m] | Classif. y | $l_{knik,y}$ [m] | aanp. y | Classif. z | $l_{knik,z}$ [m] |
|---------------|---------------|------------|------------------|---------|------------|------------------|
|---------------|---------------|------------|------------------|---------|------------|------------------|

| [kN] | sterke as | [kN] | zwakke as |
|------|-----------|------|-----------|
|------|-----------|------|-----------|

|     |                 |       |               |       |
|-----|-----------------|-------|---------------|-------|
| 1-2 | 5.200 Geschoord | 5.200 | 0.0 Geschoord | 5.200 |
|-----|-----------------|-------|---------------|-------|

0.0

|   |                 |       |               |       |
|---|-----------------|-------|---------------|-------|
| 3 | 3.710 Geschoord | 3.710 | 0.0 Geschoord | 3.710 |
|---|-----------------|-------|---------------|-------|



|     |       |           |       |     |                 |
|-----|-------|-----------|-------|-----|-----------------|
| 0.0 |       |           |       |     |                 |
| 4   | 2.890 | Geschoord | 2.890 | 0.0 | Geschoord 2.890 |
| 0.0 |       |           |       |     |                 |
| 5   | 7.539 | Geschoord | 7.539 | 0.0 | Geschoord 7.539 |
| 0.0 |       |           |       |     |                 |



Project.....: SGU021041 - Uitbreiding zwembad de Meerkamp te Amstelveen  
Onderdeel.....: Spanten entree

## KIPSTABILITEIT

| Staaf | Plts.<br>aangr. |        | l gaffel<br>[m] | Kipsteunafstanden<br>[m] |
|-------|-----------------|--------|-----------------|--------------------------|
| 1-2   | 1.0*h           | boven: | 5.20            | 5,2                      |
|       |                 | onder: | 5.20            | 5,2                      |
| 3     | 1.0*h           | boven: | 3.71            | 3,71                     |
|       |                 | onder: | 3.71            | 3,71                     |
| 4     | 1.0*h           | boven: | 2.89            | 2,89                     |
|       |                 | onder: | 2.89            | 2,89                     |
| 5     | 1.0*h           | boven: | 7.54            | 7,539                    |
|       |                 | onder: | 7.54            | 7,539                    |

## TOETSING SPANNINGEN

Staaf P/M BC Sit Kl Plaats Norm Artikel Formule Hoogste toetsing  
Opm.

| nr.      |   |   |   |   |       |         |       |        | U.C. [N/mm <sup>2</sup> ] |
|----------|---|---|---|---|-------|---------|-------|--------|---------------------------|
| 1-2      | 1 | 2 | 1 | 1 | Einde | EN3-1-1 | 6.2.8 | (6.30) | 0.243 57                  |
| 60,42,46 |   |   |   |   |       |         |       |        |                           |
| 3        | 1 | 1 | 1 | 1 | Einde | EN3-1-1 | 6.2.8 | (6.30) | 0.397 93                  |
| 4        | 1 | 1 | 1 | 1 | Begin | EN3-1-1 | 6.2.8 | (6.30) | 0.397 93                  |
| 5        | 1 | 2 | 1 | 1 | Staaf | EN3-1-1 | 6.3.3 | (6.62) | 0.487 114                 |

47

Opmerkingen:

[ 42] **Waarschuwing: Er sluiten tussentijds staven en/of opleggingen aan.**

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

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

[ 60] Waarschuwing: Er is een intern staafscharnier aanwezig!

## TOETSING DOORBUIGING

| Staaf       | Soort | Mtg | Lengte | Overst | Zeeg | $u_{tot}$ | BC    | Sit      | u           |
|-------------|-------|-----|--------|--------|------|-----------|-------|----------|-------------|
| Toelaatbaar |       |     | [m]    | I      | J    | [mm]      |       |          | [mm] [mm]   |
| *1          |       |     |        |        |      |           |       |          |             |
| 1-2         | Dak   | ss  | 5.20   | N      | N    | 0.0       | -11.0 | 3 1 Eind | -11.0 -41.6 |
| 2*0.004     |       | db  |        |        |      |           |       | 3 1 Bijk | -0.9 -20.8  |
| 0.004       |       |     |        |        |      |           |       |          |             |
| 3           | Dak   | db  | 3.71   | N      | N    | 0.0       | 1.4   | 3 1 Eind | 1.4 -14.8   |
| 0.004       |       | db  |        |        |      |           |       | 3 1 Bijk | 0.5 -14.8   |
| 0.004       |       |     |        |        |      |           |       |          |             |
| 4           | Dak   | ss  | 2.89   | N      | J    | 0.0       | -17.9 | 3 1 Eind | -17.9 -23.1 |
| 2*0.004     |       | ss  |        |        |      |           |       | 3 1 Bijk | -6.5 -23.1  |
| 2*0.004     |       |     |        |        |      |           |       |          |             |
| 5           | Dak   | db  | 7.54   | N      | N    | 0.0       | -19.8 | 3 1 Eind | -19.8 -30.2 |
| 0.004       |       | ss  |        |        |      |           |       | 3 1 Bijk | 1.5 -60.3   |
| 2*0.004     |       |     |        |        |      |           |       |          |             |

## Bijlage R Uitvoer entree spanten opvangligger

**Technosoft Liggers release 6.73a**  
**2023**

**26 jan**

Project.....: SGU021041 - Uitbreiding zwembad de Meerkamp te Amstelveen  
Onderdeel.....: Entree luifel opvang ligger  
Dimensies.....: kN/m/rad  
Datum.....: 14/12/2022  
Bestand.....: H:\SGU021041\BEREKENINGEN\04\_DO\Entree spant opvangligger.dlw

Betrouwbaarheidsklasse : 2 Referentieperiode : 50

### Toegepaste normen volgens Eurocode (CEN)

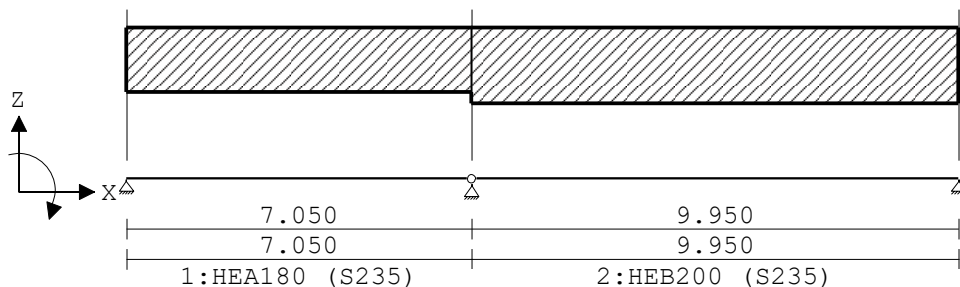
|             |                  |                 |
|-------------|------------------|-----------------|
| Belastingen | EN 1990:2002     | C2:2010,A1:2019 |
|             | EN 1991-1-1:2002 | C1/C11:2019     |
| Staal       | EN 1993-1-1:2006 | C2:2011,A1:2016 |

### LIGGER:1 dak

#### GEOMETRIE

Ligger:1

dak



#### VELDLENGTEN

Ligger:1

dak

| Veld | Vanaf | Tot    | Lengte |
|------|-------|--------|--------|
| 1    | 0.000 | 7.050  | 7.050  |
| 2    | 7.050 | 17.000 | 9.950  |

#### MATERIALEN

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

#### PROFIELEN [mm]

| Prof.      | Omschrijving | Materiaal | Oppervlak  |
|------------|--------------|-----------|------------|
| Traagheid  | Vormf.       |           |            |
| 1          | HEA180       | 1:S235    | 4.5300e+03 |
| 2.5100e+07 | 0.00         |           |            |
| 2          | HEB200       | 1:S235    | 7.8100e+03 |



5.6960e+07 0.00

Project.....: SGU021041 - Uitbreiding zwembad de Meerkamp te Amstelveen  
Onderdeel.....: Entree luifel opvang ligger

## PROFIELEN vervolg [mm]

| Prof. | Staaftype | Breedte | Hoogte | e     | Type | b1 | h1 | b2 | h2 |
|-------|-----------|---------|--------|-------|------|----|----|----|----|
| 1     | 0:Normaal | 180     | 171    | 85.5  |      |    |    |    |    |
| 2     | 0:Normaal | 200     | 200    | 100.0 |      |    |    |    |    |

## DOORSNEDEN

Ligger:1

dak

| sector | Vanaf | Tot    | Lengte | Profiel     | begin   | z-begin | Profiel  | eind |
|--------|-------|--------|--------|-------------|---------|---------|----------|------|
| 1      | 0.000 | 7.050  | 7.050  | 1:HEA180    |         | 0.000   | 1:HEA180 |      |
| 0.000  |       |        |        |             |         |         |          |      |
| 2      | 7.050 | 17.000 | 9.950  | 2:HEB200    |         | 0.000   | 2:HEB200 |      |
| 0.000  |       |        |        |             |         |         |          |      |
| sector | Vanaf | Tot    | Lengte | Eindcode    | Bedding | Br.[mm] |          |      |
| 1      | 0.000 | 7.050  | 7.050  | 0:Scharnier |         |         |          |      |
| 2      | 7.050 | 17.000 | 9.950  | 1:Vast      |         |         |          |      |

## PROFIELVORMEN [mm]

1 HEA180



2 HEB200



## BELASTINGGEVALLEN

| B.G.  | Omschrijving | Belast/onbelast     | $\psi_0$ | $\psi_1$ | $\psi_2$ |
|-------|--------------|---------------------|----------|----------|----------|
| 1     | Permanent    | 2:Permanent EN1991  |          |          |          |
| -1.00 |              |                     |          |          |          |
| 2     | Veranderlijk | 1:Schaakbord EN1991 | 0.00     | 0.00     | 0.00     |
| 0.00  |              |                     |          |          |          |

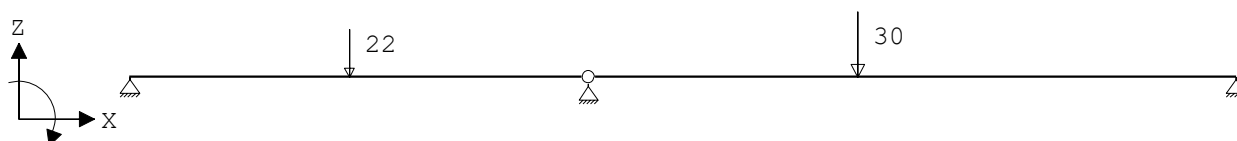
## BELASTINGGEVALLEN

| B.G.              | Omschrijving | Type                   |
|-------------------|--------------|------------------------|
| 1                 | Permanent    | 1 Permanente belasting |
| 2                 | Veranderlijk | 2 Ver. bel. pers. ed.  |
| (q <sub>k</sub> ) |              |                        |

## VELDBELASTINGEN

Ligger:1 dak B.G:1

Permanent





## VELDBELASTINGEN

Ligger:1 dak B.G:1

Permanent

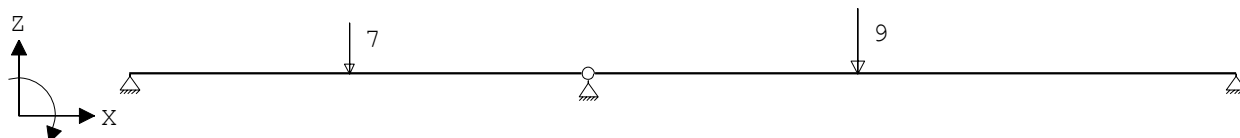
| Last Ref. | Type       | Omschrijving | q1/p/m  | q2 | psi |
|-----------|------------|--------------|---------|----|-----|
| Afstand   | Lengte     |              |         |    |     |
| 1         | 8:Puntlast |              | -22.000 |    |     |
| 3.375     |            |              |         |    |     |
| 2         | 8:Puntlast |              | -30.000 |    |     |
| 11.185    |            |              |         |    |     |

Project.....: SGU021041 - Uitbreiding zwembad de Meerkamp te Amstelveen  
Onderdeel.....: Entree luifel opvang ligger

## VELDBELASTINGEN

Ligger:1 dak B.G:2

Veranderlijk



## VELDBELASTINGEN

Ligger:1 dak B.G:2

Veranderlijk

| Last Ref. | Type       | Omschrijving | q1/p/m | q2 | psi |
|-----------|------------|--------------|--------|----|-----|
| Afstand   | Lengte     |              |        |    |     |
| 1         | 8:Puntlast |              | -7.000 |    |     |
| 3.375     |            |              |        |    |     |
| 2         | 8:Puntlast |              | -9.000 |    |     |
| 11.185    |            |              |        |    |     |

## BELASTINGCOMBINATIES

| BC Type | BG    | Gen. | Factor | BG   | Gen. | Factor | BG   | Gen. | Factor | BG | Gen. | Factor |
|---------|-------|------|--------|------|------|--------|------|------|--------|----|------|--------|
| Factor  |       |      |        |      |      |        |      |      |        |    |      |        |
| 1       | Fund. | 1    | Perm   | 1.35 |      |        |      |      |        |    |      |        |
| 2       | Fund. | 1    | Perm   | 1.15 | 2    | Extr   | 1.50 |      |        |    |      |        |
| 3       | Fund. | 1    | Perm   | 1.00 |      |        |      |      |        |    |      |        |
| 4       | Fund. | 1    | Perm   | 1.00 | 2    | Extr   | 1.50 |      |        |    |      |        |
| 5       | Kar.  | 1    | Perm   | 1.00 | 2    | Extr   | 1.00 |      |        |    |      |        |
| 6       | Freq. | 1    | Perm   | 1.00 |      |        |      |      |        |    |      |        |
| 7       | Quas. | 1    | Perm   | 1.00 |      |        |      |      |        |    |      |        |
| 8       | Blij. | 1    | Perm   | 1.00 |      |        |      |      |        |    |      |        |

## GUNSTIGE WERKING PERMANENTE BELASTINGEN

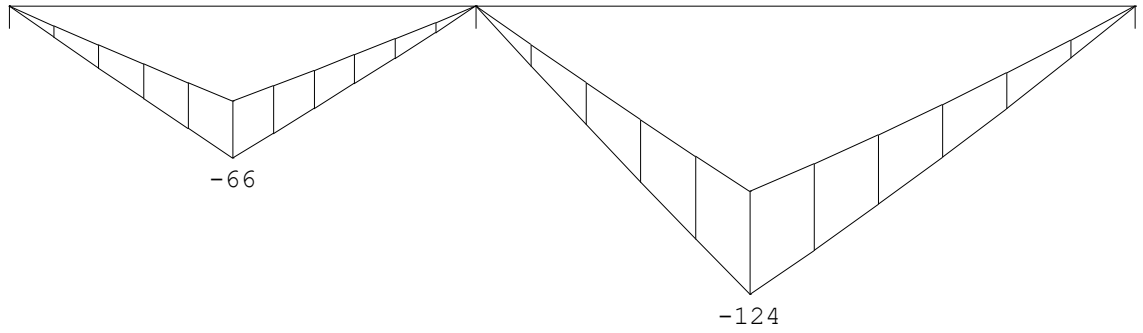
| BC Velden met gunstige werking |
|--------------------------------|
| 1 Geen                         |
| 2 Geen                         |
| 3 Alle velden de factor:1.00   |
| 4 Alle velden de factor:1.00   |

## OMHULLENDE VAN DE FUNDAMENTELE COMBINATIES

### MOMENTEN

Ligger:1 dak Fundamentele

combinatie

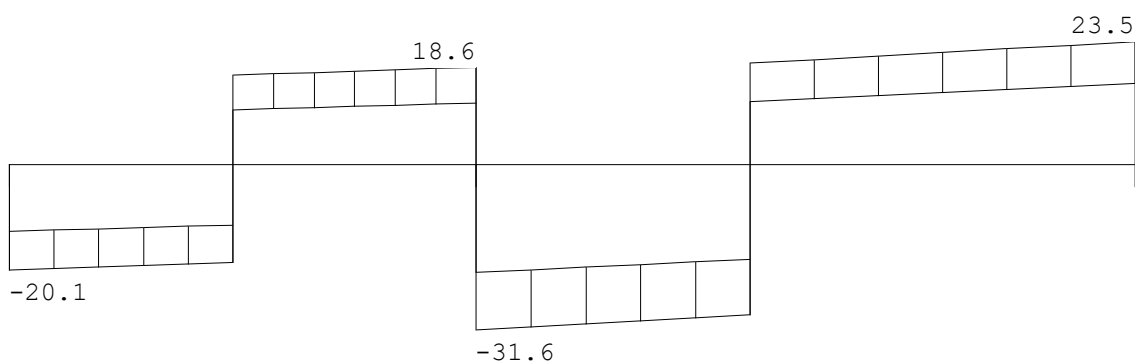


Project.....: SGU021041 - Uitbreiding zwembad de Meerkamp te Amstelveen  
Onderdeel.....: Entree luifel opvang ligger

## DWARSKRACHTEN

Ligger:1 dak Fundamentele

combinatie



Fmin:12.7  
Fmax:20.1

32.4  
50

15.5  
23.5

## REACTIES

Ligger:1 dak Fundamentele

combinatie

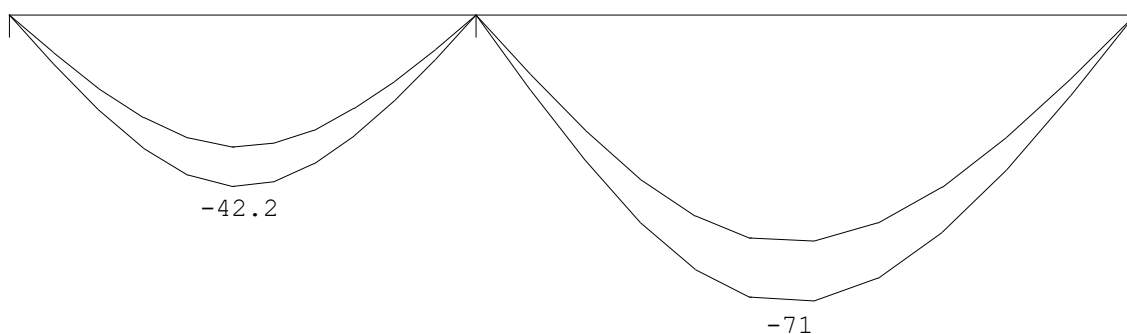
| Stp | Fmin  | Fmax  | Mmin | Mmax |
|-----|-------|-------|------|------|
| 1   | 12.72 | 20.10 | 0.00 | 0.00 |
| 2   | 32.37 | 50.14 | 0.00 | 0.00 |
| 3   | 15.52 | 23.46 | 0.00 | 0.00 |

## OMHULLENDE VAN DE KARAKTERISTIEKE COMBINATIES

### VERPLAATSINGEN [mm]

Ligger:1 dak Karakteristieke

combinatie





Project.....: SGU021041 - Uitbreiding zwembad de Meerkamp te Amstelveen  
Onderdeel.....: Entree luifel opvang ligger

## STAALPROFIELEN - ALGEMENE GEGEVENS

Ligger:1

dak

Stabiliteit: Classificatie gehele constructie: Geschoord

## PROFIEL/MATERIAAL

| P/M    | Profielnaam | Vloeisp.             | Productie | Min. |
|--------|-------------|----------------------|-----------|------|
| drsn.  |             |                      |           |      |
| nr.    |             | [N/mm <sup>2</sup> ] | methode   |      |
| klasse |             |                      |           |      |

|   |        |     |         |  |
|---|--------|-----|---------|--|
| 1 | HEA180 | 235 | Gewalst |  |
| 1 |        |     |         |  |
| 2 | HEB200 | 235 | Gewalst |  |
| 1 |        |     |         |  |

Partiële veiligheidsfactoren:

Gamma M;0 : 1.00 Gamma M;1 :

## KIPSTABILITEIT

Ligger:1

dak

| Staaaf | Plts. | l gaffel    | Kipsteunafstanden |
|--------|-------|-------------|-------------------|
| aangr. |       | [m]         | [m]               |
| 1      | 1.0*h | boven: 7.05 | 3,375;3,675       |
|        |       | onder: 7.05 | 7.050             |
| 2      | 1.0*h | boven: 9.95 | 4,285;5,665       |
|        |       | onder: 9.95 | 9.950             |

## TOETSING SPANNINGEN

Ligger:1

dak

Staaaf P/M BC Sit Kl Plaats Norm Artikel Formule Hoogste toetsing

| Opm. | nr.    |   |   |   |   |        |         |       | U.C. [N/mm <sup>2</sup> ] |
|------|--------|---|---|---|---|--------|---------|-------|---------------------------|
|      | 1      | 1 | 2 | 1 | 1 | My-max | EN3-1-1 | 6.2.8 | (6.30) 0.858 202          |
|      | 46,156 |   |   |   |   |        |         |       |                           |
|      | 2      | 2 | 2 | 1 | 1 | My-max | EN3-1-1 | 6.2.8 | (6.30) 0.825 194          |
|      | 46,156 |   |   |   |   |        |         |       |                           |

Opmerkingen:

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

[156] In afwijking van de ingestelde norm is het elastisch kippmoment M<sub>cr</sub>

berekend volgens de Nederlandse Nationale Bijlage.

## TOETSING DOORBUIGING

Ligger:1

dak

| Staaaf      | Soort | Mtg | Lengte | Overst | Zeeg | u <sub>tot</sub> | BC    | Sit | u                  |
|-------------|-------|-----|--------|--------|------|------------------|-------|-----|--------------------|
| Toelaatbaar |       |     | [m]    | I      | J    | [mm]             |       |     | [mm]               |
|             |       |     |        |        |      |                  |       |     | [mm]               |
| *1          |       |     |        |        |      |                  |       |     |                    |
| 1           | Vloer | db  | 7.05   | N      | N    | 30.0             | -42.2 | 5   | 1 Eind -12.2 ±14.1 |
| 0.002       |       |     |        |        |      |                  |       |     |                    |
|             |       | db  |        |        |      |                  |       | 5   | 1 Bijk -9.7 ±14.1  |
| 0.002       |       |     |        |        |      |                  |       |     |                    |



|              |       |    |      |   |   |      |       |   |                           |
|--------------|-------|----|------|---|---|------|-------|---|---------------------------|
| 2            | Vloer | db | 9.95 | N | N | 50.0 | -71.0 | 5 | <u>1 Eind -21.0 ±19.9</u> |
| <u>0.002</u> |       | db |      |   |   |      |       | 5 | 1 Bijk -14.9 ±19.9        |
| 0.002        |       |    |      |   |   |      |       |   |                           |

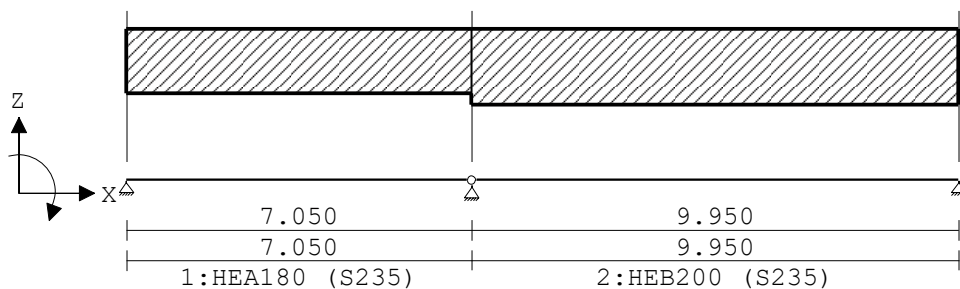
Project.....: SGU021041 - Uitbreiding zwembad de Meerkamp te Amstelveen  
Onderdeel.....: Entree luifel opvang ligger

## LIGGER:2 verdieping

### GEOMETRIE

Ligger:2

verdieping



### VELDLENGTEN

Ligger:2

verdieping

| Veld | Vanaf | Tot    | Lengte |
|------|-------|--------|--------|
| 1    | 0.000 | 7.050  | 7.050  |
| 2    | 7.050 | 17.000 | 9.950  |

### DOORSNEDEN

Ligger:2

verdieping

| sector | Vanaf | Tot    | Lengte | Profiel begin | z-begin | Profiel eind |
|--------|-------|--------|--------|---------------|---------|--------------|
| 1      | 0.000 | 7.050  | 7.050  | 1:HEA180      | 0.000   | 1:HEA180     |
| 2      | 7.050 | 17.000 | 9.950  | 2:HEB200      | 0.000   | 2:HEB200     |
| sector | Vanaf | Tot    | Lengte | Eindcode      | Bedding | Br. [mm]     |
| 1      | 0.000 | 7.050  | 7.050  | 0:Scharnier   |         |              |
| 2      | 7.050 | 17.000 | 9.950  | 1:Vast        |         |              |

### PROFIELVORMEN [mm]

1 HEA180



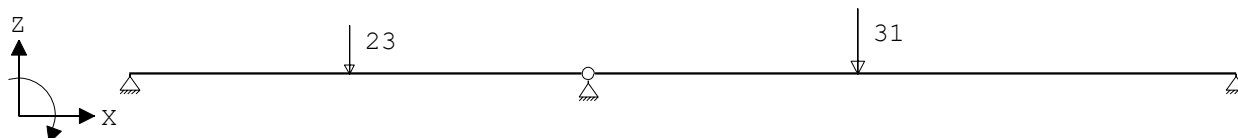
2 HEB200



### VELDBELASTINGEN

Ligger:2 verdieping B.G:1

Permanent



Project.....: SGU021041 - Uitbreiding zwembad de Meerkamp te Amstelveen  
Onderdeel.....: Entree luifel opvang ligger

### VELDBELASTINGEN

Ligger:2 verdieping B.G:1

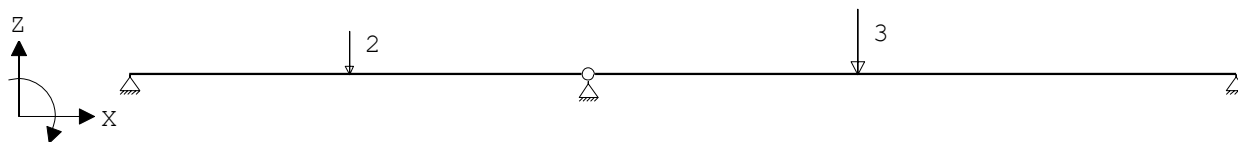
Permanent

| Last Ref. | Type       | Omschrijving | q1/p/m  | q2 | psi |
|-----------|------------|--------------|---------|----|-----|
| Afstand   | Lengte     |              |         |    |     |
| 1         | 8:Puntlast |              | -23.000 |    |     |
| 3.375     |            |              |         |    |     |
| 2         | 8:Puntlast |              | -31.000 |    |     |
| 11.185    |            |              |         |    |     |

