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## Ingenieursbureau voor bouwtechniek

|                |                                                        |
|----------------|--------------------------------------------------------|
| Project:       | Nieuwbouw woning<br>Moleneind 7B<br>!241 NE Kortenhoef |
| Opdrachtgever: | Fam. M. Mur<br>Moleneind 13<br>1231 NG Kortenhoef      |
| Architect:     | Lars de Haan                                           |

### Onderwerp: Constructieberekening

|                |                                       |             |
|----------------|---------------------------------------|-------------|
| <b>Inhoud:</b> | Belastingen                           | Blad A1/3   |
|                | Paalbelastingen                       | Blad A4     |
|                | Palenplan                             | Blad A5     |
|                | Plattegrond fundering en verd. vloer  | Blad A6/7   |
|                | Doorsneden                            | Blad A8/9   |
|                | Berekening draagvermogen palen        | Blad A11    |
|                | Plattegrond + berek. fundatiebalken   | Blad B1/4   |
|                | Wapening fundatiebalken               | Blad B5/6   |
|                | Plattegrond + berek. verdiepingsvloer | Blad B11/12 |
|                | Tabel balk- en vloerwapening          | Blad B21/22 |
|                | Berek.verd.vloer tussen as A en B     | Blad B41/46 |
|                | Berek.verd.vloer tussen as A en B     | Blad B41/56 |
|                | Berekening stalen dakbalken           | Blad C1/2   |
|                | Berekening balklaag zoldervloer       | Blad D1/3   |

**Gevolgklasse:** CC1

**Belastingen:** var. Belasting 1,75 kN/m<sup>2</sup> volgens NEN-EN

**Materialen:**

|             |        |
|-------------|--------|
| Beton:      | C28/35 |
| Betonstaal: | B500A  |
| Staal       | S235   |

**Fundering:** op betonpalen, afm. 220x220,  
inheinniveau: 5,00 m +/- NAP (4,67 m +/- peil)

**Sonderingen:** nrs 1 en 2 Rapportnr 116243, Van Dijk

**Werknr:** 2016-1487

**Berekend:** Ir J.B. Aalberts

**Datum:** 19 december 2016

**Status:** definitief

**Belastingen volgens NEN-EN 1991-1****NEN-EN 1991-1**

|                    |                    |                                         |     |            |  |
|--------------------|--------------------|-----------------------------------------|-----|------------|--|
| Projectnr:         | 1487               | project Woning Moleneind 7a Kortenhoeve |     |            |  |
| onderdeel:         | Gewichtsberekening |                                         |     |            |  |
| Gevolgklasse:      | CC1                | Betrouwbaarheidskl.                     | RC1 | Kfi = 0,90 |  |
| Referentieperiode: | 50                 |                                         |     |            |  |

| Vloerdefinitie | soort      | beton | ps-isolatie | beton | hout | hout | hout | dakpan |
|----------------|------------|-------|-------------|-------|------|------|------|--------|
|                | dikte (mm) | 400   | 250         | 220   |      |      |      |        |
|                | kN/m2      | 10,00 | 2,80        | 5,50  | 0,35 | 0,35 | 0,36 | 0,65   |

| Algemene gegevens                    | kelder | beggr 1 | verd. 1 | verd. 2 | zolder | plat dak | sch.dak 2 | opm.:                                                    |
|--------------------------------------|--------|---------|---------|---------|--------|----------|-----------|----------------------------------------------------------|
| van toepassing? ja/nee, kies 1/0     | 1      | 1       | 1       | 0       | 1      | 0        | 1         | eh/za =<br>eenzijdig<br>hellend of<br>zadeldak           |
| Dakhelling in graden:                | ----   | ----    | ----    | ----    | 0,0    | 0,0      | 51,0      |                                                          |
| Vrije hoogte (zolder) h in m:        | ----   | ----    | ----    | ----    | 0,60   | za       | eh        |                                                          |
| yg1 normaal (1)                      | a      | 1,20    | 1,20    | 1,20    | 1,20   | 1,20     | 1,20      |                                                          |
| yg gunstig (1/2)                     |        | 0,90    | 0,90    | 0,90    | 0,90   | 0,90     | 0,90      |                                                          |
| yg veranderlijk (1)                  | b      | 1,50    | 1,50    | 1,50    | 1,50   | 1,50     | 1,50      |                                                          |
| yg2 combinatie (2)                   | c      | 1,35    | 1,35    | 1,35    | 1,35   | 1,35     | 1,35      |                                                          |
| yg/q bruikbaarheid (3/4/5)           |        | 1,00    | 1,00    | 1,00    | 1,00   | 1,00     | 1,00      |                                                          |
| KFI-factor                           | 0,90   | 0,90    | 0,90    | 0,90    | 0,90   | 0,90     | 0,90      | toegepast op<br>coeff. a;b;c                             |
| Correctiefactor ref. periode         | 1,00   | 1,00    | 1,00    | 1,00    | 1,00   | 1,00     | 1,00      |                                                          |
| yg1 normaal (1) 1,20 x KFI           | 1,08   | 1,08    | 1,08    | 1,08    | 1,08   | 1,08     | 1,08      | coëfficiënten<br>vlgs klasse<br>CC1<br>en ref.per.<br>50 |
| yg gunstig (1/2)                     | 0,90   | 0,90    | 0,90    | 0,90    | 0,90   | 0,90     | 0,90      |                                                          |
| yg veranderlijk (1) 1,50 x KFI x ref | 1,35   | 1,35    | 1,35    | 1,35    | 1,35   | 1,35     | 1,35      |                                                          |
| yg2 combinatie (2) 1,35 x KFI        | 1,22   | 1,22    | 1,22    | 1,22    | 1,22   | 1,22     | 1,22      |                                                          |
| yg/q bruikbaarheid (3/4/5)           | 1,00   | 1,00    | 1,00    | 1,00    | 1,00   | 1,00     | 1,00      |                                                          |

| Permanente belasting                    | kelder | beggr 1 | verd. 1 | ---  | zolder | ---      | sch.dak 2 |       |
|-----------------------------------------|--------|---------|---------|------|--------|----------|-----------|-------|
| E.G. constructie per m²                 | 10,00  | 2,80    | 5,50    | 0,35 | 0,35   | 0,36     | 0,65      | kN/m2 |
| Afwerklaag/grind/tegels/grond:          | 0,00   | 1,00    | 1,40    | 0,00 | 0,00   | 0,00     | ----      |       |
| Scheidingswanden:                       | 0,00   | 0,50    | 0,00    | 0,00 | ----   | ----     | ----      |       |
| Plafond:                                | 0,00   | 0,00    | 0,05    | 0,20 | 0,20   | 0,20     | 0,20      |       |
| Totaal per m² grondvlak: Gk =           | 10,00  | 4,30    | 6,95    | 0,00 | 0,55   | 0,00     | 1,34      |       |
| Veranderlijke belasting                 |        |         |         |      |        | personen | sneeuw    |       |
| Karakteristieke waarde: Qk =            | 1,75   | 1,75    | 1,75    | 1,75 | 0,70   | 1,00     | 0,17      | kN/m2 |
| combinatiefactor $\psi_0$ =             | 0,40   | 0,40    | 0,40    | 0,40 | 0,40   | 0,00     | 0,00      |       |
| Freq.waarde factor $\psi_1$ =           | 0,50   | 0,50    | 0,50    | 0,20 | 0,20   | 0,20     | 0,20      |       |
| Quasi blijv. Waarde $\psi_2$ =          | 0,30   | 0,30    | 0,30    | 0,00 | 0,00   | 0,00     | 0,00      |       |
| Combinatiewaarde: $\psi_0 \times Q_k$ = | 0,70   | 0,70    | 0,70    | 0,00 | 0,28   | 0,00     | 0,00      |       |
| Extreme waarde: Qk =                    | 1,75   | 1,75    | 1,75    | 1,75 | 0,70   | 1,00     | 0,17      |       |

| BELASTINGCOMBINATIES              | kelder | beggr 1 | verd. 1 | ---  | zolder | ---  | sch.dak 2 | opm.:                                 |
|-----------------------------------|--------|---------|---------|------|--------|------|-----------|---------------------------------------|
| Combinatiewaarde (verg 6.10)      | 0      | 0       | 0       | 0    | 1      | 1    | 1         | kN/m2 grvl                            |
| Blijvend 1,2 x Kfi x Gk           | 10,80  | 4,64    | 7,51    | 0,00 | 0,59   | 0,00 | 1,45      |                                       |
| Verand. 1,5 x Kfi x $\psi_0$ x Qk | 0,95   | 0,95    | 0,95    | 0,95 | 0,38   | 0,00 | 0,00      |                                       |
| Gelijktijdig met overheersend     | 11,75  | 5,59    | 8,45    | 0,95 | 0,97   | 0,00 | 1,45      |                                       |
| Overheersende belasting           | 1      | 1       | 1       | 0    | 0      | 0    | 0         | 1 = voor<br>gew. ber.<br>in rek gebr. |
| Perman. 1,2 x Kfi x Gk            | 10,80  | 4,64    | 7,51    | 0,00 | 0,59   | 0,00 | 1,45      |                                       |
| Verand. 1,5 x Kfi x Qk            | 2,36   | 2,36    | 2,36    | 2,36 | 0,95   | 1,35 | 0,23      |                                       |
| Rekenwaarde overheersend          | 13,16  | 7,01    | 9,87    | 2,36 | 1,54   | 1,35 | 1,68      |                                       |
| Blijvend overheers. (verg.6.10a)  |        |         |         |      |        |      |           |                                       |
| blijvend 1,35 x Kfi x Gk          | 12,20  | 5,25    | 8,48    | 0,00 | 0,67   | 0,00 | 1,64      |                                       |

## Belastingen volgens NEN-EN 1991-1

## NEN-EN 1991-1

|                   |      |                    |        |                          |
|-------------------|------|--------------------|--------|--------------------------|
| <b>Project:</b>   | 1487 | project            | Woning | Moleneind 7a Kortenhoeve |
| <b>onderdeel:</b> |      | Gewichtsberekening |        |                          |

| gedragen vloerlengte in m1 |        |         |         |      |        |      |           | belast. combinaties                                |        | Alle lagen  |
|----------------------------|--------|---------|---------|------|--------|------|-----------|----------------------------------------------------|--------|-------------|
| As                         | kelder | beggr 1 | verd. 1 | ---  | zolder | ---  | sch.dak 2 | qd(1)=                                             | qd(2)= | extreem (3) |
| 1                          |        | 1,69    | 1,69    |      | 0,85   |      | 1,69      | 31,8                                               | 26,5   | 32,7        |
| 2                          |        | 1,00    | 0,00    |      |        |      | 0,50      | 7,7                                                | 6,1    | 7,8         |
| 3                          |        | 0,00    | 0,00    |      |        |      | 0,70      | 1,0                                                | 1,1    | 1,2         |
| 4                          |        | 4,33    | 4,33    |      | 2,17   |      | 4,33      | 81,3                                               | 67,8   | 83,6        |
| 5                          |        | 0,60    | 0,00    |      |        |      |           | 4,2                                                | 3,1    | 4,2         |
| 6                          |        | 1,00    | 0,00    |      |        |      | 0,50      | 7,7                                                | 6,1    | 7,8         |
| 7                          |        | 2,64    | 2,64    |      | 1,32   |      | 2,64      | 49,6                                               | 41,4   | 51,0        |
| A                          |        | 0,00    | 0,00    |      | 1,00   |      | 1,50      | 3,1                                                | 3,1    | 4,1         |
| B (37)                     | 1,40   | 1,40    | 1,40    |      | 0,47   |      | 1,40      | 44,5                                               | 38,9   | 45,1        |
| B overig                   |        | 0,00    | 0,00    |      |        |      | 1,40      | 2,0                                                | 2,3    | 2,4         |
| C (37)                     | 1,40   | 2,92    | 2,92    |      | 0,97   |      | 2,92      | 72,8                                               | 62,5   | 74,1        |
| C overig                   |        | 1,52    | 1,52    |      |        |      | 2,92      | 29,8                                               | 25,6   | 30,6        |
| D                          |        | 3,03    | 3,03    |      | 1,01   |      | 3,03      | 56,4                                               | 47,2   | 57,8        |
| E                          |        | 1,52    | 1,52    |      | 0,51   |      | 1,92      | 28,9                                               | 24,3   | 29,7        |
| A'+B' stb                  |        |         |         |      | 1,60   |      | 2,65      | 5,3                                                | 5,3    | 6,9         |
| 2'+6' stb                  |        |         |         |      | 0,90   |      | 2,13      | 3,9                                                | 4,0    | 5,0         |
|                            |        |         |         |      |        |      |           |                                                    |        |             |
|                            |        |         |         |      |        |      |           |                                                    |        |             |
|                            |        |         |         |      |        |      |           |                                                    |        |             |
|                            |        |         |         |      |        |      |           |                                                    |        |             |
|                            |        |         |         |      |        |      |           |                                                    |        |             |
|                            |        |         |         |      |        |      |           |                                                    |        |             |
|                            |        |         |         |      |        |      |           |                                                    |        |             |
|                            |        |         |         |      |        |      |           |                                                    |        |             |
|                            |        |         |         |      |        |      |           |                                                    |        |             |
|                            |        |         |         |      |        |      |           |                                                    |        |             |
| (1) kN/m2                  | 13,16  | 7,01    | 9,87    | 2,36 | 0,97   | 0,00 | 1,43      | kN/m1                                              | kN/m1  | kN/m1       |
| (2) kN/m2                  | 12,20  | 5,25    | 8,48    | 0,00 | 0,67   | 0,00 | 1,61      | <-- $\gamma_{g2} \times G_k$ blijvend overheersend |        |             |
| (3) kN/m2                  | 13,16  | 7,01    | 9,87    | 2,36 | 1,54   | 1,35 | 1,68      | <-- overheersende belasting                        |        |             |

U V

| Materiaal fund.balk | 25   | kN/m3     | Karakteristieke belast. in kN/m <sup>1</sup> |           |         |        | Rekenwaarde belast. in kN/m <sup>1</sup> |           |         |  |
|---------------------|------|-----------|----------------------------------------------|-----------|---------|--------|------------------------------------------|-----------|---------|--|
| Fund. balkbreedte   | 350  | mm        | balk                                         | halfst mw | stns mw | factor | balk                                     | halfst mw | stns mw |  |
| Fund. balkhoogte    | 450  | mm        | 3,94                                         | 2,00      | 4,00    | 1,08   | 4,25                                     | ----      | ----    |  |
| bovenkant fundering | 0,55 | m-/- peil | ----                                         | 1,10      | 2,20    | 1,08   | ----                                     | 1,19      | 2,38    |  |
| bk verd. 1          | 2,80 | m + peil  | ----                                         | 5,60      | 11,20   | 1,08   | ----                                     | 6,05      | 12,10   |  |
| bk muurplaat        | 3,50 | m + peil  | ----                                         | 1,40      | 2,80    | 1,08   | ----                                     | 1,51      | 3,02    |  |
| bk zolder           | 5,69 | m + peil  | ----                                         | 4,38      | 8,76    | 1,08   | ----                                     | 4,73      | 9,46    |  |
| bk nok 1            | 7,25 | m + peil  | ----                                         | 3,12      | 6,24    | 1,08   | ----                                     | 3,37      | 6,74    |  |
| bk nok 2            | 8,15 | m + peil  | ----                                         | 1,80      | 3,60    | 1,08   | ----                                     | 1,94      | 3,89    |  |

## Definitie afwijkende wanden

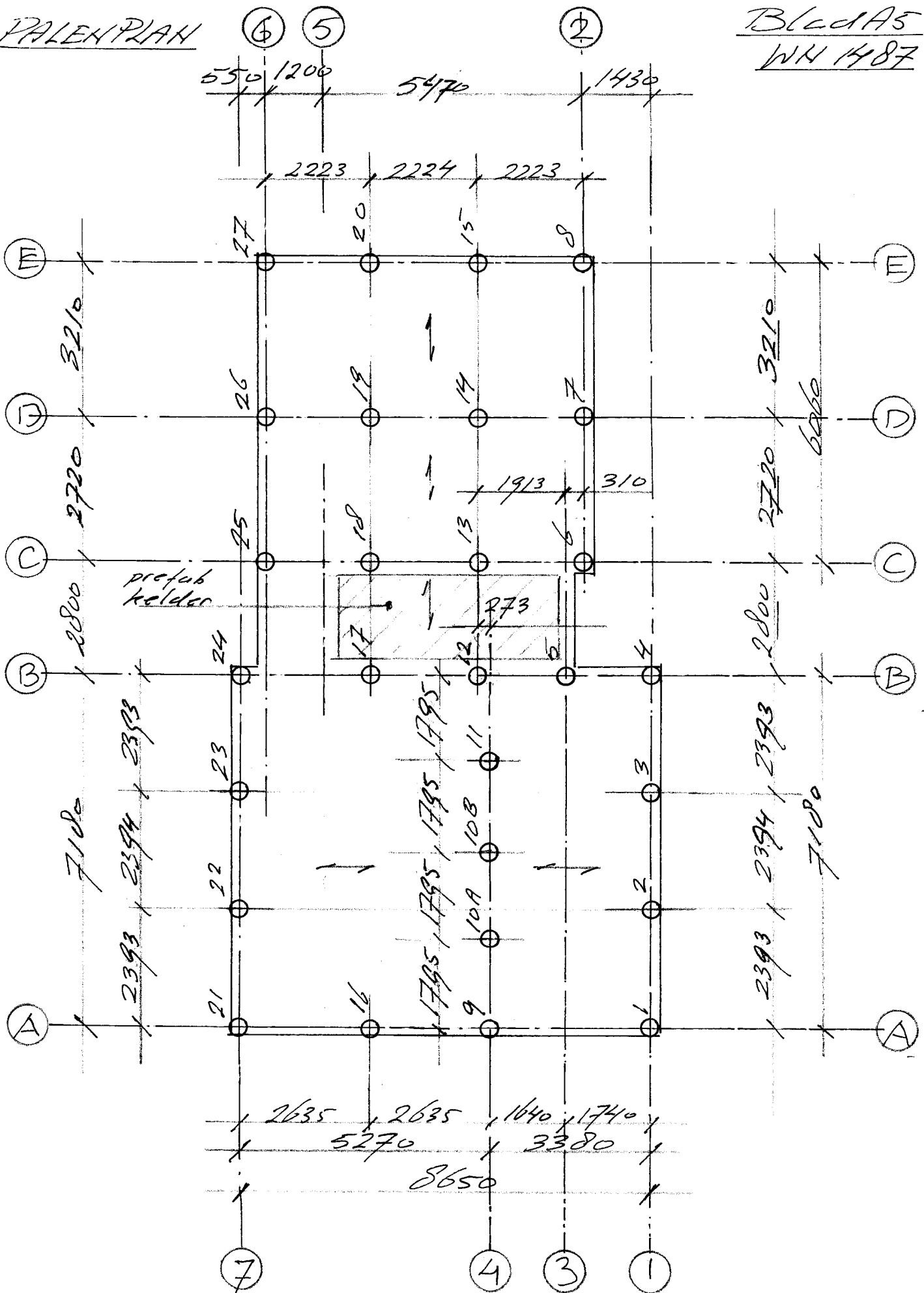
| Definitie afwijkende wanden |                                 |      |       |      |       |       |      | gewicht<br>kNm3 | dikte<br>mm | gewicht<br>kN/m2 |
|-----------------------------|---------------------------------|------|-------|------|-------|-------|------|-----------------|-------------|------------------|
| meeber. wandhoogte          |                                 | 0,55 | 2,80  | 0,70 | 2,19  | 1,56  | 0,90 |                 |             |                  |
| 1                           | m.w.                            | 1,65 | 8,40  | 2,10 | 6,57  | 4,68  | 2,70 | 20              | 150         | 3,00             |
| 2                           | beton                           | 4,95 | 25,20 | 6,30 | 19,71 | 14,04 | 8,10 | 25              | 360         | 9,00             |
| 3                           | hout                            | 0,26 | 1,34  | 0,34 | 1,05  | 0,75  | 0,43 | 8               | 60          | 0,48             |
| 1                           | Toegevoegd aan lijst op blad A3 |      |       |      |       |       |      |                 |             |                  |
| 0                           | toevoegen aan lijst op blad A3? |      |       |      |       |       |      |                 |             |                  |





PALENTPLAN

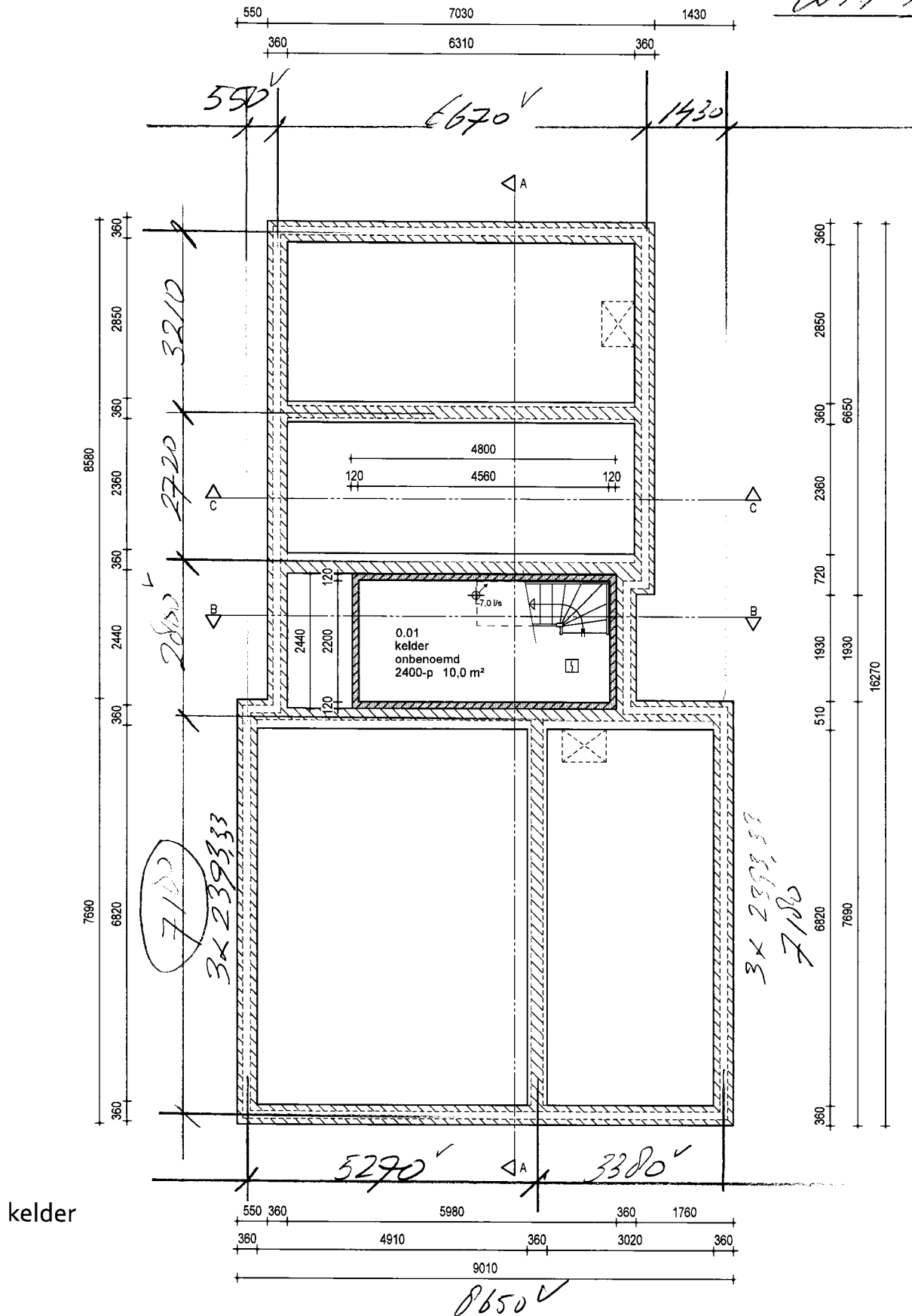
Blad A5  
WN 1487



PALENT #220 (28 st.)

