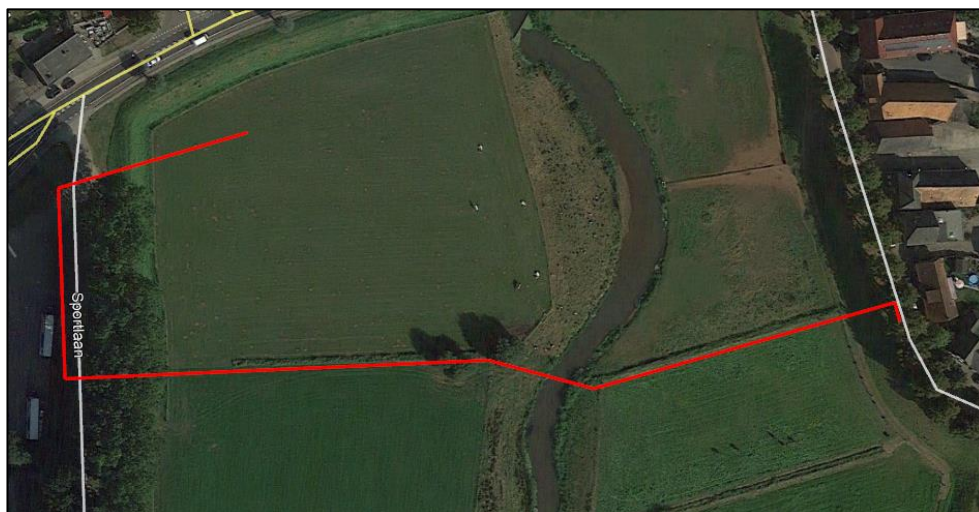


## Verleggen Ø315 HPE Persriool Wanssum

### Uitgebreide sterkteberekening



Opdrachtgever:	Mooder Maas
Auteur(s):	L. Nijsten
Versie:	1
Status:	Definitief
Kenmerk:	RA-TE16353-7688
Plaats, datum:	Rhoon, 4 september 2018

## Handtekeningen register

Opsteller van rapportage		
Naam:	Handtekening:	Datum:
L. Nijsten		1-9-2018
Rapportage gecontroleerd door		
Naam:	Handtekening:	Datum:
O. Zegwaard		4-9-2018
Kwaliteitsmanager		
Naam:	Handtekening:	Datum:
J. Slingerland		4-9-2018

## Versiebeheer

1	04-09-2018	Eerste uitgave	-
Versie	Datum	Aanpassing	Pagina

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- Bijlage 2 : Grondonderzoek
- Bijlage 3 : Resultaten zettingsberekeningen dwarsprofielen V02 en V06a
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## 1. Inleiding

In Ooijen-Wanssum vindt op dit moment gebiedsontwikkeling plaats in combinatie met een dijkverzwakingsprogramma, dit wordt uitgevoerd door de aannemerscombinatie Mooder Maas bestaande uit Dura Vermeer en Ploegam. Als onderdeel van deze dijkverzwaking dienen diverse kabels en leidingen verlegd te worden naar een nieuw tracé. Dit rapport behandelt het ontwerp van het nieuwe tracé van het persriool in beheer bij de gemeente Venray, dit tracé is weergegeven in Figuur 1.



**Figuur 1: Overzicht tracé**

### 1.1. Belanghebbenden

De volgende partijen hebben belang bij het ontwerp:

- Waterschap Limburg
- Provincie Limburg
- Gemeente Venray

### 1.2. Toetsing

Om aan de richtlijnen van de vergunningverlenende instantie te voldoen is het leidingmateriaal ontworpen en berekend overeenkomstig:

NEN 3650-1:2012	"Eisen voor buisleidingsystemen – Deel 1: Algemeen"
NEN 3650-3:2012	"Eisen voor buisleidingsystemen – Deel 3: Kunststof"
NEN 3651:2012	"Aanvullende eisen voor buisleidingen in of nabij belangrijke waterstaatswerken"