### VELDBELASTINGEN

Ligger:2 verdieping B.G:2

Veranderlijk



### VELDBELASTINGEN

Ligger:2 verdieping B.G:2

Veranderlijk

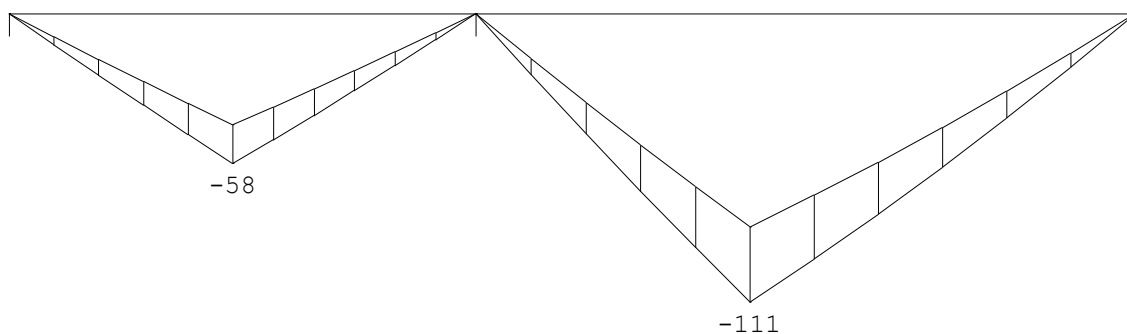
| Last Ref. | Type       | Omschrijving | q1/p/m | q2 | psi |
|-----------|------------|--------------|--------|----|-----|
| Afstand   | Lengte     |              |        |    |     |
| 1         | 8:Puntlast |              | -2.000 |    |     |
| 3.375     |            |              |        |    |     |
| 2         | 8:Puntlast |              | -3.000 |    |     |
| 11.185    |            |              |        |    |     |

### OMHULLENDE VAN DE FUNDAMENTELE COMBINATIES

#### MOMENTEN

Ligger:2 verdieping Fundamentele

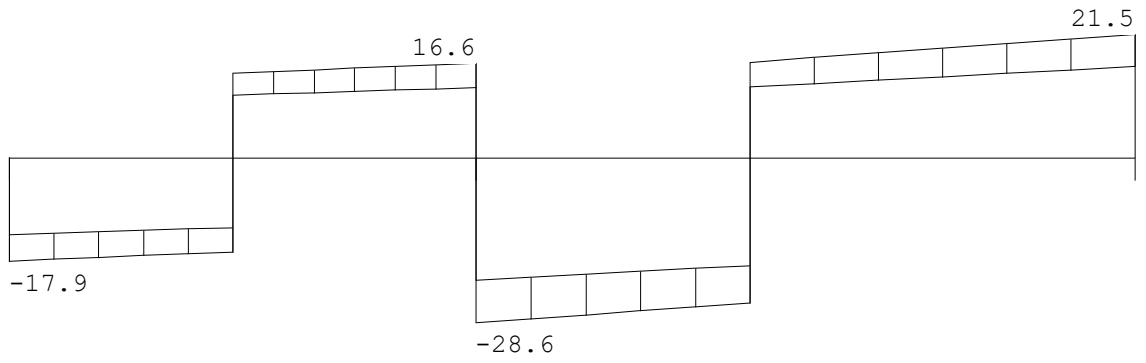
combinatie



#### DWARSKRACHTEN

Ligger:2 verdieping Fundamentele

combinatie



Fmin:13.2  
Fmax:17.9

33.4  
45.1

15.9  
21.5



Project.....: SGU021041 - Uitbreiding zwembad de Meerkamp te Amstelveen  
Onderdeel.....: Entree luifel opvang ligger

## REACTIES

Ligger:2 verdieping Fundamentele

combinatie

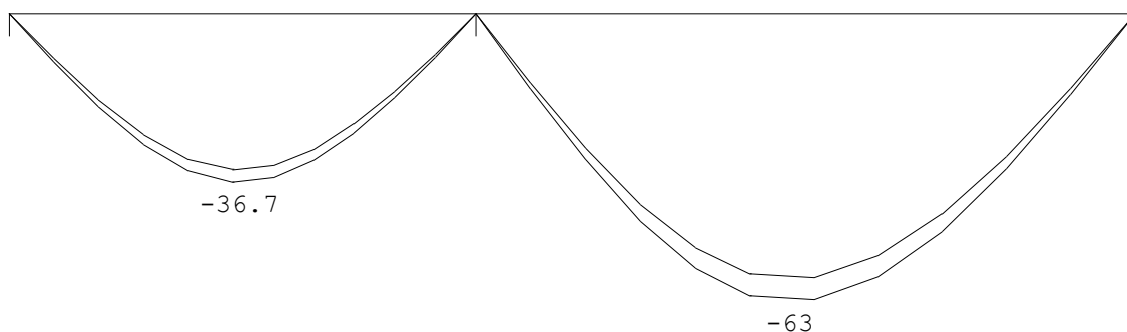
| Stp | Fmin  | Fmax  | Mmin | Mmax |
|-----|-------|-------|------|------|
| 1   | 13.24 | 17.88 | 0.00 | 0.00 |
| 2   | 33.43 | 45.13 | 0.00 | 0.00 |
| 3   | 15.93 | 21.51 | 0.00 | 0.00 |

## OMHULLENDE VAN DE KARAKTERISTIEKE COMBINATIES

### VERPLAATSINGEN [mm]

Ligger:2 verdieping Karakteristieke

combinatie



## KIPSTABILITEIT

Ligger:2

verdieping

| Staafl | Plts.<br>aanr. | l gaffel         | Kipsteunafstanden              |
|--------|----------------|------------------|--------------------------------|
|        |                | [m]              | [m]                            |
| 1      | 1.0*h          | boven:<br>onder: | 7.05 3,375;3,675<br>7.05 7.050 |
| 2      | 1.0*h          | boven:<br>onder: | 9.95 4,285;5,665<br>9.95 9.950 |

## TOETSING SPANNINGEN

Ligger:2

verdieping

Staafl P/M BC Sit Kl Plaats Norm Artikel Formule Hoogste toetsing  
Opm.

| nr.    |   |   |   |   |        |         |       | U.C. [N/mm <sup>2</sup> ] |
|--------|---|---|---|---|--------|---------|-------|---------------------------|
| 1      | 1 | 1 | 1 | 1 | My-max | EN3-1-1 | 6.2.8 | (6.30) 0.755 177          |
| 46,156 |   |   |   |   |        |         |       |                           |
| 2      | 2 | 1 | 1 | 1 | My-max | EN3-1-1 | 6.2.8 | (6.30) 0.736 173          |
| 46,156 |   |   |   |   |        |         |       |                           |

Opmerkingen:

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

[156] In afwijking van de ingestelde norm is het elastisch kippmoment M<sub>cr</sub>

berekend volgens de Nederlandse Nationale Bijlage.

## TOETSING DOORBUIGING

Ligger:2

verdieping



| Staaft<br>Toelaatbaar | Soort | Mtg | Lengte | Overst |   | Zeeg | $u_{tot}$ | BC Sit |   |      | $u$  |       |
|-----------------------|-------|-----|--------|--------|---|------|-----------|--------|---|------|------|-------|
|                       |       |     | [m]    | I      | J | [mm] | [mm]      |        |   |      | [mm] | [mm]  |
| *1                    |       |     |        |        |   |      |           |        |   |      |      |       |
| 1                     | Vloer | db  | 7.05   | N      | N | 30.0 | -36.7     | 5      | 1 | Eind | -6.7 | ±14.1 |
| 0.002                 |       | db  |        |        |   |      |           | 5      | 1 | Bijk | -2.8 | ±14.1 |
| 0.002                 |       |     |        |        |   |      |           |        |   |      |      |       |
| 2                     | Vloer | db  | 9.95   | N      | N | 60.0 | -62.7     | 5      | 1 | Eind | -2.7 | ±19.9 |
| 0.002                 |       | db  |        |        |   |      |           | 5      | 1 | Bijk | -5.0 | ±19.9 |
| 0.002                 |       |     |        |        |   |      |           |        |   |      |      |       |

## Bijlage S Uitvoer entree ligger naast bestaande as 7

**Technosoft Liggers release 6.73a**  
**2023**

**26 jan**

Project.....: Sgu021041 - Uitbreiding zwembad de Meerkamp te Amstelveen  
Onderdeel.....: entree luifel ligger langs bestaande  
Dimensies.....: kN/m/rad  
Datum.....: 14/12/2022  
Bestand.....: H:\SGU021041\BEREKENINGEN\04\_DO\Entree spant ligger naast  
bestaande.dlw

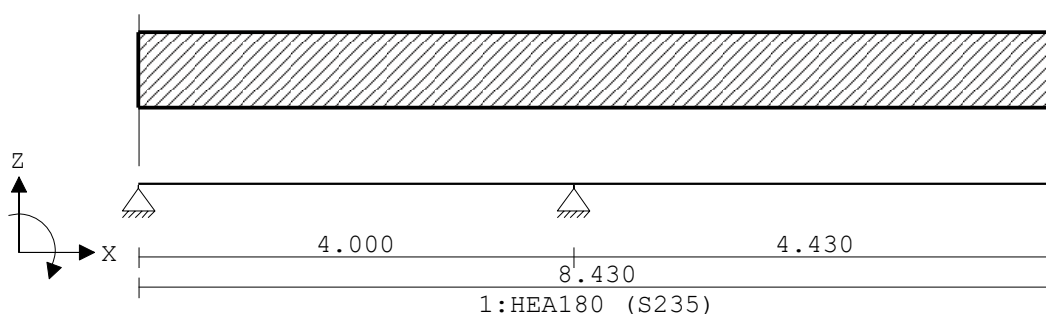
Betrouwbaarheidsklasse : 2 Referentieperiode : 50

### Toegepaste normen volgens Eurocode (CEN)

|             |                  |                 |
|-------------|------------------|-----------------|
| Belastingen | EN 1990:2002     | C2:2010,A1:2019 |
|             | EN 1991-1-1:2002 | C1/C11:2019     |
| Staal       | EN 1993-1-1:2006 | C2:2011,A1:2016 |

### GEOMETRIE

Ligger:1



### VELDLENGTEN

Ligger:1

| Veld | Vanaf | Tot   | Lengte |
|------|-------|-------|--------|
| 1    | 0.000 | 4.000 | 4.000  |
| 2    | 4.000 | 8.430 | 4.430  |

### MATERIALEN

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

### PROFIELEN [mm]

| Prof.      | Omschrijving | Materiaal | Oppervlak  |
|------------|--------------|-----------|------------|
| 1          | HEA180       | 1:S235    | 4.5300e+03 |
| 2.5100e+07 | 0.00         |           |            |

### PROFIELEN vervolg [mm]



| Prof. | Staaftype | Breedte   | Hoogte | e   | Type | b1 | h1 | b2 |
|-------|-----------|-----------|--------|-----|------|----|----|----|
| h2    | 1         | 0:Normaal | 180    | 171 | 85.5 |    |    |    |

Project.....: Sgu021041 - Uitbreiding zwembad de Meerkamp te Amstelveen  
Onderdeel.....: entree luifel ligger langs bestaande

## PROFIELVORMEN [mm]

1 HEA180



## BELASTINGGEVALLEN

| B.G. Omschrijving<br>e.g. | Belast/onbelast     | $\psi_0$ | $\psi_1$ | $\psi_2$ |
|---------------------------|---------------------|----------|----------|----------|
| 1 Permanent<br>-1.00      | 2:Permanent EN1991  |          |          |          |
| 2 Veranderlijk<br>0.00    | 1:Schaakbord EN1991 | 0.00     | 0.00     | 0.00     |

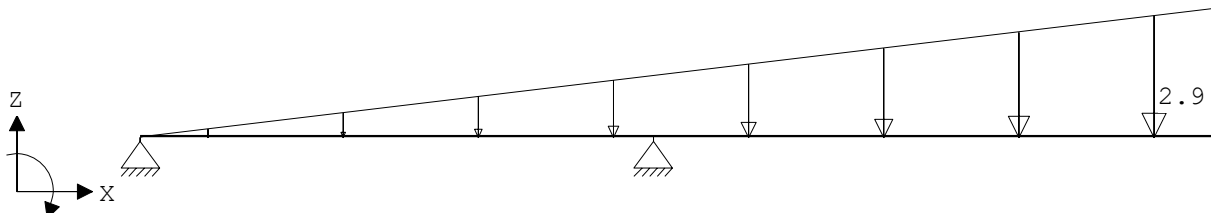
## BELASTINGGEVALLEN

| B.G. Omschrijving           | Type                   |
|-----------------------------|------------------------|
| 1 Permanent                 | 1 Permanente belasting |
| 2 Veranderlijk<br>( $q_k$ ) | 2 Ver. bel. pers. ed.  |

## VELDBELASTINGEN

Ligger:1 B.G:1

Permanent



## VELDBELASTINGEN

Ligger:1 B.G:1

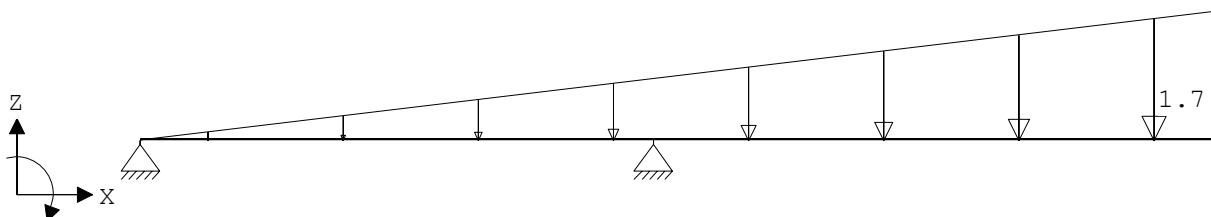
Permanent

| Last Ref. | Type     | Omschrijving | $q_1/p/m$ | $q_2$  | psi |
|-----------|----------|--------------|-----------|--------|-----|
| Afstand   | Lengte   |              |           |        |     |
| 1         | 1:q-last |              | 0.000     | -2.900 |     |
| 0.000     | 8.430    |              |           |        |     |

## 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 |              | 0.000  | -1.700 |     |
| 0.000     | 8.430    |              |        |        |     |

Project.....: Sgu021041 - Uitbreiding zwembad de Meerkamp te Amstelveen  
Onderdeel.....: entree luifel ligger langs bestaande

### BELASTINGCOMBINATIES

| BC Type | BG | Gen. | Factor | BG     | Gen. | Factor | BG | Gen. | Factor | BG | Gen. | Factor |
|---------|----|------|--------|--------|------|--------|----|------|--------|----|------|--------|
| 1 Fund. | 1  | Perm | 1.35   |        |      |        |    |      |        |    |      |        |
| 2 Fund. | 1  | Perm | 1.15   | 2 Extr |      | 1.50   |    |      |        |    |      |        |
| 3 Fund. | 1  | Perm | 1.00   |        |      |        |    |      |        |    |      |        |
| 4 Fund. | 1  | Perm | 1.00   | 2 Extr |      | 1.50   |    |      |        |    |      |        |
| 5 Kar.  | 1  | Perm | 1.00   | 2 Extr |      | 1.00   |    |      |        |    |      |        |
| 6 Freq. | 1  | Perm | 1.00   |        |      |        |    |      |        |    |      |        |
| 7 Quas. | 1  | Perm | 1.00   |        |      |        |    |      |        |    |      |        |
| 8 Blij. | 1  | Perm | 1.00   |        |      |        |    |      |        |    |      |        |

### GUNSTIGE WERKING PERMANENTE BELASTINGEN

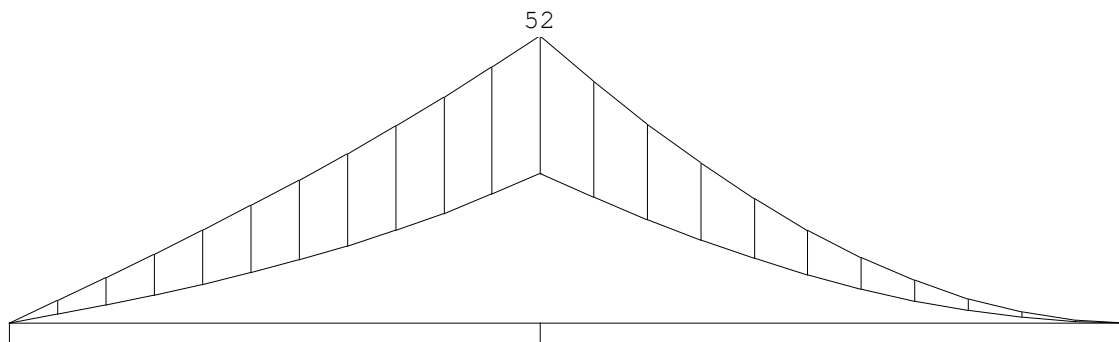
| BC Velden met gunstige werking |
|--------------------------------|
| 1 Geen                         |
| 2 Geen                         |
| 3 Alle velden de factor:1.00   |
| 4 Alle velden de factor:1.00   |

### OMHULLENDE VAN DE FUNDAMENTELE COMBINATIES

#### MOMENTEN

Ligger:1 Fundamentele

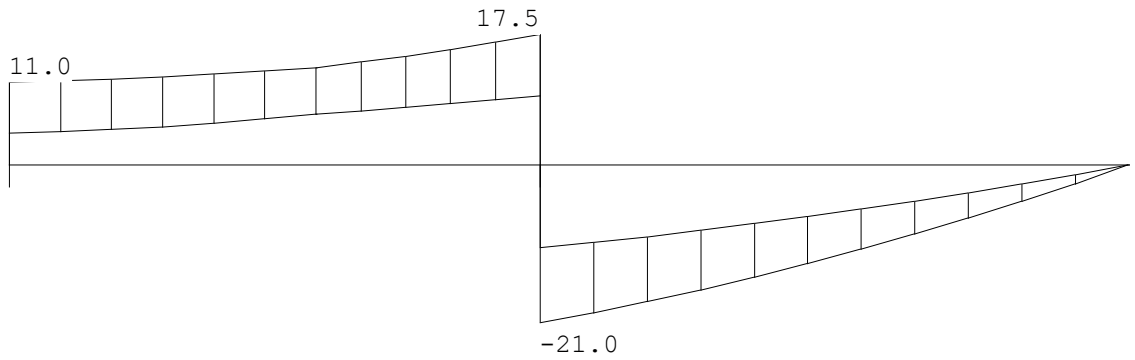
combinatie



#### DWARSKRACHTEN

Ligger:1 Fundamentele

combinatie



F<sub>min</sub>: -11.0  
F<sub>max</sub>: -4.31

20.3  
38.5

Project.....: Sgu021041 - Uitbreiding zwembad de Meerkamp te Amstelveen  
Onderdeel.....: entree luifel ligger langs bestaande

## REACTIES

Ligger:1 Fundamentele

combinatie

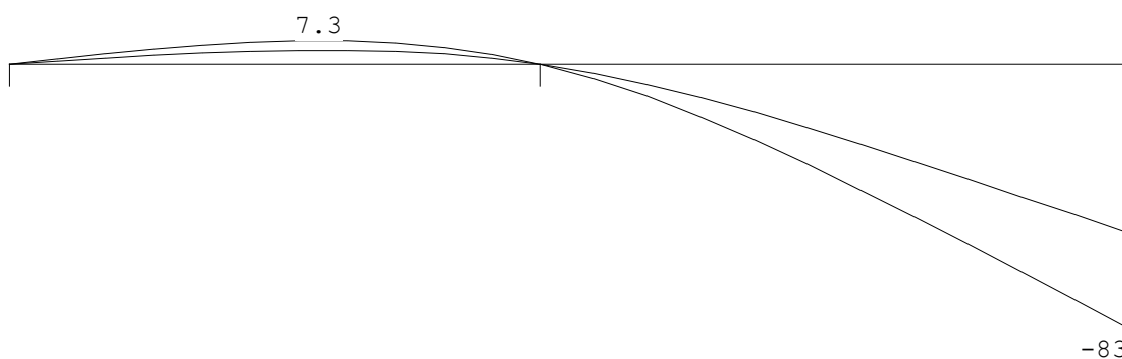
| Stp | Fmin   | Fmax  | Mmin | Mmax |
|-----|--------|-------|------|------|
| 1   | -11.04 | -4.31 | 0.00 | 0.00 |
| 2   | 20.33  | 38.48 | 0.00 | 0.00 |

## OMHULLENDE VAN DE KARAKTERISTIEKE COMBINATIES

### VERPLAATSINGEN [mm]

Ligger:1 Karakteristieke

combinatie



## STAALPROFIELEN - ALGEMENE GEGEVENS

Ligger:1

Stabiliteit: Classificatie gehele constructie: Geschoord

### PROFIEL/MATERIAAL

| P/M drsn.<br>nr.<br>klasse | Profielnaam | Vloeisp.<br>[N/mm <sup>2</sup> ] | Productie<br>methode | Min. |
|----------------------------|-------------|----------------------------------|----------------------|------|
| 1                          | HEA180      | 235                              | Gewalst              |      |

Partiële veiligheidsfactoren:  
Gamma M;0 : 1.00 Gamma M;1 :  
1.00

### KIPSTABILITEIT

Ligger:1

| Staaf | Plts.<br>aanr. | l gaffel<br>[m]            | Kipsteunafstanden<br>[m] |
|-------|----------------|----------------------------|--------------------------|
| 1     | 1.0*h          | boven: 4.00<br>onder: 4.00 | 4*1 4.000                |
| 2     | 1.0*h          | boven: 8.86<br>onder: 8.86 | 3*1,108;1,106 4.430      |

### TOETSING SPANNINGEN

Ligger:1



Staaft P/M BC Sit Kl Plaats Norm Artikel Formule Hoogste toetsing  
Opm.

| nr.    |   |   |   |   |        |         |       |        |       | U.C. [N/mm <sup>2</sup> ] |  |
|--------|---|---|---|---|--------|---------|-------|--------|-------|---------------------------|--|
| 1      | 1 | 2 | 1 | 1 | Staaft | EN3-1-1 | 6.3.2 | (6.54) | 0.705 | 166                       |  |
| 46,156 |   |   |   |   |        |         |       |        |       |                           |  |
| 2      | 1 | 2 | 1 | 1 | Staaft | EN3-1-1 | 6.3.2 | (6.54) | 0.755 | 177                       |  |
| 46,156 |   |   |   |   |        |         |       |        |       |                           |  |

Opmerkingen:

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



Project.....: Sgu021041 - Uitbreiding zwembad de Meerkamp te Amstelveen  
 Onderdeel.....: entree luifel ligger langs bestaande  
 [156] In afwijking van de ingestelde norm is het elastisch kipmoment  $M_{cr}$   
 berekend volgens de Nederlandse Nationale Bijlage.

## TOETSING DOORBUIGING

Ligger:1

| Staaft         | Soort | Mtg | Lengte | Overst | Zeeg | $u_{tot}$ | BC    | Sit | $u$           |              |              |
|----------------|-------|-----|--------|--------|------|-----------|-------|-----|---------------|--------------|--------------|
| Toelaatbaar    |       |     | [m]    | I      | J    | [mm]      |       |     | [mm]          | [mm]         |              |
| *1             |       |     |        |        |      |           |       |     |               |              |              |
| 1              | Dak   | db  | 4.00   | N      | N    | 0.0       | 7.3   | 5   | 3 Eind        | 7.3          | -16.0        |
| 0.004          |       | db  |        |        |      |           |       | 5   | 2 Bijk        | -0.3         | -12.0        |
| 0.003          |       |     |        |        |      |           |       |     |               |              |              |
| 2              | Dak   | ss  | 4.43   | N      | J    | 0.0       | -82.6 | 5   | <u>3 Eind</u> | <u>-82.6</u> | <u>-35.4</u> |
| <u>2*0.004</u> |       | ss  |        |        |      |           |       | 5   | <u>3 Bijk</u> | <u>-28.8</u> | <u>-26.6</u> |
| <u>2*0.003</u> |       |     |        |        |      |           |       |     |               |              |              |

## Bijlage T Uitvoer entree spant as 7

**Technosoft Raamwerken release 6.75b**  
**2023**

**26 jan**

Project.....: SGU021041 - Uitbreiding zwembad de Meerkamp te Amstelveen  
Onderdeel.....: Spanten entree as 9  
Dimensies.....: kN;m;rad (tenzij anders aangegeven)  
Datum.....: 26/08/2022  
Bestand.....: H:\SGU021041\BEREKENINGEN\04\_DO\Entree spanten 7.rww

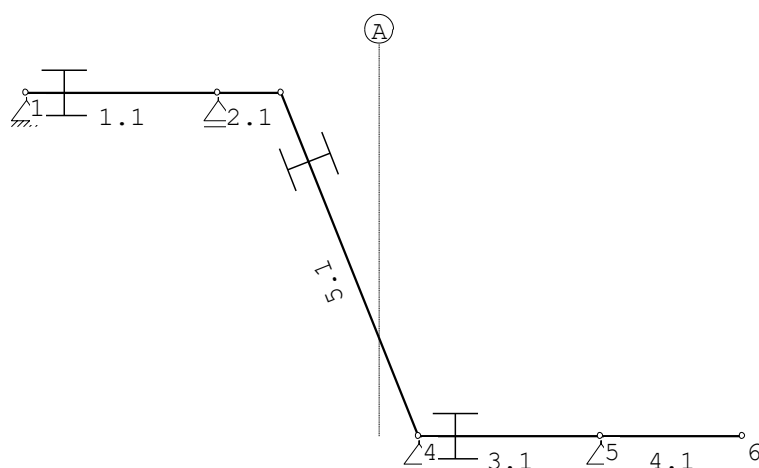
Rekenmodel.....: 1e-orde-elastisch.  
Theorie voor de bepaling van de krachtsverdeling:  
Geometrisch lineair.  
Fysisch lineair.