PUNT NIVEAU 5.00 m +/- NAP

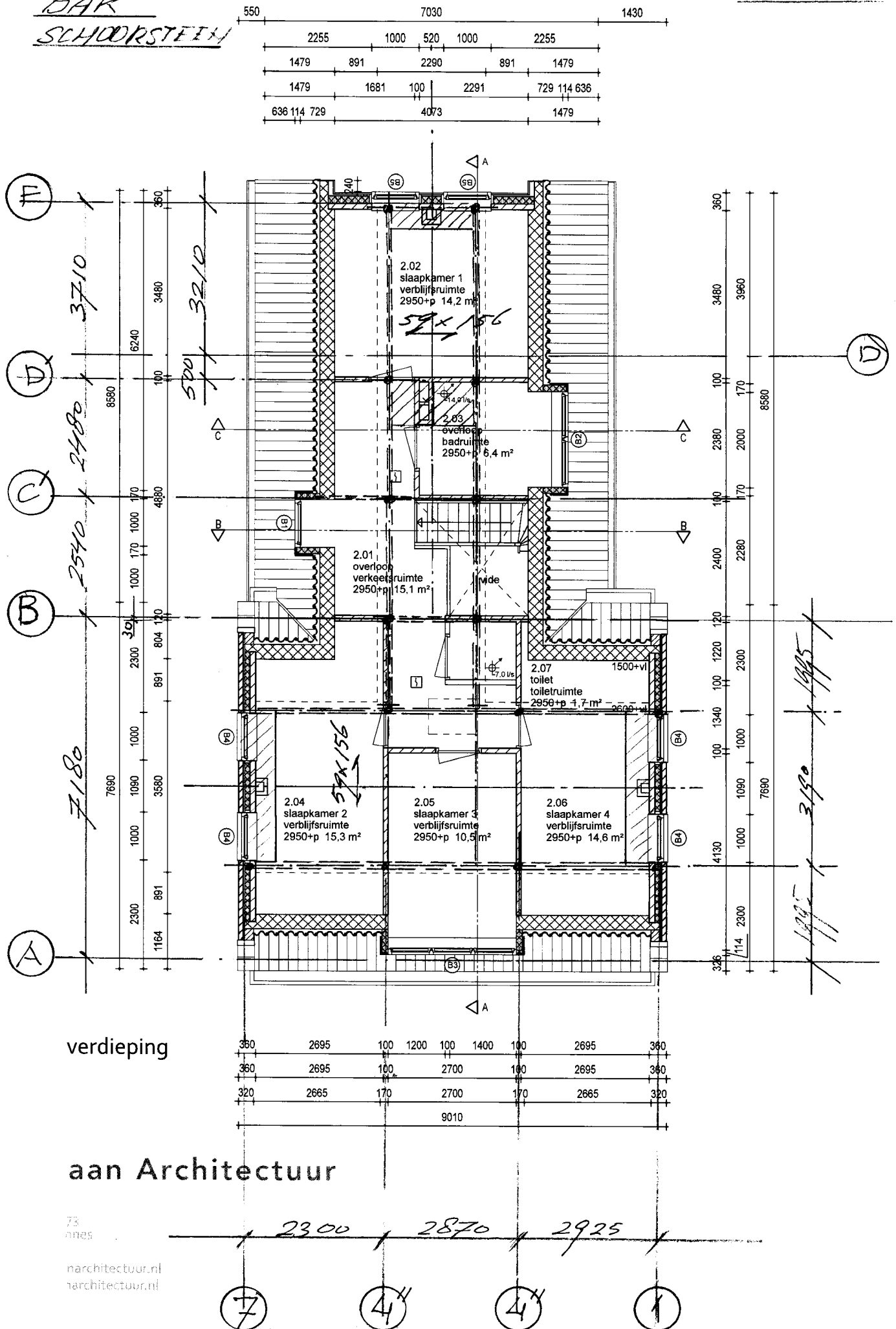
Blaad A6  
WN 14127



kelder

Haan Architectuur

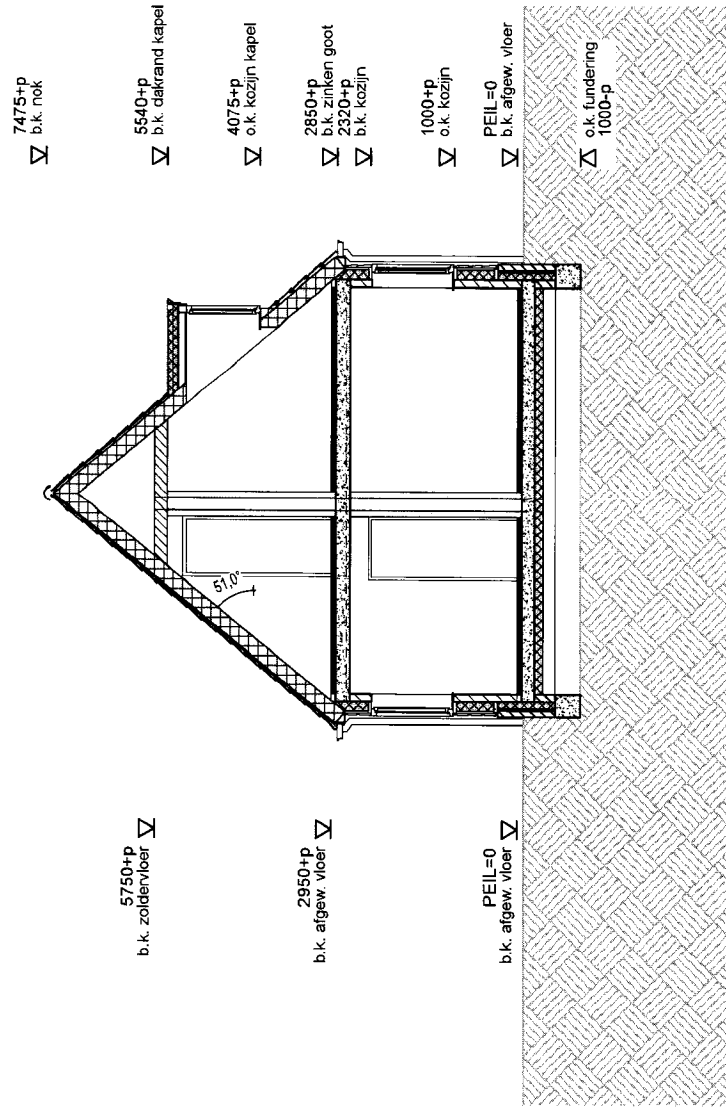
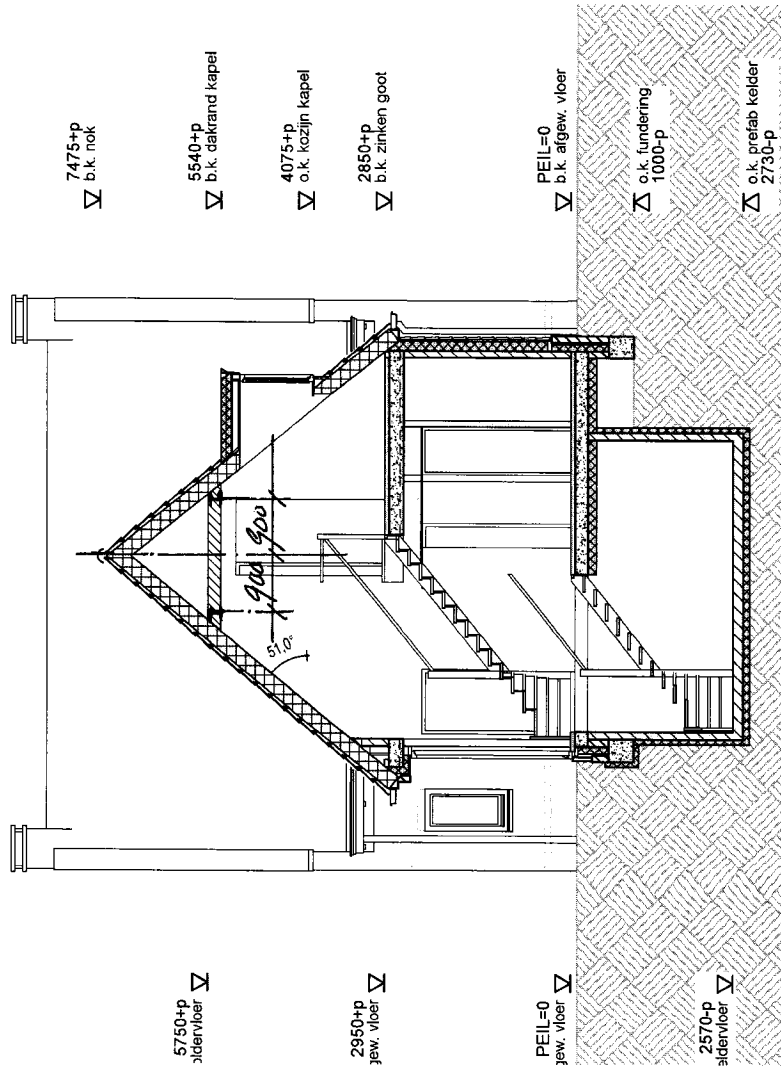
Herweg 73  
AM Eernee  
337560  
pdehaanarchitectuur.nl  
dehaanarchitectuur.nl



aan Architectuur

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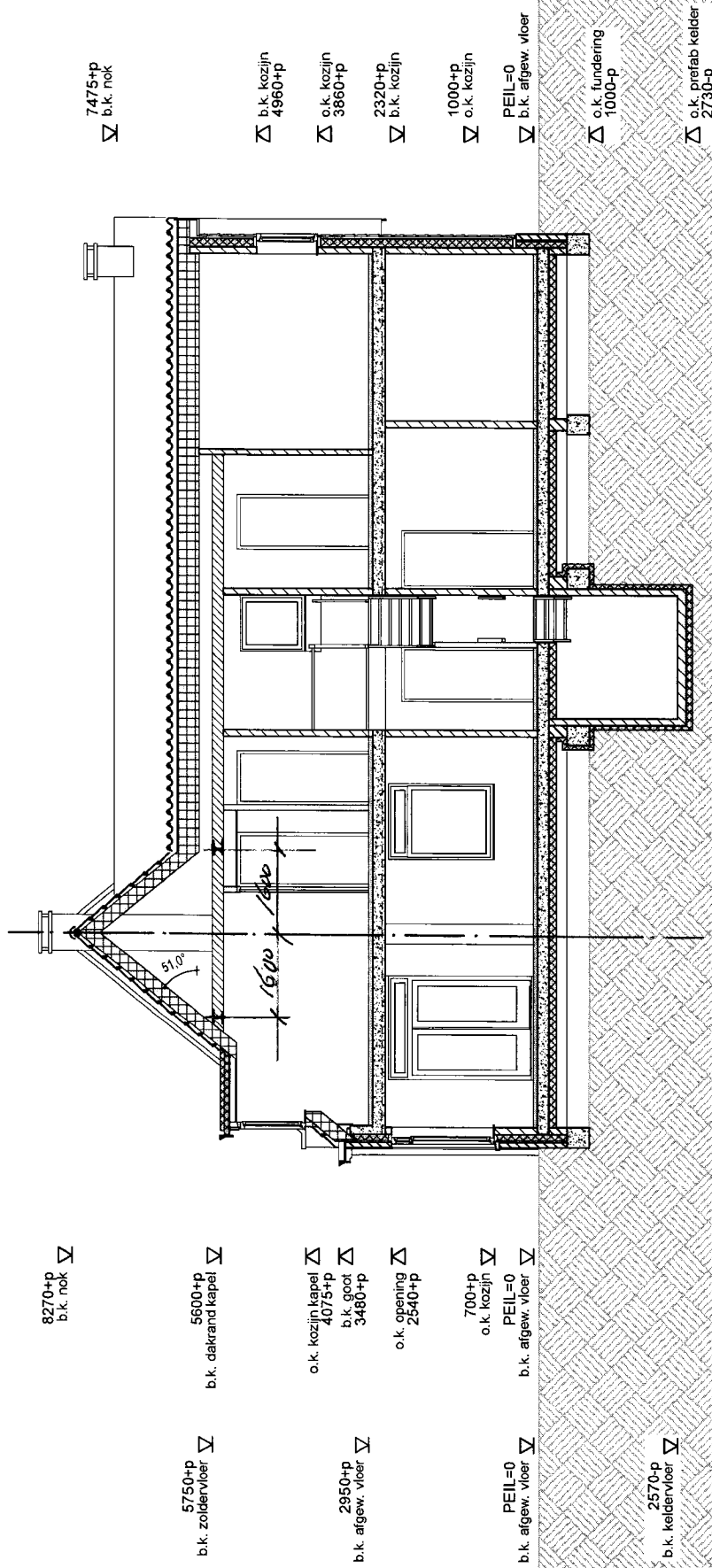


**snede B-B**

doorsnede C-C

Blad A<sup>p</sup>  
14/11/17

snede A-A



| Draagkrachtberekening voor drukpalen volgens NEN 9997-1:2011/C1:2012 |                                |                                                                                 |                                                                | GEOTECHNIEK |          |
|----------------------------------------------------------------------|--------------------------------|---------------------------------------------------------------------------------|----------------------------------------------------------------|-------------|----------|
| <b>Project:</b>                                                      | Woning Moleneind 7a Kortenhoef |                                                                                 | Projectnr: 1487                                                | Bladnr:     | A11      |
| <b>Geotechnische categorie: GC</b>                                   | 1                              | 1 = lichte bouwwerken; 2 = ... ; 3 = zeer grote constructies met veel risico    |                                                                |             |          |
| <b>Paaltype:</b>                                                     | Betonpaal                      |                                                                                 |                                                                |             |          |
| Netto paal draagkrachtberekening uit grondonderzoek volgens:         |                                |                                                                                 |                                                                |             | NEN 9997 |
| Toetsing grenstoestand volgen art 7.6.2.3                            |                                |                                                                                 |                                                                |             | NEN 9997 |
| <b>Algemene gegevens</b>                                             |                                |                                                                                 |                                                                |             |          |
| Sonderingrapportnummer:                                              | 116243                         | Van Dijk Geotechniek                                                            |                                                                |             |          |
| Referentieniveau sonderingen:                                        | NAP                            |                                                                                 |                                                                |             |          |
| Peil van het gebouw                                                  | -330                           | mm                                                                              | tov NAP = vloerpeil bestaand gebouw                            |             |          |
| Stijfheid bouwwerk 0/1                                               | 0                              | niet-stijfbouwwerk                                                              |                                                                |             |          |
| Doorsnede vorm paal                                                  | v                              | vierkant aan de punt gemeten                                                    |                                                                |             |          |
| Schachtafm. in mm min. d=                                            | 220                            | mm                                                                              | glad oppervlak                                                 |             |          |
| Voetafmeting in mm min. D=                                           | 220                            | mm                                                                              | deq= (Deq/deq)^2 1,00 <1,5; β=1,0                              |             |          |
| Hoogte verzw. voet H=                                                | 1                              | mm                                                                              | Deq= (H/Deq)^2 0,00                                            |             |          |
| Paalvoetformfactor β=                                                | 1,00                           | Zie 7.h/i Gladde paal 1,0 Stalen buispaal 1,0                                   |                                                                |             |          |
| Invloed paalvoetvorm s=                                              | 0,89                           | volgens 7.6.2.3(h) φ 40,00 gr. Dmax 311 0,89                                    |                                                                |             |          |
| Rekenwaarde max. belasting F <sub>c;d</sub> =                        | 217                            | kN                                                                              | inclus eigen gewicht paal Berekend R <sub>c;d</sub> = 217,6 kN |             |          |
| Paalklassefactor punt α <sub>p</sub> =                               | 1,000                          | volgens tabel 7.c geheid, prefab zonder voet                                    |                                                                |             |          |
| Paalklassefactor schacht α <sub>s</sub> =                            | 0,010                          | volgens tabel 7.c geheid, prefab zonder voet                                    |                                                                |             |          |
| Paalklasse schacht, trek α <sub>t</sub> =                            | 0,007                          | volgens tabel 7.c geheid, prefab zonder voet                                    |                                                                |             |          |
| Reductie op paalklassefactoren                                       | 25%                            | na 1/1/16 in rekening gebracht reductiefactor = 0,75                            |                                                                |             |          |
| Bodem bepaling: b;c;d                                                | c                              | zonder onderzoek(b); uit sonderingen(c); proefbelast(d)                         |                                                                |             |          |
| Methode van aanbrengen 1;2;3                                         | 1                              | geheid(1); geboord(2); geschroefd, type avegaar(3)                              |                                                                |             |          |
| Drukpaal of trekpaal, kies 1/2                                       | 1                              | drukpaal                                                                        |                                                                |             |          |
| Partiële weerstandsfactor γ                                          | 1,20                           | combinatie c1 Y <sub>b</sub> ;Y <sub>s</sub> ;Y <sub>t</sub> ;Y <sub>s</sub> ;t |                                                                |             |          |
| Lengte schachtwrijving max ΔL=                                       | 0,00                           | m                                                                               | niet begrenst door verzwaarde punt                             |             |          |
| Oppervlak paalpunt A <sub>b</sub> =                                  | 0,0484                         | m <sup>2</sup>                                                                  |                                                                |             |          |
| Omtrek paalschacht in m                                              | 0,8800                         | m <sup>1</sup>                                                                  |                                                                |             |          |
| Trajectgrens boven 8D=                                               | 1,99                           | m                                                                               | traject III start met laagste waarde traject II max. 2,0 voor  |             |          |
| Trajectgrens onder 4D=                                               | 0,99                           | m                                                                               | traject I en II max. avagaarpalen                              |             |          |
| Trajectgrens onder 0,7D=                                             | 0,17                           | m                                                                               | traject I en II min.                                           |             |          |

| Sonderingnummer:                         | 1     | 2     |       |       |       |       | eenheden |
|------------------------------------------|-------|-------|-------|-------|-------|-------|----------|
| Puntniveau in m +/- peil                 | 4,67  | 4,67  |       |       |       |       | m +/-    |
| Puntniveau in m +/- NAP                  | 5,00  | 5,00  |       |       |       |       | m +/-    |
| Gemidd. weerstand traject I: qc;I;gem    | 11,00 | 10,00 |       |       |       |       | Mpa      |
| Gemidd. weerstand traject II: qc;II;gem  | 8,00  | 8,80  |       |       |       |       | Mpa      |
| Gemidd. minimaal traject III: qc;III;gem | 6,50  | 6,50  |       |       |       |       | Mpa      |
| Schachtwrijving van: bovengrens          | 3,50  | 3,50  |       |       |       |       | m +/-    |
| Schachtwrijving tot: ondergrens          | 5,00  | 5,00  |       |       |       |       | m +/-    |
| Gemidd. conusweerst. schacht: qc;z;a     | 9,50  | 9,00  |       |       |       |       | Mpa      |
| Puntweerstand (maximaal 15 Mpa) qb;max   | 5,312 | 5,279 | 0,000 | 0,000 | 0,000 | 0,000 | Mpa      |
| Schachtwrijving qs;max;z                 | 0,071 | 0,068 | 0,000 | 0,000 | 0,000 | 0,000 | Mpa      |