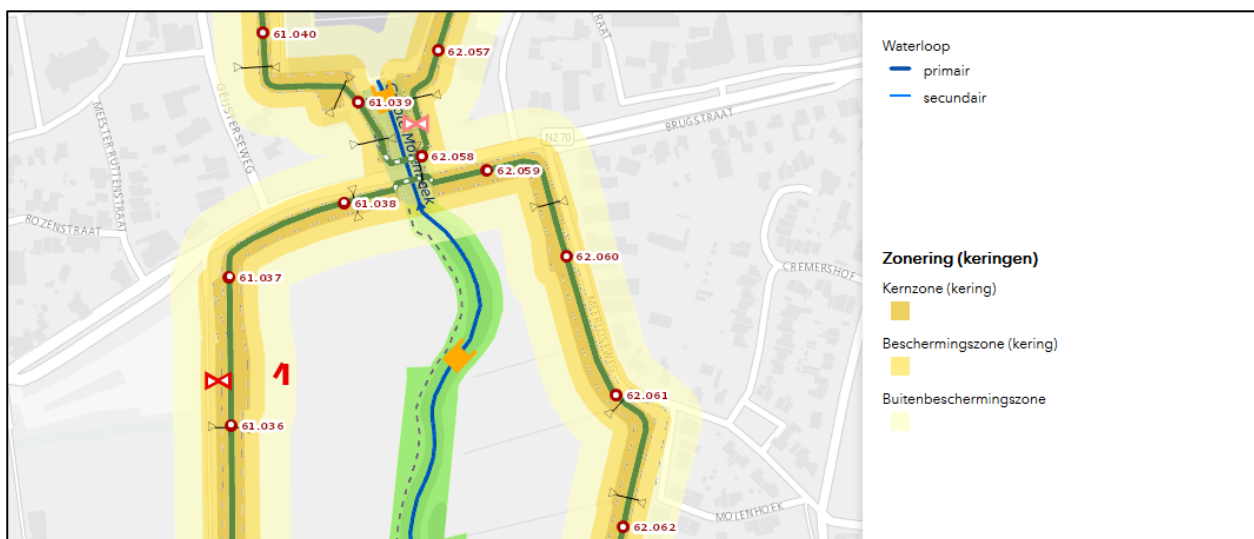
## 2. Ontwerp

### 2.1. Projectlocatie

Het nieuw te leggen persriool volgt min of meer het bestaande tracé ten zuiden van de Brugstraat, maar wordt verplaatst naar het gezamenlijke nutstracé. Het nieuwe tracé heeft een lengte van ca. 410 m en is aan oostzijde verbonden met een betonput ter hoogte van Meerloseweg 13. Aan de westzijde wordt aangesloten op een betonput in het weiland nabij de kruising van de Brugstraat met de Sportlaan.

### 2.2. Te kruisen objecten

Het tracé kruist de Groote Molenbeek, dit is een primair water in beheer bij het Waterschap Limburg. Verder loopt het tracé parallel aan de primaire waterkering ter plaatse van de Sportlaan en wordt de primaire waterkering tweemaal gekruist ter hoogte van dijkpaal 61.036 en 62.061, zie Figuur 2. Naast het drukriool wordt nog een aantal andere kabels en leidingen gelegd, deze zijn aangegeven op het dwarsprofiel in Bijlage 1.



**Figuur 2: Kruising waterloop en kering**

### 2.3. Procesgegevens

De procesgegevens zijn als volgt:

Medium	Afvalwater	[-]
Ontwerpdruk	2,16	[barg]
Bedrijfsdruk	1,44	[barg]
Minimale ontwerptemperatuur	0	[°C]
Maximale ontwerptemperatuur	+20	[°C]
Aanlegtemperatuur	+10	[°C]

Er is een maximaal temperatuurverschil van 10°C gemodelleerd aannemende dat de leiding een ambiënte temperatuur heeft en deze op tenminste 1 meter gronddek hooguit 20 °C bedraagt.