Gunstige werking van de permanente belasting wordt automatisch verwerkt.

## Toegepaste normen volgens Eurocode met Nederlandse NB

|             |                      |                 |
|-------------|----------------------|-----------------|
| Belastingen | NEN-EN 1990:2002     | C2:2010,A1:2019 |
| NB:2019(nl) |                      |                 |
|             | NEN-EN 1991-1-1:2002 | C1/C11:2019     |
| NB:2019(nl) |                      |                 |
| Staal       | NEN-EN 1993-1-1:2006 | C2:2011,A1:2016 |
| NB:2016(nl) |                      |                 |

## GEOMETRIE



## STRAMIENLIJNEN

| Nr. | Naam | X     | Z-min | Z-max  |
|-----|------|-------|-------|--------|
| 1   | A    | 7.200 | 3.500 | 10.500 |

## MATERIALEN

| Mt | Kwaliteit | E-modulus[N/mm <sup>2</sup> ] | S.G. Pois. | Uitz. coëff |
|----|-----------|-------------------------------|------------|-------------|
|----|-----------|-------------------------------|------------|-------------|



|   |      |        |      |      |            |
|---|------|--------|------|------|------------|
| 1 | S235 | 210000 | 78.5 | 0.30 | 1.2000e-05 |
|---|------|--------|------|------|------------|

Project.....: SGU021041 - Uitbreiding zwembad de Meerkamp te Amstelveen  
Onderdeel.....: Spanten entree as 9

### PROFIELEN [mm]

| Prof. Omschrijving | Materiaal | Oppervlak  |
|--------------------|-----------|------------|
| Traagheid Vormf.   |           |            |
| 1 HEB180           | 1:S235    | 6.5300e+03 |
| 3.8310e+07 0.00    |           |            |

### PROFIELEN vervolg [mm]

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

### PROFIELVORMEN [mm]

|          |                                                                                   |
|----------|-----------------------------------------------------------------------------------|
| 1 HEB180 |                                                                                   |
|          |  |

### KNOPEN

| Knoop | X      | Z      | Knoop | X      | Z     |
|-------|--------|--------|-------|--------|-------|
| 1     | 0.000  | 10.500 | 6     | 14.600 | 3.500 |
| 2     | 3.910  | 10.500 |       |        |       |
| 3     | 5.200  | 10.500 |       |        |       |
| 4     | 8.000  | 3.500  |       |        |       |
| 5     | 11.710 | 3.500  |       |        |       |

### STAVEN

| St. ki | kj   | Profiel  | Aansl.i | Aansl.j |
|--------|------|----------|---------|---------|
| Lengte | Opm. |          |         |         |
| 1      | 1 2  | 1:HEB180 | NDM     | NDM     |
| 3.910  |      |          |         |         |
| 2      | 2 3  | 1:HEB180 | NDM     | NDM     |
| 1.290  |      |          |         |         |
| 3      | 4 5  | 1:HEB180 | NDM     | NDM     |
| 3.710  |      |          |         |         |
| 4      | 5 6  | 1:HEB180 | NDM     | NDM     |
| 2.890  |      |          |         |         |
| 5      | 3 4  | 1:HEB180 | NDM     | NDM     |
| 7.539  |      |          |         |         |

### VASTE STEUNPUNTEN

| Nr. | knoop | Kode | XZR 1=vast 0=vrij | Hoek |
|-----|-------|------|-------------------|------|
| 1   | 1     | 110  |                   | 0.00 |
| 2   | 2     | 010  |                   | 0.00 |
| 3   | 4     | 010  |                   | 0.00 |
| 4   | 5     | 010  |                   | 0.00 |

### BELASTINGGEVALLEN

| B.G. | Omschrijving         | Type        |
|------|----------------------|-------------|
| 1    | Permanente belasting | EGZ=-1.00 1 |



$q_k$  2 Veranderlijke belasting

2 Ver. bel. pers. ed.

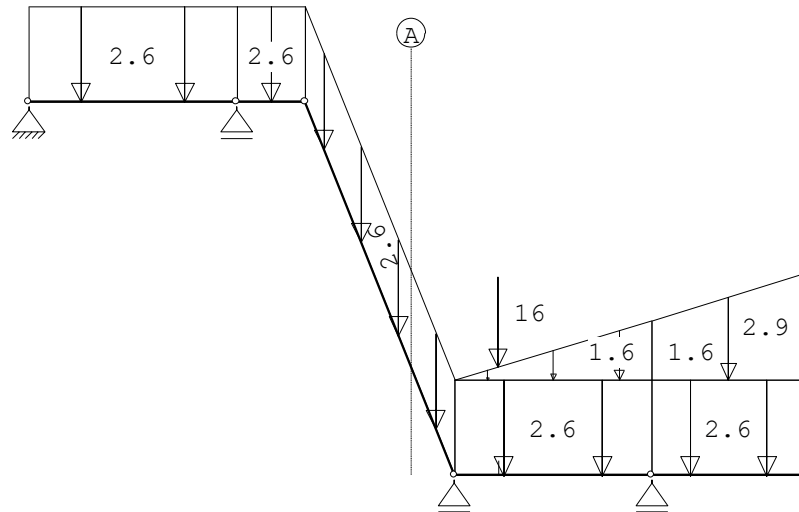
Project.....: SGU021041 - Uitbreiding zwembad de Meerkamp te Amstelveen  
Onderdeel.....: Spanten entree as 9

## BELASTINGEN

B.G:1 Permanente

belasting

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



## STAAFBELASTINGEN

B.G:1 Permanente

belasting

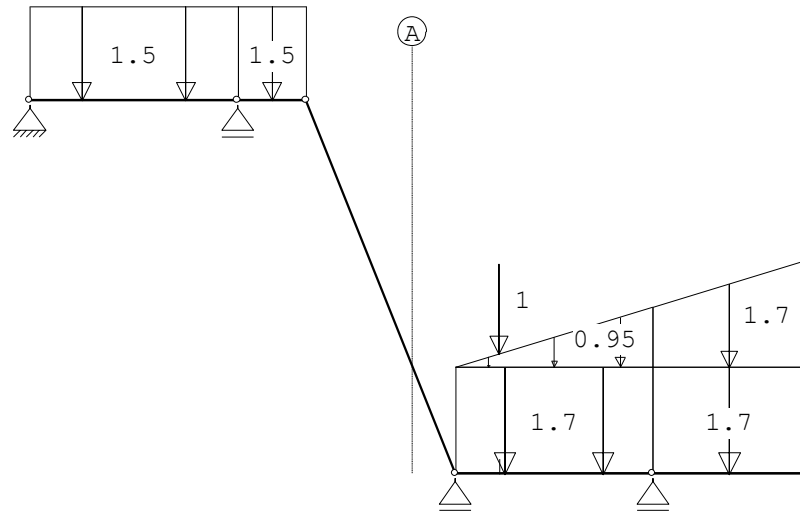
| Staaf    | Type        | q1/p/m | q2    | A     | B     | $\psi_0$ |
|----------|-------------|--------|-------|-------|-------|----------|
| $\psi_1$ | $\psi_2$    |        |       |       |       |          |
| 1        | 1:QZLokaal  | -2.60  | -2.60 | 0.000 | 0.000 |          |
| 2        | 1:QZLokaal  | -2.60  | -2.60 | 0.000 | 0.000 |          |
| 3        | 1:QZLokaal  | -2.60  | -2.60 | 0.000 | 0.000 |          |
| 4        | 1:QZLokaal  | -2.60  | -2.60 | 0.000 | 0.000 |          |
| 5        | 5:QZGlobaal | -2.60  | -2.60 | 0.000 | 0.000 |          |
| 3        | 1:QZLokaal  | 0.00   | -1.60 | 0.000 | 0.000 |          |
| 4        | 1:QZLokaal  | -1.60  | -2.90 | 0.000 | 0.000 |          |
| 3        | 8:PZLokaal  | -16.00 |       | 0.825 |       |          |

Project.....: SGU021041 - Uitbreiding zwembad de Meerkamp te Amstelveen  
Onderdeel.....: Spanten entree as 9

## BELASTINGEN

B.G:2 Veranderlijke

belasting



## STAAFBELASTINGEN

B.G:2 Veranderlijke

belasting

| Staaf    | Type       | q1/p/m | q2    | A     | B     | $\psi_0$ |
|----------|------------|--------|-------|-------|-------|----------|
| $\psi_1$ | $\psi_2$   |        |       |       |       |          |
| 1        | 1:QZLokaal | -1.50  | -1.50 | 0.000 | 0.000 | 0.00     |
| 0.00     | 0.00       |        |       |       |       |          |
| 2        | 1:QZLokaal | -1.50  | -1.50 | 0.000 | 0.000 | 0.00     |
| 0.00     | 0.00       |        |       |       |       |          |
| 3        | 1:QZLokaal | -1.70  | -1.70 | 0.000 | 0.000 | 0.00     |
| 0.00     | 0.00       |        |       |       |       |          |
| 4        | 1:QZLokaal | -1.70  | -1.70 | 0.000 | 0.000 | 0.00     |
| 0.00     | 0.00       |        |       |       |       |          |
| 3        | 1:QZLokaal | 0.00   | -0.95 | 0.000 | 0.000 | 0.00     |
| 0.00     | 0.00       |        |       |       |       |          |
| 4        | 1:QZLokaal | -0.95  | -1.70 | 0.000 | 0.000 | 0.00     |
| 0.00     | 0.00       |        |       |       |       |          |
| 3        | 8:PZLokaal | -1.00  |       | 0.825 |       | 0.00     |
| 0.00     | 0.00       |        |       |       |       |          |

## REACTIES

| Kn. | B.G. | X    | Z     | M |
|-----|------|------|-------|---|
| 1   | 1    | 0.00 | 3.40  |   |
| 1   | 2    | 0.00 | 2.39  |   |
| 2   | 1    |      | 20.60 |   |
| 2   | 2    |      | 5.84  |   |
| 4   | 1    |      | 30.94 |   |
| 4   | 2    |      | 0.30  |   |
| 5   | 1    |      | 30.72 |   |



5

2

17.08

Project.....: SGU021041 - Uitbreiding zwembad de Meerkamp te Amstelveen  
Onderdeel.....: Spanten entree as 9

## BELASTINGCOMBINATIES

| BC Type |      |           |   |      |                  |
|---------|------|-----------|---|------|------------------|
| 1 Fund. | 1.20 | $G_{k,1}$ | + | 1.50 | $Q_{k,2}$        |
| 2 Fund. | 1.35 | $G_{k,1}$ |   |      |                  |
| 3 Kar.  | 1.00 | $G_{k,1}$ | + | 1.00 | $Q_{k,2}$        |
| 4 Freq. | 1.00 | $G_{k,1}$ | + | 1.00 | $\psi_1 Q_{k,2}$ |
| 5 Quas. | 1.00 | $G_{k,1}$ | + | 1.00 | $\psi_2 Q_{k,2}$ |
| 6 Blij. | 1.00 | $G_{k,1}$ |   |      |                  |

## GUNSTIGE WERKING PERMANENTE BELASTINGEN

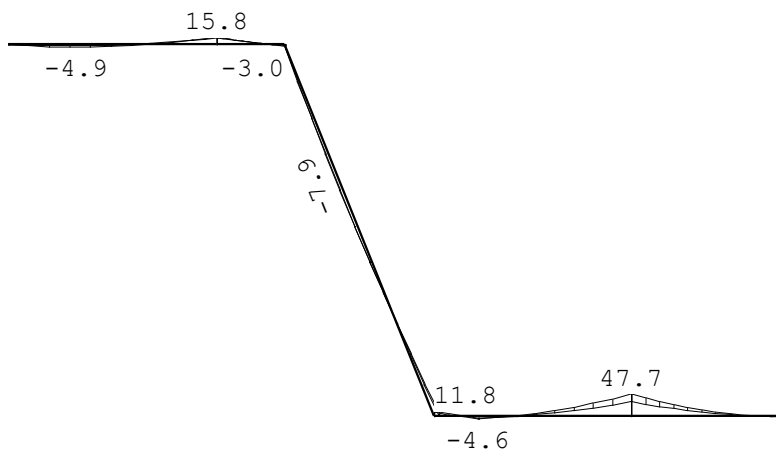
| BC Staven met gunstige werking |      |
|--------------------------------|------|
| 1                              | Geen |
| 2                              | Geen |

## OMHULLENDE VAN DE FUNDAMENTELE COMBINATIES

### MOMENTEN

Fundamentele

combinatie

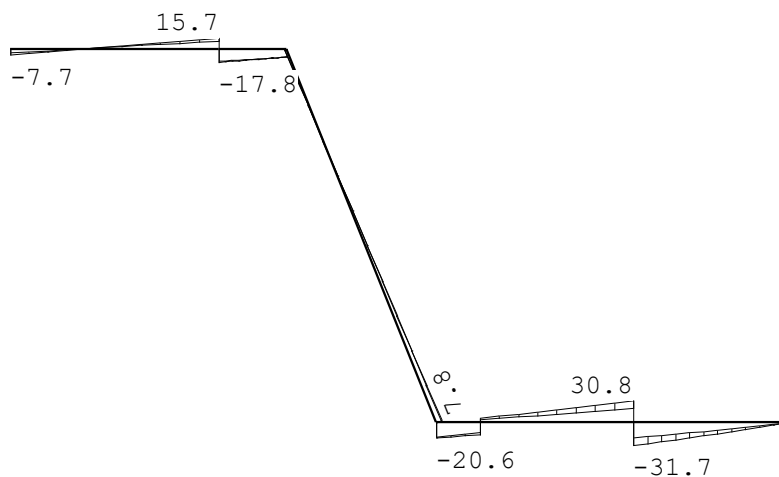


Project.....: SGU021041 - Uitbreiding zwembad de Meerkamp te Amstelveen  
Onderdeel.....: Spanten entree as 9

## DWARSKRACHTEN

combinatie

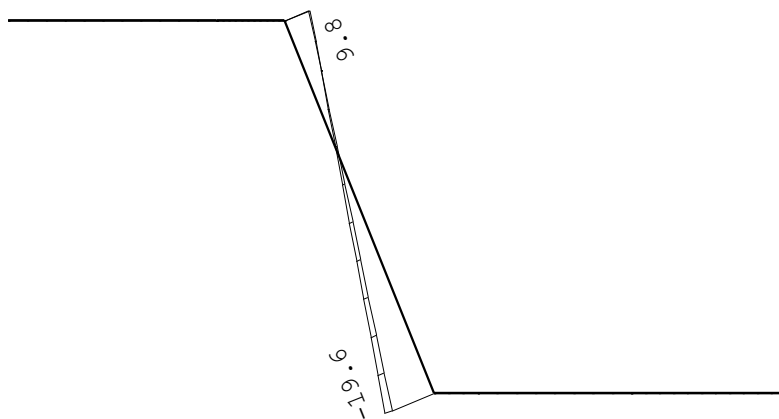
Fundamentele



## NORMAALKRACHTEN

combinatie

Fundamentele



## REACTIES

combinatie

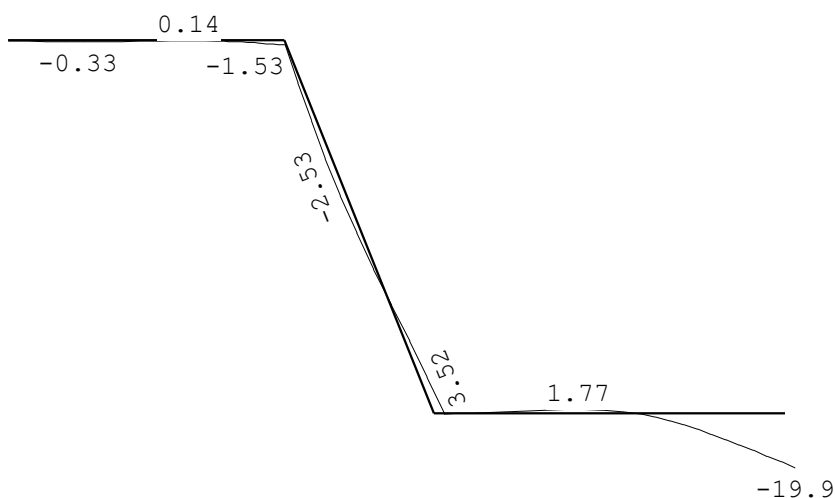
Fundamentele

| Kn.   | X-min | X-max | Z-min | Z-max | M-min |
|-------|-------|-------|-------|-------|-------|
| M-max |       |       |       |       |       |
| 1     | 0.00  | 0.00  | 4.59  | 7.67  |       |
| 2     |       |       | 27.81 | 33.49 |       |
| 4     |       |       | 37.58 | 41.76 |       |
| 5     |       |       | 41.48 | 62.49 |       |

Project.....: SGU021041 - Uitbreiding zwembad de Meerkamp te Amstelveen  
Onderdeel.....: Spanten entree as 9

## OMHULLENDE VAN DE KARAKTERISTIEKE COMBINATIES

**VERPLAATSINGEN** [mm] Karakteristieke combinatie



## STAALPROFIELEN - ALGEMENE GEGEVENS

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

## PROFIEL/MATERIAAL

| P/M drsn.<br>nr.<br>klasse | Profielnaam | Vloeisp.<br>[N/mm <sup>2</sup> ] | Productie<br>methode | Min. |
|----------------------------|-------------|----------------------------------|----------------------|------|
|----------------------------|-------------|----------------------------------|----------------------|------|

|   |        |     |         |  |
|---|--------|-----|---------|--|
| 1 | HEB180 | 235 | Gewalst |  |
|---|--------|-----|---------|--|

Partiële veiligheidsfactoren:

Gamma M;0 : 1.00 Gamma M;1 :

## KNIKSTABILITEIT

Extra

Extra

| Staaft<br>aanp. z | $l_{sys}$<br>[m] | Classif. y<br>sterke as | $l_{knik;y}$<br>[m] | aanp. y<br>[kN] | Classif. z<br>zwakke as | $l_{knik;z}$<br>[m] |
|-------------------|------------------|-------------------------|---------------------|-----------------|-------------------------|---------------------|
|-------------------|------------------|-------------------------|---------------------|-----------------|-------------------------|---------------------|

|     |       |           |       |     |           |       |
|-----|-------|-----------|-------|-----|-----------|-------|
| 1-2 | 5.200 | Geschoord | 5.200 | 0.0 | Geschoord | 5.200 |
| 0.0 |       |           |       |     |           |       |



|          |                 |       |               |       |
|----------|-----------------|-------|---------------|-------|
| 3<br>0.0 | 3.710 Geschoord | 3.710 | 0.0 Geschoord | 3.710 |
| 4<br>0.0 | 2.890 Geschoord | 2.890 | 0.0 Geschoord | 2.890 |
| 5<br>0.0 | 7.539 Geschoord | 7.539 | 0.0 Geschoord | 7.539 |

Project.....: SGU021041 - Uitbreiding zwembad de Meerkamp te Amstelveen  
Onderdeel.....: Spanten entree as 9

## KIPSTABILITEIT

| Staafl | Plts. | l gaffel    | Kipsteunafstanden |
|--------|-------|-------------|-------------------|
| aangr. |       | [m]         | [m]               |
| 1-2    | 1.0*h | boven: 5.20 | 5,2               |
|        |       | onder: 5.20 | 5,2               |
| 3      | 1.0*h | boven: 3.71 | 3,71              |
|        |       | onder: 3.71 | 3,71              |
| 4      | 1.0*h | boven: 2.89 | 2,89              |
|        |       | onder: 2.89 | 2,89              |
| 5      | 1.0*h | boven: 7.54 | 7,539             |
|        |       | onder: 7.54 | 7,539             |

## TOETSING SPANNINGEN

Staafl P/M BC Sit Kl Plaats Norm Artikel Formule Hoogste toetsing  
Opm. nr. U.C. [N/mm<sup>2</sup>]

|       |   |   |   |   |        |         |       |        |       |    |
|-------|---|---|---|---|--------|---------|-------|--------|-------|----|
| 1-2   | 1 | 1 | 1 | 1 | My-max | EN3-1-1 | 6.2.8 | (6.30) | 0.139 | 33 |
| 42,46 |   |   |   |   |        |         |       |        |       |    |
| 3     | 1 | 1 | 1 | 1 | Einde  | EN3-1-1 | 6.2.8 | (6.30) | 0.422 | 99 |
| 46    |   |   |   |   |        |         |       |        |       |    |
| 4     | 1 | 1 | 1 | 1 | Begin  | EN3-1-1 | 6.2.8 | (6.30) | 0.422 | 99 |
| 46    |   |   |   |   |        |         |       |        |       |    |
| 5     | 1 | 2 | 1 | 1 | Staafl | EN3-1-1 | 6.3.3 | (6.62) | 0.155 | 36 |
| 47    |   |   |   |   |        |         |       |        |       |    |

Opmerkingen:

[ 42] Waarschuwing: Er sluiten tussentijds staven en/of opleggingen aan.

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

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

## TOETSING DOORBUIGING

| Staafl      | Soort | Mtg | Lengte | Overst | Zeeg | u <sub>tot</sub> | BC    | Sit      | u           |
|-------------|-------|-----|--------|--------|------|------------------|-------|----------|-------------|
| Toelaatbaar |       |     | [m]    | I      | J    | [mm]             |       |          | [mm]        |
| *1          |       |     |        |        |      |                  |       |          |             |
| 1-2         | Dak   | ss  | 5.20   | N      | N    | 0.0              | -1.5  | 3 1 Eind | -1.5 -41.6  |
| 2*0.004     |       | db  |        |        |      |                  |       | 3 1 Bijk | -0.6 -20.8  |
| 0.004       |       |     |        |        |      |                  |       |          |             |
| 3           | Dak   | db  | 3.71   | N      | N    | 0.0              | 1.8   | 3 1 Eind | 1.8 -14.8   |
| 0.004       |       | db  |        |        |      |                  |       | 3 1 Bijk | 0.7 -14.8   |
| 0.004       |       |     |        |        |      |                  |       |          |             |
| 4           | Dak   | ss  | 2.89   | N      | J    | 0.0              | -19.9 | 3 1 Eind | -19.9 -23.1 |
| 2*0.004     |       | ss  |        |        |      |                  |       | 3 1 Bijk | -7.3 -23.1  |
| 2*0.004     |       |     |        |        |      |                  |       |          |             |
| 5           | Dak   | db  | 7.54   | N      | N    | 0.0              | -3.4  | 3 1 Eind | -3.4 -30.2  |
| 0.004       |       | db  |        |        |      |                  |       | 3 1 Bijk | -0.2 -30.2  |
| 0.004       |       |     |        |        |      |                  |       |          |             |



## Bijlage U Uitvoer entree dakligger as B'

**Technosoft Liggers release 6.73a**  
**2023**

**26 jan**

Project.....: Sgu021041 - Uitbreiding zwembad de Meerkamp te Amstelveen  
Onderdeel.....: entree dakligger as B'  
Dimensies.....: kN/m/rad  
Datum.....: 14/12/2022  
Bestand.....: H:\SGU021041\BEREKENINGEN\04\_DO\Entree spant dakligger as  
B'.dlw

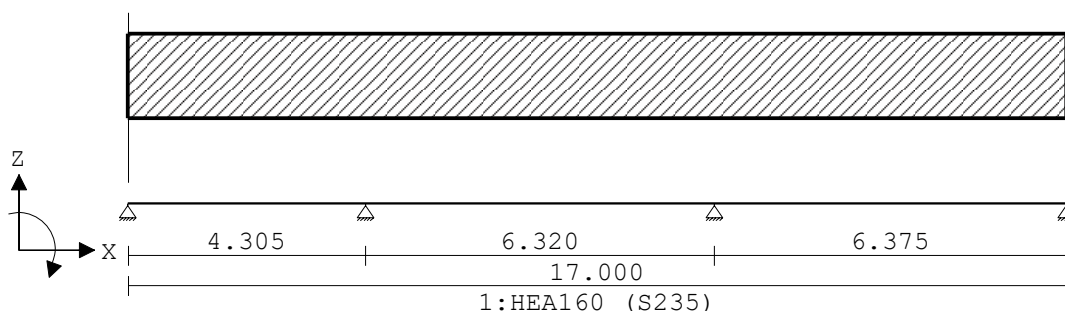
Betrouwbaarheidsklasse : 2 Referentieperiode : 50

### Toegepaste normen volgens Eurocode (CEN)

|             |                  |                 |
|-------------|------------------|-----------------|
| Belastingen | EN 1990:2002     | C2:2010,A1:2019 |
|             | EN 1991-1-1:2002 | C1/C11:2019     |
| Staal       | EN 1993-1-1:2006 | C2:2011,A1:2016 |

### GEOMETRIE

Ligger:1



### VELDLENGTEN

Ligger:1

| Veld | Vanaf  | Tot    | Lengte |
|------|--------|--------|--------|
| 1    | 0.000  | 4.305  | 4.305  |
| 2    | 4.305  | 10.625 | 6.320  |
| 3    | 10.625 | 17.000 | 6.375  |

### MATERIALEN

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

### PROFIELEN [mm]

| Prof.      | Omschrijving | Materiaal | Oppervlak  |
|------------|--------------|-----------|------------|
| 1          | HEA160       | 1:S235    | 3.8800e+03 |
| 1.6730e+07 | 0.00         |           |            |



## PROFIELEN vervolg [mm]

| Prof. | Staaftype | Breedte | Hoogte | e    | Type | b1 | h1 | b2 |
|-------|-----------|---------|--------|------|------|----|----|----|
| h2    |           |         |        |      |      |    |    |    |
| 1     | 0:Normaal | 160     | 152    | 76.0 |      |    |    |    |

Project.....: Sgu021041 - Uitbreiding zwembad de Meerkamp te Amstelveen  
Onderdeel.....: entree dakligger as B'

## PROFIELVORMEN [mm]

1 HEA160



## BELASTINGGEVALLEN

| B.G. Omschrijving<br>e.g. | Belast/onbelast     | $\psi_0$ | $\psi_1$ | $\psi_2$ |
|---------------------------|---------------------|----------|----------|----------|
| 1 Permanent<br>-1.00      | 2:Permanent EN1991  |          |          |          |
| 2 Veranderlijk<br>0.00    | 1:Schaakbord EN1991 | 0.00     | 0.00     | 0.00     |