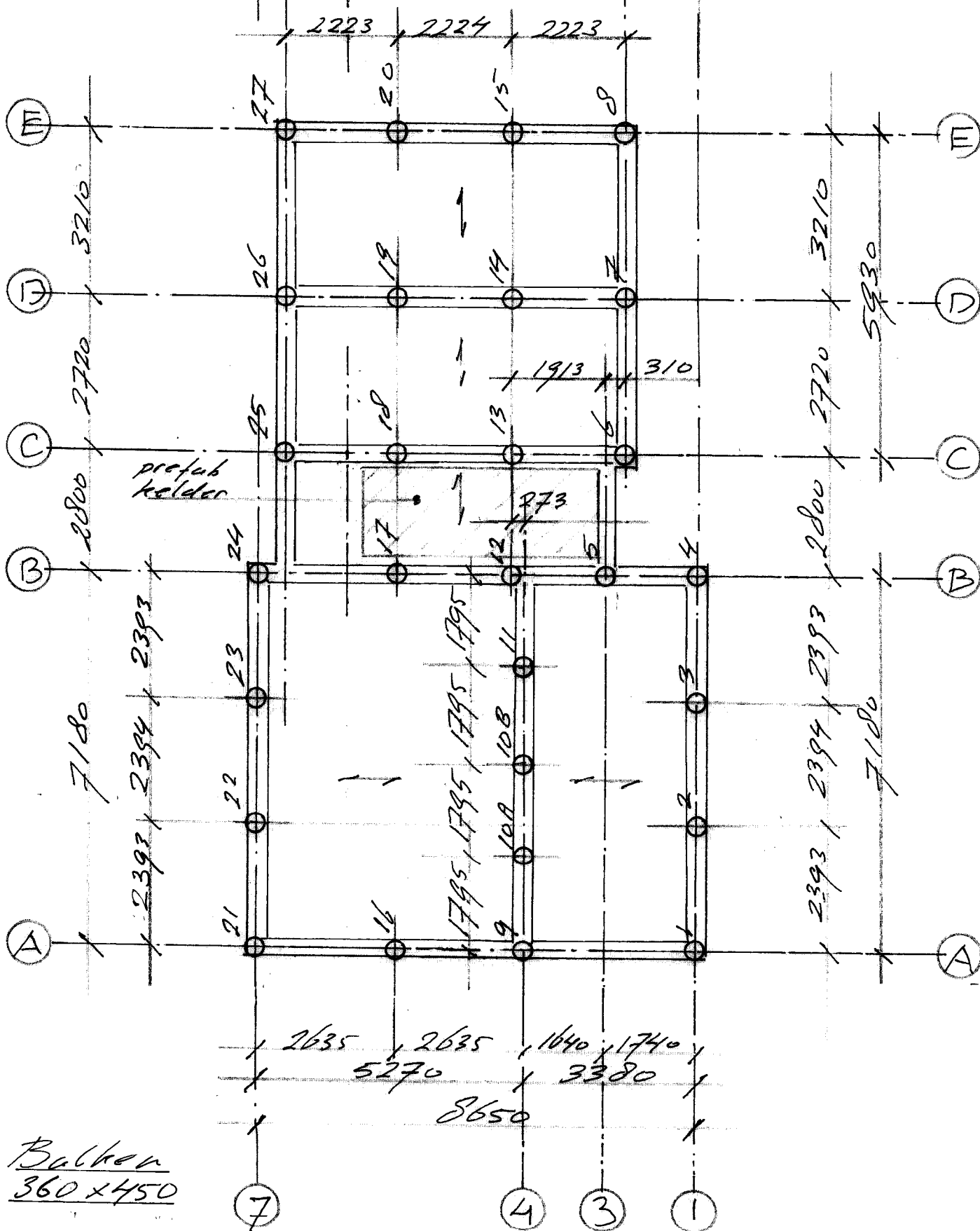
|                                                     | N=                     | 1     | 2     |      |      |      |      |       |
|-----------------------------------------------------|------------------------|-------|-------|------|------|------|------|-------|
| Max draagkracht volgens 7.6.2.5(c)                  | R <sub>b;cal;max</sub> | 257,1 | 255,5 |      |      |      |      | kN    |
|                                                     | R <sub>s;cal;max</sub> | 94,1  | 89,1  |      |      |      |      | kN    |
|                                                     | R <sub>c;cal;max</sub> | 351,2 | 344,6 |      |      |      |      | kN    |
|                                                     | R <sub>c;cal;gem</sub> |       |       |      |      |      |      | 347,9 |
|                                                     | R <sub>c;cal;min</sub> |       |       |      |      |      |      | 344,6 |
| ((R <sub>c;cal;max</sub> )gemiddeld)/ξ <sub>3</sub> | ξ <sub>3</sub> =       | 1,39  | 1,32  | 1,30 | 1,28 | 1,28 | 1,28 | 263,6 |
| ((R <sub>c;cal;max</sub> )minimum)/ξ <sub>4</sub>   | ξ <sub>4</sub> =       | 1,39  | 1,32  | 1,30 | 1,03 | 1,03 | 1,01 | 261,1 |
| Voor een niet-stijf bouwwerk                        | R <sub>c;k</sub> =     | 261,1 | 261,1 |      |      |      |      | kN    |
| Rekenw. max. draagkracht:                           | R <sub>c;d</sub> =     | 217,6 | 217,6 |      |      |      |      | kN    |
| Rekenwaarde belasting                               | F <sub>c;d</sub> =     | 217,0 | 217,0 |      |      |      |      |       |
| Grenstoestand                                       | u.c.=                  | 0,997 | 0,997 |      |      |      |      |       |

Fundatie  
balken

⑥ ⑤  
550 1200  
5470

②

Bled B1  
WN 1487



Balken  
360 x 450

PALEN  $\varnothing 220$  (28 st.)

PUNT NIVEAU 5.00 m +/- NAP

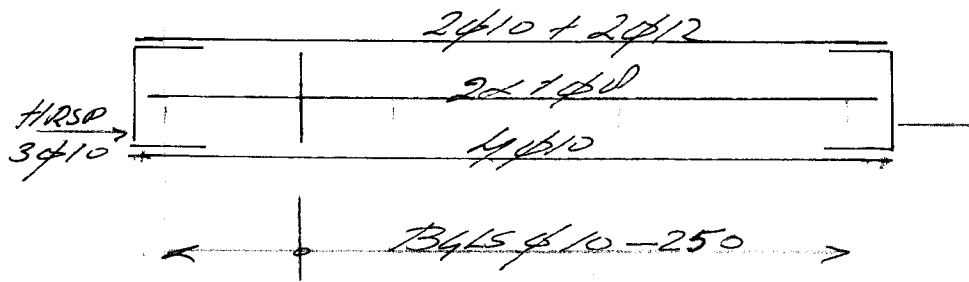
|                                   |                           |                  |        |        |        |                                  |      |
|-----------------------------------|---------------------------|------------------|--------|--------|--------|----------------------------------|------|
| Balkberekening                    |                           |                  |        |        |        |                                  |      |
| Toepassing van standaard wapening |                           |                  |        |        |        | balkafm: 360x450<br>zie blad B21 |      |
| 2r10+2r12                         | A= 382 mm <sup>2</sup>    | M <sub>u</sub> = | 64     | kNm    |        |                                  |      |
| 4r10                              | A= 312 mm <sup>2</sup>    | M <sub>u</sub> = | 52     | kNm    |        |                                  |      |
| beugels r8-250                    | A= 384 mm <sup>2</sup> /m | V <sub>u</sub> = | 73     | kN     |        |                                  |      |
| beugels r10-250                   | A= 624 mm <sup>2</sup> /m | V <sub>u</sub> = | 105    | kN     |        |                                  |      |
| beugels r10-200                   | A= 780 mm <sup>2</sup> /m | V <sub>u</sub> = | 131    | kN     |        |                                  |      |
|                                   |                           |                  |        |        |        |                                  |      |
| Balk in as                        | qd                        |                  |        |        |        |                                  |      |
| 1                                 | 71,6                      |                  | veld 1 | veld 2 | veld 3 | veld 4                           |      |
|                                   |                           | L=               | 2,40   | 2,40   | 2,40   |                                  | m    |
|                                   |                           | qd=              | 71,6   | 71,6   | 71,6   |                                  | kN/m |
|                                   | Md;stp;max=               | 1/8xqdxLxL       | 51,6   | 51,6   | 51,6   |                                  | kNm  |
|                                   | Md;veld;max=              | 1/11xqdxLxL      | 37,5   | 37,5   | 37,5   |                                  | kNm  |
|                                   | Vd;max=                   | 5/8xqdxL         | 107,5  | 107,5  | 107,5  |                                  | kN   |
| boven 2r10+2r12                   | A= 382 mm <sup>2</sup>    | M <sub>u</sub> = | 64     | 64     | 64     |                                  | kNm  |
| onder 4r10                        | A= 312 mm <sup>2</sup>    | M <sub>u</sub> = | 52     | 52     | 52     |                                  | kNm  |
| beugels r10-250                   | A= 624 mm <sup>2</sup> /m | V <sub>u</sub> = | 105    | 105    | 105    |                                  | kN   |
|                                   |                           |                  |        |        |        |                                  |      |
| Balk in as                        | qd                        |                  |        |        |        |                                  |      |
| 2                                 | 24,6                      |                  | veld 1 | veld 2 | veld 3 | veld 4                           |      |
|                                   |                           | L=               | 2,72   | 3,21   |        |                                  | m    |
|                                   |                           | qd=              | 24,6   | 24,6   |        |                                  | kN/m |
|                                   | Md;stp;max=               | 1/8xqdxLxL       | 22,7   | 31,7   |        |                                  | kNm  |
|                                   | Md;veld;max=              | 1/11xqdxLxL      | 16,5   | 23,0   |        |                                  | kNm  |
|                                   | Vd;max=                   | 5/8xqdxL         | 41,8   | 49,3   |        |                                  | kN   |
| boven 2r10+2r12                   | A= 382 mm <sup>2</sup>    | M <sub>u</sub> = | 64     | 64     |        |                                  | kNm  |
| onder 4r10                        | A= 312 mm <sup>2</sup>    | M <sub>u</sub> = | 52     | 52     |        |                                  | kNm  |
| beugels r8-250                    | A= 400 mm <sup>2</sup> /m | V <sub>u</sub> = | 73     | 73     |        |                                  | kN   |
|                                   |                           |                  |        |        |        |                                  |      |
| Balk in as                        | qd                        |                  |        |        |        |                                  |      |
| 3                                 | 22,3                      |                  | veld 1 | veld 2 | veld 3 | veld 4                           |      |
|                                   |                           | L=               | 2,80   |        |        |                                  | m    |
|                                   |                           | qd=              | 22,3   |        |        |                                  | kN/m |
|                                   | Md;stp;max=               | 1/8xqdxLxL       | 21,8   |        |        |                                  | kNm  |
|                                   | Md;veld;max=              | 1/8xqdxLxL       | 21,8   |        |        |                                  | kNm  |
|                                   | Vd;max=                   | 5/8xqdxL         | 39,0   |        |        |                                  | kN   |
| boven 4r10                        | A= 312 mm <sup>2</sup>    | M <sub>u</sub> = | 52     |        |        |                                  | kNm  |
| onder 2r10+2r12                   | A= 384 mm <sup>2</sup>    | M <sub>u</sub> = | 64     |        |        |                                  | kNm  |
| beugels r8-250                    | A= 400 mm <sup>2</sup> /m | V <sub>u</sub> = | 73     |        |        |                                  | kN   |
|                                   |                           |                  |        |        |        |                                  |      |
| Balk in as                        | qd                        |                  |        |        |        |                                  |      |
| 4                                 | 106,0                     |                  | veld 1 | veld 2 | veld 3 | veld 4                           |      |
|                                   |                           | L=               | 1,80   | 1,80   | 1,80   | 1,80                             | m    |
|                                   |                           | qd=              | 106,0  | 106,0  | 106,0  | 106,0                            | kN/m |
|                                   | Md;stp;max=               | 1/8xqdxLxL       | 42,9   | 42,9   | 42,9   | 42,9                             | kNm  |
|                                   | Md;veld;max=              | 1/11xqdxLxL      | 31,2   | 31,2   | 31,2   | 31,2                             | kNm  |
|                                   | Vd;max=                   | 5/8xqdxL         | 119,2  | 119,2  | 119,2  | 119,2                            | kN   |
| boven 2r10+2r12                   | A= 384 mm <sup>2</sup>    | M <sub>u</sub> = | 64     | 64     | 64     | 64                               | kNm  |
| onder 4r10                        | A= 312 mm <sup>2</sup>    | M <sub>u</sub> = | 52     | 52     | 52     | 52                               | kNm  |
| beugels r10-200                   | A= 780 mm <sup>2</sup> /m | V <sub>u</sub> = | 131    | 131    | 131    | 131                              | kN   |

|                 |                           |                                    |        |        |        |        |
|-----------------|---------------------------|------------------------------------|--------|--------|--------|--------|
| Balk in as      | qd                        |                                    |        |        |        |        |
| 5               | 16,0                      |                                    | veld 1 | veld 2 | veld 3 | veld 4 |
| vervallen       |                           | L=                                 | 2,80   |        |        | m      |
|                 |                           | qd=                                | 16,0   |        |        | kN/m   |
|                 | Md;stp;max=               | $1/8 \times qd \times L \times L$  | 15,7   |        |        | kNm    |
|                 | Md;veld;max=              | $1/8 \times qd \times L \times L$  | 15,7   |        |        | kNm    |
|                 | Vd;max=                   | $5/8 \times qd \times L$           | 28,0   |        |        | kN     |
| boven 4r10      | A= 312 mm <sup>2</sup>    | Mu=                                | 52     |        |        | kNm    |
| onder 2r10+2r12 | A= 384 mm <sup>2</sup>    | Mu=                                | 64     |        |        | kNm    |
| beugels r8-250  | A= 400 mm <sup>2</sup> /m | Vu=                                | 73     |        |        | kN     |
| Balk in as      | qd                        |                                    |        |        |        |        |
| 6               | 24,6                      |                                    | veld 1 | veld 2 | veld 3 | veld 4 |
|                 |                           | L=                                 | 2,80   | 2,72   | 3,21   | m      |
|                 |                           | qd=                                | 24,6   | 24,6   | 24,6   | kN/m   |
|                 | Md;stp;max=               | $1/8 \times qd \times L \times L$  | 24,1   | 22,7   | 31,7   | kNm    |
|                 | Md;veld;max=              | $1/11 \times qd \times L \times L$ | 17,5   | 16,5   | 23,0   | kNm    |
|                 | Vd;max=                   | $5/8 \times qd \times L$           | 43,0   | 41,8   | 49,3   | kN     |
| boven 2r10+2r12 | A= 382 mm <sup>2</sup>    | Mu=                                | 64     | 64     | 64     | kNm    |
| onder 4r10      | A= 312 mm <sup>2</sup>    | Mu=                                | 52     | 52     | 52     | kNm    |
| beugels r8-250  | A= 400 mm <sup>2</sup> /m | Vu=                                | 73     | 73     | 73     | kN     |
| Balk in as      | qd                        |                                    |        |        |        |        |
| 7               | 89,5                      |                                    | veld 1 | veld 2 | veld 3 | veld 4 |
|                 |                           | L=                                 | 2,40   | 2,40   | 2,40   | m      |
|                 |                           | qd=                                | 89,5   | 89,5   | 89,5   | kN/m   |
|                 | Md;stp;max=               | $1/8 \times qd \times L \times L$  | 64,4   | 64,4   | 64,4   | kNm    |
|                 | Md;veld;max=              | $1/11 \times qd \times L \times L$ | 46,8   | 46,8   | 46,8   | kNm    |
|                 | Vd;max=                   | $5/8 \times qd \times L$           | 134,2  | 134,2  | 134,2  | kN     |
| boven 2r10+2r12 | A= 384 mm <sup>2</sup>    | Mu=                                | 64     | 64     | 64     | kNm    |
| onder 4r10      | A= 312 mm <sup>2</sup>    | Mu=                                | 52     | 52     | 52     | kNm    |
| beugels r10-200 | A= 780 mm <sup>2</sup> /m | Vu=                                | 131    | 131    | 131    | kN     |
| Balk in as      | qd                        |                                    |        |        |        |        |
| A               | 34,5                      |                                    | veld 1 | veld 2 | veld 3 | veld 4 |
|                 |                           | L=                                 | 2,64   | 2,64   | 3,38   | m      |
|                 |                           | qd=                                | 34,5   | 34,5   | 34,5   | kN/m   |
|                 | Md;stp;max=               | $1/8 \times qd \times L \times L$  | 30,1   | 30,1   | 49,3   | kNm    |
|                 | Md;veld;max=              | $1/11 \times qd \times L \times L$ | 21,9   | 21,9   | 35,9   | kNm    |
|                 | Vd;max=                   | $5/8 \times qd \times L$           | 57,0   | 57,0   | 72,9   | kN     |
| boven 2r10+2r12 | A= 382 mm <sup>2</sup>    | Mu=                                | 64     | 64     | 64     | kNm    |
| onder 4r10      | A= 312 mm <sup>2</sup>    | Mu=                                | 52     | 52     | 52     | kNm    |
| beugels r8-250  | A= 400 mm <sup>2</sup> /m | Vu=                                | 73     | 73     | 73     | kN     |

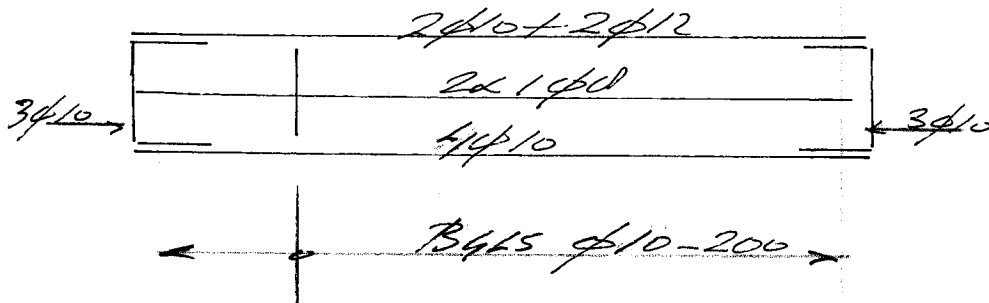
|                 |                           |             |        |        |        |        |      |
|-----------------|---------------------------|-------------|--------|--------|--------|--------|------|
| Balk in as      | qd                        |             |        |        |        |        |      |
| B (37)          | 61,8                      |             | veld 1 | veld 2 | veld 3 | veld 4 |      |
| B overig        | 28,4                      | L=          | 2,77   | 2,22   | 1,91   | 1,43   | m    |
|                 |                           | qd=         | 61,8   | 61,8   | 61,8   | 28,4   | kN/m |
|                 | Md;stp;max=               | 1/8xqdxLxL  | 59,3   | 38,1   | 28,2   | 7,3    | kNm  |
|                 | Md;veld;max=              | 1/11xqdxLxL | 43,1   | 27,7   | 20,5   | 5,3    | kNm  |
|                 | Vd;max=                   | 5/8xqdxL    | 107,1  | 85,8   | 73,8   | 25,4   | kN   |
| boven 2r10+2r12 | A= 382 mm <sup>2</sup>    | Mu=         | 64     | 64     | 64     | 64     | kNm  |
| onder 4r10      | A= 312 mm <sup>2</sup>    | Mu=         | 52     | 52     | 52     | 52     | kNm  |
| beugels r10-200 | A= 780 mm <sup>2</sup> /m | Vu=         | 131    | 131    | 131    | 131    | kN   |
| Balk in as      | qd                        |             |        |        |        |        |      |
| C (37)          | 93,4                      |             | veld 1 | veld 2 | veld 3 | veld 4 |      |
|                 |                           | L=          | 2,22   | 2,22   | 2,22   |        | m    |
|                 |                           | qd=         | 93,4   | 93,4   | 93,4   |        | kN/m |
|                 | Md;stp;max=               | 1/8xqdxLxL  | 57,5   | 57,5   | 57,5   |        | kNm  |
|                 | Md;veld;max=              | 1/11xqdxLxL | 41,8   | 41,8   | 41,8   |        | kNm  |
|                 | Vd;max=                   | 5/8xqdxL    | 129,6  | 129,6  | 129,6  |        | kN   |
| boven 2r10+2r12 | A= 382 mm <sup>2</sup>    | Mu=         | 64     | 64     | 64     |        | kNm  |
| onder 4r10      | A= 312 mm <sup>2</sup>    | Mu=         | 52     | 52     | 52     |        | kNm  |
| beugels r10-200 | A= 780 mm <sup>2</sup> /m | Vu=         | 131    | 131    | 131    |        | kN   |
| Balk in as      | qd                        |             |        |        |        |        |      |
| D               | 78,2                      |             | veld 1 | veld 2 | veld 3 | veld 4 |      |
|                 |                           | L=          | 2,22   | 2,22   | 2,22   |        | m    |
|                 |                           | qd=         | 78,2   | 78,2   | 78,2   |        | kN/m |
|                 | Md;stp;max=               | 1/8xqdxLxL  | 48,2   | 48,2   | 48,2   |        | kNm  |
|                 | Md;veld;max=              | 1/11xqdxLxL | 35,1   | 35,1   | 35,1   |        | kNm  |
|                 | Vd;max=                   | 5/8xqdxL    | 108,6  | 108,6  | 108,6  |        | kN   |
| boven 2r10+2r12 | A= 382 mm <sup>2</sup>    | Mu=         | 64     | 64     | 64     |        | kNm  |
| onder 4r10      | A= 312 mm <sup>2</sup>    | Mu=         | 52     | 52     | 52     |        | kNm  |
| beugels r10-200 | A= 780 mm <sup>2</sup> /m | Vu=         | 131    | 131    | 131    |        | kN   |
| Balk in as      | qd                        |             |        |        |        |        |      |
| E               | 65,1                      |             | veld 1 | veld 2 | veld 3 | veld 4 |      |
|                 |                           | L=          | 2,22   | 2,22   | 2,22   |        | m    |
|                 |                           | qd=         | 65,1   | 65,1   | 65,1   |        | kN/m |
|                 | Md;stp;max=               | 1/8xqdxLxL  | 40,1   | 40,1   | 40,1   |        | kNm  |
|                 | Md;veld;max=              | 1/11xqdxLxL | 29,2   | 29,2   | 29,2   |        | kNm  |
|                 | Vd;max=                   | 5/8xqdxL    | 90,4   | 90,4   | 90,4   |        | kN   |
| boven 2r10+2r12 | A= 382 mm <sup>2</sup>    | Mu=         | 64     | 64     | 64     |        | kNm  |
| onder 4r10      | A= 312 mm <sup>2</sup>    | Mu=         | 52     | 52     | 52     |        | kNm  |
| beugels r10-250 | A= 624 mm <sup>2</sup> /m | Vu=         | 105    | 105    | 105    |        | kN   |