## 2.4. Materiaalgegevens

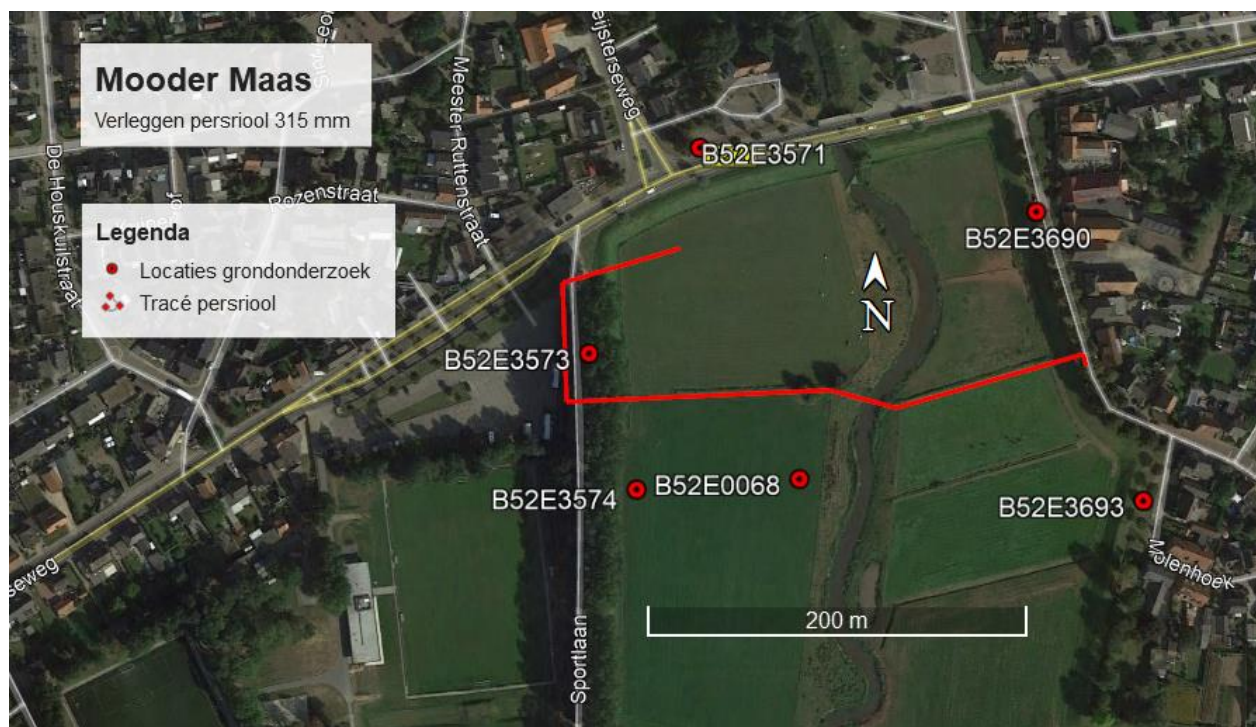
De rioolleiding zal uitgevoerd worden in PE100, van dit materiaal zijn de volgende gegevens gehanteerd:

### 2.4.1. HPE315

Materiaal	PE100	[-]
Korte duur treksterkte (MRS)	10	[N/mm <sup>2</sup> ]
Lange duur elasticiteitsmodulus	350	[N/mm <sup>2</sup> ]
Korte duur elasticiteitsmodulus	975	[N/mm <sup>2</sup> ]
Lineaire uitzettingscoëfficiënt	$20 \times 10^{-5}$	[° C-1]
Dwarscontractiecoëfficiënt (Poisson)	0,4	[-]
Verhouding zuivere trek/buigtrek	0,65	[-]
Uitwendige diameter Ø315	315	[mm]
Wanddikte SDR11	28,6	[mm]
Bochtradius (3,5D)	1050	[mm]