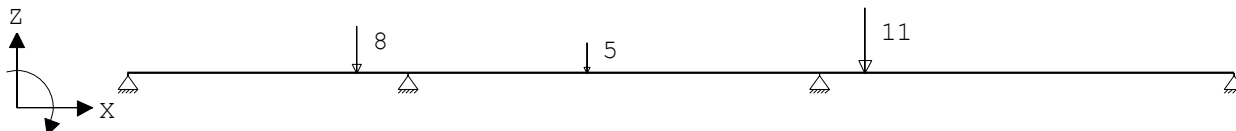
## BELASTINGGEVALLEN

| B.G. Omschrijving           | Type                   |
|-----------------------------|------------------------|
| 1 Permanent                 | 1 Permanente belasting |
| 2 Veranderlijk<br>( $q_k$ ) | 2 Ver. bel. pers. ed.  |

## VELDBELASTINGEN

Ligger:1 B.G:1

Permanent



## VELDBELASTINGEN

Ligger:1 B.G:1

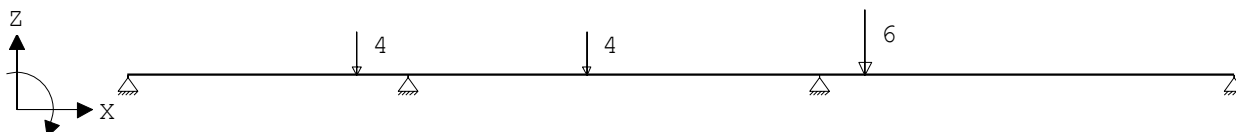
Permanent

| Last Ref.<br>Afstand | Type<br>Lengte | Omschrijving | $q_1/p/m$ | $q_2$ psi |
|----------------------|----------------|--------------|-----------|-----------|
| 1<br>3.520           | 8:Puntlast     |              | -8.000    |           |
| 2<br>7.050           | 8:Puntlast     |              | -5.000    |           |
| 3<br>11.330          | 8:Puntlast     |              | -11.000   |           |

## VELDBELASTINGEN

Ligger:1 B.G:2

Veranderlijk



## VELDBELASTINGEN

Ligger:1 B.G:2

Veranderlijk



| Last Ref. | Type       | Omschrijving | q1/p/m | q2 | psi |
|-----------|------------|--------------|--------|----|-----|
| Afstand   | Lengte     |              |        |    |     |
| 1         | 8:Puntlast |              | -4.000 |    |     |
| 3.520     |            |              |        |    |     |
| 2         | 8:Puntlast |              | -4.000 |    |     |
| 7.050     |            |              |        |    |     |
| 3         | 8:Puntlast |              | -6.000 |    |     |
| 11.330    |            |              |        |    |     |

Project.....: Sgu021041 - Uitbreiding zwembad de Meerkamp te Amstelveen  
Onderdeel.....: entree dakligger as B'

## BELASTINGCOMBINATIES

| BC Type | BG | Gen. | Factor | BG     | Gen. | Factor | BG | Gen. | Factor | BG | Gen. | Factor |
|---------|----|------|--------|--------|------|--------|----|------|--------|----|------|--------|
| 1 Fund. | 1  | Perm | 1.35   |        |      |        |    |      |        |    |      |        |
| 2 Fund. | 1  | Perm | 1.15   | 2 Extr |      | 1.50   |    |      |        |    |      |        |
| 3 Fund. | 1  | Perm | 1.00   |        |      |        |    |      |        |    |      |        |
| 4 Fund. | 1  | Perm | 1.00   | 2 Extr |      | 1.50   |    |      |        |    |      |        |
| 5 Kar.  | 1  | Perm | 1.00   | 2 Extr |      | 1.00   |    |      |        |    |      |        |
| 6 Freq. | 1  | Perm | 1.00   |        |      |        |    |      |        |    |      |        |
| 7 Quas. | 1  | Perm | 1.00   |        |      |        |    |      |        |    |      |        |
| 8 Blij. | 1  | Perm | 1.00   |        |      |        |    |      |        |    |      |        |

## GUNSTIGE WERKING PERMANENTE BELASTINGEN

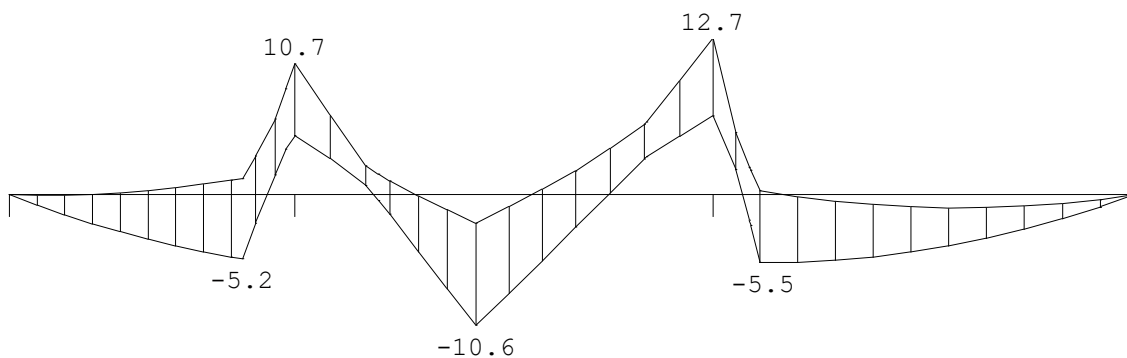
| BC Velden met gunstige werking |
|--------------------------------|
| 1 Geen                         |
| 2 Geen                         |
| 3 Alle velden de factor:1.00   |
| 4 Alle velden de factor:1.00   |

## OMHULLENDE VAN DE FUNDAMENTELE COMBINATIES

### MOMENTEN

Ligger:1 Fundamentele

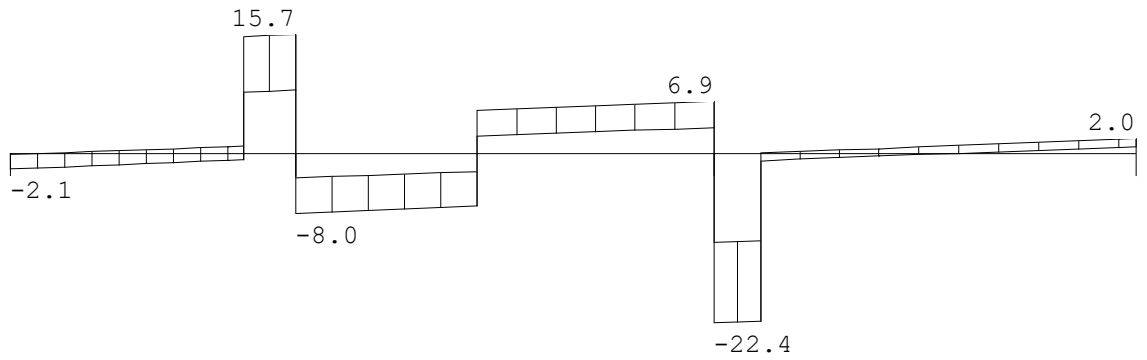
combinatie



### DWARSKRACHTEN

Ligger:1 Fundamentele

combinatie



Fmin:0.16  
Fmax:2.09

11.9  
23.6

15.1  
29.3

0.81  
1.97

Project.....: Sgu021041 - Uitbreiding zwembad de Meerkamp te Amstelveen  
Onderdeel.....: entree dakligger as B'

## REACTIES

Ligger:1 Fundamentele

combinatie

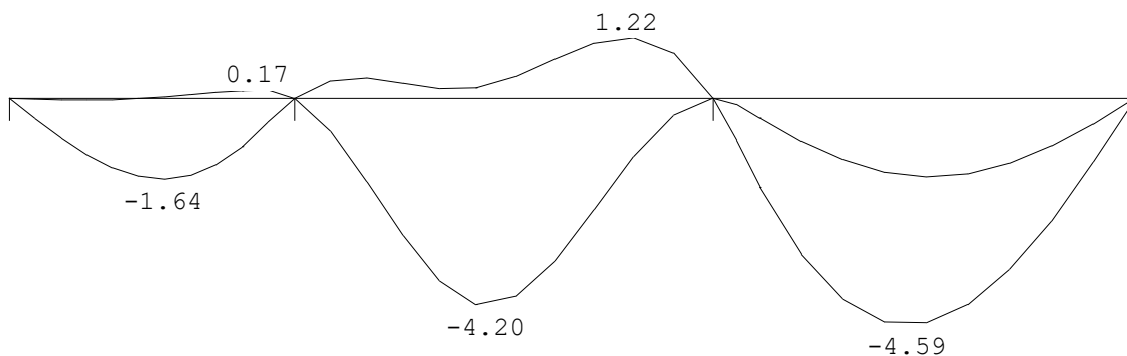
| Stp | Fmin  | Fmax  | Mmin | Mmax |
|-----|-------|-------|------|------|
| 1   | 0.16  | 2.09  | 0.00 | 0.00 |
| 2   | 11.85 | 23.62 | 0.00 | 0.00 |
| 3   | 15.14 | 29.26 | 0.00 | 0.00 |
| 4   | 0.81  | 1.97  | 0.00 | 0.00 |

## OMHULLENDE VAN DE KARAKTERISTIEKE COMBINATIES

### VERPLAATSINGEN [mm]

Ligger:1 Karakteristieke

combinatie



## STAALPROFIELEN - ALGEMENE GEGEVENS

Ligger:1

Stabiliteit: Classificatie gehele constructie: Geschoord

### PROFIEL/MATERIAAL

P/M Profielnaam Vloeisp. Productie Min.  
drsn. [N/mm<sup>2</sup>] methode  
nr.  
klasse

1 HEA160 235 Gewalst

1

Partiële veiligheidsfactoren:

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

### KIPSTABILITEIT

Ligger:1

Staaft Plts. l gaffel Kipsteunafstanden  
aangr. [m] [m]

|   |       |        |      |       |
|---|-------|--------|------|-------|
| 1 | 1.0*h | boven: | 4.30 | 4.305 |
|   |       | onder: | 4.30 | 4.305 |
| 2 | 1.0*h | boven: | 6.32 | 6.320 |
|   |       | onder: | 6.32 | 6.320 |
| 3 | 1.0*h | boven: | 6.38 | 6.375 |



onder: 6.38 6.375



Project.....: Sgu021041 - Uitbreiding zwembad de Meerkamp te Amstelveen  
Onderdeel.....: entree dakligger as B'

## TOETSING SPANNINGEN

Ligger:1

Staaft P/M BC Sit Kl Plaats Norm Artikel Formule Hoogste toetsing  
Opm.

| nr.    |   |   |   |   |        |         |       |        | U.C. [N/mm <sup>2</sup> ] |    |
|--------|---|---|---|---|--------|---------|-------|--------|---------------------------|----|
| 1      | 1 | 2 | 4 | 1 | Einde  | EN3-1-1 | 6.2.8 | (6.30) | 0.185                     | 43 |
| 46,156 |   |   |   |   |        |         |       |        |                           |    |
| 2      | 1 | 2 | 5 | 1 | Staaft | EN3-1-1 | 6.3.2 | (6.54) | 0.285                     | 67 |
| 46,156 |   |   |   |   |        |         |       |        |                           |    |
| 3      | 1 | 2 | 1 | 1 | Staaft | EN3-1-1 | 6.3.2 | (6.54) | 0.270                     | 63 |
| 46,156 |   |   |   |   |        |         |       |        |                           |    |

Opmerkingen:

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

[156] In afwijking van de ingestelde norm is het elastisch kipmoment M<sub>cr</sub>

berekend volgens de Nederlandse Nationale Bijlage.

## TOETSING DOORBUIGING

Ligger:1

Staaft Soort Mtg Lengte Overst Zeeg u<sub>tot</sub> BC Sit  
Toelaatbaar

|       |       |    | [m]  | I | J | [mm] | [mm] |   |   |      | [mm] | [mm]  |
|-------|-------|----|------|---|---|------|------|---|---|------|------|-------|
| *1    |       |    |      |   |   |      |      |   |   |      |      |       |
| 1     | Vloer | db | 4.30 | N | N | 0.0  | -1.6 | 5 | 2 | Eind | -1.6 | ±8.6  |
| 0.002 |       |    |      |   |   |      |      |   |   |      |      |       |
|       |       | db |      |   |   |      |      | 5 | 3 | Bijk | 1.0  | ±8.6  |
| 0.002 |       |    |      |   |   |      |      |   |   |      |      |       |
| 2     | Vloer | db | 6.32 | N | N | 0.0  | -4.2 | 5 | 3 | Eind | -4.2 | ±12.6 |
| 0.002 |       |    |      |   |   |      |      |   |   |      |      |       |
|       |       | db |      |   |   |      |      | 5 | 3 | Bijk | -3.0 | ±12.6 |
| 0.002 |       |    |      |   |   |      |      |   |   |      |      |       |
| 3     | Vloer | db | 6.38 | N | N | 0.0  | -4.6 | 5 | 2 | Eind | -4.6 | ±12.8 |
| 0.002 |       |    |      |   |   |      |      |   |   |      |      |       |
|       |       | db |      |   |   |      |      | 5 | 2 | Bijk | -1.8 | ±12.8 |
| 0.002 |       |    |      |   |   |      |      |   |   |      |      |       |

## Bijlage V Uitvoer entree liggers verdieping

**Technosoft Liggers release 6.73a**  
**2023**

**26 jan**

Project.....: Sgu021041 - Uitbreiding zwembad de Meerkamp te Amstelveen  
Onderdeel.....: entree liggers verdieping  
Dimensies.....: kN/m/rad  
Datum.....: 14/12/2022  
Bestand.....: H:\SGU021041\BEREKENINGEN\04\_DO\Entree liggers verdieping.dlw

Betrouwbaarheidsklasse : 2 Referentieperiode : 50

### Toegepaste normen volgens Eurocode (CEN)

|             |                  |                 |
|-------------|------------------|-----------------|
| Belastingen | EN 1990:2002     | C2:2010,A1:2019 |
|             | EN 1991-1-1:2002 | C1/C11:2019     |
| Staal       | EN 1993-1-1:2006 | C2:2011,A1:2016 |

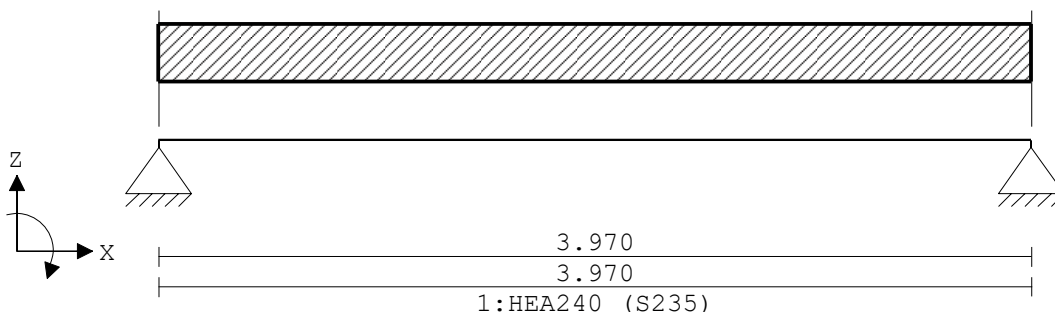
### LIGGER:as 9 B'

Profiel : HEA240

### GEOMETRIE

Ligger:as 9

B'



### VELDLENGTEN

Ligger:as 9

B'

| Veld | Vanaf | Tot   | Lengte |
|------|-------|-------|--------|
| 1    | 0.000 | 3.970 | 3.970  |

### MATERIALEN

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

### PROFIELEN [mm]

| Prof. | Omschrijving | Materiaal | Oppervlak  |
|-------|--------------|-----------|------------|
| 1     | HEA240       | 1:S235    | 7.6800e+03 |
| 2     | HEA140       | 1:S235    | 3.1420e+03 |



1.0330e+07 0.00  
3 HEA220  
5.4100e+07 0.00

1:S235

6.4300e+03

Project.....: Sgu021041 - Uitbreiding zwembad de Meerkamp te Amstelveen  
Onderdeel.....: entree liggers verdieping

### PROFIELEN vervolg [mm]

| Prof. | Staaftype | Breedte | Hoogte | e     | Type | b1 | h1 | b2 |
|-------|-----------|---------|--------|-------|------|----|----|----|
| h2    |           |         |        |       |      |    |    |    |
| 1     | 0:Normaal | 240     | 230    | 115.0 |      |    |    |    |
| 2     | 0:Normaal | 140     | 133    | 66.5  |      |    |    |    |
| 3     | 0:Normaal | 220     | 210    | 105.0 |      |    |    |    |

### PROFIELVORMEN [mm]

|   |        |                                                                                    |
|---|--------|------------------------------------------------------------------------------------|
| 1 | HEA240 |   |
| 2 | HEA140 |   |
| 3 | HEA220 |  |

### 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 | 0.70     | 0.70     | 0.60     |
| 0.00  |              |                     |          |          |          |

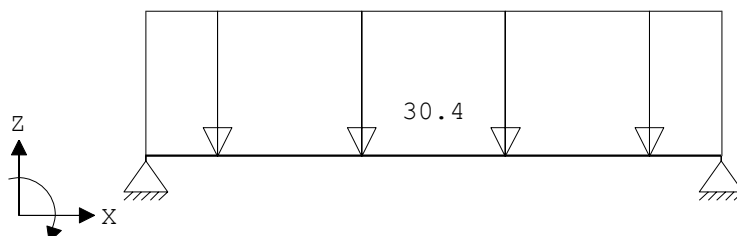
### BELASTINGGEVALLEN

| B.G.              | Omschrijving | Type                   |
|-------------------|--------------|------------------------|
| 1                 | Permanent    | 1 Permanente belasting |
| 2                 | Veranderlijk | 2 Ver. bel. pers. ed.  |
| (q <sub>k</sub> ) |              |                        |

### VELDBELASTINGEN

Ligger:as 9 B' B.G:1

Permanent



### VELDBELASTINGEN

Ligger:as 9 B' B.G:1

Permanent

| Last Ref. | Type     | Omschrijving | q1/p/m  | q2      | psi |
|-----------|----------|--------------|---------|---------|-----|
| Afstand   | Lengte   |              |         |         |     |
| 1         | 1:q-last |              | -30.400 | -30.400 |     |



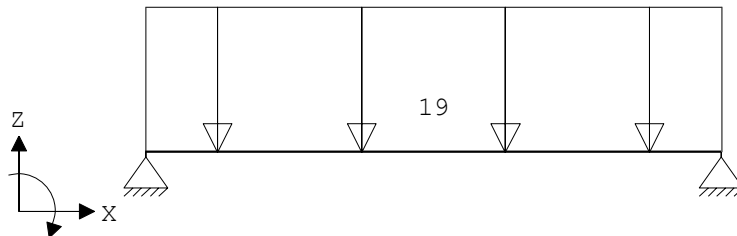
0.000 3.970

Project.....: Sgu021041 - Uitbreiding zwembad de Meerkamp te Amstelveen  
Onderdeel.....: entree liggers verdieping

## VELDBELASTINGEN

Ligger:as 9 B' B.G:2

Veranderlijk



## VELDBELASTINGEN

Ligger:as 9 B' B.G:2

Veranderlijk

| Last Ref. | Type     | Omschrijving | q1/p/m  | q2      | psi |
|-----------|----------|--------------|---------|---------|-----|
| Afstand   | Lengte   |              |         |         |     |
| 1         | 1:q-last |              | -19.000 | -19.000 |     |
| 0.000     | 3.970    |              |         |         |     |

## BELASTINGCOMBINATIES

| BC Type  | BG Gen. | Factor | BG Gen. | Factor | BG Gen. | Factor | BG Gen. |
|----------|---------|--------|---------|--------|---------|--------|---------|
| Factor   |         |        |         |        |         |        |         |
| 1 Fund.  | 1 Perm  | 1.35   |         |        |         |        |         |
| 2 Fund.  | 1 Perm  | 1.35   | 2 psi0  | 1.50   |         |        |         |
| 3 Fund.  | 1 Perm  | 1.15   | 2 Extr  | 1.50   |         |        |         |
| 4 Fund.  | 1 Perm  | 1.00   |         |        |         |        |         |
| 5 Fund.  | 1 Perm  | 1.00   | 2 psi0  | 1.50   |         |        |         |
| 6 Fund.  | 1 Perm  | 1.00   | 2 Extr  | 1.50   |         |        |         |
| 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:1.00   |
| 5 Alle velden de factor:1.00   |
| 6 Alle velden de factor:1.00   |

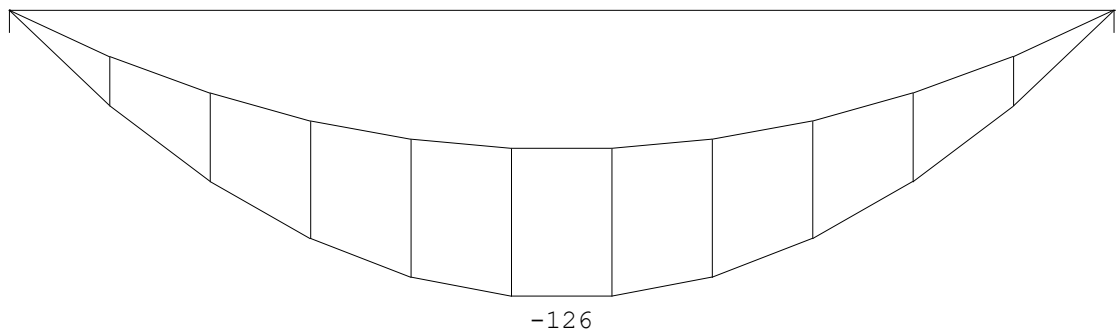
Project.....: Sgu021041 - Uitbreiding zwembad de Meerkamp te Amstelveen  
Onderdeel.....: entree liggers verdieping

## OMHULLENDE VAN DE FUNDAMENTELE COMBINATIES

### MOMENTEN

Ligger:as 9 B' Fundamentele

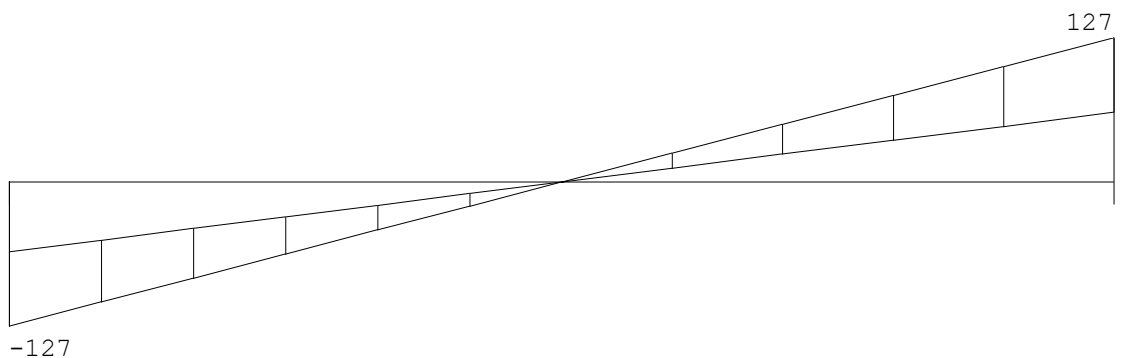
combinatie



### DWARSKRACHTEN

Ligger:as 9 B' Fundamentele

combinatie



Fmin:62  
Fmax:127

62  
127

### REACTIES

Ligger:as 9 B' Fundamentele

combinatie

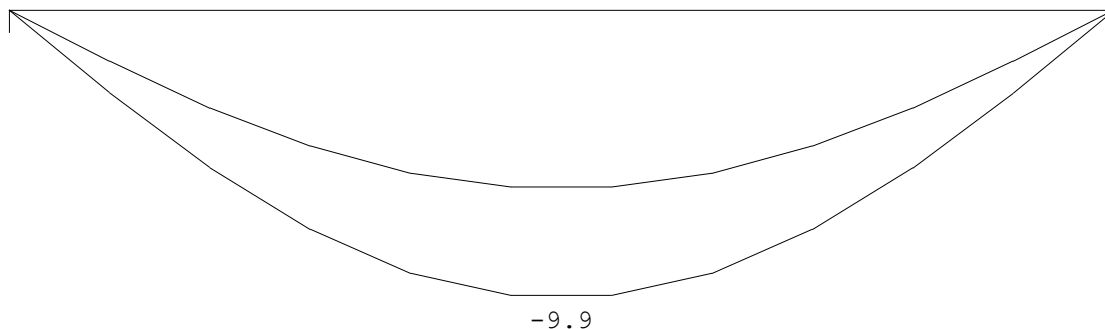
| Stp | Fmin  | Fmax   | Mmin | Mmax |
|-----|-------|--------|------|------|
| 1   | 61.54 | 127.34 | 0.00 | 0.00 |
| 2   | 61.54 | 127.34 | 0.00 | 0.00 |



Project.....: Sgu021041 - Uitbreiding zwembad de Meerkamp te Amstelveen  
Onderdeel.....: entree liggers verdieping

## OMHULLENDE VAN DE KARAKTERISTIEKE COMBINATIES

**VERPLAATSINGEN** [mm] Ligger:as 9 B' Karakteristieke combinatie



## STAALPROFIELEN - ALGEMENE GEGEVENS

Ligger:as

9 B'

Stabiliteit: Classificatie gehele constructie: Geschoord

## PROFIEL/MATERIAAL

| P/M drsn.<br>nr.<br>klasse | Profielnaam | Vloeisp.<br>[N/mm <sup>2</sup> ] | Productie<br>methode | Min. |
|----------------------------|-------------|----------------------------------|----------------------|------|
|----------------------------|-------------|----------------------------------|----------------------|------|

|   |        |     |         |  |
|---|--------|-----|---------|--|
| 1 | HEA240 | 235 | Gewalst |  |
| 1 |        |     |         |  |
| 2 | HEA140 | 235 | Gewalst |  |
| 1 |        |     |         |  |
| 3 | HEA220 | 235 | Gewalst |  |
| 1 |        |     |         |  |

Partiële veiligheidsfactoren:

Gamma M;0 : 1.00 Gamma M;1 :

## KIPSTABILITEIT

Ligger:as 9

B'

| Staaf | Plts.<br>aanr. | l gaffel<br>[m]            | Kipsteunafstanden<br>[m] |
|-------|----------------|----------------------------|--------------------------|
| 1     | 1.0*h          | boven: 3.97<br>onder: 3.97 | 2*1,323;1,324<br>3.970   |

## TOETSING SPANNINGEN

Ligger:as 9

B'

| Staaf | P/M | BC | Sit | Kl | Plaats | Norm | Artikel | Formule | Hoogste toetsing |
|-------|-----|----|-----|----|--------|------|---------|---------|------------------|
|-------|-----|----|-----|----|--------|------|---------|---------|------------------|

|     |     |   |   |   |        |         |       |         |                           |
|-----|-----|---|---|---|--------|---------|-------|---------|---------------------------|
|     | nr. |   |   |   |        |         |       |         | U.C. [N/mm <sup>2</sup> ] |
| 1   | 1   | 3 | 1 | 1 | My-max | EN3-1-1 | 6.2.5 | (6.12y) | 0.723 170                 |
| 156 |     |   |   |   |        |         |       |         |                           |



Opmerkingen:

[156] In afwijking van de ingestelde norm is het elastisch kipmoment  $M_{cr}$

berekend volgens de Nederlandse Nationale Bijlage.