# Balkwepening

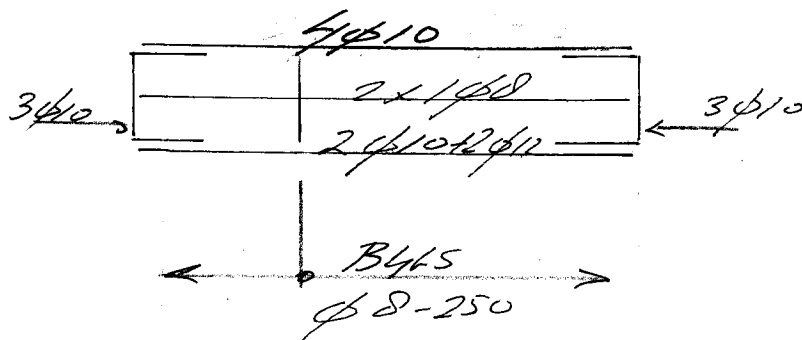
Bloc B5  
WH 1497



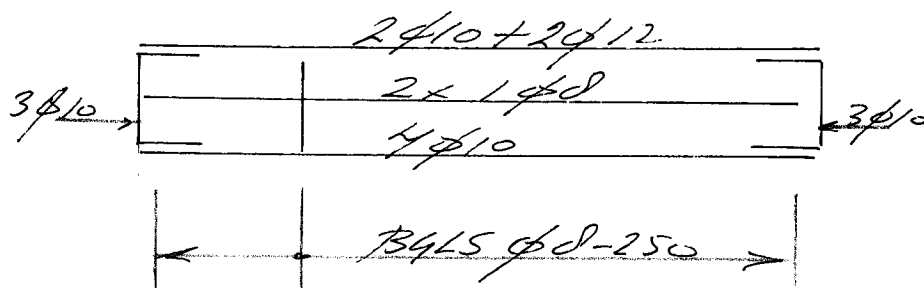
Balk in as  
1 en E



Balk in as  
4, 7, B, C, D

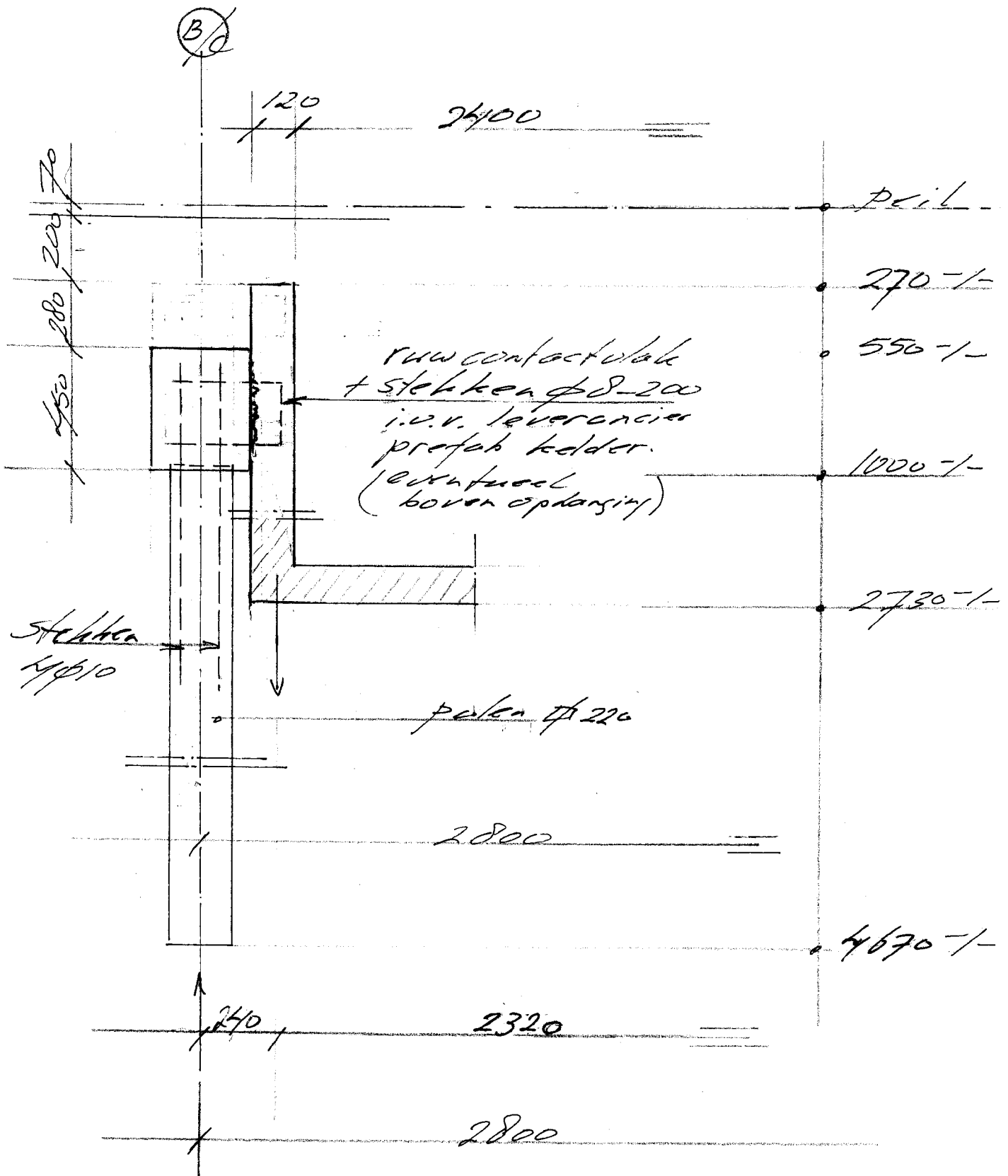


Balk in as  
3 en 5



Balk in as  
2, 6, A

Ophangconstructie kelder



Verdiepingsvloer

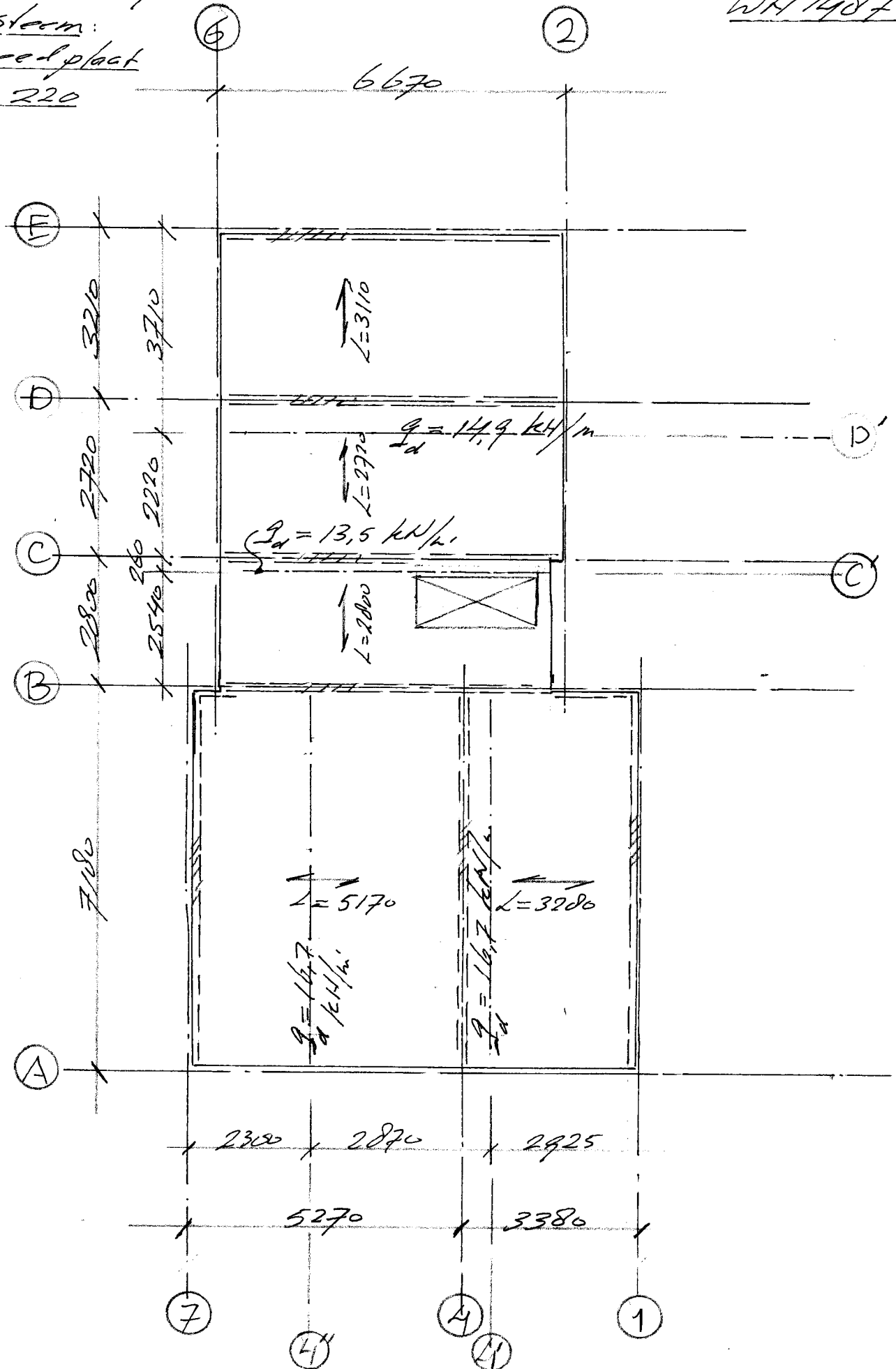
Blad B11

WH 1487

System:

breedplaat

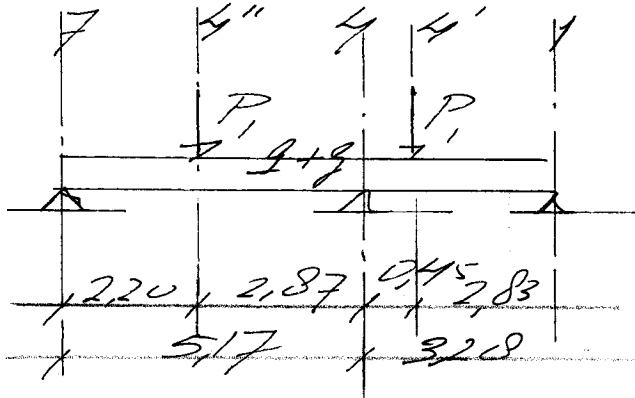
d = 220



# Berekening verd. vloer

Blad B12

Vloerdeel tussen as A en B

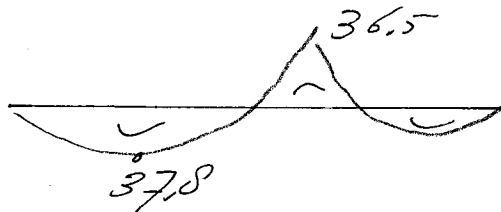


$$q_g = 6,95 \text{ kN/m}$$

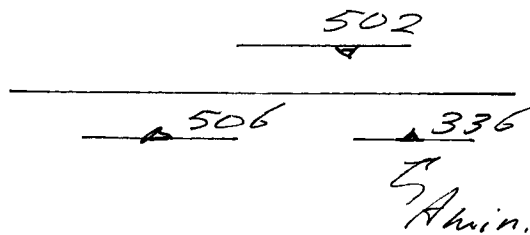
$$q_d = 1,75 \text{ kN/m}$$

$$P_{g1} = 13,02 \text{ kN}$$

$$P_{d1} = 1,93 \text{ kN}$$

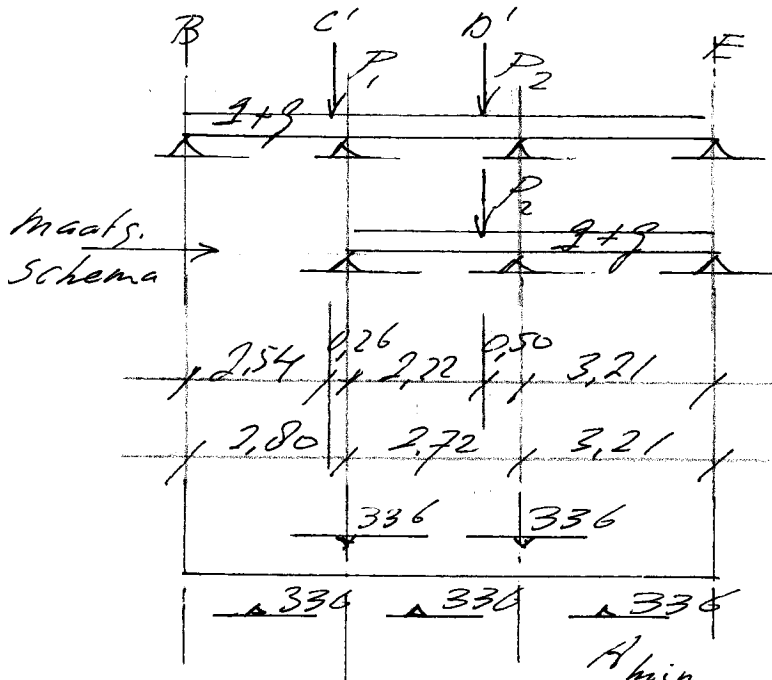


omvullende  
momenten  
zie blad B41/46



Wapening  
 $A \text{ mm}^2/\text{m}$   
zie ook blad B22

Vloer tussen as B en E



$$q_g = 6,95 \text{ kN/m}$$

$$q_d = 1,75 \text{ ''}$$

$$P_{g1} = 10,83 \text{ kN}$$

$$P_{d1} = 1,35 \text{ ''}$$

$$P_{g2} = 11,76 \text{ ''}$$

$$P_{d2} = 1,66 \text{ ''}$$

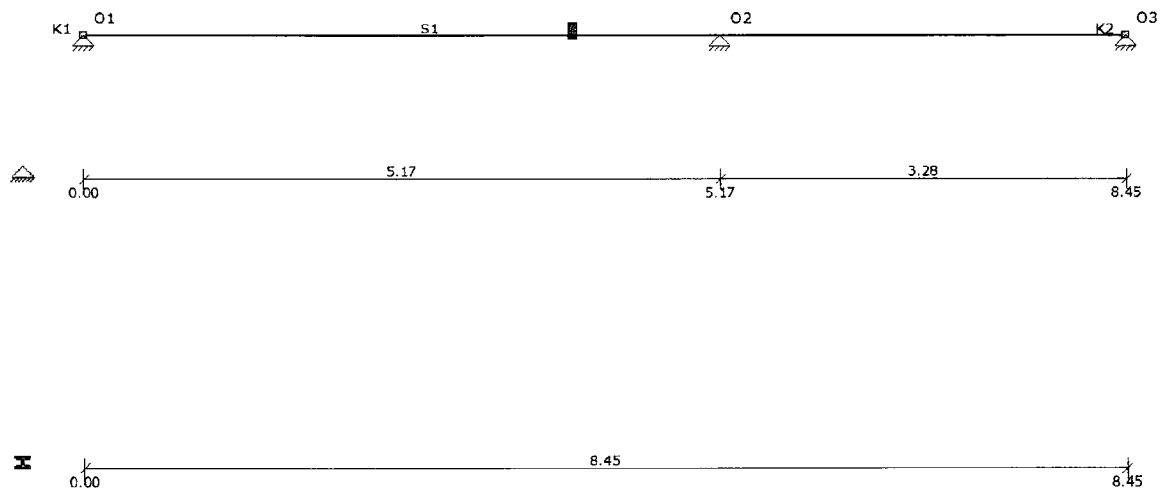
Wapening  
zie blad B51/56

| WAPENING VOLGENS NEN EN 1992 |                         |                   |                     | WN 1487 Fundatiebalk |                     |                      |                      | Doorsn: 360x450      |          |
|------------------------------|-------------------------|-------------------|---------------------|----------------------|---------------------|----------------------|----------------------|----------------------|----------|
| Betonkwaliteit:              | C25/30                  | 30                | = f'ck              | verlaagde            | scheurvorming       |                      |                      | f'b=                 | 18       |
| Staalkwaliteit:              | FeB                     | 500               | 100%                | <--staal-            | voor buiging        |                      |                      | f <sub>b,rep</sub> = | 1,785    |
| Staafooppervlak:             | kies 1,2,3              | 3                 | geribt              | spanning             | zonder trekkracht   |                      |                      | f <sub>b</sub> =     | 1,275    |
| Milieuklasse:                | kies 1,2,3              | XC3               | 30                  | mm dekk.             | G= 1,00             |                      |                      | fbm=                 | 2,550    |
| Balkbreedte:                 | b=                      | 360               | mm                  |                      | k1= 2500            |                      |                      | max-kx1=             | 0,335    |
| Balkhoogte:                  | h=                      | 450               | mm                  |                      | k2= 500             |                      |                      | max-kx2=             | 0,535    |
| Verhouding:                  | Mrep/Mu=                | 0,75              |                     |                      | k3= 40000           |                      |                      | fs=                  | 435      |
| Moment (tabel):              | M <sub>u</sub> -start=  | 40                | kNm                 |                      | kr = 0,675          |                      |                      | fs/fb=               | 24,17    |
| Stapgrootte:                 | Delta-M=                | 2                 | kNm                 |                      | Mr= 43,4            |                      |                      | Sigma-s=             | 326,25   |
| Beugels/verdeelwap:          | diameter=               | 10                | mm                  |                      | Nuttige balkhoogte: |                      |                      | d=                   | 399      |
| Max. toe te passen           | staafdiam:              | 12                | mm                  |                      | Dekking: 30         |                      |                      | c totaal=            | 35       |
| Toeslag op dekking           | ct=                     | 5                 | mm                  |                      |                     |                      |                      |                      |          |
| Constructietype              | kies p,b,k              | b                 | balk                |                      |                     |                      |                      |                      |          |
| Positie wapening:            | wapening in tweede laag |                   |                     |                      | Minimum wapening:   |                      |                      | A <sub>min</sub> =   | 259      |
| Plaats betonvlak: o,b,v,a,r  |                         | r                 | bov.& ond.          |                      | Milieu:             |                      | XC3 S3               | Matig vochtig        |          |
| Mu                           | Mu/bd²                  | wo                | kx                  | xmax                 | A mm²               | Mrep                 | Sigma-rep            | scheurv.             | max diam |
| 40,0                         | 698                     | 0,164             | 0,053               | ----                 | 235                 | 30,0                 | 2,47                 | onv.ontw             |          |
| 42,0                         | 733                     | 0,172             | 0,055               | ----                 | 247                 | 31,5                 | 2,59                 | voll.ontw            |          |
| 44,0                         | 768                     | 0,181             | 0,058               | ----                 | 259                 | 33,0                 | 2,72                 | voll.ontw            |          |
| 46,0                         | 803                     | 0,189             | 0,061               | ----                 | 271                 | 34,5                 | 2,84                 | voll.ontw            |          |
| 48,0                         | 838                     | 0,197             | 0,064               | ----                 | 284                 | 36,0                 | 2,96                 | voll.ontw            |          |
| 50,0                         | 872                     | 0,206             | 0,066               | ----                 | 296                 | 37,5                 | 3,09                 | voll.ontw            |          |
| 52,0                         | 907                     | 0,214             | 0,069               | ----                 | 308                 | 39,0                 | 3,21                 | voll.ontw            |          |
| 54,0                         | 942                     | 0,223             | 0,072               | ----                 | 320                 | 40,5                 | 3,33                 | voll.ontw            |          |
| 56,0                         | 977                     | 0,231             | 0,075               | ----                 | 332                 | 42,0                 | 3,46                 | voll.ontw            |          |
| 58,0                         | 1012                    | 0,240             | 0,077               | ----                 | 345                 | 43,5                 | 3,58                 | voll.ontw            |          |
| 60,0                         | 1047                    | 0,248             | 0,080               | ----                 | 357                 | 45,0                 | 3,70                 | voll.ontw            |          |
| 62,0                         | 1082                    | 0,257             | 0,083               | ----                 | 369                 | 46,5                 | 3,83                 | voll.ontw            |          |
| 64,0                         | 1117                    | 0,266             | 0,086               | ----                 | 381                 | 48,0                 | 3,95                 | voll.ontw            |          |
| 66,0                         | 1152                    | 0,274             | 0,088               | ----                 | 394                 | 49,5                 | 4,07                 | voll.ontw            |          |
| 68,0                         | 1186                    | 0,283             | 0,091               | ----                 | 406                 | 51,0                 | 4,20                 | voll.ontw            |          |
| 70,0                         | 1221                    | 0,291             | 0,094               | ----                 | 419                 | 52,5                 | 4,32                 | voll.ontw            |          |
| 72,0                         | 1256                    | 0,300             | 0,097               | ----                 | 431                 | 54,0                 | 4,44                 | voll.ontw            |          |
| 74,0                         | 1291                    | 0,309             | 0,099               | ----                 | 444                 | 55,5                 | 4,57                 | voll.ontw            |          |
| 76,0                         | 1326                    | 0,317             | 0,102               | ----                 | 456                 | 57,0                 | 4,69                 | voll.ontw            |          |
| 78,0                         | 1361                    | 0,326             | 0,105               | ----                 | 469                 | 58,5                 | 4,81                 | voll.ontw            |          |
| 80,0                         | 1396                    | 0,335             | 0,108               | ----                 | 481                 | 60,0                 | 4,94                 | voll.ontw            |          |
| 82,0                         | 1431                    | 0,344             | 0,111               | ----                 | 494                 | 61,5                 | 5,06                 | voll.ontw            |          |
| 84,0                         | 1466                    | 0,353             | 0,114               | ----                 | 506                 | 63,0                 | 5,19                 | voll.ontw            |          |
| 86,0                         | 1501                    | 0,361             | 0,116               | ----                 | 519                 | 64,5                 | 5,31                 | voll.ontw            |          |
| 88,0                         | 1535                    | 0,370             | 0,119               | ----                 | 532                 | 66,0                 | 5,43                 | voll.ontw            |          |
| 90,0                         | 1570                    | 0,379             | 0,122               | ----                 | 544                 | 67,5                 | 5,56                 | voll.ontw            |          |
| 92,0                         | 1605                    | 0,388             | 0,125               | ----                 | 557                 | 69,0                 | 5,68                 | voll.ontw            |          |
| 94,0                         | 1640                    | 0,397             | 0,128               | ----                 | 570                 | 70,5                 | 5,80                 | voll.ontw            |          |
| 96,0                         | 1675                    | 0,406             | 0,131               | ----                 | 583                 | 72,0                 | 5,93                 | voll.ontw            |          |
| 98,0                         | 1710                    | 0,415             | 0,134               | ----                 | 596                 | 73,5                 | 6,05                 | voll.ontw            |          |
| M <sub>u</sub> kNm           | beugels                 | V <sub>u</sub> kN | A <sub>sv</sub> mm² | k-theta              | k-h                 | T <sub>1</sub> N/mm² | T <sub>2</sub> N/mm² | T <sub>d</sub> N/mm² | z mm     |
| 100                          | 8-250                   | 73                | 0                   | 1,00                 | 1,150               | 0,510                | 3,600                | 0,510                | 378      |
| 100                          | 8-200                   | 83                | 503                 | 1,00                 | 1,150               | 0,510                | 3,600                | 0,575                | 378      |
| 100                          | 8-150                   | 110               | 670                 | 1,00                 | 1,150               | 0,510                | 3,600                | 0,767                | 378      |
| 78                           | 10-250                  | 105               | 628                 | 1,00                 | 1,150               | 0,510                | 3,600                | 0,728                | 383      |
| 78                           | 10-200                  | 131               | 785                 | 1,00                 | 1,150               | 0,510                | 3,600                | 0,910                | 383      |
| 78                           | 12-150                  | 251               | 1508                | 1,00                 | 1,150               | 0,510                | 3,600                | 1,748                | 383      |