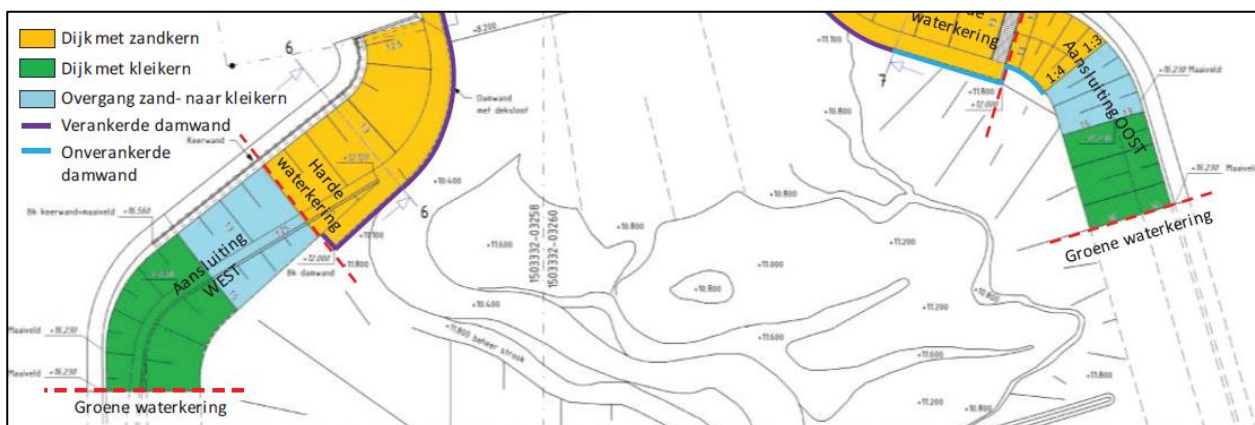
## 2.5. Grondmechanische gegevens

Voor de modellering van de grond is gebruik gemaakt van gegevens uit het Dinoloket van TNO, zie Figuur 3. Dit onderzoek is opgenomen in Bijlage 2.



**Figuur 3: Locaties grondonderzoek**

Uit rapport "DOUO DR62 Molenbeek" v1 d.d. 22-06-2018 van Mooder Maas is overgenomen dat de dijk ter plaatse van de kruising met de dijk aan de Sportlaan en Meerloseweg bestaat uit zand met een kleikern, zie Figuur 4. De dikte van de kleilaag is aangehouden op 1,3 m conform de "Overzichtstekening reserveringsstrook kabels en leidingen" v1 d.d. 20-08-2018 van Mooder Maas. Het type klei is Klei A of Klei B, de kering betreft immers geen hoge gronddijk, dit is gemodelleerd als klei, matig vast gepakt.



**Figuur 4: Locatie dijk met kleikern**



### **3. Belastingen en factoren**

In de sterkteberekeningen is rekening gehouden met de belastingen welke zijn opgenomen in dit hoofdstuk. Voor alle belastingen zijn onzekerheidsfactoren toegepast conform de NEN3650:2012.

#### **3.1. Schadefactor**

De leiding bevindt zich (deels) in een primaire waterkering, er is dan ook rekening gehouden met een importantiefactor S. Deze is bepaald aan de hand van Bijlage B.1 van de NEN3651:2012 waarbij is uitgegaan van een Personele risicofactor C en een Materiële risicofactor F; dit geeft importantiefactor van 0,75 welke is toegepast op spanningen en vervormingen.

#### **3.2. Inwendige druk**

De maximale bedrijfsdruk is gelijk aan de opvoerhoogte van de pomp (Xylem NP 3127 LT3): 14,4 m (1,44 bar). De ontwerpdruk van het systeem is aangehouden op  $1,5 \times 1,44 = 2,16$  bar.

#### **3.3. Ontwerptemperatuur**

De ontwerptemperaturen zijn vastgesteld op minimaal 10°C en maximaal +20 °C.

#### **3.4. Eigen gewicht leiding**

Het eigen gewicht is het gewicht inclusief het gewicht van het medium. Daar waar de leiding zich onder de grondwaterstand bevindt is bij het eigen gewicht rekening gehouden met het opdrijvende vermogen van de leiding.

#### **3.5. Grondbelastingen**

##### **3.5.1. Reële/neutrale grondbelasting**

In de berekeningen van de korte termijn situatie is over het gehele tracé de reële grondbelasting gemodelleerd. In de lange termijn situatie is uitsluitend neutrale grondbelasting gemodelleerd.