## TOETSING DOORBUIGING

Ligger: as

9 B'

| Staaft      | Soort | Mtg | Lengte | Overst | Zeeg | $u_{tot}$ | BC | Sit | $u$  |      |
|-------------|-------|-----|--------|--------|------|-----------|----|-----|------|------|
| Toelaatbaar |       |     | [m]    | I      | J    | [mm]      |    |     | [mm] | [mm] |

\*1

|              |       |    |      |   |   |     |      |   |               |             |             |
|--------------|-------|----|------|---|---|-----|------|---|---------------|-------------|-------------|
| 1            | Vloer | db | 3.97 | N | N | 0.0 | -9.9 | 7 | <u>1 Eind</u> | <u>-9.9</u> | <u>±7.9</u> |
| <u>0.002</u> |       |    |      |   |   |     |      |   |               |             |             |

db

|   |        |      |      |
|---|--------|------|------|
| 7 | 1 Bijk | -3.8 | ±7.9 |
|---|--------|------|------|

0.002

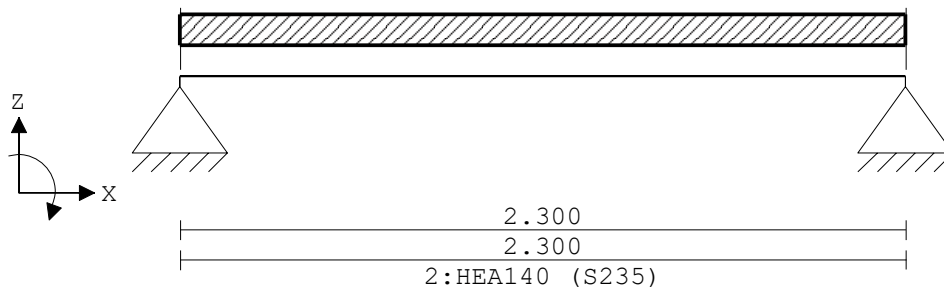
Project.....: Sgu021041 - Uitbreiding zwembad de Meerkamp te Amstelveen  
Onderdeel.....: entree liggers verdieping

## LIGGER:as 7-9 C'

### GEOMETRIE

Ligger:as 7-9

C'



### VELDLENGTEN

Ligger:as 7-9

C'

| Veld | Vanaf | Tot   | Lengte |
|------|-------|-------|--------|
| 1    | 0.000 | 2.300 | 2.300  |

### DOORSNEDEN

Ligger:as 7-9

C'

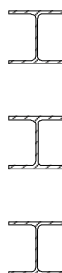
| sector | Vanaf | Tot   | Lengte | Profiel begin | z-begin | Profiel eind |
|--------|-------|-------|--------|---------------|---------|--------------|
| z-eind |       |       |        |               |         |              |
| 1      | 0.000 | 2.300 | 2.300  | 2:HEA140      | 0.000   | 2:HEA140     |
| 0.000  |       |       |        |               |         |              |
| sector | Vanaf | Tot   | Lengte | Eindcode      | Bedding | Br.[mm]      |
| 1      | 0.000 | 2.300 | 2.300  | 1:Vast        |         |              |

### PROFIELVORMEN [mm]

1 HEA240

2 HEA140

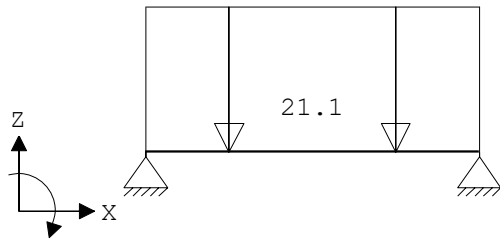
3 HEA220



### VELDBELASTINGEN

Ligger:as 7-9 C' B.G:1

Permanent



Project.....: Sgu021041 - Uitbreiding zwembad de Meerkamp te Amstelveen  
Onderdeel.....: entree liggers verdieping

## VELDBELASTINGEN

Ligger:as 7-9 C' B.G:1

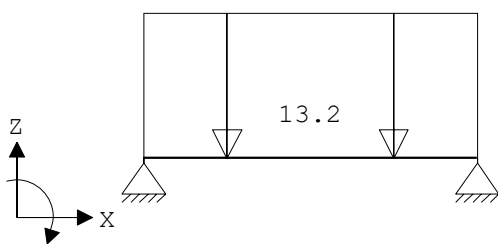
Permanent

| Last Ref. | Type     | Omschrijving | q1/p/m  | q2      | psi |
|-----------|----------|--------------|---------|---------|-----|
| Afstand   | Lengte   |              |         |         |     |
| 1         | 1:q-last |              | -21.100 | -21.100 |     |
| 0.000     | 2.300    |              |         |         |     |

## VELDBELASTINGEN

Ligger:as 7-9 C' B.G:2

Veranderlijk



## VELDBELASTINGEN

Ligger:as 7-9 C' B.G:2

Veranderlijk

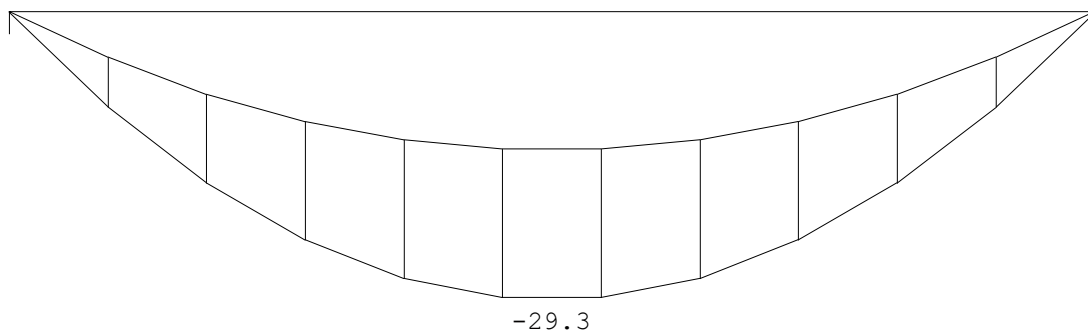
| Last Ref. | Type     | Omschrijving | q1/p/m  | q2      | psi |
|-----------|----------|--------------|---------|---------|-----|
| Afstand   | Lengte   |              |         |         |     |
| 1         | 1:q-last |              | -13.200 | -13.200 |     |
| 0.000     | 2.300    |              |         |         |     |

## OMHULLENDE VAN DE FUNDAMENTELE COMBINATIES

### MOMENTEN

Ligger:as 7-9 C' Fundamentele

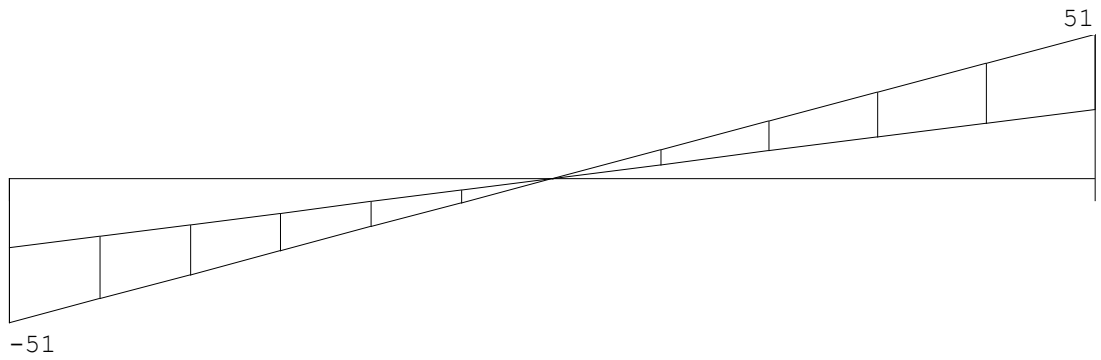
combinatie



### DWARSKRACHTEN

Ligger:as 7-9 C' Fundamentele

combinatie



Fmin:24.5  
Fmax:51

24.5  
51

Project.....: Sgu021041 - Uitbreiding zwembad de Meerkamp te Amstelveen  
Onderdeel.....: entree liggers verdieping

## REACTIES

Ligger:as 7-9 C' Fundamentele

combinatie

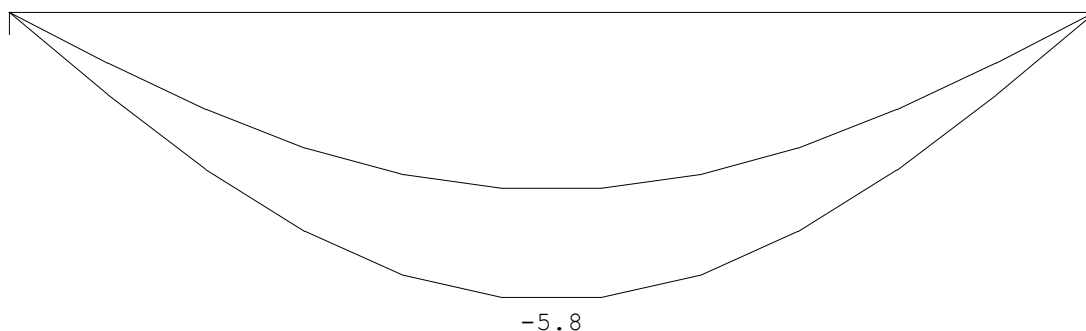
| Stp | Fmin  | Fmax  | Mmin | Mmax |
|-----|-------|-------|------|------|
| 1   | 24.55 | 51.00 | 0.00 | 0.00 |
| 2   | 24.55 | 51.00 | 0.00 | 0.00 |

## OMHULLENDE VAN DE KARAKTERISTIEKE COMBINATIES

### VERPLAATSINGEN [mm]

Ligger:as 7-9 C' Karakteristieke

combinatie



## KIPSTABILITEIT

Ligger:as 7-9

C'

| Staaft | Plts.<br>aanr. | l gaffel                   | Kipsteunafstanden |
|--------|----------------|----------------------------|-------------------|
|        |                | [m]                        | [m]               |
| 1      | 1.0*h          | boven: 2.30<br>onder: 2.30 | 1*2,3<br>2.300    |

## TOETSING SPANNINGEN

Ligger:as 7-9

C'

Staaft P/M BC Sit Kl Plaats Norm Artikel Formule Hoogste toetsing  
Opm.

| nr. | U.C. [N/mm <sup>2</sup> ] |
|-----|---------------------------|
| 1   | 0.761 179                 |

156

Opmerkingen:

[156] In afwijking van de ingestelde norm is het elastisch kippmoment M<sub>cr</sub>

berekend volgens de Nederlandse Nationale Bijlage.

## TOETSING DOORBUIGING

Ligger:as 7-

9 C'

| Staaft      | Soort | Mtg | Lengte | Overst | Zeeg | u <sub>t o t</sub> | BC   | Sit | u    |
|-------------|-------|-----|--------|--------|------|--------------------|------|-----|------|
| Toelaatbaar |       |     | [m]    | I      | J    | [mm]               | [mm] |     | [mm] |

\*1

|   |       |    |      |   |   |     |      |   |        |      |      |
|---|-------|----|------|---|---|-----|------|---|--------|------|------|
| 1 | Vloer | db | 2.30 | N | N | 0.0 | -5.8 | 7 | 1 Eind | -5.8 | ±4.6 |
|---|-------|----|------|---|---|-----|------|---|--------|------|------|

0.002



0.002 db 7 1 Bijk -2.2 ±4.6

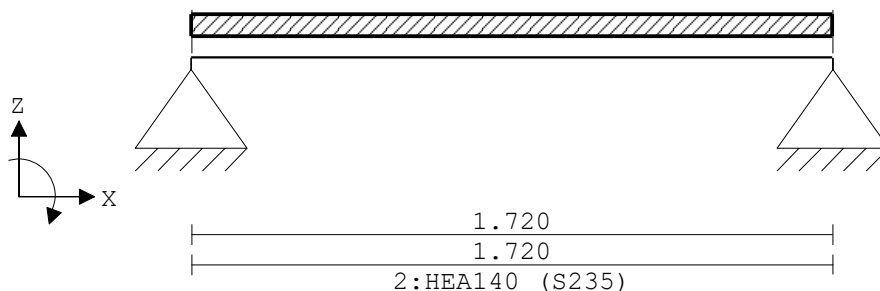
Project.....: Sgu021041 - Uitbreiding zwembad de Meerkamp te Amstelveen  
Onderdeel.....: entree liggers verdieping

## LIGGER:as 9 C'

### GEOMETRIE

Ligger:as 9

C'



### VELDLENGTEN

Ligger:as 9

C'

| Veld | Vanaf | Tot   | Lengte |
|------|-------|-------|--------|
| 1    | 0.000 | 1.720 | 1.720  |

### DOORSNEDEN

Ligger:as 9

C'

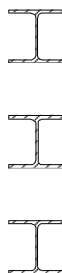
| sector | Vanaf | Tot   | Lengte | Profiel begin | z-begin | Profiel eind |
|--------|-------|-------|--------|---------------|---------|--------------|
| z-eind |       |       |        |               |         |              |
| 1      | 0.000 | 1.720 | 1.720  | 2:HEA140      | 0.000   | 2:HEA140     |
| 0.000  |       |       |        |               |         |              |
| sector | Vanaf | Tot   | Lengte | Eindcode      | Bedding | Br.[mm]      |
| 1      | 0.000 | 1.720 | 1.720  | 1:Vast        |         |              |

### PROFIELVORMEN [mm]

1 HEA240

2 HEA140

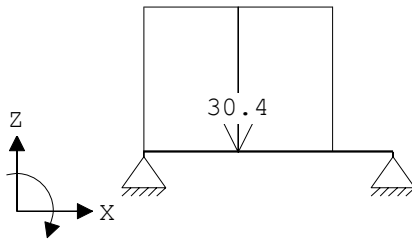
3 HEA220



### VELDBELASTINGEN

Ligger:as 9 C' B.G:1

Permanent



Project.....: Sgu021041 - Uitbreiding zwembad de Meerkamp te Amstelveen  
Onderdeel.....: entree liggers verdieping

## VELDBELASTINGEN

Ligger:as 9 C' B.G:1

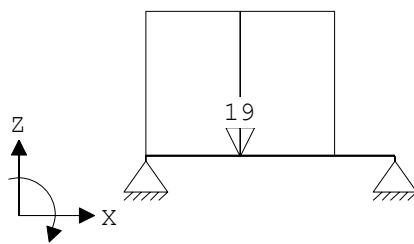
Permanent

| Last Ref. | Type     | Omschrijving | q1/p/m  | q2      | psi |
|-----------|----------|--------------|---------|---------|-----|
| Afstand   | Lengte   |              |         |         |     |
| 1         | 1:q-last |              | -30.400 | -30.400 |     |
| 0.000     | 1.300    |              |         |         |     |

## VELDBELASTINGEN

Ligger:as 9 C' B.G:2

Veranderlijk



## VELDBELASTINGEN

Ligger:as 9 C' B.G:2

Veranderlijk

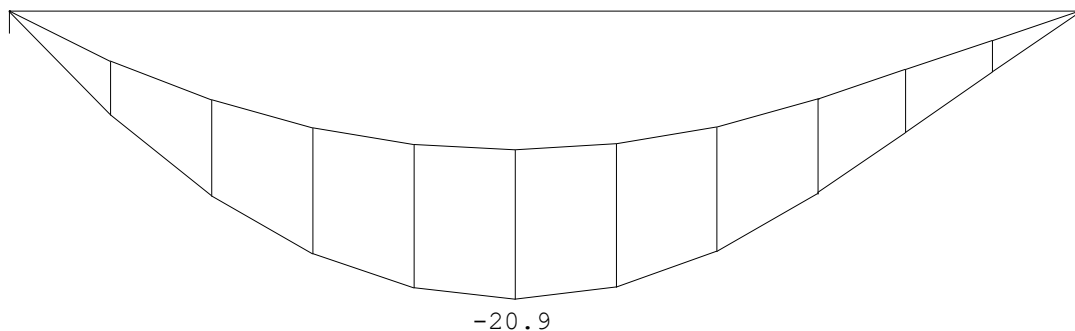
| Last Ref. | Type     | Omschrijving | q1/p/m  | q2      | psi |
|-----------|----------|--------------|---------|---------|-----|
| Afstand   | Lengte   |              |         |         |     |
| 1         | 1:q-last |              | -19.000 | -19.000 |     |
| 0.000     | 1.300    |              |         |         |     |

## OMHULLENDE VAN DE FUNDAMENTELE COMBINATIES

### MOMENTEN

Ligger:as 9 C' Fundamentele

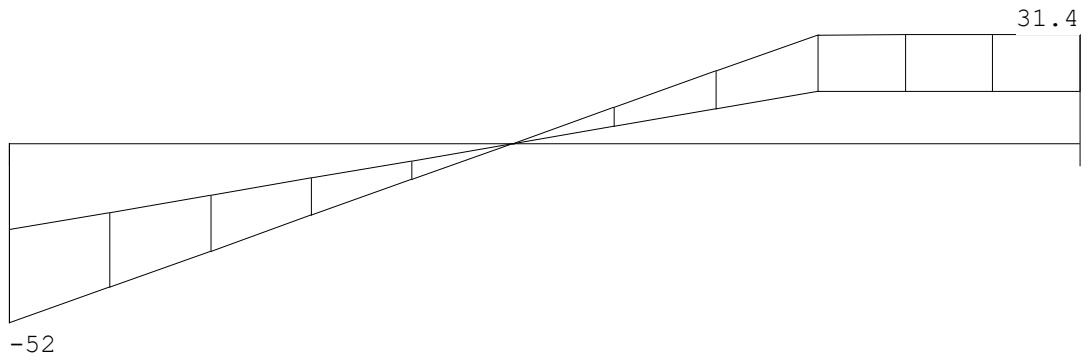
combinatie



### DWARSKRACHTEN

Ligger:as 9 C' Fundamentele

combinatie



Fmin:24.8  
Fmax:52

15.1  
31.4



Project.....: Sgu021041 - Uitbreiding zwembad de Meerkamp te Amstelveen  
Onderdeel.....: entree liggers verdieping

## REACTIES

Ligger:as 9 C' Fundamentele

combinatie

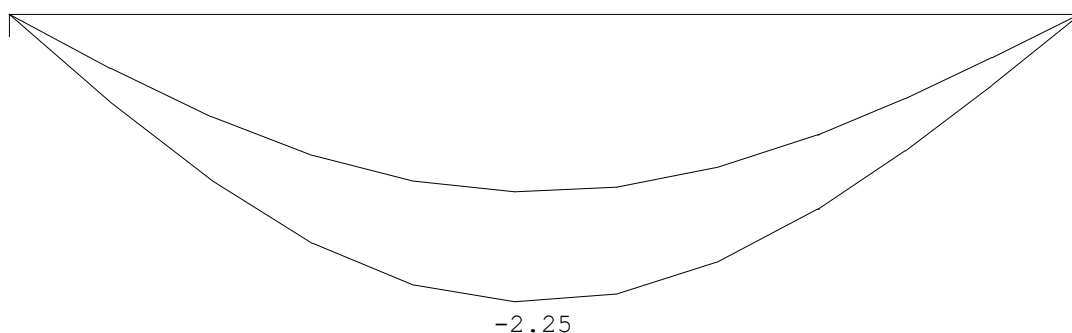
| Stp | Fmin  | Fmax  | Mmin | Mmax |
|-----|-------|-------|------|------|
| 1   | 24.80 | 51.57 | 0.00 | 0.00 |
| 2   | 15.15 | 31.42 | 0.00 | 0.00 |

## OMHULLENDE VAN DE KARAKTERISTIEKE COMBINATIES

### VERPLAATSINGEN [mm]

Ligger:as 9 C' Karakteristieke

combinatie



## KIPSTABILITEIT

Ligger:as 9

C'

| Staaft | Plts.<br>aanr. | l gaffel | Kipsteunafstanden |
|--------|----------------|----------|-------------------|
|        |                | [m]      | [m]               |
| 1      | 1.0*h          | boven:   | 1.72 1.720        |
|        |                | onder:   | 1.72 1.720        |

## TOETSING SPANNINGEN

Ligger:as 9

C'

Staaft P/M BC Sit Kl Plaats Norm Artikel Formule Hoogste toetsing  
Opm.

| nr. | U.C. [N/mm <sup>2</sup> ] |
|-----|---------------------------|
| 1   | 0.512 120                 |

46,156

Opmerkingen:

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

[156] In afwijking van de ingestelde norm is het elastisch kipmoment M<sub>cr</sub>

berekend volgens de Nederlandse Nationale Bijlage.

## TOETSING DOORBUIGING

Ligger:as

9 C'

Staaft Soort Mtg Lengte Overst Zeeg u<sub>t o t</sub> BC Sit u  
Toelaatbaar

|    | [m]      | I    | J | [mm] | [mm] | [mm] | [mm]               |
|----|----------|------|---|------|------|------|--------------------|
| *1 |          |      |   |      |      |      |                    |
| 1  | Vloer db | 1.72 | N | N    | 0.0  | -2.3 | 7 1 Eind -2.3 ±3.4 |



0.002

db

0.002

7 1 Bijk -0.9 ±3.4

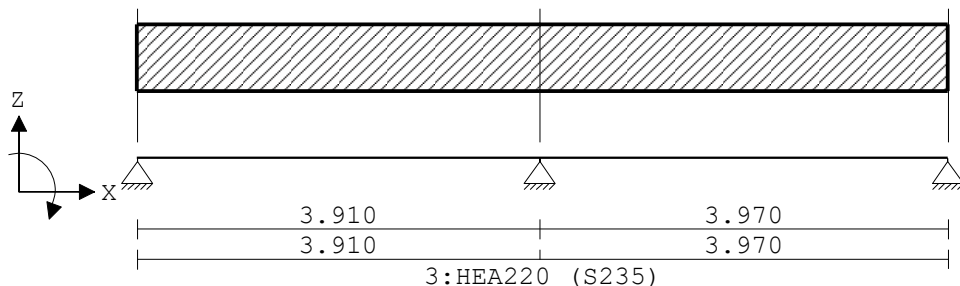
Project.....: Sgu021041 - Uitbreiding zwembad de Meerkamp te Amstelveen  
Onderdeel.....: entree liggers verdieping

## LIGGER:as 7' B'-C'

### GEOMETRIE

Ligger:as 7'

B'-C'



### VELDLENGTEN

Ligger:as 7'

B'-C'

| Veld | Vanaf | Tot   | Lengte |
|------|-------|-------|--------|
| 1    | 0.000 | 3.910 | 3.910  |
| 2    | 3.910 | 7.880 | 3.970  |

### DOORSNEDEN

Ligger:as 7'

B'-C'

| sector | Vanaf | Tot   | Lengte | Profiel begin | z-begin | Profiel eind |
|--------|-------|-------|--------|---------------|---------|--------------|
| z-eind |       |       |        |               |         |              |
| 1      | 0.000 | 3.910 | 3.910  | 3:HEA220      | 0.000   | 3:HEA220     |
| 0.000  |       |       |        |               |         |              |
| 2      | 3.910 | 7.880 | 3.970  | 3:HEA220      | 0.000   | 3:HEA220     |
| 0.000  |       |       |        |               |         |              |
| sector | Vanaf | Tot   | Lengte | Eindcode      | Bedding | Br. [mm]     |
| 1      | 0.000 | 3.910 | 3.910  | 1:Vast        |         |              |
| 2      | 3.910 | 7.880 | 3.970  | 1:Vast        |         |              |

### PROFIELVORMEN [mm]

1 HEA240



2 HEA140



3 HEA220

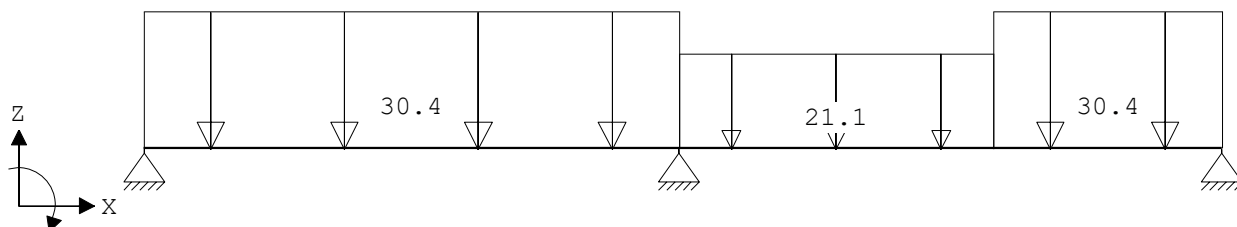


Project.....: Sgu021041 - Uitbreiding zwembad de Meerkamp te Amstelveen  
Onderdeel.....: entree liggers verdieping