| WAPENING VOLGENS NEN EN     |                         |                   |                                 | Verdiepingsvloer |                     |                                  |                                  | Doorsn: 1000x210                 |          |
|-----------------------------|-------------------------|-------------------|---------------------------------|------------------|---------------------|----------------------------------|----------------------------------|----------------------------------|----------|
| Betonkwaliteit:             | C25/30                  | 30                | = $f'_{ck}$                     | verlaagde        | scheurvorming       | $f'_b = 18$                      |                                  |                                  |          |
| Staalkwaliteit:             | B500                    | 500               | 100%                            | <--staal-        | voor buiging        | $f_{b,rep} = 1,785$              |                                  |                                  |          |
| Staafooppervlak:            | kies 1,2,3              | 3                 | geribt                          | spanning         | zonder trekkracht   | $f_b = 1,275$                    |                                  |                                  |          |
| Milieuklasse:               | kies 1,2,3              | XC1               | 25                              | mm dekk.         | G=                  | 1,00                             | $f_{bm} = 2,550$                 |                                  |          |
| Balkbreedte:                | b=                      | 1000              | mm                              | CK=S4            | k1=                 | 2500                             | $\max-kx1 = 0,335$               |                                  |          |
| Balkhoogte:                 | h=                      | 210               | mm                              |                  | k2=                 | 500                              | $\max-kx2 = 0,535$               |                                  |          |
| Verhouding:                 | Mrep/Mu=                | 0,75              |                                 |                  | k3=                 | 40000                            | $f_s = 435$                      |                                  |          |
| Moment (tabel):             | M <sub>u</sub> -start=  | 20                | kNm                             |                  | kr =                | 0,795                            | $f_s/f_b = 24,17$                |                                  |          |
| Stapgrootte:                | Delta-M=                | 2                 | kNm                             |                  | Mr=                 | 26,2                             | $\Sigma\sigma-s = 326,25$        |                                  |          |
| Beugels/verdeelwap:         | diameter=               | 0                 | mm                              |                  | Nuttige balkhoogte: |                                  | $d = 180$                        |                                  |          |
| Max. toe te passen          | staafdiam:              | 10                | mm                              |                  | Dekking:            | 25                               | <b>c totaal= 25</b>              |                                  |          |
| Toeslag op dekking          | ct=                     | 0                 | mm                              |                  | Max. staafafstand:  |                                  | $\max-s = 23$                    |                                  |          |
| Constructietype             | kies p,b,k              | p                 | plaat/wnd                       |                  | Min. aantal staven: |                                  | $N_s = 42$                       |                                  |          |
| Positie wapening:           | wapening in eerste laag |                   |                                 |                  | Minimum wapening:   |                                  | $A_{min} = 336$                  |                                  |          |
| Plaats betonvlak: o,b,v,a,r |                         | r                 | bov.& ond.                      |                  | Milieu:             |                                  |                                  |                                  |          |
| Mu                          | Mu/bd <sup>2</sup>      | wo                | kx                              | xmax             | A mm <sup>2</sup>   | Mrep                             | Sigma-rep                        | scheurv.                         | max diam |
| 20,0                        | 617                     | 0,145             | 0,047                           | ----             | 260                 | 15,0                             | 2,04                             | onv.ontw                         |          |
| 22,0                        | 679                     | 0,159             | 0,051                           | ----             | 287                 | 16,5                             | 2,24                             | onv.ontw                         |          |
| 24,0                        | 741                     | 0,174             | 0,056                           | ----             | 313                 | 18,0                             | 2,45                             | onv.ontw                         |          |
| 26,0                        | 802                     | 0,189             | 0,061                           | ----             | 340                 | 19,5                             | 2,65                             | voll.ontw                        |          |
| 28,0                        | 864                     | 0,204             | 0,066                           | ----             | 367                 | 21,0                             | 2,86                             | voll.ontw                        |          |
| 30,0                        | 926                     | 0,219             | 0,071                           | ----             | 394                 | 22,5                             | 3,06                             | voll.ontw                        |          |
| 32,0                        | 988                     | 0,234             | 0,075                           | ----             | 421                 | 24,0                             | 3,27                             | voll.ontw                        |          |
| 34,0                        | 1049                    | 0,249             | 0,080                           | ----             | 448                 | 25,5                             | 3,47                             | voll.ontw                        |          |
| 36,0                        | 1111                    | 0,264             | 0,085                           | ----             | 476                 | 27,0                             | 3,67                             | voll.ontw                        |          |
| 38,0                        | 1173                    | 0,279             | 0,090                           | ----             | 503                 | 28,5                             | 3,88                             | voll.ontw                        |          |
| 40,0                        | 1235                    | 0,295             | 0,095                           | ----             | 530                 | 30,0                             | 4,08                             | voll.ontw                        |          |
| 42,0                        | 1296                    | 0,310             | 0,100                           | ----             | 558                 | 31,5                             | 4,29                             | voll.ontw                        |          |
| 44,0                        | 1358                    | 0,325             | 0,105                           | ----             | 586                 | 33,0                             | 4,49                             | voll.ontw                        |          |
| 46,0                        | 1420                    | 0,341             | 0,110                           | ----             | 614                 | 34,5                             | 4,69                             | voll.ontw                        |          |
| 48,0                        | 1481                    | 0,356             | 0,115                           | ----             | 642                 | 36,0                             | 4,90                             | voll.ontw                        |          |
| 50,0                        | 1543                    | 0,372             | 0,120                           | ----             | 670                 | 37,5                             | 5,10                             | voll.ontw                        |          |
| 52,0                        | 1605                    | 0,388             | 0,125                           | ----             | 698                 | 39,0                             | 5,31                             | voll.ontw                        |          |
| 54,0                        | 1667                    | 0,404             | 0,130                           | ----             | 726                 | 40,5                             | 5,51                             | voll.ontw                        |          |
| 56,0                        | 1728                    | 0,419             | 0,135                           | ----             | 755                 | 42,0                             | 5,71                             | voll.ontw                        |          |
| 58,0                        | 1790                    | 0,435             | 0,140                           | ----             | 783                 | 43,5                             | 5,92                             | voll.ontw                        |          |
| 60,0                        | 1852                    | 0,451             | 0,145                           | ----             | 812                 | 45,0                             | 6,12                             | voll.ontw                        |          |
| 62,0                        | 1914                    | 0,467             | 0,151                           | ----             | 841                 | 46,5                             | 6,33                             | voll.ontw                        |          |
| 64,0                        | 1975                    | 0,483             | 0,156                           | ----             | 870                 | 48,0                             | 6,53                             | voll.ontw                        |          |
| 66,0                        | 2037                    | 0,500             | 0,161                           | ----             | 899                 | 49,5                             | 6,73                             | voll.ontw                        |          |
| 68,0                        | 2099                    | 0,516             | 0,166                           | ----             | 928                 | 51,0                             | 6,94                             | voll.ontw                        |          |
| 70,0                        | 2160                    | 0,532             | 0,171                           | ----             | 958                 | 52,5                             | 7,14                             | voll.ontw                        |          |
| 72,0                        | 2222                    | 0,549             | 0,177                           | ----             | 987                 | 54,0                             | 7,35                             | voll.ontw                        |          |
| 74,0                        | 2284                    | 0,565             | 0,182                           | ----             | 1017                | 55,5                             | 7,55                             | voll.ontw                        |          |
| 76,0                        | 2346                    | 0,582             | 0,187                           | ----             | 1047                | 57,0                             | 7,76                             | voll.ontw                        |          |
| 78,0                        | 2407                    | 0,598             | 0,193                           | ----             | 1077                | 58,5                             | 7,96                             | voll.ontw                        |          |
| M <sub>u</sub> kNm          | beugels                 | V <sub>u</sub> kN | A <sub>sv</sub> mm <sup>2</sup> | k-theta          | k-h                 | T <sub>1</sub> N/mm <sup>2</sup> | T <sub>2</sub> N/mm <sup>2</sup> | T <sub>d</sub> N/mm <sup>2</sup> | z mm     |
| 38                          | 10-300                  | 92                | 0                               | 1,00             | 1,390               | 0,510                            | 3,600                            | 0,510                            | 174      |
| 38                          | 10-250                  | 47                | 628                             | 1,00             | 1,390               | 0,510                            | 3,600                            | 0,264                            | 174      |
| 38                          | 10-200                  | 59                | 785                             | 1,00             | 1,390               | 0,510                            | 3,600                            | 0,330                            | 174      |
| 58                          | 10-150                  | 82                | 1047                            | 1,00             | 1,390               | 0,537                            | 3,600                            | 0,458                            | 170      |
| 58                          | 10-100                  | 121               | 1571                            | 1,00             | 1,390               | 0,537                            | 3,600                            | 0,673                            | 170      |
| 58                          | 10-075                  | 160               | 2094                            | 1,00             | 1,390               | 0,537                            | 3,600                            | 0,889                            | 170      |

|               |                                                             |               |               |          |
|---------------|-------------------------------------------------------------|---------------|---------------|----------|
| Projectnaam   | Woning Moleneind 7                                          | Projectnummer | 1487          | Blad B41 |
| Omschrijving  | Verdiepings vloer tussen as A en B                          | Constructeur  | J.B. Aalberts |          |
| Opdrachtgever |                                                             | Eenheden      | m, kN, kNm    |          |
| Bestand       | C:\Users\user\HP Personal Media Drive\BUREAU\CAE-projecten\ |               |               |          |

#### AFB. GEOMETRIE RAAMWERK



#### BALKGEOMETRIE

| Positie          | Profielnaam | Hoek | Traagheidsmoment | Materiaal | E-Modulus  | Uitzettingcoëff | Gewicht |
|------------------|-------------|------|------------------|-----------|------------|-----------------|---------|
| 0,000 - L(8,450) | R1000x210   | 0    | 7.7175e-04       | C25/30    | 3.1000e+07 | 10.0000e-06     | 5.25    |
| m -              |             | °    | m4 -             |           | kN/m2      | C°m             | kN/m    |

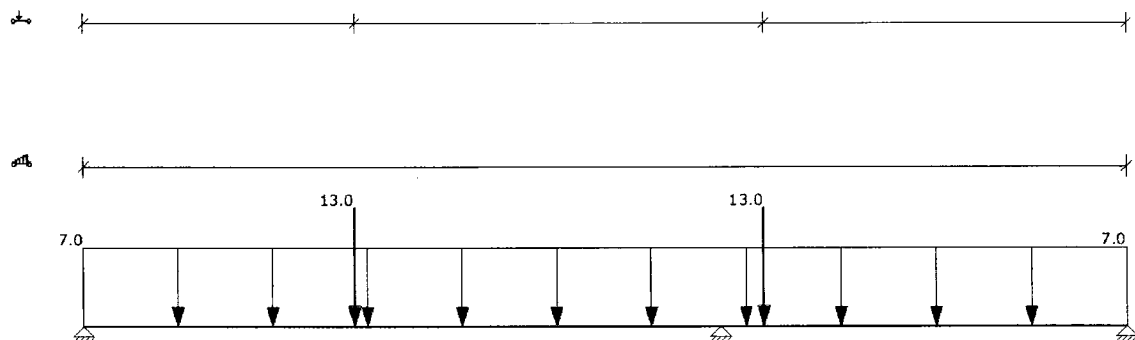
#### OPLEGGINGEN

| Oplegging | Positie  | Z    | Yr     |
|-----------|----------|------|--------|
| O1        | 0,000    | vast | vrij   |
| O2        | 5,170    | vast | vrij   |
| O3        | L(8,450) | vast | vrij   |
| -         | m        | kN/m | kNmrad |

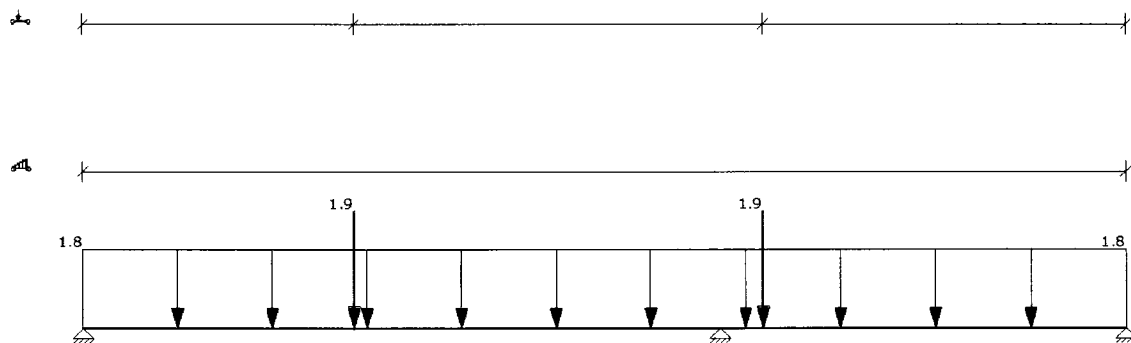
#### BELASTINGSGEVALLEN TYPEN

| Oplegg. | Staven    | B.G.Type  | Gunstig/Ong. | Element | Niveau | Veld   | Psi0 | Psi1 | Psi2 | Cprob |
|---------|-----------|-----------|--------------|---------|--------|--------|------|------|------|-------|
| B.G.1   | Permanent | Permanent | -            |         | N.v.t. | N.v.t. |      |      |      |       |
| B.G.2   | Variabel  | Variabel  |              |         | N.v.t. | N.v.t. |      |      |      | 1,00  |

#### AFB. LASTEN B.G.1 PERMANENT

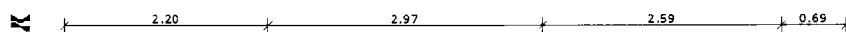
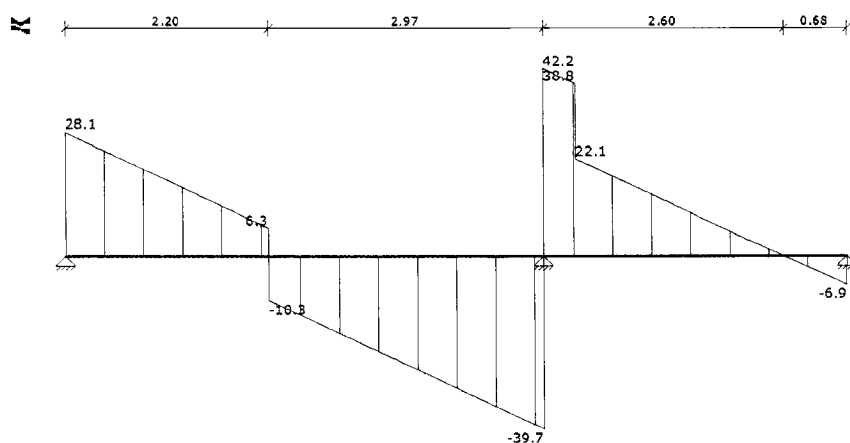


AFB. LASTEN B.G.2 VARIABEL



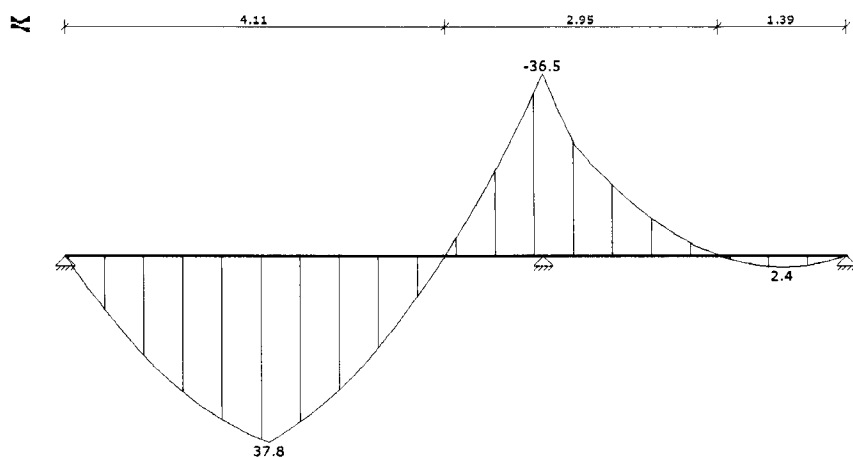
AFB. FU.C. DWARSKRACHT (VZ) OMHULLENDE

Fundamenteel Belastingscombinaties



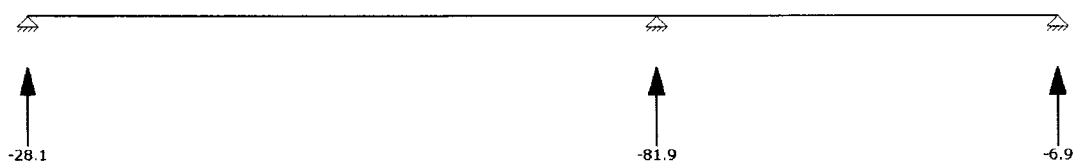
AFB. FU.C. MOMENT (MY) OMHULLENDE

Fundamenteel Belastingscombinaties



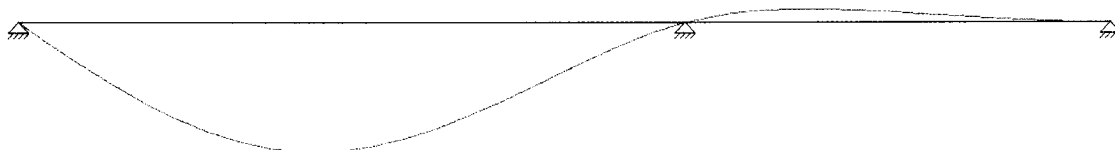
AFB. FU.C. OPLEGREACTIES OMHULLENDE

Fundamenteel Belastingscombinaties



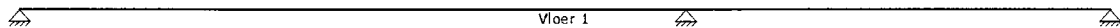
AFB. FU.C. VERPLAATSINGEN OMHULLENDE

Fundamenteel Belastingscombinaties



|               |                                                             |               |               |          |
|---------------|-------------------------------------------------------------|---------------|---------------|----------|
| Projectnaam   | Woning Moleneind 7                                          | Projectnummer | 1487          | Blad B44 |
| Omschrijving  | Verdiepings vloer tussen as A en B                          | Constructeur  | J.B. Aalberts |          |
| Opdrachtgever |                                                             | Eenheden      | m, kN, kNm    |          |
| Bestand       | C:\Users\user\HP Personal Media Drive\BUREAU\CAE-projecten\ |               |               |          |

FIG. BETONDEFINITIE



## BETON EIGENSCHAPPEN (NEN-EN1992-1-1+C2:2010/NB:2011)

| Naam               | Waarde | Eenheden |
|--------------------|--------|----------|
| Hoek drukdiagonaal | 21.80  | °        |

### VLOER 1

#### DOORSNEDE BOVENWAPENING

| Positie | Md Basis | Mod. | Bijleg | As,ben | As,toe | Scheurvorming | D,max | Vloer 1<br>S,max |
|---------|----------|------|--------|--------|--------|---------------|-------|------------------|
| 0.000   | 5.68     | Mti  |        | 75     | 0      | N/B           |       |                  |
| 5.170   | 36.46    |      |        | 502    | 0      | N/B           |       |                  |
| 8.450   | 0.36     | Mti  |        | 5      | 0      | N/B           |       |                  |
| m       | kNm      | -    | -      | mm     | mm     | -             | mm    | mm               |

#### DOORSNEDE ONDERWAPENING

| Positie | Md Basis | Mod. | Bijleg | As,ben | As,toe | Scheurvorming | D,max | Vloer 1<br>S,max |
|---------|----------|------|--------|--------|--------|---------------|-------|------------------|
| 2.200   | 37.84    |      |        | 506    | 0      | N/B           |       |                  |
| 7.755   | 2.38     |      |        | 31     | 0      | N/B           |       |                  |
| m       | kNm      | -    | -      | mm     | mm     | -             | mm    | mm               |

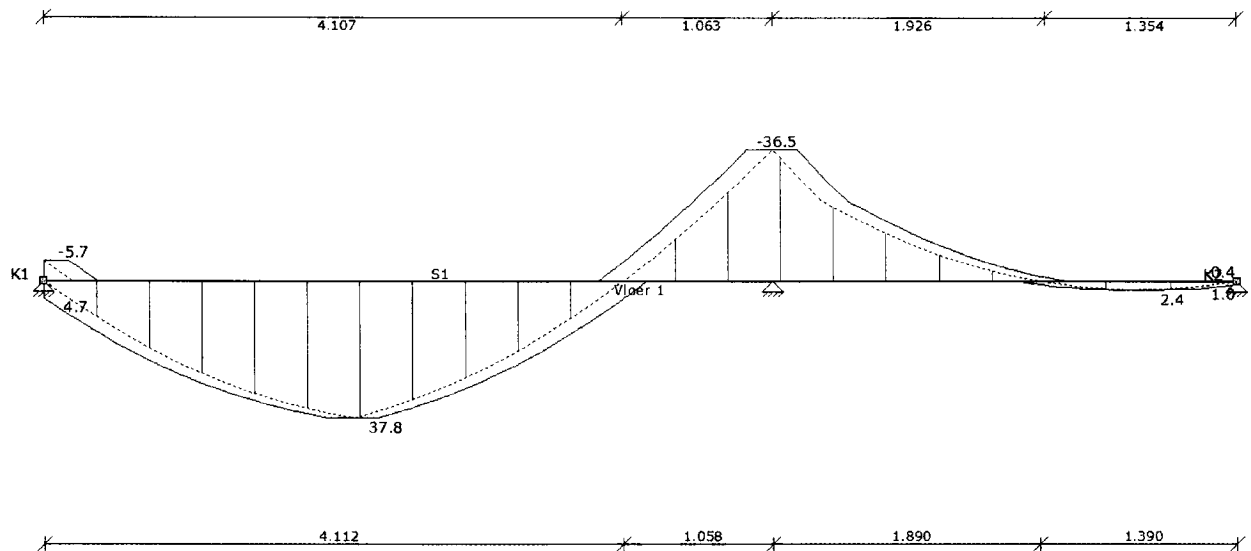
#### DOORSNEDE FLANKWAPENING

| Positie | Mx   | Wapening | As,ben | As,toe | Vloer 1 |
|---------|------|----------|--------|--------|---------|
| 0.000   | 0,00 |          | 0      | 0      |         |
| m       | kNm  | -        | mm     | mm     |         |