##### **3.5.2. Verkeersbelasting**

Er is rekening gehouden met verkeersbelasting conform  $\frac{1}{2}$  x Grafiek II uit Figuur C.17 van de NEN 3650-1 waar de leiding zich bevindt in de berm van de Sportlaan. Ter plaatse van de kruising met de Sportlaan en de Meerloseweg is Grafiek II aangehouden

##### **3.5.3. Ondersteuningshoek**

De ondersteuningshoek is aangehouden op 70° voor zowel de korte termijn als lange termijn situatie.

### 3.6. Zettingen

Waar de dijk wordt versterkt door middel van grondaanvullingen zullen zettingen optreden; deze zijn gekwantificeerd in Bijlage 14 van rapport "DOUO DR62 Molenbeek" v1 d.d. 22-06-2018 van Mooder Maas. Volgens paragraaf 8.5.4.2 van de NEN3650-3 zijn deze van toepassing op de situatie na 2 jaar.

#### 3.6.1. Zettingen op locatie V02 (Sportlaan)

De zettingen ter plaatse van de dijk kruising aan de Sportlaan zijn door Fugro bepaald op 27 cm op een diepte van 11,85 m NAP (het oorspronkelijke maaiveld), zie Bijlage 3. Onder deze diepte bevindt zich een zandlaag waarin het persriool wordt aangelegd. Deze zandlaag is onsamendrukbaar, de zettingen hebben dan ook geen invloed op het persriool. Door Fugro is een laag veen met een dikte van ca. 0,5 m opgenomen in het model; deze wordt verwijderd bij de dijkversterking en waarmee er geen zettingen in deze laag zullen optreden.

#### 3.6.2. Zettingen op locatie V06a (Meerloseweg)

De zettingen ter plaatse van de dijk kruising aan de Meerloseweg zijn door Fugro bepaald op 20 cm op een diepte van 12,10 m NAP (het oorspronkelijke maaiveld), zie Bijlage 3. Onder deze diepte is een kleilaag gemodelleerd met een dikte van ca. 1,5 m waarin het persriool wordt aangelegd. Deze wordt niet aangetroffen in het grondonderzoek dat is opgenomen in Bijlage 2, omdat niet uit te sluiten is dat deze in werkelijkheid wel aanwezig is zijn de zettingen uit het Fugro-model opgenomen in de sterkteberekening van het persriool.

### 3.7. Uitvoeringszakingsverschil

Er is een uitvoeringszakingsverschil gemodelleerd van 5 mm conform Tabel C.4 van de NEN3650-1; voor de lengte is 20 m aangehouden conform paragraaf C.4.7.2. Volgens paragraaf 8.5.4.2 van de NEN3650-3 zijn deze van toepassing op de situatie direct na aanleg en na 2 jaar.

## **4. Sterkteberekeningen**

### **4.1. Belastingcombinaties**

De volgende vier belastingcombinaties (BC's) zijn beschouwd:

- Kafk Korte duur, drukloze situatie (geen inwendige druk), inclusief uitwendige belastingen en temperatuurverschil (afkoelend);
- Kopw Korte duur, drukloze situatie (geen inwendige druk), inclusief uitwendige belastingen en temperatuurverschil (opwarmend);
- Lafk Lange duur, drukloze situatie (geen inwendige druk), inclusief uitwendige belastingen en temperatuurverschil (afkoelend);
- Lopw Lange duur, drukloze situatie (geen inwendige druk), inclusief uitwendige belastingen en temperatuurverschil (opwarmend);

Omdat niet op voorhand is te voorspellen wat de maatgevende bedrijfssituatie is, is zowel opwarmen als afkoelen beschouwd. De bedrijfssituatie (inclusief inwendige druk) wordt niet via een belastingcombinatie berekend, maar apart conform NEN3650-3 paragraaf 8.5.4.4.1 in hoofdstuk 6.1.

### **4.2. Gebruikte software**

De berekeningen zijn uitgevoerd met behulp van het elementenprogramma Ple4Win versie 4.4.2 van Expert Design Systems B.V. te Rijswijk.