## VELDBELASTINGEN

Ligger:as 7' B'-C' B.G:1

Permanent



## VELDBELASTINGEN

Ligger:as 7' B'-C' B.G:1

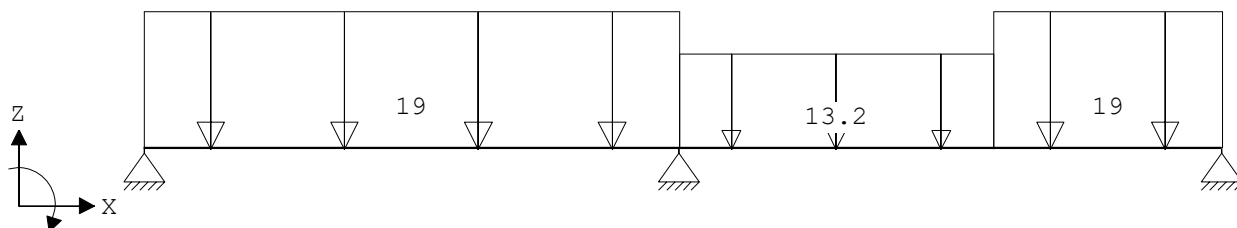
Permanent

| Last Ref. | Type     | Omschrijving | q1/p/m  | q2      | psi |
|-----------|----------|--------------|---------|---------|-----|
| Afstand   | Lengte   |              |         |         |     |
| 1         | 1:q-last |              | -30.400 | -30.400 |     |
| 0.000     | 3.910    |              |         |         |     |
| 2         | 1:q-last |              | -21.100 | -21.100 |     |
| 3.910     | 2.300    |              |         |         |     |
| 3         | 1:q-last |              | -30.400 | -30.400 |     |
| 6.210     | 1.670    |              |         |         |     |

## VELDBELASTINGEN

Ligger:as 7' B'-C' B.G:2

Veranderlijk



## VELDBELASTINGEN

Ligger:as 7' B'-C' B.G:2

Veranderlijk

| Last Ref. | Type     | Omschrijving | q1/p/m  | q2      | psi |
|-----------|----------|--------------|---------|---------|-----|
| Afstand   | Lengte   |              |         |         |     |
| 1         | 1:q-last |              | -19.000 | -19.000 |     |
| 0.000     | 3.910    |              |         |         |     |
| 2         | 1:q-last |              | -13.200 | -13.200 |     |
| 3.910     | 2.300    |              |         |         |     |
| 3         | 1:q-last |              | -19.000 | -19.000 |     |
| 6.210     | 1.670    |              |         |         |     |

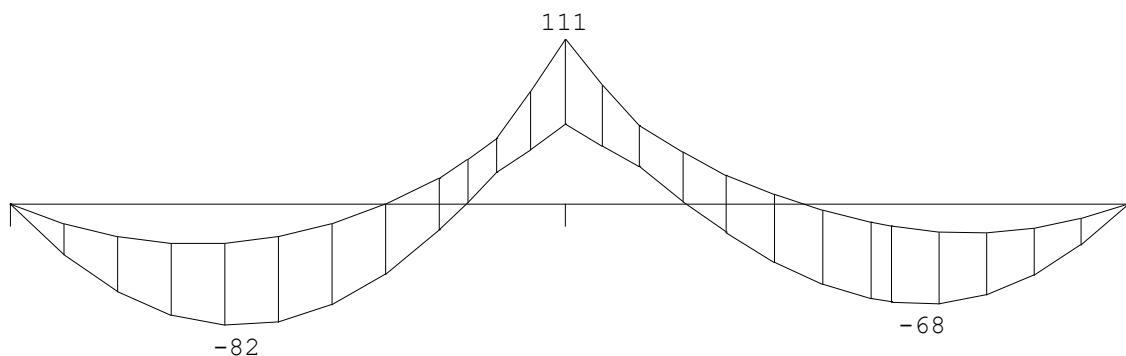
Project.....: Sgu021041 - Uitbreiding zwembad de Meerkamp te Amstelveen  
Onderdeel.....: entree liggers verdieping

## OMHULLENDE VAN DE FUNDAMENTELE COMBINATIES

### MOMENTEN

Ligger:as 7' B'-C' Fundamentele

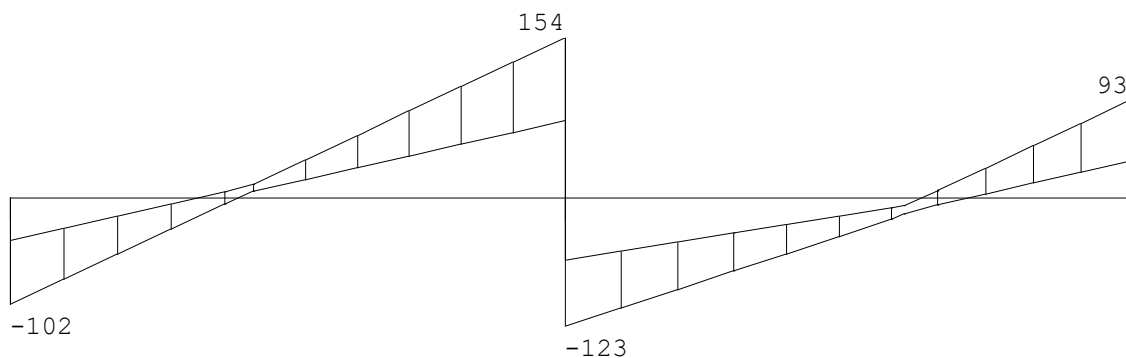
combinatie



### DWARSKRACHTEN

Ligger:as 7' B'-C' Fundamentele

combinatie



Fmin:40.9  
Fmax:102

134  
277

34.8  
93

### REACTIES

Ligger:as 7' B'-C' Fundamentele

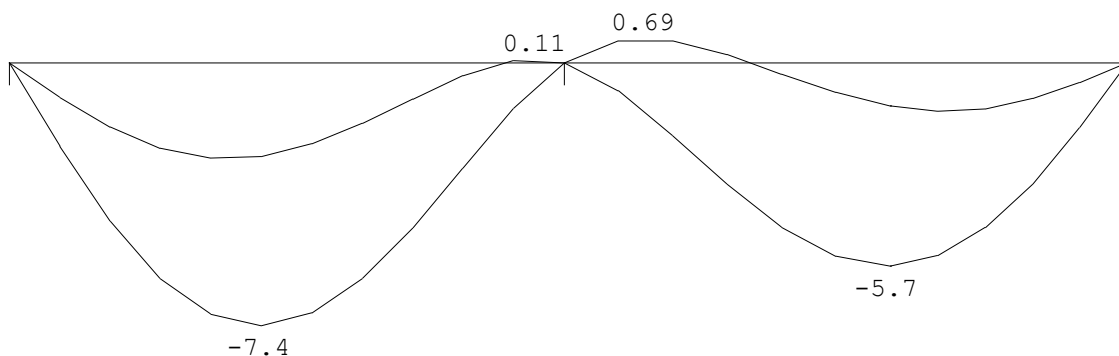
combinatie

| Stp | Fmin   | Fmax   | Mmin | Mmax |
|-----|--------|--------|------|------|
| 1   | 40.94  | 102.49 | 0.00 | 0.00 |
| 2   | 133.84 | 277.11 | 0.00 | 0.00 |
| 3   | 34.81  | 92.98  | 0.00 | 0.00 |

Project.....: Sgu021041 - Uitbreiding zwembad de Meerkamp te Amstelveen  
Onderdeel.....: entree liggers verdieping

## OMHULLENDE VAN DE KARAKTERISTIEKE COMBINATIES

**VERPLAATSINGEN** [mm] Ligger:as 7' B'-C' Karakteristieke combinatie



## KIPSTABILITEIT

Ligger:as 7'

B'-C'

| Staafl | Plts.<br>aanr. | l gaffel         | Kipsteunafstanden                |
|--------|----------------|------------------|----------------------------------|
|        |                | [m]              | [m]                              |
| 1      | 1.0*h          | boven:<br>onder: | 3.91 2*1,303;1,304<br>3.91 3.910 |
| 2      | 1.0*h          | boven:<br>onder: | 3.97 2*1,323;1,324<br>3.97 3.970 |

## TOETSING SPANNINGEN

Ligger:as 7'

B'-C'

Staafl P/M BC Sit Kl Plaats Norm Artikel Formule Hoogste toetsing  
Opm.

| nr.    |   |   |   |   |        |         |       |        | U.C. [N/mm <sup>2</sup> ] |
|--------|---|---|---|---|--------|---------|-------|--------|---------------------------|
| 1      | 3 | 3 | 1 | 1 | Einde  | EN3-1-1 | 6.2.8 | (6.30) | 0.834 196                 |
| 156    |   |   |   |   |        |         |       |        |                           |
| 2      | 3 | 3 | 1 | 1 | Staafl | EN3-1-1 | 6.3.2 | (6.54) | 0.857 201                 |
| 46,156 |   |   |   |   |        |         |       |        |                           |

Opmerkingen:

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

[156] In afwijking van de ingestelde norm is het elastisch kippmoment  $M_{cr}$

berekend volgens de Nederlandse Nationale Bijlage.

## TOETSING DOORBUIGING

Ligger:as 7'

B'-C'

Staafl Soort Mtg Lengte Overst Zeeg  $u_{tot}$  BC Sit  
Toelaatbaar

|       |       |    |  | [m]  | I | J | [mm] | [mm] |   |   | [mm] | [mm]      |
|-------|-------|----|--|------|---|---|------|------|---|---|------|-----------|
| *1    |       |    |  |      |   |   |      |      |   |   |      |           |
| 1     | Vloer | db |  | 3.91 | N | N | 0.0  | -7.4 | 7 | 2 | Eind | -7.4 ±7.8 |
| 0.002 |       |    |  |      |   |   |      |      |   |   |      |           |
|       |       | db |  |      |   |   |      |      | 7 | 2 | Bijk | -3.6 ±7.8 |



|       |       |    |      |   |   |     |      |   |   |      |      |      |
|-------|-------|----|------|---|---|-----|------|---|---|------|------|------|
| 0.002 |       |    |      |   |   |     |      |   |   |      |      |      |
| 2     | Vloer | db | 3.97 | N | N | 0.0 | -5.7 | 7 | 3 | Eind | -5.7 | ±7.9 |
| 0.002 |       |    |      |   |   |     |      |   |   |      |      |      |
|       |       | db |      |   |   |     |      | 7 | 3 | Bijk | -3.1 | ±7.9 |
| 0.002 |       |    |      |   |   |     |      |   |   |      |      |      |

## Bijlage W Uitvoer entree kolommen

**Technosoft Raamwerken release 6.75b**  
**2023**

**26 jan**

Project.....: SGU021041 - Uitbreiding zwembad de Meerkant te Amstelveen  
Onderdeel.....: Entree kolom  
Dimensies.....: kN;m;rad (tenzij anders aangegeven)  
Datum.....: 16/11/2022  
Bestand.....: H:\SGU021041\BEREKENINGEN\04\_DO\Entree kolom.rww

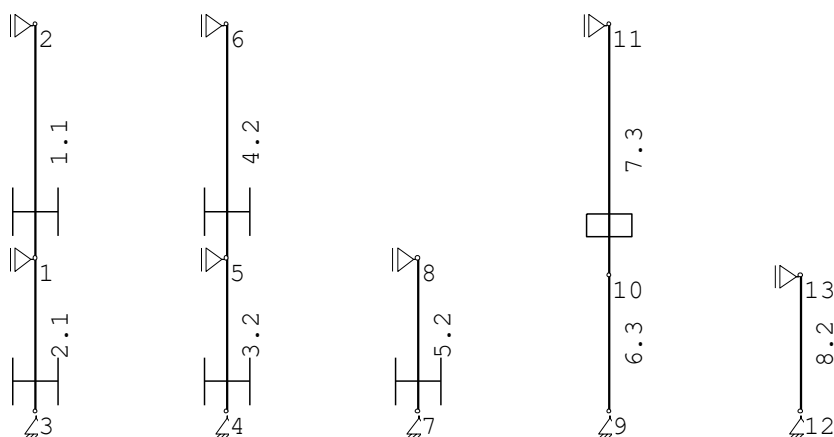
Belastingbreedte.: 6.350  
Rekenmodel.....: 1e-orde-elastisch.  
Theorie voor de bepaling van de krachtsverdeling:  
Geometrisch lineair.  
Fysisch lineair.

Gunstige werking van de permanente belasting wordt automatisch verwerkt.

## Toegepaste normen volgens Eurocode met Nederlandse NB

|             |                      |                 |
|-------------|----------------------|-----------------|
| Belastingen | NEN-EN 1990:2002     | C2:2010,A1:2019 |
| NB:2019(nl) |                      |                 |
|             | NEN-EN 1991-1-1:2002 | C1/C11:2019     |
| NB:2019(nl) |                      |                 |
|             | NEN-EN 1991-1-4:2005 | C2:2011         |
| NB:2011(nl) |                      |                 |
| Staal       | NEN-EN 1993-1-1:2006 | C2:2011,A1:2016 |
| NB:2016(nl) |                      |                 |

## GEOMETRIE



## MATERIALEN

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



## PROFIELEN [mm]

| Prof. Omschrijving<br>Traagheid Vormf. | Materiaal | Oppervlak  |
|----------------------------------------|-----------|------------|
| 1 HEA160<br>1.6730e+07 0.00            | 1:S235    | 3.8800e+03 |
| 2 HEA140<br>1.0330e+07 0.00            | 1:S235    | 3.1420e+03 |
| 3 K400/200/12.5CF<br>2.7100e+08 0.00   | 1:S235    | 1.3704e+04 |

Project.....: SGU021041 - Uitbreiding zwembad de Meerkant te Amstelveen  
Onderdeel.....: Entree kolom

### PROFIELEN vervolg [mm]

| Prof. | Staaftype | Breedte | Hoogte | e     | Type | b1 | h1 | b2 |
|-------|-----------|---------|--------|-------|------|----|----|----|
| h2    |           |         |        |       |      |    |    |    |
| 1     | 0:Normaal | 160     | 152    | 76.0  |      |    |    |    |
| 2     | 0:Normaal | 140     | 133    | 66.5  |      |    |    |    |
| 3     | 0:Normaal | 200     | 400    | 200.0 |      |    |    |    |

### PROFIELVORMEN [mm]

|   |                 |                                                                                    |
|---|-----------------|------------------------------------------------------------------------------------|
| 1 | HEA160          |   |
| 2 | HEA140          |   |
| 3 | K400/200/12.5CF |  |

### KNOPEN

| Knoop | X      | Z      | Knoop | X      | Z      |
|-------|--------|--------|-------|--------|--------|
| 1     | 0.000  | 4.000  | 6     | 5.000  | 10.110 |
| 2     | 0.000  | 10.110 | 7     | 10.000 | 0.000  |
| 3     | 0.000  | 0.000  | 8     | 10.000 | 4.000  |
| 4     | 5.000  | 0.000  | 9     | 15.000 | 0.000  |
| 5     | 5.000  | 4.000  | 10    | 15.000 | 3.550  |
| 11    | 15.000 | 10.110 |       |        |        |
| 12    | 20.000 | 0.000  |       |        |        |
| 13    | 20.000 | 3.550  |       |        |        |

### STAVEN

| St.    | ki   | kj | Profiel           | Aansl.i | Aansl.j |
|--------|------|----|-------------------|---------|---------|
| Lengte | Opm. |    |                   |         |         |
| 1      | 1    | 2  | 1:HEA160          | NDM     | NDM     |
| 6.110  |      |    |                   |         |         |
| 2      | 3    | 1  | 1:HEA160          | NDM     | NDM     |
| 4.000  |      |    |                   |         |         |
| 3      | 4    | 5  | 2:HEA140          | NDM     | NDM     |
| 4.000  |      |    |                   |         |         |
| 4      | 5    | 6  | 2:HEA140          | NDM     | NDM     |
| 6.110  |      |    |                   |         |         |
| 5      | 7    | 8  | 2:HEA140          | NDM     | NDM     |
| 4.000  |      |    |                   |         |         |
| 6      | 9    | 10 | 3:K400/200/12.5CF | NDM     | NDM     |
| 3.550  |      |    |                   |         |         |
| 7      | 10   | 11 | 3:K400/200/12.5CF | NDM     | NDM     |
| 6.560  |      |    |                   |         |         |



8 12 13 2:HEA140  
3.550

NDM

NDM



Project.....: SGU021041 - Uitbreiding zwembad de Meerkant te Amstelveen  
Onderdeel.....: Entree kolom

### VASTE STEUNPUNTEN

| Nr. | knoop | Kode | XZR | 1=vast | 0=vrij | Hoek |
|-----|-------|------|-----|--------|--------|------|
| 1   | 1     | 100  |     |        |        | 0.00 |
| 2   | 2     | 100  |     |        |        | 0.00 |
| 3   | 3     | 110  |     |        |        | 0.00 |
| 4   | 4     | 110  |     |        |        | 0.00 |
| 5   | 5     | 100  |     |        |        | 0.00 |
| 6   | 6     | 100  |     |        |        | 0.00 |
| 7   | 7     | 110  |     |        |        | 0.00 |
| 8   | 8     | 100  |     |        |        | 0.00 |
| 9   | 9     | 110  |     |        |        | 0.00 |
| 10  | 11    | 100  |     |        |        | 0.00 |
| 11  | 12    | 110  |     |        |        | 0.00 |
| 12  | 13    | 100  |     |        |        | 0.00 |

### BELASTINGGENERATIE ALGEMEEN.

|                              |       |                         |       |
|------------------------------|-------|-------------------------|-------|
| Betrouwbaarheidsklasse.....: | 2     | Referentieperiode.....: | 50    |
| Gebouwdiepte.....:           | 34.45 | Gebouwhoogte.....:      | 10.11 |
| Niveau aansl.terrein.....:   | 0.00  | E.g. scheid.w. [kN/m2]: | 1.20  |

### WIND

|                                    |                                |
|------------------------------------|--------------------------------|
| Terrein categorie ...[4.3.2]....:  | Onbebouwd                      |
| Windgebied .....                   | 2 Vb,0 ..[4.2].....:           |
| 27.000                             |                                |
| Positie spant in het gebouw.....:  | 0.000 Kr ....[4.3.2].....:     |
| 0.209                              |                                |
| z0 .....[4.3.2]....:               | 0.200 Zmin ..[4.3.2].....:     |
| 4.000                              |                                |
| Co wind van links ..[4.3.3]....:   | 1.000 Co wind van rechts.....: |
| 1.000                              |                                |
| Co wind loodrecht ..[4.3.3]....:   | 1.000                          |
| Cpi wind van links ..[7.2.9]....:  | 0.200 -0.300                   |
| Cpi windloodrecht ...[7.2.9]....:  | 0.200 -0.300                   |
| Cpi wind van rechts ..[7.2.9]....: | 0.200 -0.300                   |
| Cfr windwrijving ....[7.5].....:   | 0.040                          |

### STAFTYPEN

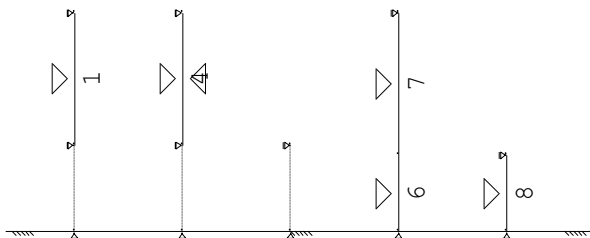
| Type                          | staven  |
|-------------------------------|---------|
| 2:Vloer (overstek buiten) ..: | 4       |
| 4:Wand / kolom.               | : 2,3,5 |
| 5:Linker gevel.               | : 1,6-8 |

Project.....: SGU021041 - Uitbreiding zwembad de Meerkant te Amstelveen  
Onderdeel.....: Entree kolom

## LASTVELDEN

Wind staven

Sneeuw staven



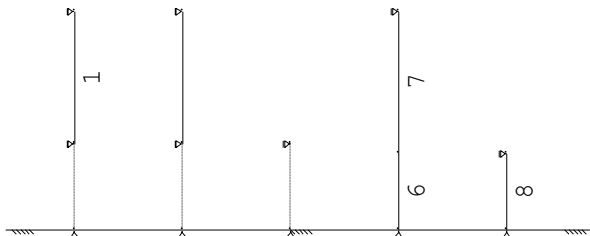
## WIND DAKTYPES

| Nr.          | Staaftype | reductie bij<br>wind van links | reductie bij<br>wind van rechts | Cpe   |
|--------------|-----------|--------------------------------|---------------------------------|-------|
| volgens art: |           |                                |                                 |       |
| 1            | 1 Gevel   | 1.000                          | 1.000                           | 7.2.2 |
| 2            | 6-7 Gevel | 1.000                          | 1.000                           | 7.2.2 |
| 3            | 8 Gevel   | 1.000                          | 1.000                           | 7.2.2 |

## WIND ZONES

Wind van links

Wind van rechts



## WIND VAN LINKS ZONES

| Nr. | Staaftype | Positie | Lengte | Zone |
|-----|-----------|---------|--------|------|
| 1   | 1         | 0.000   | 6.110  | D    |
| 2   | 6-7       | 0.000   | 10.110 | D    |
| 3   | 8         | 0.000   | 3.550  | D    |

## Wind indexen

| Index    | CsCd | Cpe/Cpi | qp    | breedte | reductie | Qw     | Zone |
|----------|------|---------|-------|---------|----------|--------|------|
| Hoek(en) |      |         |       |         |          |        |      |
| Qw1      |      | 0.300   | 0.853 | 6.350   |          | -1.625 | -i   |
| Qw2      | 1.00 | 0.800   | 0.853 | 6.350   |          | -4.332 | D    |
| Qw3      |      | -0.200  | 0.853 | 6.350   |          | 1.083  | +i   |

Project.....: SGU021041 - Uitbreiding zwembad de Meerkant te Amstelveen  
Onderdeel.....: Entree kolom

## BELASTINGGEVALLEN

| B.G.              | Omschrijving                 | EGZ       | Type                  |
|-------------------|------------------------------|-----------|-----------------------|
| 1                 | Permanente belasting         | EGZ=-1.00 | 1                     |
| 2                 | Veranderlijke belasting      |           | 2 Ver. bel. pers. ed. |
| (q <sub>k</sub> ) |                              |           |                       |
| g                 | 3 Wind van links onderdruk A |           | 7                     |
| g                 | 4 Wind van links overdruk A  |           | 8                     |
|                   | 5 Wind druk onderdruk A      |           | 11 Wind van rechts    |
|                   | 6 Wind trek overdruk A       |           | 12 Wind van rechts    |
|                   | 7 Sneeuw                     |           | 22 Sneeuw A           |
|                   | 8 Knik                       |           | 0 Onbekend            |

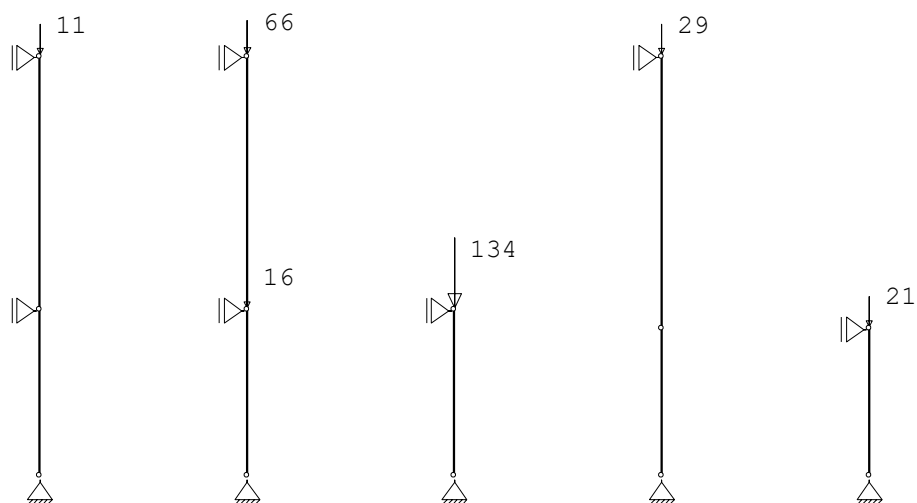
g = gegenereerd belastinggeval

## BELASTINGEN

B.G:1 Permanente

belasting

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



## KNOOPBELASTINGEN

B.G:1 Permanente

belasting

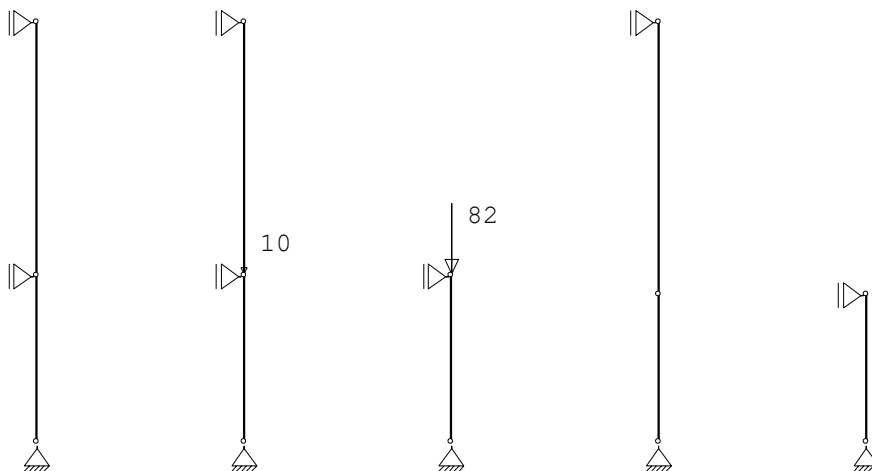
| Last | Knoop | Richting | waarde   | $\psi_0$ | $\psi_1$ | $\psi_2$ |
|------|-------|----------|----------|----------|----------|----------|
| 1    | 2     | Z        | -11.000  |          |          |          |
| 2    | 6     | Z        | -66.000  |          |          |          |
| 3    | 5     | Z        | -16.000  |          |          |          |
| 4    | 8     | Z        | -134.000 |          |          |          |
| 5    | 11    | Z        | -29.000  |          |          |          |
| 6    | 13    | Z        | -21.000  |          |          |          |

Project.....: SGU021041 - Uitbreiding zwembad de Meerkant te Amstelveen  
Onderdeel.....: Entree kolom