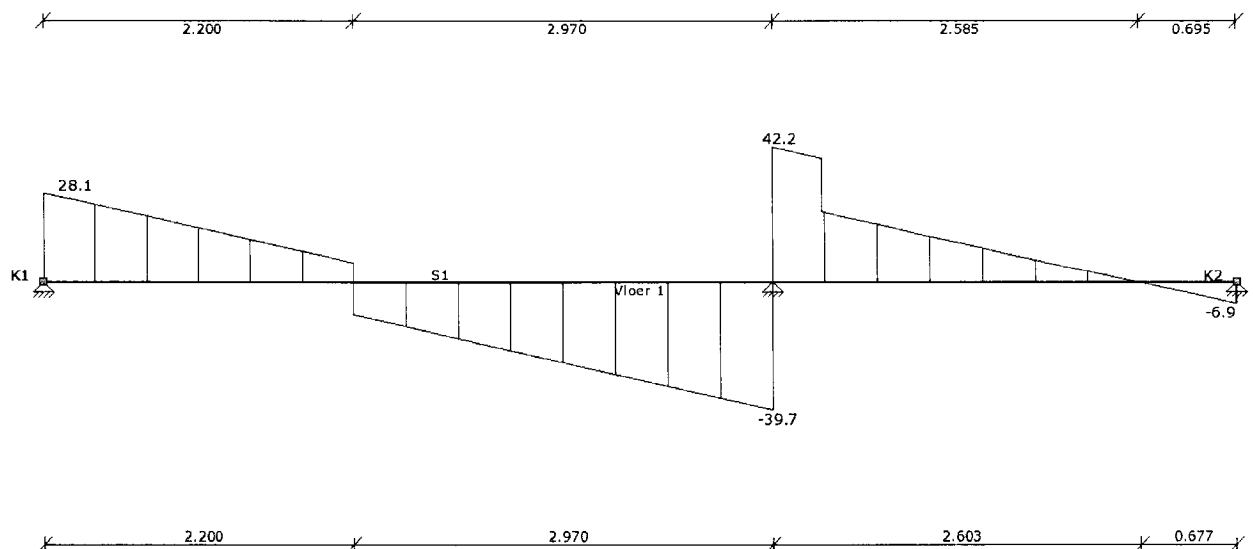
#### DOORSNEDE BEUGELWAPENING

| Positie | Zijde  | Vd    | Wapening | AsV;ben. | AsT;ben. | As,toe | Vrd;c  | Vrd   | Ved   | VRdi | Vloer 1<br>VEdi |
|---------|--------|-------|----------|----------|----------|--------|--------|-------|-------|------|-----------------|
| 0.000   | Rechts | 28.07 | -        | 0        | 0        | 0      | 86.126 | 86.13 | 28.07 | N/B  | N/B             |
| 5.170   | Links  | 39.69 | -        | 0        | 0        | 0      | 86.126 | 86.13 | 39.69 | N/B  | N/B             |
| 5.170   | Rechts | 42.22 | -        | 0        | 0        | 0      | 86.126 | 86.13 | 42.22 | N/B  | N/B             |
| 8.450   | Links  | 6.86  | -        | 0        | 0        | 0      | 86.126 | 86.13 | 6.86  | N/B  | N/B             |
| m       | -      | kN    | -        | mm       | mm       | mm     | kN     | kN    | kN    | kN   | kN              |

AFB. VLOER 1 LANGSWAPENING. (AFBOUW)



AFB. VLOER 1 DWARSKRACHTWAPENING. (AFBOUW)



# VLOER 1

## DOORSNEDE BOVENWAPENING

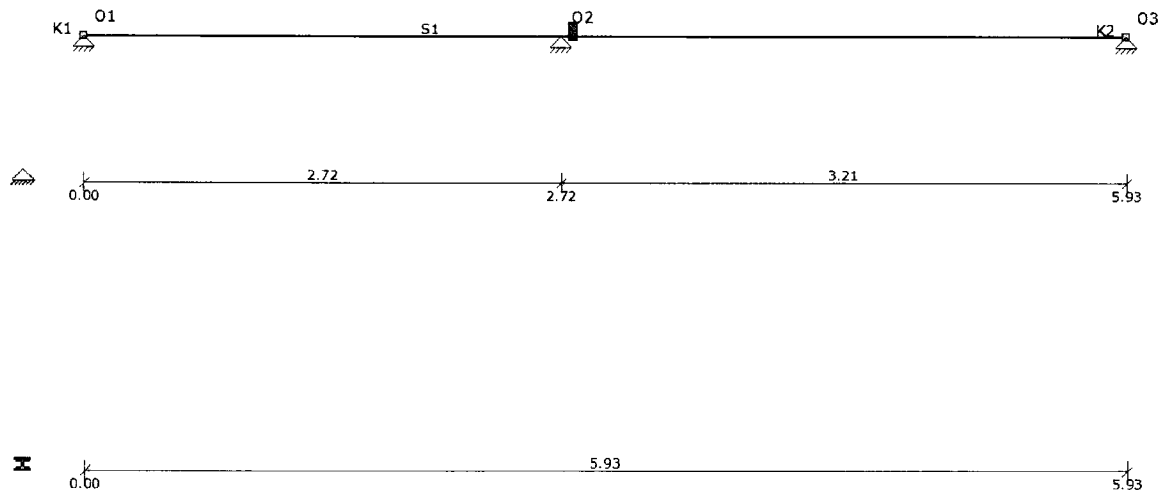
## Vloer 1

| Positie | Md        | Toetsing         |               | Toegepast                            |            | Normartikel               |         |
|---------|-----------|------------------|---------------|--------------------------------------|------------|---------------------------|---------|
| 0.000   | 5,68 kNm  | As,toe           | 0 mm          | As,min2:                             | 0 > 94     | NEN-EN1992-1-1#9.2.1.1(1) | Niet Ok |
|         | Mti       | d = 174,00       |               | As,max:                              | 75 < 8400  | NEN-EN1992-1-1#9.2.1.1(3) |         |
|         |           | x,u = 2,6        |               | As,toe                               | 0 > 75     | NEN-EN1992-1-1#6.1        | Niet Ok |
|         |           | w;ben = 0,043    | w;toe = 0,000 |                                      |            |                           |         |
|         |           | Md/(bd^2): 187   | Mu: 0,00      | Mr: 26,39                            |            |                           |         |
|         |           | Basiswapening:   |               | Basiswapening is niet noodzakelijk , |            |                           |         |
|         |           |                  |               | NEN-EN1992-1-1#9.3.1.1(8)            |            |                           |         |
|         |           | Hoofdwapening:   |               |                                      |            |                           |         |
|         |           | Dekking:         | 30 mm         | C,nom                                | 30 >= 30   | NEN-EN1992-1-1#4.4.1      |         |
|         |           | Scheurvorming:   |               | N.v.t. omdat Milieu = X0/XC1         |            |                           |         |
|         |           | Mrep: 4,16       |               |                                      |            |                           |         |
| 5.170   | 36,46 kNm | As,toe           | 0 mm          | As,min1:                             | 0 > 254    | NEN-EN1992-1-1#9.2.1.1(1) | Niet Ok |
|         |           | d = 174,00       |               | As,max:                              | 502 < 8400 | NEN-EN1992-1-1#9.2.1.1(3) |         |
|         |           | x,u = 17,4       |               | As,toe                               | 0 > 502    | NEN-EN1992-1-1#6.1        | Niet Ok |
|         |           | w;ben = 0,288    | w;toe = 0,000 |                                      |            |                           |         |
|         |           | Md/(bd^2): 1.204 | Mu: 0,00      | Mr: 26,39                            |            |                           |         |
|         |           | Basiswapening:   |               | Basiswapening is niet noodzakelijk , |            |                           |         |
|         |           |                  |               | NEN-EN1992-1-1#9.3.1.1(8)            |            |                           |         |
|         |           | Hoofdwapening:   |               |                                      |            |                           |         |
|         |           | Dekking:         | 30 mm         | C,nom                                | 30 >= 30   | NEN-EN1992-1-1#4.4.1      |         |
|         |           | Scheurvorming:   |               | N.v.t. omdat Milieu = X0/XC1         |            |                           |         |
|         |           | Mrep: -26,51     |               |                                      |            |                           |         |
| 8.450   | 0,36 kNm  | As,toe           | 0 mm          | As,min2:                             | 0 > 6      | NEN-EN1992-1-1#9.2.1.1(1) | Niet Ok |
|         | Mti       | d = 174,00       |               | As,max:                              | 5 < 8400   | NEN-EN1992-1-1#9.2.1.1(3) |         |
|         |           | x,u = 0,2        |               | As,toe                               | 0 > 5      | NEN-EN1992-1-1#6.1        | Niet Ok |
|         |           | w;ben = 0,003    | w;toe = 0,000 |                                      |            |                           |         |
|         |           | Md/(bd^2): 12    | Mu: 0,00      | Mr: 26,39                            |            |                           |         |
|         |           | Basiswapening:   |               | Basiswapening is niet noodzakelijk , |            |                           |         |
|         |           |                  |               | NEN-EN1992-1-1#9.3.1.1(8)            |            |                           |         |
|         |           | Hoofdwapening:   |               |                                      |            |                           |         |
|         |           | Dekking:         | 30 mm         | C,nom                                | 30 >= 30   | NEN-EN1992-1-1#4.4.1      |         |
|         |           | Scheurvorming:   |               | N.v.t. omdat Milieu = X0/XC1         |            |                           |         |
|         |           | Mrep: 0,26       |               |                                      |            |                           |         |

m

|               |                                                             |               |               |          |
|---------------|-------------------------------------------------------------|---------------|---------------|----------|
| Projectnaam   | Woning Moleneind 7                                          | Projectnummer | 1487          | Blad B51 |
| Omschrijving  | Verdiepings vloer tussen as B en E                          | Constructeur  | J.B. Aalberts |          |
| Opdrachtgever |                                                             | Eenheden      | m, kN, kNm    |          |
| Bestand       | C:\Users\user\HP Personal Media Drive\BUREAU\CAE-projecten\ |               |               |          |

#### AFB. GEOMETRIE RAAMWERK



#### BALKGEOMETRIE

| Positie          | Profielnaam | Hoek | Traagheidsmoment | Materiaal | E-Modulus  | Uitzettingcoeff | Gewicht |
|------------------|-------------|------|------------------|-----------|------------|-----------------|---------|
| 0,000 - L(5,930) | R1000x210   | 0    | 7.7175e-04       | C25/30    | 3.1000e+07 | 10.0000e-06     | 5.25    |
| m -              |             | °    | m4 -             |           | kN/m2      | C°m             | kN/m    |

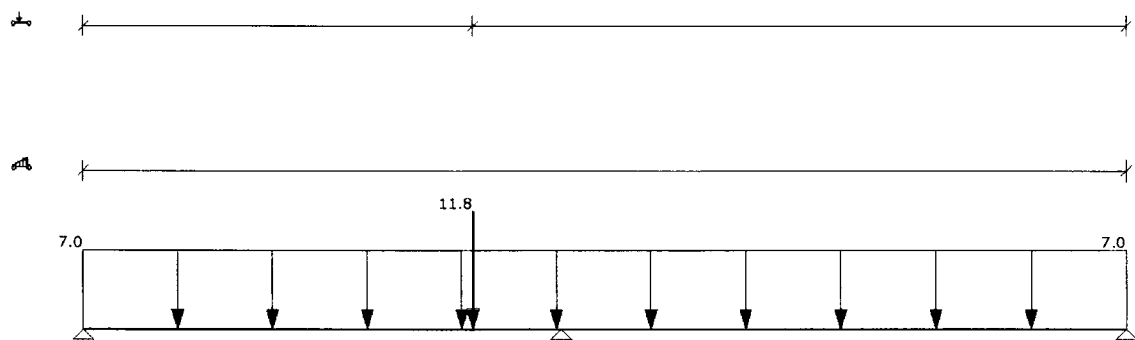
#### OPLEGGINGEN

| Oplegging | Positie | Z    | Yr     |
|-----------|---------|------|--------|
| O1        | 0,000   | vast | vrij   |
| O2        | 2,720   | vast | vrij   |
| O3        | 5,930   | vast | vrij   |
| -         | m       | kN/m | kNmrad |

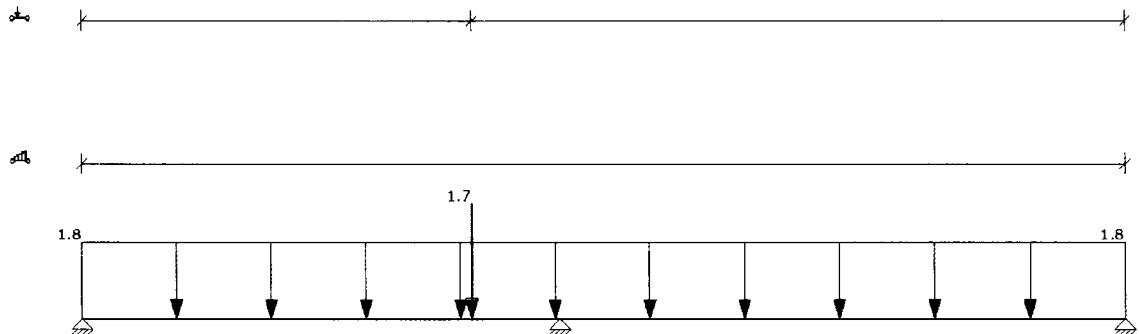
#### BELASTINGSGEVALLEN TYPEN

| Oplegg. | Staven    | B.G.Type  | Gunstig/Ong. | Element | Niveau | Veld   | Psi0 | Psi1 | Psi2 | Cprob |
|---------|-----------|-----------|--------------|---------|--------|--------|------|------|------|-------|
| B.G.1   | Permanent | Permanent | -            |         | N.v.t. | N.v.t. |      |      |      |       |
| B.G.2   | Variabel  | Variabel  |              |         | N.v.t. | N.v.t. |      |      |      | 1,00  |

#### AFB. LASTEN B.G.1 PERMANENT

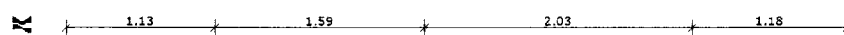
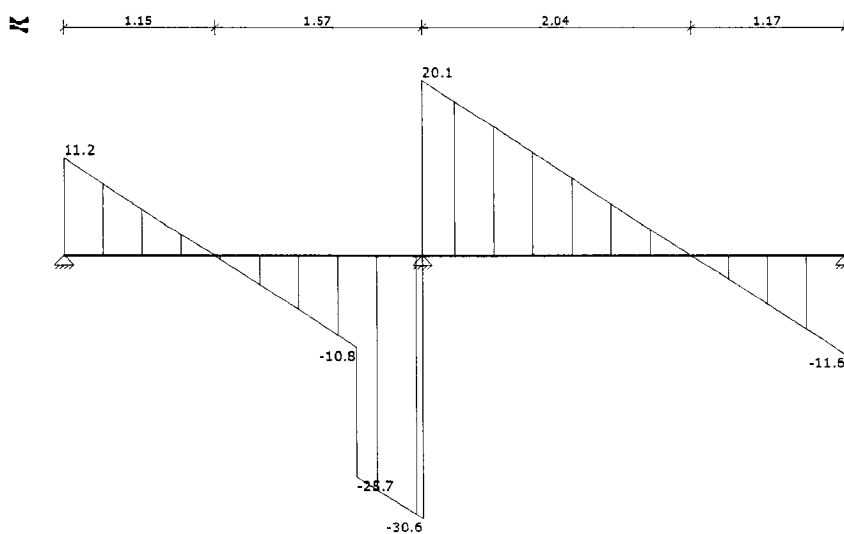


AFB. LASTEN B.G.2 VARIABEL



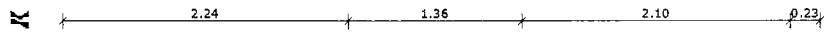
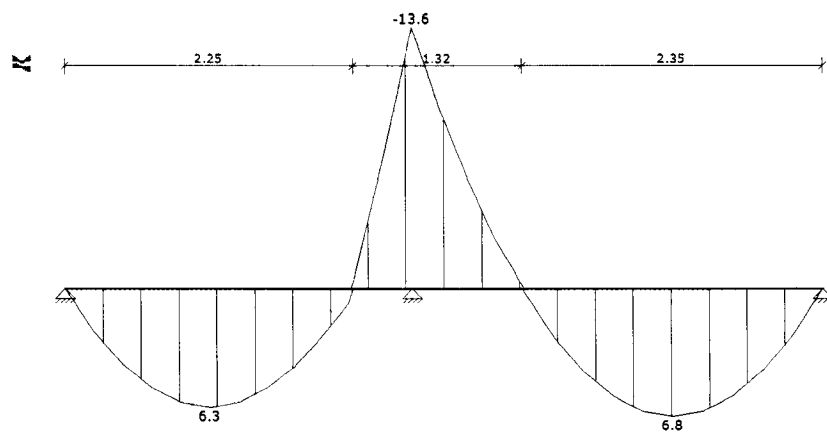
AFB. FU.C. DWARSKRACHT (VZ) OMHULLENDE

Fundamenteel Belastingscombinaties



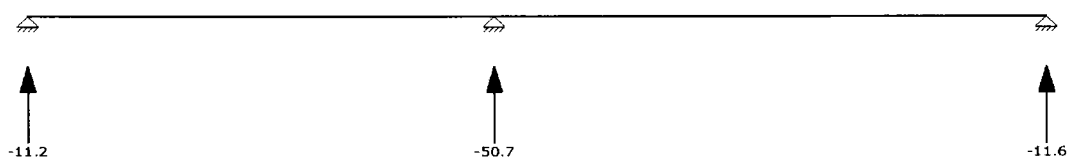
AFB. FU.C. MOMENT (MY) OMHULLENDE

Fundamenteel Belastingscombinaties



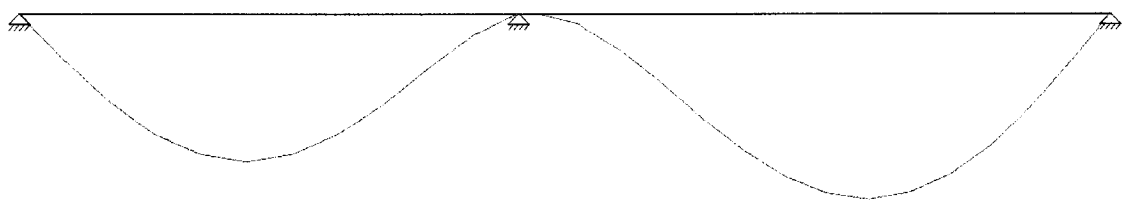
AFB. FU.C. OPLEGREACTIES OMHULLENDE

Fundamenteel Belastingscombinaties



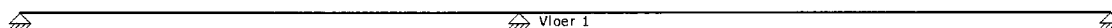
AFB. FU.C. VERPLAATSINGEN OMHULLENDE

Fundamenteel Belastingscombinaties



|               |                                                             |               |               |                 |
|---------------|-------------------------------------------------------------|---------------|---------------|-----------------|
| Projectnaam   | Woning Moleneind 7                                          | Projectnummer | 1487          | <u>Blad B54</u> |
| Omschrijving  | Verdiepings vloer tussen as B en E                          | Constructeur  | J.B. Aalberts |                 |
| Opdrachtgever |                                                             | Eenheden      | m, kN, kNm    |                 |
| Bestand       | C:\Users\user\HP Personal Media Drive\BUREAU\CAE-projecten\ |               |               |                 |

FIG. BETONDEFINITIE



## BETON EIGENSCHAPPEN (NEN-EN1992-1-1+C2:2010/NB:2011)

| Naam               | Waarde | Eenheden |
|--------------------|--------|----------|
| Hoek drukdiagonaal | 21.80  | °        |

### VLOER 1

#### DOORSNEDE BOVENWAPENING

| Positie | Md Basis | Mod. | Bijleg | As,ben | As,toe | Scheurvorming | D,max | Vloer 1<br>S,max |
|---------|----------|------|--------|--------|--------|---------------|-------|------------------|
| 0.000   | 0.95     | Mti  |        | 13     | 0      | N/B           |       |                  |
| 2.720   | 13.62    |      |        | 183    | 0      | N/B           |       |                  |
| 5.930   | 1.02     | Mti  |        | 14     | 0      | N/B           |       |                  |
| m       | kNm      | -    | -      | mm     | mm     | -             | mm    | mm               |

#### DOORSNEDE ONDERWAPENING

| Positie | Md Basis | Mod. | Bijleg | As,ben | As,toe | Scheurvorming | D,max | Vloer 1<br>S,max |
|---------|----------|------|--------|--------|--------|---------------|-------|------------------|
| 1.131   | 6.32     |      |        | 82     | 0      | N/B           |       |                  |
| 4.755   | 6.82     |      |        | 88     | 0      | N/B           |       |                  |
| m       | kNm      | -    | -      | mm     | mm     | -             | mm    | mm               |

#### DOORSNEDE FLANKWAPENING

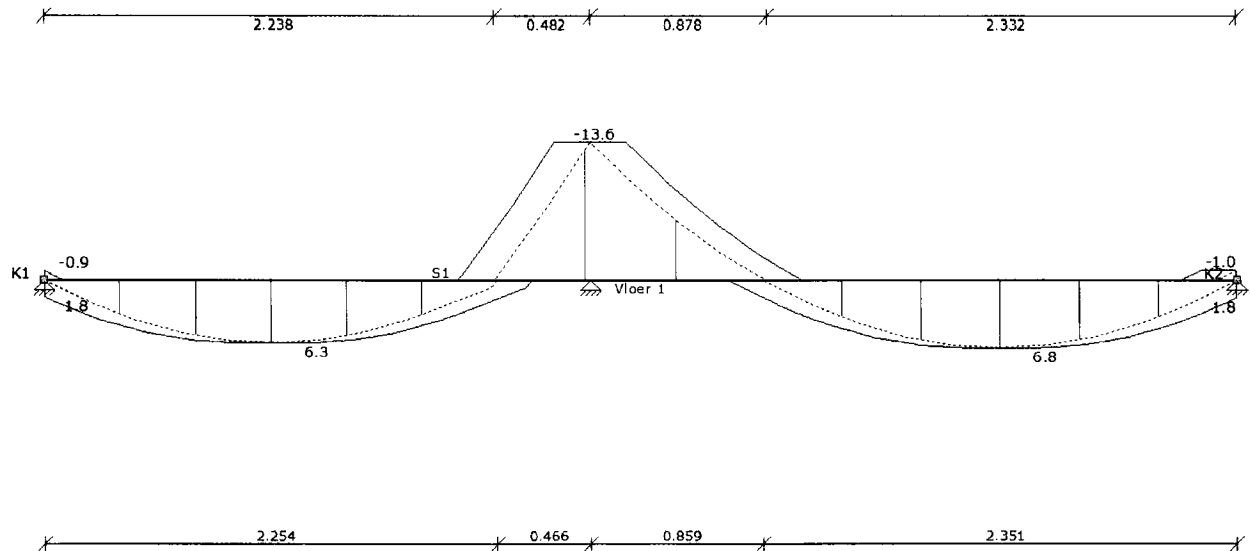
| Positie | Mx   | Wapening | As,ben | As,toe | Vloer 1 |
|---------|------|----------|--------|--------|---------|
| 0.000   | 0,00 |          | 0      | 0      |         |
| m       | kNm  | -        | mm     | mm     |         |