#### **4.2.1. Rekenmodel**

De berekening in Ple4Win is opgezet in General mode met een geometrisch niet-lineair model. Op alle uiteindes in de rekenmodellen zijn de randvoorwaardes "fixed" en "open". Zie Program Status summary in Bijlage 3 voor een volledige opzet van de toegepaste software.

#### 4.2.2. PLE-berekeningen

Hieronder volgt de opsomming van een gedeelte van de resultaten van de uitgebreide sterkteberekeningen, zoals deze zijn opgenomen in de bijlagen:

##### 0 Overview

- 3D overzichten

##### 1 Input:

- Alle input files
- Polygon point data
- Identification names
- Program Status Summary + Warnings

##### 2 Output stresses:

- Grafiek stresses
- Maximum check stresses – min/max

##### 3 Output deformation:

- Grafiek Max. Total radial deformation.
- Maximum radial deformations – min/max.

Voor de volledige output van de berekeningen wordt verwezen naar de digitale bestanden van de software, de zogenoemde plex-files.



## 5. Toetswaarden

De leiding wordt getoetst op de maximale axiale spanning, omtrekspanning en deflectie.

### 5.1. Toelaatbare korte duur spanning PE

De toelaatbare korte duur spanning is conform de NEN 3650-3 gelijk aan de MRS waarde, in dit geval  $10 \text{ N/mm}^2$ . Rekening houdend met een importantiefactor van 0,75 geeft dit een toetswaarde van  $10 \times 0,8 = 7,5 \text{ N/mm}^2$ .

### 5.2. Toelaatbare lange duur spanning PE

De toelaatbare lange duur spanning volgt door de toelaatbare korte duur spanning te delen door de materiaalfactor. De NEN 3650-3 schrijft een materiaalfactor van 1,25 voor (zie paragraaf 8.6.2). Rekening houdend met een importantiefactor van 0,8 geeft dit een toetswaarde van  $10 / 1,25 \times 0,75 = 6,0 \text{ N/mm}^2$

### 5.3. Toelaatbare deflectie

De toelaatbare deflectie voor de PE leidingdelen wordt in overeenstemming met de NEN 3650-3 paragraaf 8.6.4 gesteld op 8%. Rekening houdend met een importantiefactor van 0,8 geeft dit een toetswaarde van  $8 \times 0,75 = 6,0 \%$ .

## 6. Resultaten

### 6.1. Inwendige druk PE leiding

Met behulp van de ketelformule is de omtrekspanning in de PE leiding als volgt te berekenen:

$$\sigma_p = \gamma_p \times p_d \times D_g / 2d$$

waarin:

$\sigma_p$	: omtrekspanning a.g.v. inwendige druk		[N/mm <sup>2</sup> ]
$p_d$	: ontwerpdruk	0,216	[N/mm <sup>2</sup> ]
$D_g$	: gemiddelde diameter	301	[mm]
$d$	: wanddikte	28,6	[mm]
$\gamma_p$	: partiële factor voor inwendige druk	1,0	[-]

Hieruit volgt een omtrekspanning als gevolg van inwendige druk  $\sigma_p$  van 1,14 N/mm<sup>2</sup>, dit is lager dan de lange duur toetsspanning van 6,4 N/mm<sup>2</sup>.

### 6.2. Axiale spanning PE leiding

Onderstaande tabel 1 en tabel 2 geven een samenvatting van de berekende axiale spanning; zowel voor de situatie binnen 2 jaar na aanleg (kort, aangeduid met letter K) en daarna (lang, aangeduid met letter L).