## BELASTINGEN

B.G:2 Veranderlijke

belasting



## KNOOPBELASTINGEN

B.G:2 Veranderlijke

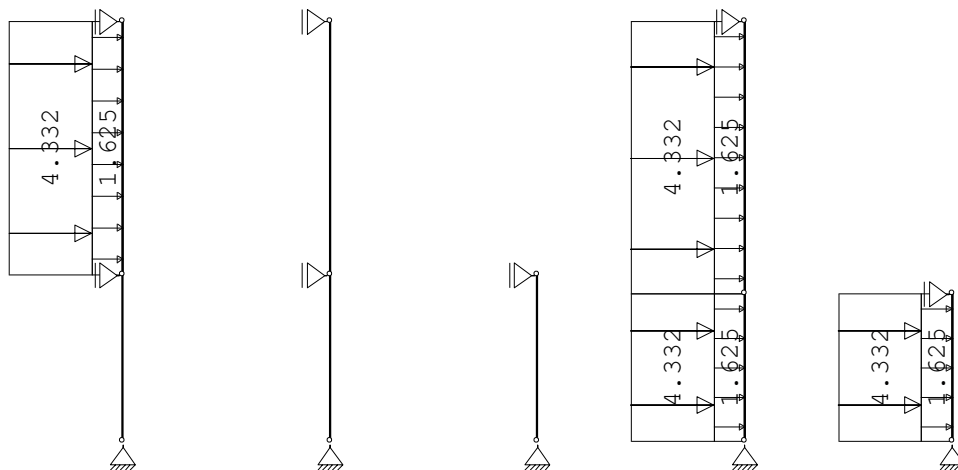
belasting

| Last | Knoop | Richting | waarde  | $\psi_0$ | $\psi_1$ | $\psi_2$ |
|------|-------|----------|---------|----------|----------|----------|
| 1    | 5     | Z        | -10.000 | 0.40     | 0.70     | 0.60     |
| 2    | 8     | Z        | -82.000 | 0.40     | 0.70     | 0.60     |

## BELASTINGEN

B.G:3 Wind van links

onderdruk A



## STAAFBELASTINGEN

B.G:3 Wind van links

onderdruk A

| Staat    | Type       | Index | $q_1/p/m$ | $q_2$ | A     | B     | $\psi_0$ |
|----------|------------|-------|-----------|-------|-------|-------|----------|
| $\psi_1$ | $\psi_2$   |       |           |       |       |       |          |
| 1        | 1:QZLokaal | Qw1   | -1.62     | -1.62 | 0.000 | 0.000 | 0.00     |
| 0.20     | 0.00       |       |           |       |       |       |          |



|      |            |     |       |       |       |       |      |
|------|------------|-----|-------|-------|-------|-------|------|
| 6    | 1:QZLokaal | Qw1 | -1.62 | -1.62 | 0.000 | 0.000 | 0.00 |
| 0.20 | 0.00       |     |       |       |       |       |      |
| 7    | 1:QZLokaal | Qw1 | -1.62 | -1.62 | 0.000 | 0.000 | 0.00 |
| 0.20 | 0.00       |     |       |       |       |       |      |
| 8    | 1:QZLokaal | Qw1 | -1.62 | -1.62 | 0.000 | 0.000 | 0.00 |
| 0.20 | 0.00       |     |       |       |       |       |      |
| 1    | 1:QZLokaal | Qw2 | -4.33 | -4.33 | 0.000 | 0.000 | 0.00 |
| 0.20 | 0.00       |     |       |       |       |       |      |

Project.....: SGU021041 - Uitbreiding zwembad de Meerkant te Amstelveen  
Onderdeel.....: Entree kolom

## STAAFBELASTINGEN

B.G:3 Wind van links

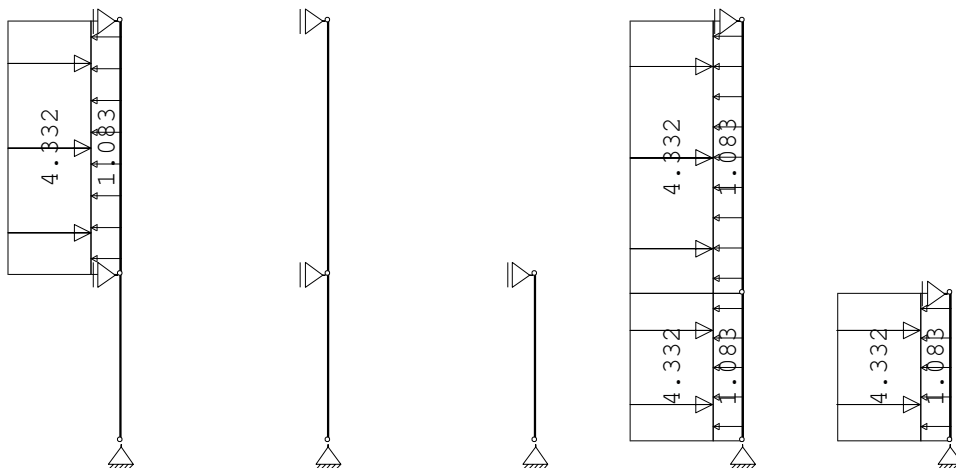
onderdruk A

| Staaf    | Type       | Index | q1/p/m | q2    | A     | B     | $\psi_0$ |
|----------|------------|-------|--------|-------|-------|-------|----------|
| $\psi_1$ | $\psi_2$   |       |        |       |       |       |          |
| 6        | 1:QZLokaal | Qw2   | -4.33  | -4.33 | 0.000 | 0.000 | 0.00     |
| 0.20     | 0.00       |       |        |       |       |       |          |
| 7        | 1:QZLokaal | Qw2   | -4.33  | -4.33 | 0.000 | 0.000 | 0.00     |
| 0.20     | 0.00       |       |        |       |       |       |          |
| 8        | 1:QZLokaal | Qw2   | -4.33  | -4.33 | 0.000 | 0.000 | 0.00     |
| 0.20     | 0.00       |       |        |       |       |       |          |

## BELASTINGEN

B.G:4 Wind van links

overdruk A



## STAAFBELASTINGEN

B.G:4 Wind van links

overdruk A

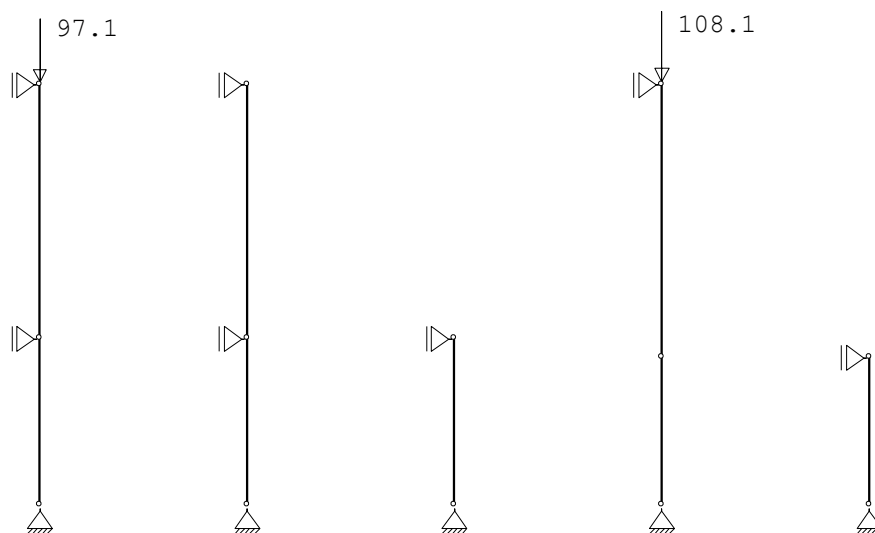
| Staaf    | Type       | Index | q1/p/m | q2    | A     | B     | $\psi_0$ |
|----------|------------|-------|--------|-------|-------|-------|----------|
| $\psi_1$ | $\psi_2$   |       |        |       |       |       |          |
| 1        | 1:QZLokaal | Qw3   | 1.08   | 1.08  | 0.000 | 0.000 | 0.00     |
| 0.20     | 0.00       |       |        |       |       |       |          |
| 6        | 1:QZLokaal | Qw3   | 1.08   | 1.08  | 0.000 | 0.000 | 0.00     |
| 0.20     | 0.00       |       |        |       |       |       |          |
| 7        | 1:QZLokaal | Qw3   | 1.08   | 1.08  | 0.000 | 0.000 | 0.00     |
| 0.20     | 0.00       |       |        |       |       |       |          |
| 8        | 1:QZLokaal | Qw3   | 1.08   | 1.08  | 0.000 | 0.000 | 0.00     |
| 0.20     | 0.00       |       |        |       |       |       |          |
| 1        | 1:QZLokaal | Qw2   | -4.33  | -4.33 | 0.000 | 0.000 | 0.00     |
| 0.20     | 0.00       |       |        |       |       |       |          |
| 6        | 1:QZLokaal | Qw2   | -4.33  | -4.33 | 0.000 | 0.000 | 0.00     |
| 0.20     | 0.00       |       |        |       |       |       |          |
| 7        | 1:QZLokaal | Qw2   | -4.33  | -4.33 | 0.000 | 0.000 | 0.00     |
| 0.20     | 0.00       |       |        |       |       |       |          |
| 8        | 1:QZLokaal | Qw2   | -4.33  | -4.33 | 0.000 | 0.000 | 0.00     |
| 0.20     | 0.00       |       |        |       |       |       |          |

Project.....: SGU021041 - Uitbreiding zwembad de Meerkant te Amstelveen  
Onderdeel.....: Entree kolom

## BELASTINGEN

B.G:5 Wind

druk



## KNOOPBELASTINGEN

B.G:5 Wind

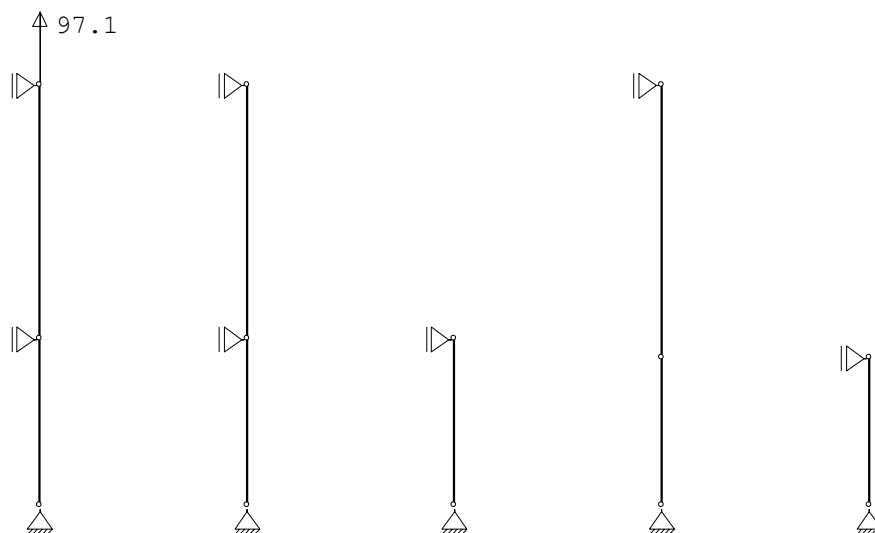
druk

| Last | Knoop | Richting | waarde   | $\psi_0$ | $\psi_1$ | $\psi_2$ |
|------|-------|----------|----------|----------|----------|----------|
| 1    | 2     | Z        | -97.100  | 0.00     | 0.20     | 0.00     |
| 2    | 11    | Z        | -108.100 | 0.00     | 0.20     | 0.00     |

## BELASTINGEN

B.G:6 Wind

trek



Project.....: SGU021041 - Uitbreiding zwembad de Meerkant te Amstelveen  
Onderdeel.....: Entree kolom

## KNOOPBELASTINGEN

B.G:6 Wind

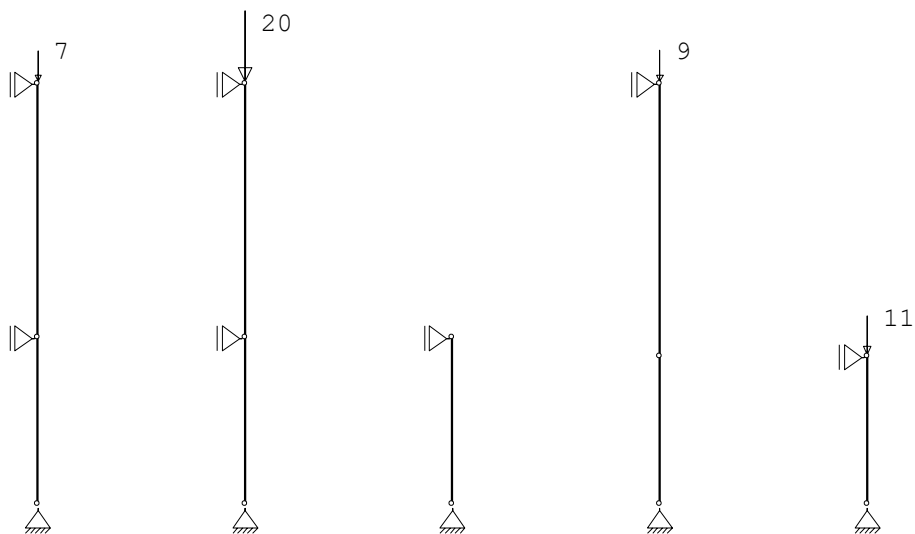
trek

| Last | Knoop | Richting | waarde | $\psi_0$ | $\psi_1$ | $\psi_2$ |
|------|-------|----------|--------|----------|----------|----------|
| 1    | 2     | Z        | 97.100 | 0.00     | 0.20     | 0.00     |

## BELASTINGEN

B.G:7

Sneeuw



## KNOOPBELASTINGEN

B.G:7

Sneeuw

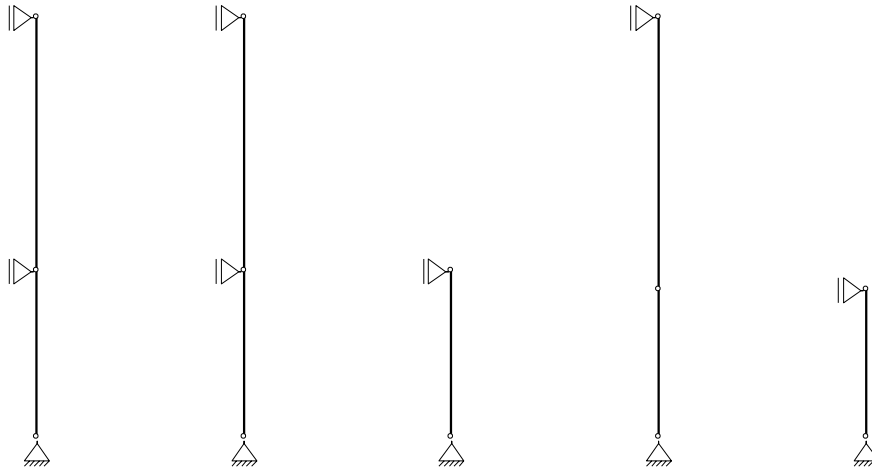
| Last | Knoop | Richting | waarde  | $\psi_0$ | $\psi_1$ | $\psi_2$ |
|------|-------|----------|---------|----------|----------|----------|
| 1    | 2     | Z        | -7.000  | 0.00     | 0.20     | 0.00     |
| 2    | 6     | Z        | -20.000 | 0.00     | 0.20     | 0.00     |
| 3    | 11    | Z        | -9.000  | 0.00     | 0.20     | 0.00     |
| 4    | 13    | Z        | -11.000 | 0.00     | 0.20     | 0.00     |

Project.....: SGU021041 - Uitbreiding zwembad de Meerkant te  
Amstelveen  
Onderdeel.....: Entree kolom

## BELASTINGEN

B.G:8

Knik



## REACTIES

| Kn. | B.G. | X      | Z      | M |
|-----|------|--------|--------|---|
| 1   | 1    | 0.00   |        |   |
| 1   | 2    | 0.00   |        |   |
| 1   | 3    | -25.15 |        |   |
| 1   | 4    | -13.72 |        |   |
| 1   | 5    | 0.00   |        |   |
| 1   | 6    | 0.00   |        |   |
| 1   | 7    | 0.00   |        |   |
| 1   | 8    | 0.00   |        |   |
| 2   | 1    | 0.00   |        |   |
| 2   | 2    | 0.00   |        |   |
| 2   | 3    | -15.45 |        |   |
| 2   | 4    | -8.43  |        |   |
| 2   | 5    | 0.00   |        |   |
| 2   | 6    | 0.00   |        |   |
| 2   | 7    | 0.00   |        |   |
| 2   | 8    | 0.00   |        |   |
| 3   | 1    | 0.00   | 14.08  |   |
| 3   | 2    | 0.00   | 0.00   |   |
| 3   | 3    | 4.20   | 0.00   |   |
| 3   | 4    | 2.29   | 0.00   |   |
| 3   | 5    | 0.00   | 97.10  |   |
| 3   | 6    | 0.00   | -97.10 |   |
| 3   | 7    | 0.00   | 7.00   |   |
| 3   | 8    | 0.00   | 0.00   |   |



Project.....: SGU021041 - Uitbreiding zwembad de Meerkant te  
Amstelveen  
Onderdeel.....: Entree kolom

## REACTIES

| Kn. | B.G. | X    | Z      | M |
|-----|------|------|--------|---|
| 4   | 1    | 0.00 | 84.49  |   |
| 4   | 2    | 0.00 | 10.00  |   |
| 4   | 3    | 0.00 | 0.00   |   |
| 4   | 4    | 0.00 | 0.00   |   |
| 4   | 5    | 0.00 | 0.00   |   |
| 4   | 6    | 0.00 | 0.00   |   |
| 4   | 7    | 0.00 | 20.00  |   |
| 4   | 8    | 0.00 | 0.00   |   |
| 5   | 1    | 0.00 |        |   |
| 5   | 2    | 0.00 |        |   |
| 5   | 3    | 0.00 |        |   |
| 5   | 4    | 0.00 |        |   |
| 5   | 5    | 0.00 |        |   |
| 5   | 6    | 0.00 |        |   |
| 5   | 7    | 0.00 |        |   |
| 5   | 8    | 0.00 |        |   |
| 6   | 1    | 0.00 |        |   |
| 6   | 2    | 0.00 |        |   |
| 6   | 3    | 0.00 |        |   |
| 6   | 4    | 0.00 |        |   |
| 6   | 5    | 0.00 |        |   |
| 6   | 6    | 0.00 |        |   |
| 6   | 7    | 0.00 |        |   |
| 6   | 8    | 0.00 |        |   |
| 7   | 1    | 0.00 | 134.99 |   |
| 7   | 2    | 0.00 | 82.00  |   |
| 7   | 3    | 0.00 | 0.00   |   |
| 7   | 4    | 0.00 | 0.00   |   |
| 7   | 5    | 0.00 | 0.00   |   |
| 7   | 6    | 0.00 | 0.00   |   |
| 7   | 7    | 0.00 | 0.00   |   |
| 7   | 8    | 0.00 | 0.00   |   |
| 8   | 1    | 0.00 |        |   |
| 8   | 2    | 0.00 |        |   |
| 8   | 3    | 0.00 |        |   |
| 8   | 4    | 0.00 |        |   |
| 8   | 5    | 0.00 |        |   |
| 8   | 6    | 0.00 |        |   |
| 8   | 7    | 0.00 |        |   |
| 8   | 8    | 0.00 |        |   |



Project.....: SGU021041 - Uitbreiding zwembad de Meerkant te Amstelveen  
Onderdeel.....: Entree kolom

## REACTIES

| Kn. | B.G. | X      | Z      | M |
|-----|------|--------|--------|---|
| 9   | 1    | 0.00   | 39.88  |   |
| 9   | 2    | 0.00   | 0.00   |   |
| 9   | 3    | -30.11 | 0.00   |   |
| 9   | 4    | -16.42 | 0.00   |   |
| 9   | 5    | 0.00   | 108.10 |   |
| 9   | 6    | 0.00   | 0.00   |   |
| 9   | 7    | 0.00   | 9.00   |   |
| 9   | 8    | 0.00   | 0.00   |   |
|     |      |        |        |   |
| 11  | 1    | 0.00   |        |   |
| 11  | 2    | 0.00   |        |   |
| 11  | 3    | -30.11 |        |   |
| 11  | 4    | -16.42 |        |   |
| 11  | 5    | 0.00   |        |   |
| 11  | 6    | 0.00   |        |   |
| 11  | 7    | 0.00   |        |   |
| 11  | 8    | 0.00   |        |   |
|     |      |        |        |   |
| 12  | 1    | 0.00   | 21.88  |   |
| 12  | 2    | 0.00   | 0.00   |   |
| 12  | 3    | -10.57 | 0.00   |   |
| 12  | 4    | -5.77  | 0.00   |   |
| 12  | 5    | 0.00   | 0.00   |   |
| 12  | 6    | 0.00   | 0.00   |   |
| 12  | 7    | 0.00   | 11.00  |   |
| 12  | 8    | 0.00   | 0.00   |   |
|     |      |        |        |   |
| 13  | 1    | 0.00   |        |   |
| 13  | 2    | 0.00   |        |   |
| 13  | 3    | -10.57 |        |   |
| 13  | 4    | -5.77  |        |   |
| 13  | 5    | 0.00   |        |   |
| 13  | 6    | 0.00   |        |   |
| 13  | 7    | 0.00   |        |   |
| 13  | 8    | 0.00   |        |   |

## BELASTINGCOMBINATIES

| BC | Type  |      |           |                         |
|----|-------|------|-----------|-------------------------|
| 1  | Fund. | 1.35 | $G_{k,1}$ |                         |
| 2  | Fund. | 0.90 | $G_{k,1}$ |                         |
| 3  | Fund. | 1.35 | $G_{k,1}$ | + 1.50 $\psi_0 Q_{k,2}$ |
| 4  | Fund. | 1.20 | $G_{k,1}$ | + 1.50 $Q_{k,2}$        |
| 5  | Fund. | 1.20 | $G_{k,1}$ | + 1.50 $Q_{k,3}$        |
|    |       |      |           |                         |
| 6  | Fund. | 1.20 | $G_{k,1}$ | + 1.50 $Q_{k,4}$        |
| 7  | Fund. | 1.20 | $G_{k,1}$ | + 1.50 $Q_{k,5}$        |
| 8  | Fund. | 1.20 | $G_{k,1}$ | + 1.50 $Q_{k,6}$        |
| 9  | Fund. | 1.20 | $G_{k,1}$ | + 1.50 $Q_{k,7}$        |



Project.....: SGU021041 - Uitbreiding zwembad de Meerkant te Amstelveen  
Onderdeel.....: Entree kolom

## BELASTINGCOMBINATIES

| BC Type  |      |           |   |      |          |           |   |      |                  |
|----------|------|-----------|---|------|----------|-----------|---|------|------------------|
| 10 Fund. | 0.90 | $G_{k,1}$ | + | 1.50 | $\psi_0$ | $Q_{k,2}$ |   |      |                  |
| 11 Fund. | 0.90 | $G_{k,1}$ | + | 1.50 |          | $Q_{k,2}$ |   |      |                  |
| 12 Fund. | 0.90 | $G_{k,1}$ | + | 1.50 |          | $Q_{k,3}$ |   |      |                  |
| 13 Fund. | 0.90 | $G_{k,1}$ | + | 1.50 |          | $Q_{k,4}$ |   |      |                  |
| 14 Fund. | 0.90 | $G_{k,1}$ | + | 1.50 |          | $Q_{k,5}$ |   |      |                  |
| 15 Fund. | 0.90 | $G_{k,1}$ | + | 1.50 |          | $Q_{k,6}$ |   |      |                  |
| 16 Fund. | 0.90 | $G_{k,1}$ | + | 1.50 |          | $Q_{k,7}$ |   |      |                  |
| 17 Fund. | 1.20 | $G_{k,1}$ | + | 1.50 |          | $Q_{k,3}$ | + | 1.50 | $\psi_0 Q_{k,2}$ |
| 18 Fund. | 1.20 | $G_{k,1}$ | + | 1.50 |          | $Q_{k,4}$ | + | 1.50 | $\psi_0 Q_{k,2}$ |
| 19 Fund. | 1.20 | $G_{k,1}$ | + | 1.50 |          | $Q_{k,5}$ | + | 1.50 | $\psi_0 Q_{k,2}$ |
| 20 Fund. | 1.20 | $G_{k,1}$ | + | 1.50 |          | $Q_{k,6}$ | + | 1.50 | $\psi_0 Q_{k,2}$ |
| 21 Fund. | 1.20 | $G_{k,1}$ | + | 1.50 |          | $Q_{k,7}$ | + | 1.50 | $\psi_0 Q_{k,2}$ |
| 22 Fund. | 0.90 | $G_{k,1}$ | + | 1.50 |          | $Q_{k,3}$ | + | 1.50 | $\psi_0 Q_{k,2}$ |
| 23 Fund. | 0.90 | $G_{k,1}$ | + | 1.50 |          | $Q_{k,4}$ | + | 1.50 | $\psi_0 Q_{k,2}$ |
| 24 Fund. | 0.90 | $G_{k,1}$ | + | 1.50 |          | $Q_{k,5}$ | + | 1.50 | $\psi_0 Q_{k,2}$ |
| 25 Fund. | 0.90 | $G_{k,1}$ | + | 1.50 |          | $Q_{k,6}$ | + | 1.50 | $\psi_0 Q_{k,2}$ |
| 26 Fund. | 0.90 | $G_{k,1}$ | + | 1.50 |          | $Q_{k,7}$ | + | 1.50 | $\psi_0 Q_{k,2}$ |
| 27 Kar.  | 1.00 | $G_{k,1}$ | + | 1.00 |          | $Q_{k,2}$ |   |      |                  |
| 28 Kar.  | 1.00 | $G_{k,1}$ | + | 1.00 |          | $Q_{k,3}$ |   |      |                  |
| 29 Kar.  | 1.00 | $G_{k,1}$ | + | 1.00 |          | $Q_{k,4}$ |   |      |                  |
| 30 Kar.  | 1.00 | $G_{k,1}$ | + | 1.00 |          | $Q_{k,5}$ |   |      |                  |
| 31 Kar.  | 1.00 | $G_{k,1}$ | + | 1.00 |          | $Q_{k,6}$ |   |      |                  |
| 32 Kar.  | 1.00 | $G_{k,1}$ | + | 1.00 |          | $Q_{k,7}$ |   |      |                  |
| 33 Kar.  | 1.00 | $G_{k,1}$ | + | 1.00 |          | $Q_{k,3}$ | + | 1.00 | $\psi_0 Q_{k,2}$ |
| 34 Kar.  | 1.00 | $G_{k,1}$ | + | 1.00 |          | $Q_{k,4}$ | + | 1.00 | $\psi_0 Q_{k,2}$ |
| 35 Kar.  | 1.00 | $G_{k,1}$ | + | 1.00 |          | $Q_{k,5}$ | + | 1.00 | $\psi_0 Q_{k,2}$ |
| 36 Kar.  | 1.00 | $G_{k,1}$ | + | 1.00 |          | $Q_{k,6}$ | + | 1.00 | $\psi_0 Q_{k,2}$ |
| 37 Kar.  | 1.00 | $G_{k,1}$ | + | 1.00 |          | $Q_{k,7}$ | + | 1.00 | $\psi_0 Q_{k,2}$ |
| 38 Quas. | 1.00 | $G_{k,1}$ |   |      |          |           |   |      |                  |
| 39 Quas. | 1.00 | $G_{k,1}$ | + | 1.00 | $\psi_2$ | $Q_{k,2}$ |   |      |                  |
| 40 Freq. | 1.00 | $G_{k,1}$ |   |      |          |           |   |      |                  |
| 41 Freq. | 1.00 | $G_{k,1}$ | + | 1.00 | $\psi_1$ | $Q_{k,2}$ |   |      |                  |
| 42 Freq. | 1.00 | $G_{k,1}$ | + | 1.00 | $\psi_1$ | $Q_{k,3}$ |   |      |                  |
| 43 Freq. | 1.00 | $G_{k,1}$ | + | 1.00 | $\psi_1$ | $Q_{k,4}$ |   |      |                  |
| 44 Freq. | 1.00 | $G_{k,1}$ | + | 1.00 | $\psi_1$ | $Q_{k,5}$ |   |      |                  |
| 45 Freq. | 1.00 | $G_{k,1}$ | + | 1.00 | $\psi_1$ | $Q_{k,6}$ |   |      |                  |
| 46 Freq. | 1.00 | $G_{k,1}$ | + | 1.00 | $\psi_1$ | $Q_{k,7}$ |   |      |                  |
| 47 Freq. | 1.00 | $G_{k,1}$ | + | 1.00 | $\psi_1$ | $Q_{k,3}$ | + | 1.00 | $\psi_2 Q_{k,2}$ |
| 48 Freq. | 1.00 | $G_{k,1}$ | + | 1.00 | $\psi_1$ | $Q_{k,4}$ | + | 1.00 | $\psi_2 Q_{k,2}$ |