#### DOORSNEDE BEUGELWAPENING

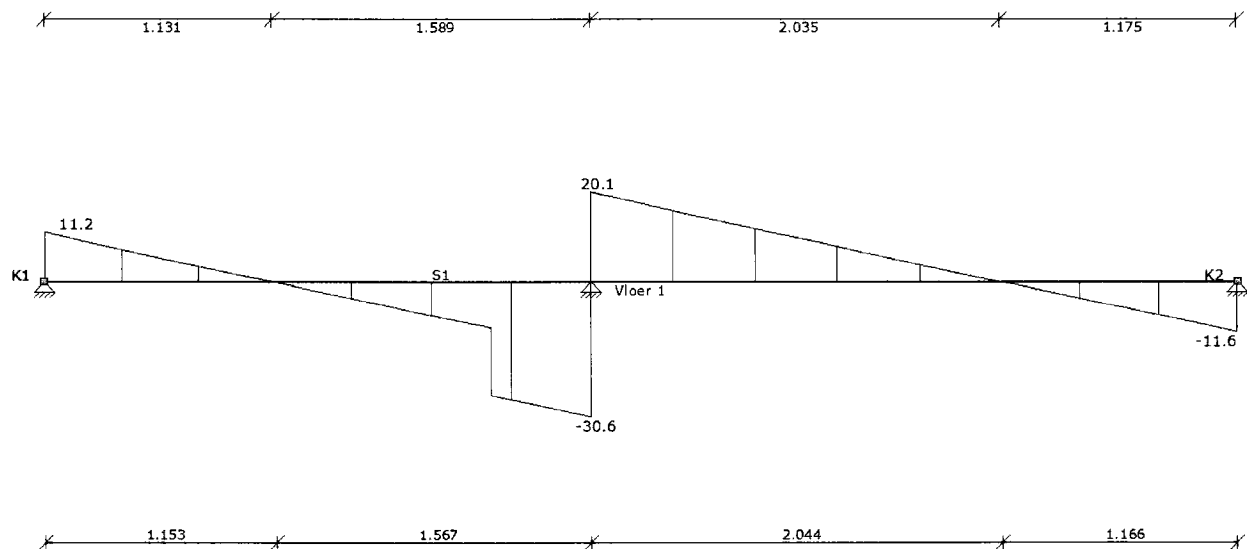
| Positie | Zijde  | Vd    | Wapening | AsV;ben. | AsT;ben. | As,toe | Vrd;c  | Vrd   | Ved   | VRdi | VEdi | Vloer 1 |
|---------|--------|-------|----------|----------|----------|--------|--------|-------|-------|------|------|---------|
| 0.000   | Rechts | 11.18 | -        | 0        | 0        | 0      | 86.126 | 86.13 | 11.18 | N/B  | N/B  |         |
| 2.720   | Links  | 30.65 | -        | 0        | 0        | 0      | 86.126 | 86.13 | 30.65 | N/B  | N/B  |         |
| 2.720   | Rechts | 20.10 | -        | 0        | 0        | 0      | 86.126 | 86.13 | 20.10 | N/B  | N/B  |         |
| 5.930   | Links  | 11.61 | -        | 0        | 0        | 0      | 86.126 | 86.13 | 11.61 | N/B  | N/B  |         |
| m       | -      | kN    | -        | mm       | mm       | mm     | kN     | kN    | kN    | kN   | kN   |         |

AFB. VLOER 1 LANGSWAPENING. (AFBOUW)

|               |                                                             |               |               |                 |
|---------------|-------------------------------------------------------------|---------------|---------------|-----------------|
| Projectnaam   | Woning Moleneind 7                                          | Projectnummer | 1487          | <u>Blad B55</u> |
| Omschrijving  | Verdiepings vloer tussen as B en E                          | Constructeur  | J.B. Aalberts |                 |
| Opdrachtgever |                                                             | Eenheden      | m, kN, kNm    |                 |
| Bestand       | C:\Users\user\HP Personal Media Drive\BUREAU\CAE-projecten\ |               |               |                 |



#### AFB. VLOER 1 DWARSKRACHTWAPENING. (AFBOUW)



# VLOER 1

## DOORSNEDE BOVENWAPENING

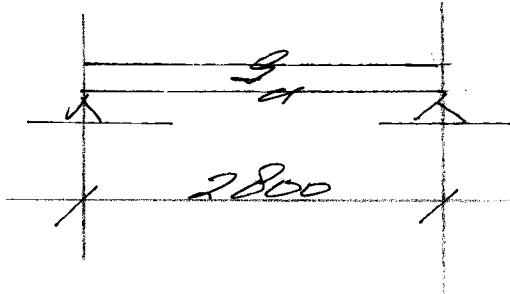
| Positie | Md        | Toetsing       |               | Toegepast                            |            | Normartikel               | Vloer 1 |
|---------|-----------|----------------|---------------|--------------------------------------|------------|---------------------------|---------|
| 0.000   | 0,95 kNm  | As,toe         | 0 mm          | As,min2:                             | 0 > 16     | NEN-EN1992-1-1#9.2.1.1(1) | Niet Ok |
|         | Mti       | d = 174,00     |               | As,max:                              | 13 < 8400  | NEN-EN1992-1-1#9.2.1.1(3) |         |
|         |           | x,u = 0,4      |               | As,toe                               | 0 > 13     | NEN-EN1992-1-1#6.1        | Niet Ok |
|         |           | w;ben = 0,007  | w;toe = 0,000 |                                      |            |                           |         |
|         |           | Md/(bd^2): 31  | Mu: 0,00      | Mr: 26,39                            |            |                           |         |
|         |           | Basiswapening: |               | Basiswapening is niet noodzakelijk , |            |                           |         |
|         |           |                |               | NEN-EN1992-1-1#9.3.1.1(8)            |            |                           |         |
|         |           | Hoofdwapening: |               |                                      |            |                           |         |
|         |           | Dekking:       | 30 mm         | C,nom                                | 30 >= 30   | NEN-EN1992-1-1#4.4.1      |         |
|         |           | Scheurvorming: |               | N.v.t. omdat Milieu = X0/XC1         |            |                           |         |
|         |           | Mrep: 0,70     |               |                                      |            |                           |         |
| 2.720   | 13,62 kNm | As,toe         | 0 mm          | As,min2:                             | 0 > 228    | NEN-EN1992-1-1#9.2.1.1(1) | Niet Ok |
|         |           | d = 174,00     |               | As,max:                              | 183 < 8400 | NEN-EN1992-1-1#9.2.1.1(3) |         |
|         |           | x,u = 6,4      |               | As,toe                               | 0 > 183    | NEN-EN1992-1-1#6.1        | Niet Ok |
|         |           | w;ben = 0,105  | w;toe = 0,000 |                                      |            |                           |         |
|         |           | Md/(bd^2): 450 | Mu: 0,00      | Mr: 26,39                            |            |                           |         |
|         |           | Basiswapening: |               | Basiswapening is niet noodzakelijk , |            |                           |         |
|         |           |                |               | NEN-EN1992-1-1#9.3.1.1(8)            |            |                           |         |
|         |           | Hoofdwapening: |               |                                      |            |                           |         |
|         |           | Dekking:       | 30 mm         | C,nom                                | 30 >= 30   | NEN-EN1992-1-1#4.4.1      |         |
|         |           | Scheurvorming: |               | N.v.t. omdat Milieu = X0/XC1         |            |                           |         |
|         |           | Mrep: -9,79    |               |                                      |            |                           |         |
| 5.930   | 1,02 kNm  | As,toe         | 0 mm          | As,min2:                             | 0 > 17     | NEN-EN1992-1-1#9.2.1.1(1) | Niet Ok |
|         | Mti       | d = 174,00     |               | As,max:                              | 14 < 8400  | NEN-EN1992-1-1#9.2.1.1(3) |         |
|         |           | x,u = 0,5      |               | As,toe                               | 0 > 14     | NEN-EN1992-1-1#6.1        | Niet Ok |
|         |           | w;ben = 0,008  | w;toe = 0,000 |                                      |            |                           |         |
|         |           | Md/(bd^2): 34  | Mu: 0,00      | Mr: 26,39                            |            |                           |         |
|         |           | Basiswapening: |               | Basiswapening is niet noodzakelijk , |            |                           |         |
|         |           |                |               | NEN-EN1992-1-1#9.3.1.1(8)            |            |                           |         |
|         |           | Hoofdwapening: |               |                                      |            |                           |         |
|         |           | Dekking:       | 30 mm         | C,nom                                | 30 >= 30   | NEN-EN1992-1-1#4.4.1      |         |
|         |           | Scheurvorming: |               | N.v.t. omdat Milieu = X0/XC1         |            |                           |         |
|         |           | Mrep: 0,70     |               |                                      |            |                           |         |

m

clak/zolder balken

voor plattegrond  
zie blad A0

as A' en B'



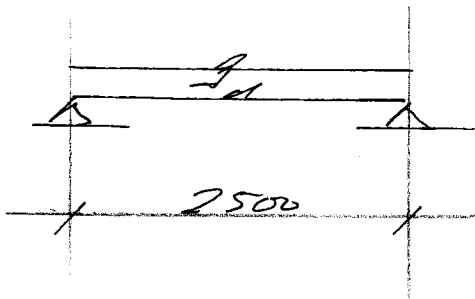
$$g_d = 7,3 \text{ kN/m}$$

$$g_{d(1,22)} = 5,8 \text{ kN/m}$$

HE 140 A

zie blad C11

as 2' en 6'



$$g_d = 5,4 \text{ kN/m}$$

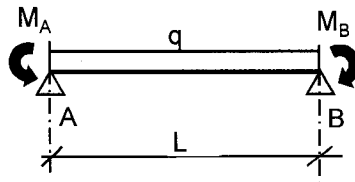
$$g_{d(1,22)} = 4,5 \text{ kN/m}$$

HE 140 A

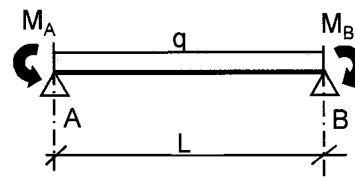
zie blad C11

|            |               |
|------------|---------------|
| werknr:    | 2016 1487     |
| onderdeel: | stalen balken |

|             |        |                                      |
|-------------|--------|--------------------------------------|
| balknr:     | stb 1  | as A' en B'                          |
| CC          | 1      | gevolgklasse $\gamma_g = 1,08$       |
| qd(g+q)=    | 7,30   | kN/m $\gamma_q = 1,35$               |
| qd(g)=      | 5,80   | kN/m $\gamma_g = 1,22$               |
| L=          | 2800   | mm                                   |
| d bij =     | 0,0020 | xL=norm= 5,6 mm                      |
| d totaal=   | 0,0030 | xL=norm= 8,4 mm                      |
| Md(A)=      | 0,0    | kNm = 0,000 maal $1/8qL^2$           |
| Md(B)=      | 0,0    | kNm = 0,000 maal $1/8qL^2$           |
| fs=         | 235    | N/mm <sup>2</sup>                    |
| profiel HE  | 140    | A praktisch                          |
| profieltype | H      | kies H, HB of I                      |
| W=          | 155    | $\times 10^3$ mm <sup>3</sup>        |
| I =         | 1030   | $\times 10^4$ mm <sup>4</sup>        |
| g rep =     | 4,75   | kN/m                                 |
| q rep =     | 1,60   | kN/m                                 |
| qd(max)=    | 7,3    | kN/m                                 |
| 1/8qLL =    | 7,2    | kNm                                  |
| RA=         | 10,22  | kN                                   |
| RB=         | 10,22  | kN                                   |
| x-Mveld=    | 1,40   | m                                    |
| M-veld=     | 7,2    | kNm                                  |
| M-max=      | 7,2    | kNm veld                             |
| Sigma =     | 46     | N/mm <sup>2</sup> accoord U.C.= 0,20 |
| d reken =   | 2,7    | mm                                   |
| d onm.=     | 1,8    | mm                                   |
| d bij =     | 0,6    | mm < 5,6 U.C.= 0,11                  |
| d totaal=   | 2,4    | mm < 8,4 U.C.= 0,28                  |



|             |        |                                      |
|-------------|--------|--------------------------------------|
| balknr:     | stb 2  | 2' en 6'                             |
| CC          | 1      | gevolgklasse $\gamma_g = 1,08$       |
| qd(g+q)=    | 5,40   | kN/m $\gamma_q = 1,35$               |
| qd(g)=      | 4,50   | kN/m $\gamma_g = 1,22$               |
| L=          | 2500   | mm                                   |
| d bij =     | 0,0020 | xL=norm= 5,0 mm                      |
| d totaal=   | 0,0030 | xL=norm= 7,5 mm                      |
| Md(A)=      | 0,0    | kNm = 0,000 maal $1/8qL^2$           |
| Md(B)=      | 0,0    | kNm = 0,000 maal $1/8qL^2$           |
| fs=         | 235    | N/mm <sup>2</sup>                    |
| profiel HE  | 140    | A                                    |
| profieltype | H      | kies H, HB of I                      |
| W=          | 155    | $\times 10^3$ mm <sup>3</sup>        |
| I =         | 1030   | $\times 10^4$ mm <sup>4</sup>        |
| g rep =     | 3,69   | kN/m                                 |
| q rep =     | 1,05   | kN/m                                 |
| qd(max)=    | 5,4    | kN/m                                 |
| 1/8qLL =    | 4,2    | kNm                                  |
| RA=         | 6,75   | kN                                   |
| RB=         | 6,75   | kN                                   |
| x-Mveld=    | 1,25   | m                                    |
| M-veld=     | 4,2    | kNm                                  |
| M-max=      | 4,2    | kNm veld                             |
| Sigma =     | 27     | N/mm <sup>2</sup> accoord U.C.= 0,12 |
| d reken =   | 1,3    | mm                                   |
| d onm.=     | 0,9    | mm                                   |
| d bij =     | 0,2    | mm < 5,0 U.C.= 0,05                  |
| d totaal=   | 1,1    | mm < 7,5 U.C.= 0,15                  |

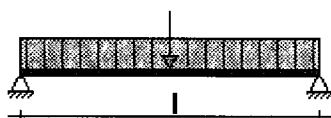


|               |                    |               |            |         |
|---------------|--------------------|---------------|------------|---------|
| Projectnaam   | woning moleneind 7 | Projectnummer | 1487       | Blad D1 |
| Omschrijving  | zolderbalklaag     | Constructeur  | jba        |         |
| Opdrachtgever |                    | Eenheden      | m, kN, kNm |         |

## 1. Zoldervloer (NEN-EN1995-1-1:2011/NB:2013)

### PROFIELGEGEVENS: HT-GS 59 X 156

|                      |                     |                          |                  |                    |                          |
|----------------------|---------------------|--------------------------|------------------|--------------------|--------------------------|
| Breedte              | b                   | 59 mm                    | Oppervlak        | A                  | 9204 mm <sup>2</sup>     |
| Hoogte               | h                   | 156 mm                   |                  |                    |                          |
| Weerstandsmoment     | Wy                  | 2393e+02 mm <sup>3</sup> | Traagheidsmoment | I <sub>tor</sub>   | 8124e+03 mm <sup>4</sup> |
| Weerstandsmoment     | Wz                  | 9051e+01 mm <sup>3</sup> | Traagheidsmoment | I <sub>y</sub>     | 1867e+04 mm <sup>4</sup> |
|                      |                     |                          | Traagheidsmoment | I <sub>z</sub>     | 2670e+03 mm <sup>4</sup> |
| Sterkte klasse       |                     | C18                      |                  |                    |                          |
|                      | f <sub>m,0,k</sub>  | 18.0 N/mm <sup>2</sup>   |                  | f <sub>c,0,k</sub> | 18.0 N/mm <sup>2</sup>   |
|                      | f <sub>t,0,k</sub>  | 11.0 N/mm <sup>2</sup>   |                  | f <sub>v,0,k</sub> | 3.4 N/mm <sup>2</sup>    |
| Elasticiteitsmodulus | E <sub>0,mean</sub> | 9000.0 N/mm <sup>2</sup> |                  | G <sub>mean</sub>  | 560.0 N/mm <sup>2</sup>  |



|                          |        |         |                           |         |       |
|--------------------------|--------|---------|---------------------------|---------|-------|
| Klimaatklasse            |        | I       |                           | Gamma;M | 1.30  |
|                          | k;h    | 1.00    | I (Permanent)             | k;mod   | 0.60  |
|                          |        |         | II (Lange termijn)        | k;mod   | 0.70  |
|                          | Beta;c | 0.2     | III (Middellange termijn) | k;mod   | 0.80  |
| Ontwerplevensduur        |        | 50 Jaar | IV (Korte termijn)        | k;mod   | 0.90  |
| Betrouwbaarheidsklasse   |        | 1       | V (Onmiddellijk)          | k;mod   | 1.10  |
| l <sub>sys</sub>         |        | 3.190 m | Beschot kwaliteit         |         | C27   |
| hoh afstand              | Lt     | 0.600 m | Beschot dikte             |         | 22 mm |
| Zeeg                     |        | 0 mm    |                           |         |       |
| Doorbuigingen beschouwen |        | Ja      |                           |         |       |
| Stootbelasting           |        | Nee     |                           |         |       |
| Reductiefactor spreiding |        | 0.65    |                           |         |       |

### BELASTINGEN

### CPROB

|           |                                 |                              |      |
|-----------|---------------------------------|------------------------------|------|
| Permanent | Eigen gewicht                   | 0.06 kN/m <sup>2</sup>       |      |
|           | beschot                         | 0.16 kN/m <sup>2</sup>       |      |
|           | plafond                         | 0.20 kN/m <sup>2</sup>       |      |
|           | <b>Totaal</b>                   | <b>0.42 kN/m<sup>2</sup></b> |      |
| Opgelegd  | q <sub>k</sub>                  | 1.00 kN/m <sup>2</sup>       | 1.00 |
|           | psi (-)_0; psi (-)_1; psi (-)_2 | 0.40; 0.00; 0.00             |      |
|           | Q <sub>k</sub>                  | 3.00 kN                      |      |
| Bijzonder | Bijzonder; F <sub>bijz</sub>    | 0.00 kN                      |      |
|           | Bijzonder; p <sub>bijz</sub>    | 0.00 kN/m <sup>2</sup>       |      |

### BELASTINGSCOMBINATIES VOOR UITERSTE GRENSTOESTAND (610A + 6.10B)

|        |                                                     |                                 |                        |
|--------|-----------------------------------------------------|---------------------------------|------------------------|
| Fu.C.1 | p = + yG * G <sub>rep</sub> + yQ * Q <sub>rep</sub> | = + 1.22 * 0.42 + 0.54 * 1.00 = | 1.05 kN/m <sup>2</sup> |
| Fu.C.2 | p = + yG * G <sub>rep</sub> + yQ * Q <sub>rep</sub> | = + 1.08 * 0.42 + 1.35 * 1.00 = | 1.80 kN/m <sup>2</sup> |
| Fu.C.3 | p = + yG * G <sub>rep</sub>                         | = + 1.22 * 0.42 =               | 0.51 kN/m <sup>2</sup> |
|        | F = + yQ * F <sub>rep</sub>                         | = + 0.54 * 3.00 =               | 1.62 kN                |
| Fu.C.4 | p = + yG * G <sub>rep</sub>                         | = + 1.08 * 0.42 =               | 0.45 kN/m <sup>2</sup> |
|        | F = + yQ * F <sub>rep</sub>                         | = + 1.35 * 3.00 =               | 4.05 kN                |
| Bi.C.1 | p = + yG * G <sub>rep</sub>                         | = + 1.00 * 0.42 =               | 0.42 kN/m <sup>2</sup> |

### MAATGEVENDE SNEDEKRACHTEN

| Comb.  | N <sub>c</sub> ;E <sub>d</sub> , N <sub>t</sub> ;E <sub>d</sub> | V <sub>y</sub> ;E <sub>d</sub> | V <sub>z</sub> ;E <sub>d</sub> | M <sub>y</sub> ;E <sub>d</sub> | M <sub>z</sub> ;E <sub>d</sub> |
|--------|-----------------------------------------------------------------|--------------------------------|--------------------------------|--------------------------------|--------------------------------|
| Fu.C.1 | 0.00                                                            | 0.00                           | 1.00                           | 0.80                           | 0.00                           |
| Fu.C.2 | 0.00                                                            | 0.00                           | 1.72                           | 1.38                           | 0.00                           |
| Fu.C.3 | 0.00                                                            | 0.00                           | 2.11                           | 1.22                           | 0.00                           |
| Fu.C.4 | 0.00                                                            | 0.00                           | 4.48                           | 2.43                           | 0.00                           |
| Bi.C.1 | 0.00                                                            | 0.00                           | 0.40                           | 0.32                           | 0.00                           |
|        | kN                                                              | kN                             | kN                             | kNm                            | kNm                            |

|               |                    |               |            |         |
|---------------|--------------------|---------------|------------|---------|
| Projectnaam   | woning moleneind 7 | Projectnummer | 1487       | Blad D2 |
| Omschrijving  | zolderbalklaag     | Constructeur  | jba        |         |
| Opdrachtgever |                    | Eenheden      | m, kN, kNm |         |

## MAX UC SNEDEKRACHT

| Comb.  | Nc;Ed, Nt;Ed | Vy;Ed | Vz;Ed | My;Ed | Mz;Ed |
|--------|--------------|-------|-------|-------|-------|
| Fu.C.1 | 0.00         | 0.00  | 0.00  | 0.80  | 0.00  |
| Fu.C.2 | 0.00         | 0.00  | 0.00  | 1.38  | 0.00  |
| Fu.C.3 | 0.00         | 0.00  | 0.52  | 1.22  | 0.00  |
| Fu.C.4 | 0.00         | 0.00  | 1.31  | 2.43  | 0.00  |
| Bi.C.1 | 0.00         | 0.00  | 0.00  | 0.32  | 0.00  |
|        | kN           | kN    | kN    | kNm   | kNm   |