BC [-]	Ax. spanning uit PLE [N/mm <sup>2</sup> ]	Ax. spanning uit inw. druk (=0,5* $\sigma_p$ ) [N/mm <sup>2</sup> ]	Totale ax. spanning [N/mm <sup>2</sup> ]	Toelaatbare spanning [N/mm <sup>2</sup> ]
Kafk	3,99	0,57	4,6	7,5
Kopw	3,91	0,57	4,5	7,5

**Tabel 1: Berekeningsresultaat axiale spanning in PE, korte duur**

BC [-]	Ax. spanning uit PLE [N/mm <sup>2</sup> ]	Ax. spanning uit inw. druk (=0,5* $\sigma_p$ ) [N/mm <sup>2</sup> ]	Totale ax. spanning [N/mm <sup>2</sup> ]	Toelaatbare spanning [N/mm <sup>2</sup> ]
Lafk	3,14	0,57	3,7	6,0
Lopw	2,20	0,57	2,8	6,0

**Tabel 2: Berekeningsresultaat axiale spanning in PE, lange duur**

Het blijkt dat de axiale spanningen in alle situaties lager zijn dan de toelaatbare spanning.

### 6.3. Omtrekspanning PE leiding

Onderstaande tabel 3 en tabel 4 geven een samenvatting van de berekende omtrekspanning, conform NEN3650-3 paragraaf 8.5.4.4.1, zowel voor de situatie binnen 2 jaar na aanleg en daarna.

BC [-]	Omtr. spanning uit PLE [N/mm <sup>2</sup> ]	Omtr. spanning uit inw. druk ( $=\sigma_p$ ) [N/mm <sup>2</sup> ]	Toelaatbare spanning [N/mm <sup>2</sup> ]
Kafk	4,01	1,14	7,5
Kopw	4,05	1,14	7,5

**Tabel 3: Berekeningsresultaat omtrekspanning in PE, korte duur**

BC [-]	Omtr. spanning uit PLE [N/mm <sup>2</sup> ]	Omtr. spanning uit inw. druk ( $=\sigma_p$ ) [N/mm <sup>2</sup> ]	Toelaatbare spanning [N/mm <sup>2</sup> ]
Lafk	2,78	1,14	6,0
Lopw	2,93	1,14	6,0

**Tabel 4: Berekeningsresultaat omtrekspanning in PE, lange duur**

Het blijkt dat de omtrekspanningen die berekend zijn, en de omtrekspanningen uit inwendige druk in alle situaties lager zijn dan de toelaatbare spanning.

### 6.4. Deflectie

De resultaten van de (absolute waarde van de) deflectie zijn weergegeven in onderstaande tabel 5.

Deflectie	Berekend [%]	Toelaatbaar [%]
Kafk	0,92	6,0
Kopw	0,94	6,0
Lafk	2,22	6,0
Lopw	2,30	6,0

**Tabel 5: Berekeningsresultaat deflectie**

Het blijkt dat de deflectie in alle situaties lager is dan de toelaatbare deflectie.

## 7. Conclusie

Op basis van de tekeningen en de in dit rapport beschreven uitgangspunten is het ontwerp berekend in overeenstemming met de NEN3650 serie. Hieruit blijkt dat de berekende spanningen en deflecties in de leiding gedurende de gebruiksfases lager zijn dan de maximaal toegestane waarden.