Project.....: SGU021041 - Uitbreiding zwembad de Meerkant te  
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Onderdeel.....: Entree kolom

## BELASTINGCOMBINATIES

| BC Type  |      |           |   |      |          |           |   |      |                    |
|----------|------|-----------|---|------|----------|-----------|---|------|--------------------|
| 49 Freq. | 1.00 | $G_{k,1}$ | + | 1.00 | $\psi_1$ | $Q_{k,5}$ | + | 1.00 | $\psi_2$ $Q_{k,2}$ |
| 50 Freq. | 1.00 | $G_{k,1}$ | + | 1.00 | $\psi_1$ | $Q_{k,6}$ | + | 1.00 | $\psi_2$ $Q_{k,2}$ |
| 51 Freq. | 1.00 | $G_{k,1}$ | + | 1.00 | $\psi_1$ | $Q_{k,7}$ | + | 1.00 | $\psi_2$ $Q_{k,2}$ |
| 52 Blij. | 1.00 | $G_{k,1}$ |   |      |          |           |   |      |                    |

## GUNSTIGE WERKING PERMANENTE BELASTINGEN

| BC Staven met gunstige werking |                            |
|--------------------------------|----------------------------|
| 1                              | Geen                       |
| 2                              | Alle staven de factor:0.90 |
| 3                              | Geen                       |
| 4                              | Geen                       |
| 5                              | Geen                       |
| 6                              | Geen                       |
| 7                              | Geen                       |
| 8                              | Geen                       |
| 9                              | Geen                       |
| 10                             | Alle staven de factor:0.90 |
| 11                             | Alle staven de factor:0.90 |
| 12                             | Alle staven de factor:0.90 |
| 13                             | Alle staven de factor:0.90 |
| 14                             | Alle staven de factor:0.90 |
| 15                             | Alle staven de factor:0.90 |
| 16                             | Alle staven de factor:0.90 |
| 17                             | Geen                       |
| 18                             | Geen                       |
| 19                             | Geen                       |
| 20                             | Geen                       |
| 21                             | Geen                       |
| 22                             | Alle staven de factor:0.90 |
| 23                             | Alle staven de factor:0.90 |
| 24                             | Alle staven de factor:0.90 |
| 25                             | Alle staven de factor:0.90 |
| 26                             | Alle staven de factor:0.90 |

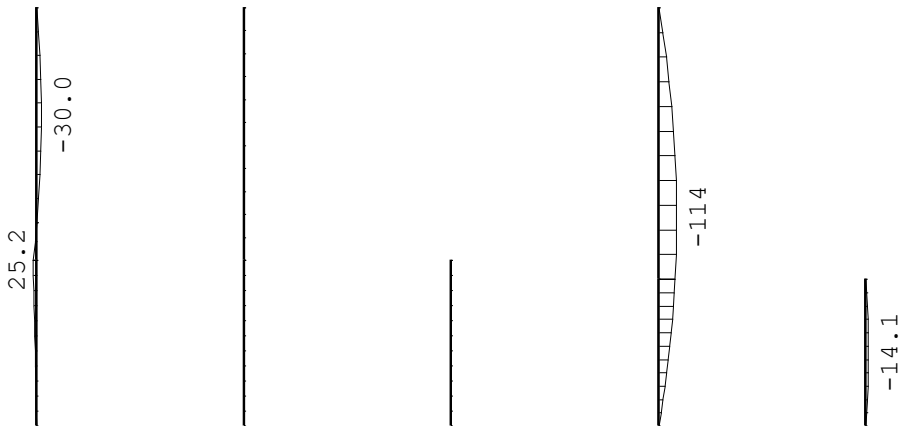


Project.....: SGU021041 - Uitbreiding zwembad de Meerkant te Amstelveen  
Onderdeel.....: Entree kolom

OMHULLENDE VAN DE FUNDAMENTELE COMBINATIES

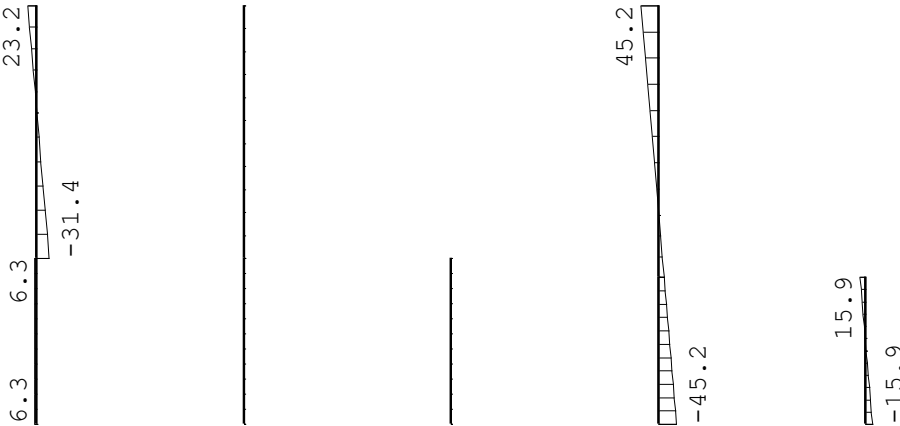
MOMENTEN  
combinatie

Fundamentele



DWARSKRACHTEN  
combinatie

Fundamentele



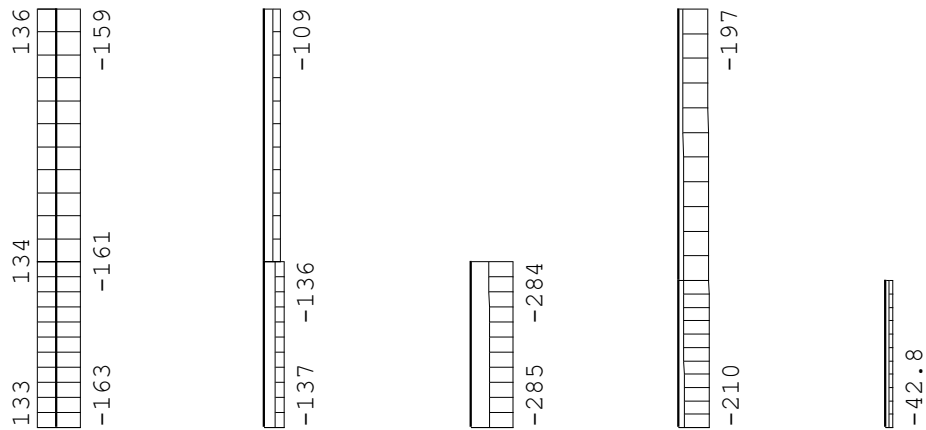


Project.....: SGU021041 - Uitbreiding zwembad de Meerkant te Amstelveen  
Onderdeel.....: Entree kolom

## NORMAALKRACHTEN

Fundamentele

combinatie



## REACTIES

Fundamentele

combinatie

| Kn.   | X-min  | X-max | Z-min   | Z-max  | M-min |
|-------|--------|-------|---------|--------|-------|
| M-max |        |       |         |        |       |
| 1     | -37.72 | 0.00  |         |        |       |
| 2     | -23.17 | 0.00  |         |        |       |
| 3     | 0.00   | 6.30  | -132.98 | 162.55 |       |
| 4     | 0.00   | 0.00  | 76.04   | 137.39 |       |
| 5     | 0.00   | 0.00  |         |        |       |
| 6     | 0.00   | 0.00  |         |        |       |
| 7     | 0.00   | 0.00  | 121.49  | 284.98 |       |
| 8     | 0.00   | 0.00  |         |        |       |
| 9     | -45.17 | 0.00  | 35.89   | 210.00 |       |
| 11    | -45.17 | 0.00  |         |        |       |
| 12    | -15.86 | 0.00  | 19.69   | 42.75  |       |
| 13    | -15.86 | 0.00  |         |        |       |

Project.....: SGU021041 - Uitbreiding zwembad de Meerkant te Amstelveen  
Onderdeel.....: Entree kolom

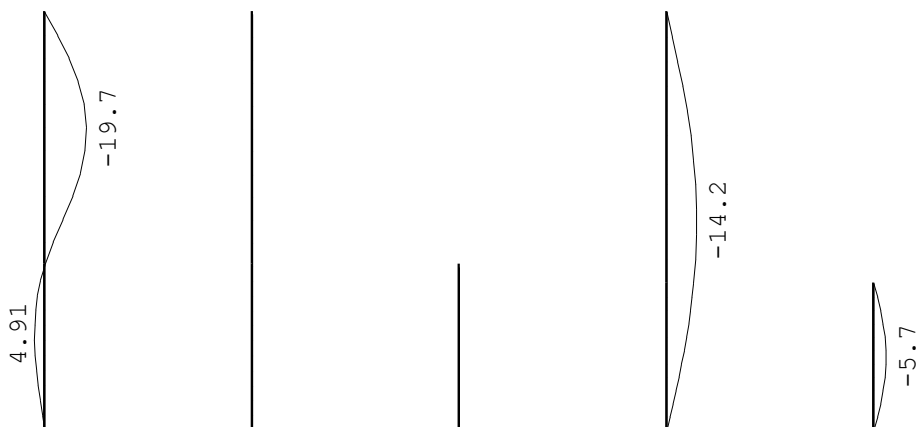
## OMHULLENDE VAN DE KARAKTERISTIEKE COMBINATIES

### VERPLAATSINGEN

[mm]

Karakteristieke

combinatie



## STAALPROFIELEN - ALGEMENE GEGEVENS

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

## PROFIEL/MATERIAAL

| P/M drsn.<br>nr.<br>klasse | Profielnaam | Vloeisp.<br>[N/mm <sup>2</sup> ] | Productie<br>methode | Min. |
|----------------------------|-------------|----------------------------------|----------------------|------|
|----------------------------|-------------|----------------------------------|----------------------|------|

|   |                 |     |             |  |
|---|-----------------|-----|-------------|--|
| 1 | HEA160          | 235 | Gewalst     |  |
| 1 |                 |     |             |  |
| 2 | HEA140          | 235 | Gewalst     |  |
| 1 |                 |     |             |  |
| 3 | K400/200/12.5CF | 235 | Koudgevormd |  |
| 1 |                 |     |             |  |

Partiële veiligheidsfactoren:

Gamma M;0 : 1.00 Gamma M;1 :

## KNIKSTABILITEIT

Extra

Extra

| Staaf<br>aanp. z | $l_{sys}$<br>[m] | Classif. y<br>sterke as | $l_{knik;y}$<br>[m] | aanp. y<br>[kN] | Classif. z<br>zwakke as | $l_{knik;z}$<br>[m] |
|------------------|------------------|-------------------------|---------------------|-----------------|-------------------------|---------------------|
|------------------|------------------|-------------------------|---------------------|-----------------|-------------------------|---------------------|



|            |                  |        |               |        |
|------------|------------------|--------|---------------|--------|
| 1<br>0.0   | 6.110 Geschoord  | 6.110  | 0.0 Geschoord | 6.110  |
| 2<br>0.0   | 4.000 Geschoord  | 4.000  | 0.0 Geschoord | 4.000  |
| 3<br>0.0   | 4.000 Geschoord  | 4.000  | 0.0 Geschoord | 4.000  |
| 4<br>0.0   | 6.110 Geschoord  | 6.110  | 0.0 Geschoord | 6.110  |
| 5<br>0.0   | 4.000 Geschoord  | 4.000  | 0.0 Geschoord | 4.000  |
| 6-7<br>0.0 | 10.110 Geschoord | 10.110 | 0.0 Geschoord | 6.620* |
| 8<br>0.0   | 3.550 Geschoord  | 3.550  | 0.0 Geschoord | 3.550  |

Project.....: SGU021041 - Uitbreiding zwembad de Meerkant te Amstelveen

Onderdeel.....: Entree kolom

\* Door gebruiker gedefinieerde kniklengte

## KIPSTABILITEIT

| Staafl | Plts.<br>aangr. |        | l gaffel<br>[m] | Kipsteunafstanden<br>[m] |
|--------|-----------------|--------|-----------------|--------------------------|
| 1      | 1.0*h           | boven: | 6.11            | 6,11                     |
|        |                 | onder: | 6.11            | 6,11                     |
| 2      | 1.0*h           | boven: | 4.00            | 4.000                    |
|        |                 | onder: | 4.00            | 4.000                    |
| 3      | 0.0*h           | boven: | 4.00            | 4.000                    |
|        |                 | onder: | 4.00            | 4.000                    |
| 4      | 1.0*h           | boven: | 6.11            | 6.110                    |
|        |                 | onder: | 6.11            | 6.110                    |
| 5      | 0.0*h           | boven: | 4.00            | 4.000                    |
|        |                 | onder: | 4.00            | 4.000                    |
| 6-7    | 1.0*h           | boven: | 10.11           | 10.110                   |
|        |                 | onder: | 10.11           | 10.110                   |
| 8      | 1.0*h           | boven: | 3.55            | 3.550                    |
|        |                 | onder: | 3.55            | 3.550                    |

## TOETSING SPANNINGEN

Staafl P/M BC Sit Kl Plaats Norm Artikel Formule Hoogste toetsing  
Opm.

| nr. |   |    |   |   |        |         |         |         | U.C. [N/mm <sup>2</sup> ] |
|-----|---|----|---|---|--------|---------|---------|---------|---------------------------|
| 1   | 1 | 5  | 1 | 1 | Staafl | EN3-1-1 | 6.3.3   | (6.62)  | 0.775 182                 |
| 47  |   |    |   |   |        |         |         |         |                           |
| 2   | 1 | 5  | 1 | 1 | Staafl | EN3-1-1 | 6.3.3   | (6.62)  | 0.470 110                 |
| 47  |   |    |   |   |        |         |         |         |                           |
| 3   | 2 | 21 | 1 | 1 | Staafl | EN3-1-1 | 6.3.1.1 | (6.46z) | 0.434 102                 |
| 47  |   |    |   |   |        |         |         |         |                           |
| 4   | 2 | 9  | 1 | 1 | Staafl | EN3-1-1 | 6.3.1.1 | (6.46z) | 0.671 158                 |
| 47  |   |    |   |   |        |         |         |         |                           |
| 5   | 2 | 4  | 1 | 1 | Staafl | EN3-1-1 | 6.3.1.1 | (6.46z) | 0.900 212                 |
| 47  |   |    |   |   |        |         |         |         |                           |
| 6-7 | 3 | 5  | 1 | 1 | Staafl | EN3-1-1 | 6.3.3   | (6.61)  | 0.294 69                  |
| 47  |   |    |   |   |        |         |         |         |                           |
| 8   | 2 | 5  | 1 | 1 | Staafl | EN3-1-1 | 6.3.3   | (6.62)  | 0.471 111                 |
| 47  |   |    |   |   |        |         |         |         |                           |

Opmerkingen:

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

## TOETSING HORIZONTALE VERPLAATSING

| Staafl | BC | Sit | Lengte<br>[m] | u <sub>e i n d</sub><br>[mm] | Toelaatbaar<br>[mm] | Maatgevend<br>[h/] |
|--------|----|-----|---------------|------------------------------|---------------------|--------------------|
| 1      | 28 | 1   | 6.110         | -19.7                        | 20.4                | 300 doorbuiging    |
| 2      | 28 | 1   | 4.000         | 4.9                          | 13.3                | 300 doorbuiging    |
| 3      | 27 | 1   | 4.000         | 0.0                          | 13.3                | 300 scheefstand    |
| 4      | 27 | 1   | 6.110         | 0.0                          | 20.4                | 300 scheefstand    |
| 5      | 27 | 1   | 4.000         | 0.0                          | 13.3                | 300 scheefstand    |



|     |    |   |        |       |      |                 |
|-----|----|---|--------|-------|------|-----------------|
| 6-7 | 28 | 1 | 10.110 | -14.2 | 33.7 | 300 doorbuiging |
| 8   | 28 | 1 | 3.550  | -5.7  | 11.8 | 300 doorbuiging |

#### **TOETSING HOR. VERPLAATSING GLOBAAL**

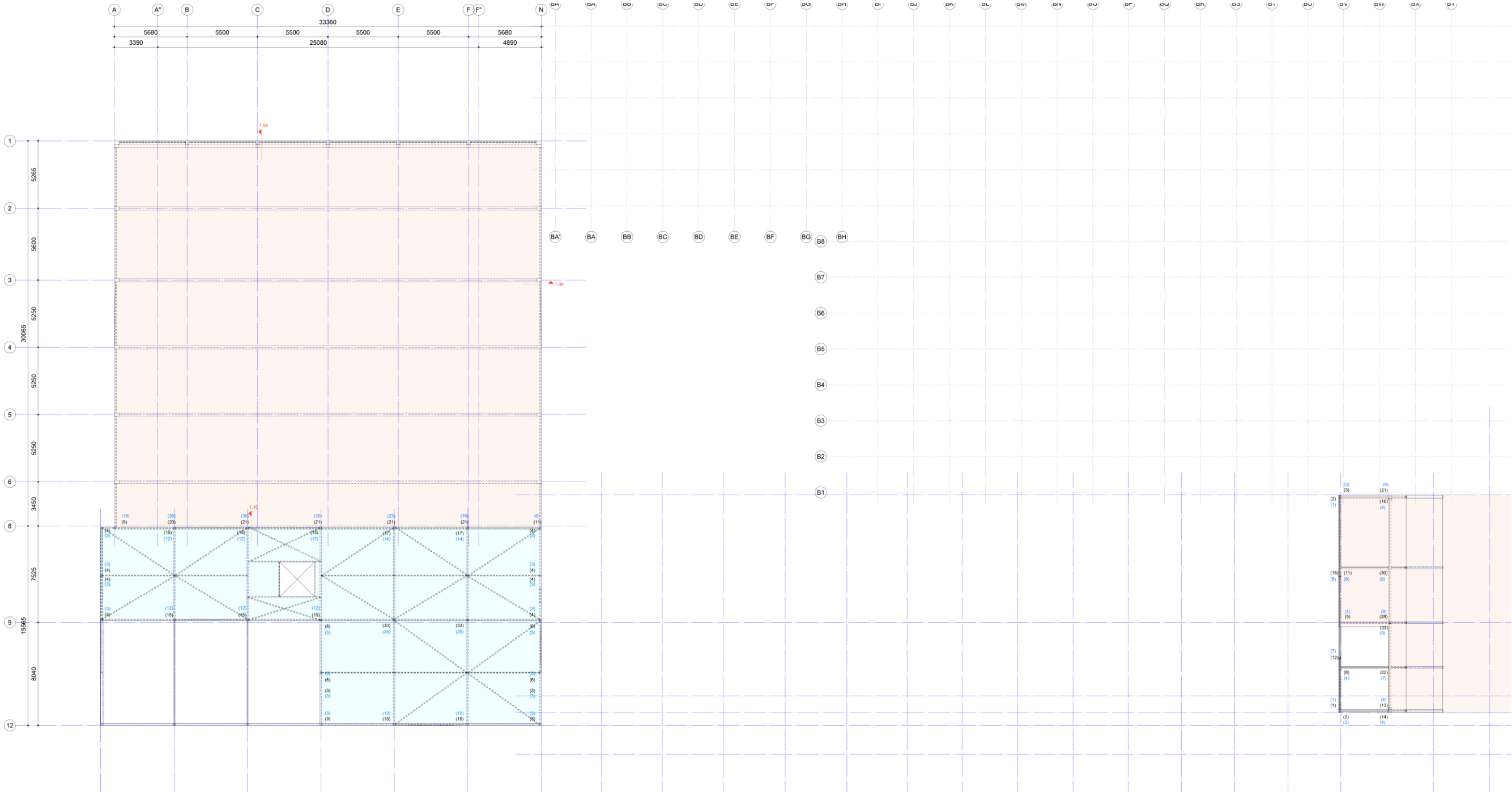
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Er is een maximale horizontale verplaatsing van 0.0127 [m] gevonden bij knoop 10 en combinatie 28; belastingsituatie 1 (combinatietype 2). Bij een hoogte van 3.550 [m] levert dit  $h / \underline{279}$  (toel.:  $h / 300$ ).



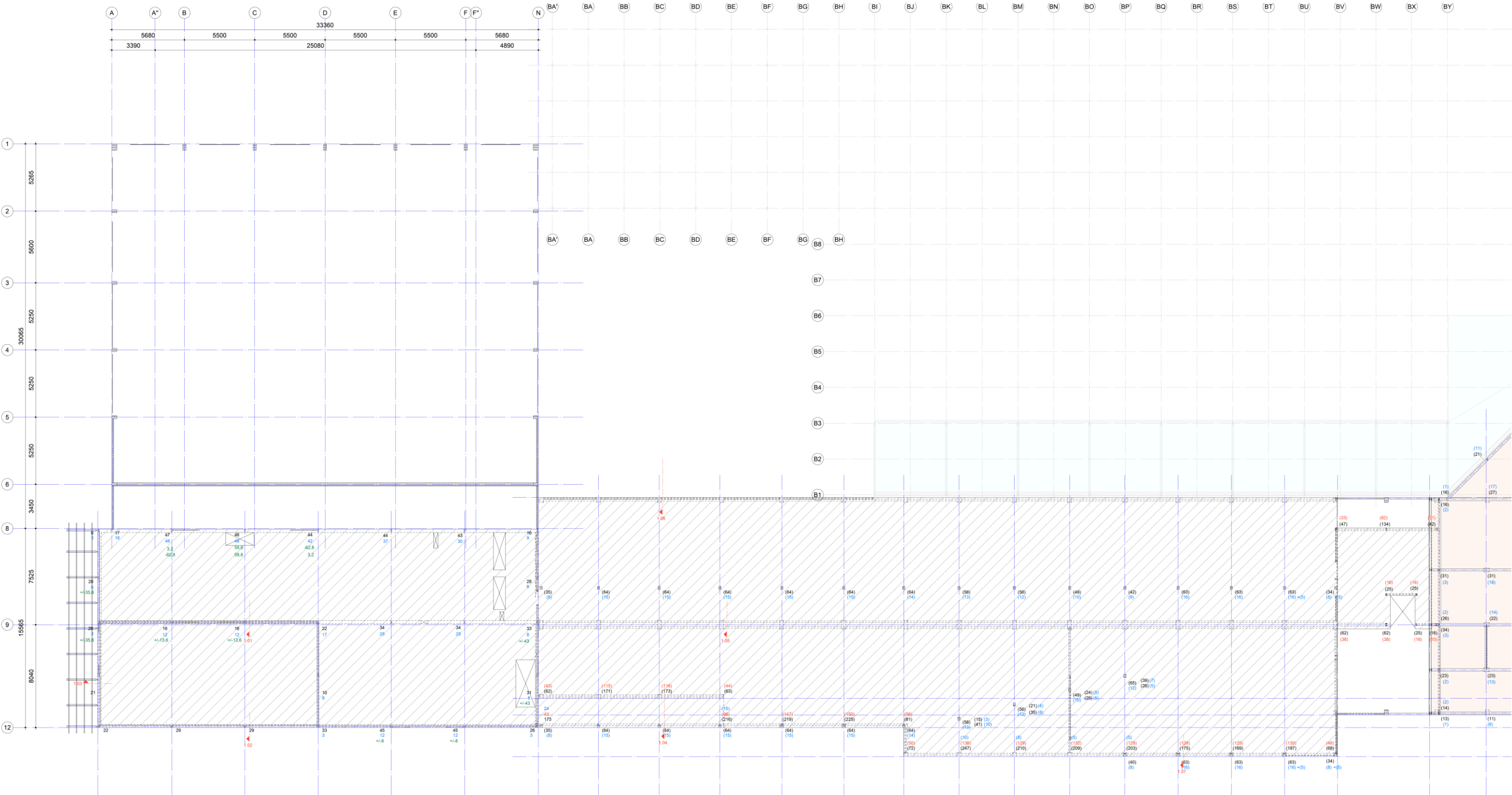
Bijlage X Kolomreacties

Dak





1<sup>E</sup> verdieping optie 1





1<sup>E</sup> verdieping optie 2