## REKENSTERKTE

| Comb.  | Belasting duurklasse      | f;m,y,d           | f;m,z,d           | f;t,0,d           | f;c,0,d           | f;v,0,d           |
|--------|---------------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
| Fu.C.1 | III (Middellange termijn) | 11.08             | 13.35             | 6.77              | 11.08             | 2.09              |
| Fu.C.2 | III (Middellange termijn) | 11.08             | 13.35             | 6.77              | 11.08             | 2.09              |
| Fu.C.3 | III (Middellange termijn) | 11.08             | 13.35             | 6.77              | 11.08             | 2.09              |
| Fu.C.4 | III (Middellange termijn) | 11.08             | 13.35             | 6.77              | 11.08             | 2.09              |
| Bi.C.1 | I (Permanent)             | 8.31              | 10.01             | 5.08              | 8.31              | 1.57              |
|        |                           | N/mm <sup>2</sup> | N/mm <sup>2</sup> | N/mm <sup>2</sup> | N/mm <sup>2</sup> | N/mm <sup>2</sup> |

## REKENSPANNING

| Comb.  | sigma;m,y,d       | sigma;m,z,d       | tau;v,y,d         | tau;v,z,d         | sigma;c(t),0,d    |
|--------|-------------------|-------------------|-------------------|-------------------|-------------------|
| Fu.C.1 | 3.34              | 0.00              | 0.00              | 0.00              | 0.00              |
| Fu.C.2 | 5.75              | 0.00              | 0.00              | 0.00              | 0.00              |
| Fu.C.3 | 5.11              | 0.00              | 0.00              | 0.09              | 0.00              |
| Fu.C.4 | 10.16             | 0.00              | 0.00              | 0.21              | 0.00              |
| Bi.C.1 | 1.33              | 0.00              | 0.00              | 0.00              | 0.00              |
|        | N/mm <sup>2</sup> | N/mm <sup>2</sup> | N/mm <sup>2</sup> | N/mm <sup>2</sup> | N/mm <sup>2</sup> |

## UC DOORSNEDE PER BELASTINGSCOMBINATIE

|        |                             |                                  |         |
|--------|-----------------------------|----------------------------------|---------|
| Fu.C.1 | NEN-EN1995-1-1#6.1.6 (6.11) | 3.343 / 11.077 + 0.7 x 0 / 13.35 | 0.30 Ok |
| Fu.C.2 | NEN-EN1995-1-1#6.1.6 (6.11) | 5.748 / 11.077 + 0.7 x 0 / 13.35 | 0.52 Ok |
| Fu.C.3 | NEN-EN1995-1-1#6.1.6 (6.11) | 5.108 / 11.077 + 0.7 x 0 / 13.35 | 0.46 Ok |
| Fu.C.3 | NEN-EN1995-1-1#6.1.7 (6.13) | Vz 0.085 / 2.092                 | 0.04 Ok |
| Fu.C.4 | NEN-EN1995-1-1#6.1.6 (6.11) | 10.16 / 11.077 + 0.7 x 0 / 13.35 | 0.92 Ok |
| Fu.C.4 | NEN-EN1995-1-1#6.1.7 (6.13) | Vz 0.213 / 2.092                 | 0.10 Ok |
| Bi.C.1 | NEN-EN1995-1-1#6.1.6 (6.11) | 1.334 / 8.308 + 0.7 x 0 / 10.012 | 0.16 Ok |

## BELASTINGSCOMBINATIES VOOR BRUIKBAARHEIDSGRENSTOESTAND

|           |                               |                                 |                        |
|-----------|-------------------------------|---------------------------------|------------------------|
| Ka.C.1    | p = + yG * G_rep + yQ * Q_rep | = + 1.00 * 0.42 + 0.40 * 1.00 = | 0.82 kN/m <sup>2</sup> |
| Ka.C.2    | p = + yG * G_rep + yQ * Q_rep | = + 1.00 * 0.42 + 1.00 * 1.00 = | 1.42 kN/m <sup>2</sup> |
| Qu.C.1    | p = + yG * G_rep              | = + 1.00 * 0.42 =               | 0.42 kN/m <sup>2</sup> |
| Ka.C.(w1) | p = + yG * G_rep              | = + 1.00 * 0.42 =               | 0.42 kN/m <sup>2</sup> |

## UC DOORBUIGINGEN PER BELASTINGSCOMBINATIE

|           |                |                          |                    |                |                           |
|-----------|----------------|--------------------------|--------------------|----------------|---------------------------|
| L/250     | Limiet w;max   | 12.8 mm                  | L/333              | Limiet w;2+w;3 | 9.6 mm                    |
| E;mean    | E;0;ser;d;inst | 9000.0 N/mm <sup>2</sup> | E;mean / Kdef      | E;0;ser;d;cr   | 15000.0 N/mm <sup>2</sup> |
|           |                |                          | E-Mod/E;0;ser;d;cr |                | 0.60                      |
| Ka.C.(w1) | w;1            | 2.0 mm                   |                    | w;c            | 0.0 mm                    |
| Qu.C.1    | w;2            | 1.2 mm                   |                    |                |                           |
| Comb.     | w;3            | w;tot                    | w;max              | w;2+w;3        | UC(w;max) UC(w;2+w;3)     |
| Ka.C.1    | 1.9            | 5.1                      | 5.1                | 3.1            | 0.40 0.33                 |
| Ka.C.2    | 4.8            | 8.0                      | 8.0                | 6.0            | 0.63 0.63                 |
|           | mm             | mm                       | mm                 | mm             |                           |

|               |                    |               |            |         |
|---------------|--------------------|---------------|------------|---------|
| Projectnaam   | woning moleneind 7 | Projectnummer | 1487       | Blad D3 |
| Omschrijving  | zolderbalklaag     | Constructeur  | jba        |         |
| Opdrachtgever |                    | Eenheden      | m, kN, kNm |         |

#### MAATGEVENDE KRACHTEN (FU.C.4)

|               |       |          |
|---------------|-------|----------|
| Normaalkracht | Nt;Ed | 0.00 kN  |
| Dwarskracht   | Vy;Ed | 0.00 kN  |
| Dwarskracht   | Vz;Ed | 1.31 kN  |
| Torsie        | Mx;Ed | 0.00 kNm |
| Moment        | My;Ed | 2.43 kNm |
| Moment        | Mz;Ed | 0.00 kNm |

#### MAATGEVENDE DOORBUIGINGEN (KA.C.2)

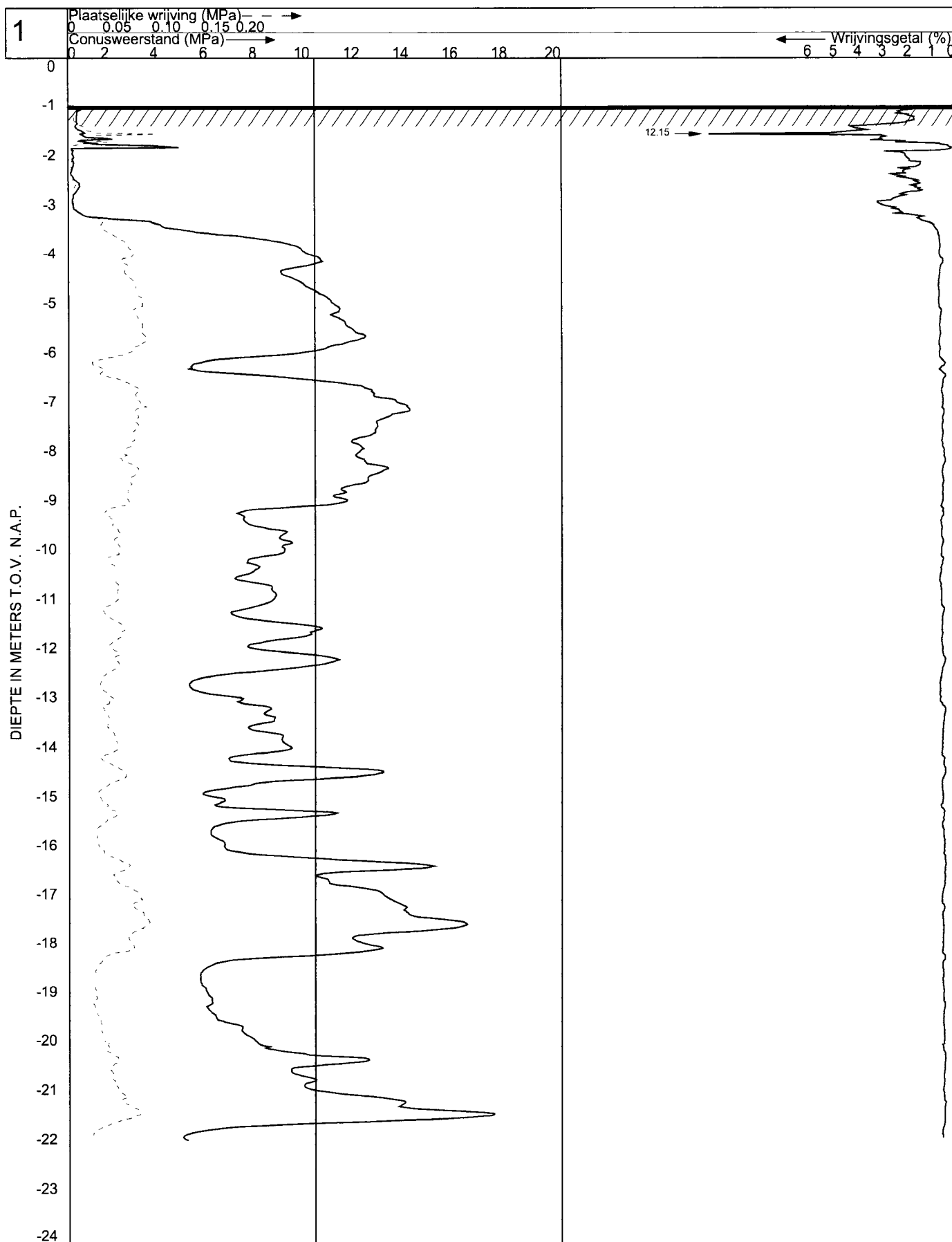
|           |                |         |
|-----------|----------------|---------|
| Ka.C.(w1) | w;1            | 2.0 mm  |
| Qu.C.1    | w;2            | 1.2 mm  |
| Ka.C.2    | w;3            | 4.8 mm  |
|           | w;tot          | 8.0 mm  |
|           | w;max          | 8.0 mm  |
|           | w;2+w;3        | 6.0 mm  |
|           | Limiet w;max   | 12.8 mm |
|           | Limiet w;2+w;3 | 9.6 mm  |
|           | UC(w;max)      | 0.63    |
|           | UC(w;2+w;3)    | 0.63    |

#### UITGEVOERDE CONTROLES

|               |                                      |    |                                  |         |
|---------------|--------------------------------------|----|----------------------------------|---------|
| Doorsnede     | NEN-EN1995-1-1#6.1.7 (6.13)          | Vz | 0.731 / 2.092                    | 0.35 Ok |
| Doorsnede     | NEN-EN1995-1-1#6.1.6 (6.11)          |    | 10.16 / 11.077 + 0.7 x 0 / 13.35 | 0.92 Ok |
| Doorbuigingen | NEN-EN1995#7.2 NEN-EN1990#A1.4.3 (4) |    | 8.0 / 12.8                       | 0.63 Ok |

**Ligger gecontroleerd op sterkte en doorbuiging**

**Ligger Ok**



GEO- EN MILIEUTECHNIEK b.v.

Plaats : Kortemhoef

Maaiveld : -0.93 m t.o.v. N.A.P.  
 Uitgevoerd : 21-10-2016 conus: CF-15 110319  
 Omschrijving : nieuwbouw woning, Moleneind 7b

OPDRACHT NR: 116243

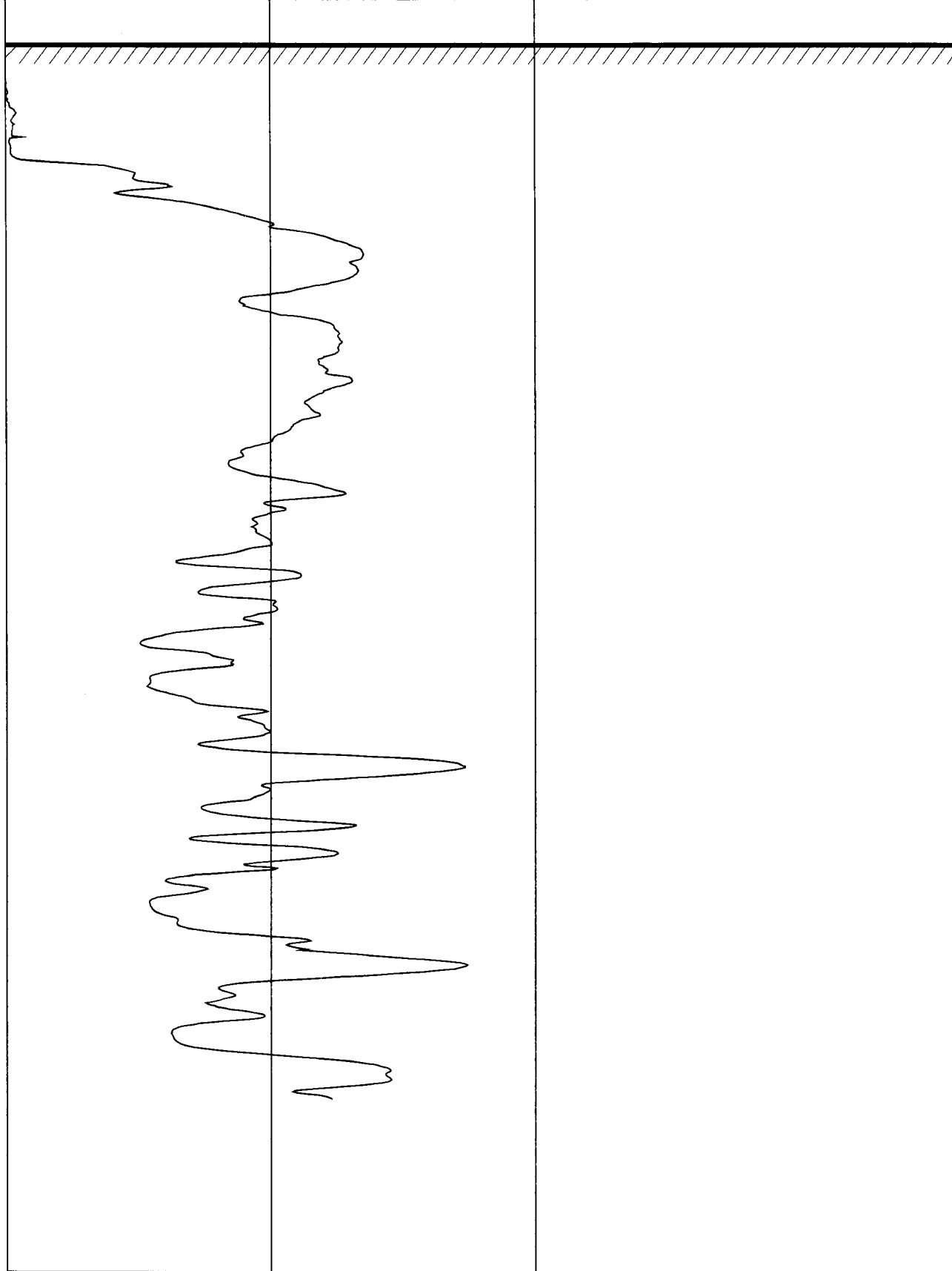
SONDERING : 1

2

Conusweerstand (MPa)

0 2 4 6 8 10 12 14 16 18 20

DIEPTE IN METERS T.O.V. N.A.P.

0  
-1  
-2  
-3  
-4  
-5  
-6  
-7  
-8  
-9  
-10  
-11  
-12  
-13  
-14  
-15  
-16  
-17  
-18  
-19  
-20  
-21  
-22  
-23  
-24

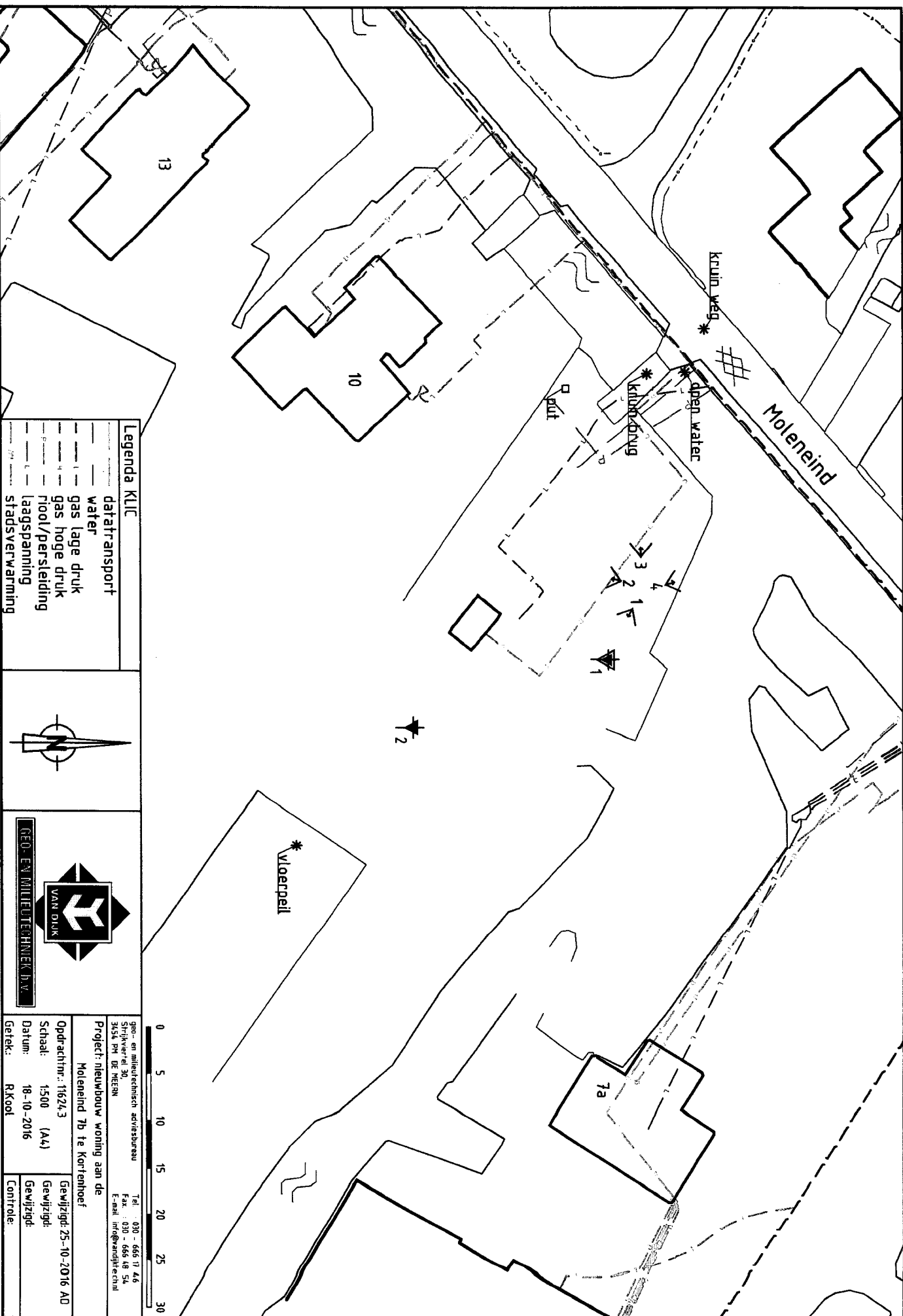
GEO- EN MILIEUTECHNIEK b.v.

Plaats : Kortemhoef

Maaiveld : -0.82 m t.o.v. N.A.P.  
 Uitgevoerd : 21-10-2016 conus: CF-15 110319  
 Omschrijving : nieuwbouw woning, Moleneind 7b

OPDRACHT NR: 116243

SONDERING : 2



# Legenda KLIC

|  |                  |
|--|------------------|
|  | data transport   |
|  | water            |
|  | gas lage druk    |
|  | gas hoge druk    |
|  | riool/perleiding |
|  | laagspanning     |
|  | stadsverwarming  |



GEO-EN MILIEUTECHNIEK D.V.



geo- en milieutechnisch adviesbureau  
 Srijverwal 30  
 3554 PM DE MEERN  
 Tel.: 030 - 665 11 46  
 Fax: 030 - 665 48 54  
 E-mail: info@van-dijk.nl

Project: nieuwbouw woning aan de  
 Moleneind 7b te Korttenhoef

Opdrachtnr.: 11624.3  
 Schaal: 1:500 (A4)

Datum: 18-10-2016

Getek.: Rikool

Gewijzigd: 25-10-2016 AD

Gewijzigd:

Controle:

# WATERPASSTAAT



GEO- EN MILIEUTECHNIEK b.v.

| OPDRACHTNR.: 116243                                                                             |                                    | PLAATS:Kortenhoef                         |                         |
|-------------------------------------------------------------------------------------------------|------------------------------------|-------------------------------------------|-------------------------|
| sondering/boring nr                                                                             | hoogte maaiveld in<br>m t.o.v. NAP | RD X-coördinaat<br>in m                   | RD Y-coördinaat<br>in m |
| 1                                                                                               | -0,93                              | 134161,14                                 | 470761,78               |
| 2                                                                                               | -0,82                              | 134168,38                                 | 470740,80               |
| kruin brug                                                                                      | -0,14                              |                                           |                         |
| kruin weg                                                                                       | -0,44                              |                                           |                         |
| put                                                                                             | -0,83                              |                                           |                         |
| vloerpeil                                                                                       | -0,33                              |                                           |                         |
| open water                                                                                      | -1,20                              |                                           |                         |
| De gemeten hoogten en coördinaten zijn niet geschikt voor andere doeleinden dan deze rapportage |                                    |                                           |                         |
| Meetmethode:                                                                                    |                                    | Coördinaten en hoogten gemeten met 06-GPS |                         |
| Gewaterpast door:                                                                               |                                    | van DIJK geo- en milieutechniek b.v.      |                         |
| Datum waterpassing:                                                                             |                                    | 18 oktober 2016                           |                         |
| Datum verwerking:                                                                               |                                    | 25 oktober 2016                           |                         |