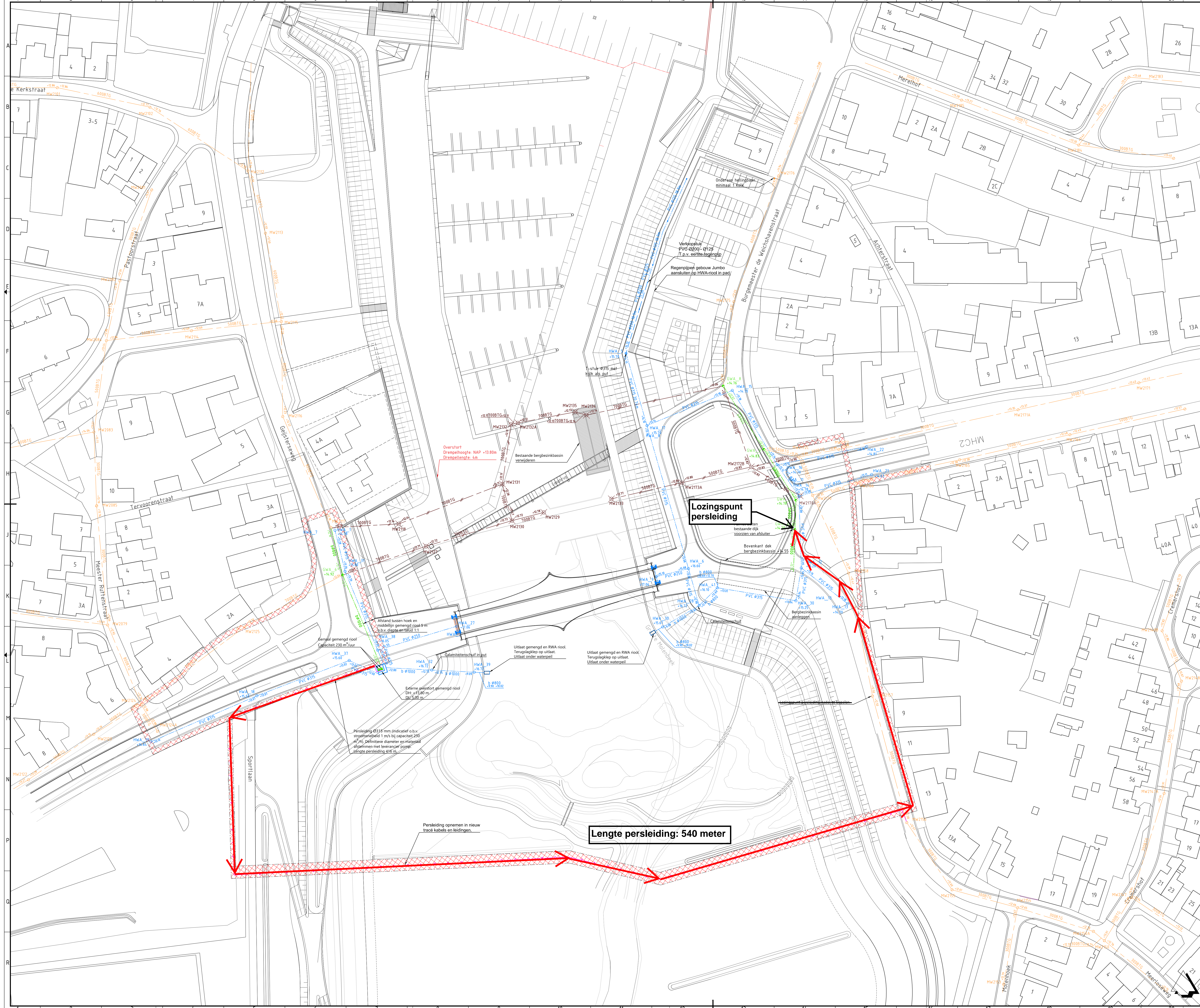
Deze sterkteberekening is van toepassing indien:

- De sleuf rondom de leiding aangevuld wordt met zand;
- De sleufaanvulling goed verdicht wordt;
- Het Ø315 persriool uitgevoerd wordt in SDR11.



## **Bijlage 1:          Ontwerptekeningen**





Referentielijst

Verklaring

**Trace persleiding**

**Legenda**

Bestaand stelsel

- GWA put
- GWA streng
- Verwijderd GWA put
- Verwijderd GWA streng

Nieuw stelsel

- Nieuw HWA put
- Nieuw HWA streng
- Nieuw HWA kolk
- Nieuw GWA put
- Nieuw GWA streng
- Gemengd Pomput
- Persleiding
- Uitlaat
- Verloopstuk PVC Ø200-Ø125

Planoverzicht

Verste	Datum	Ger.	Omschrijving
Versie 0.1	2020-10-20	Ger. D. Looze	Omschrijving: Uitwerking riolerings ontwerp

Van: F. d. Hoff	Vrij	Van: L. van Pelt	Van: L. van Houten	Van: J. Jansen
De: :	de: :	de: :	de: :	de: :
Per: :	per: :	per: :	per: :	per: :

**Opdrachtgever**

provincie limburg

**Project**

Gebiedsontwikkeling Ooijen - Wanssum

Fase: Definitief ontwerp

Onderwerp: Riolering Centrum

Schaal: 1:500

Contractnummer: ONT-2019-001

Bladformaat: A0L

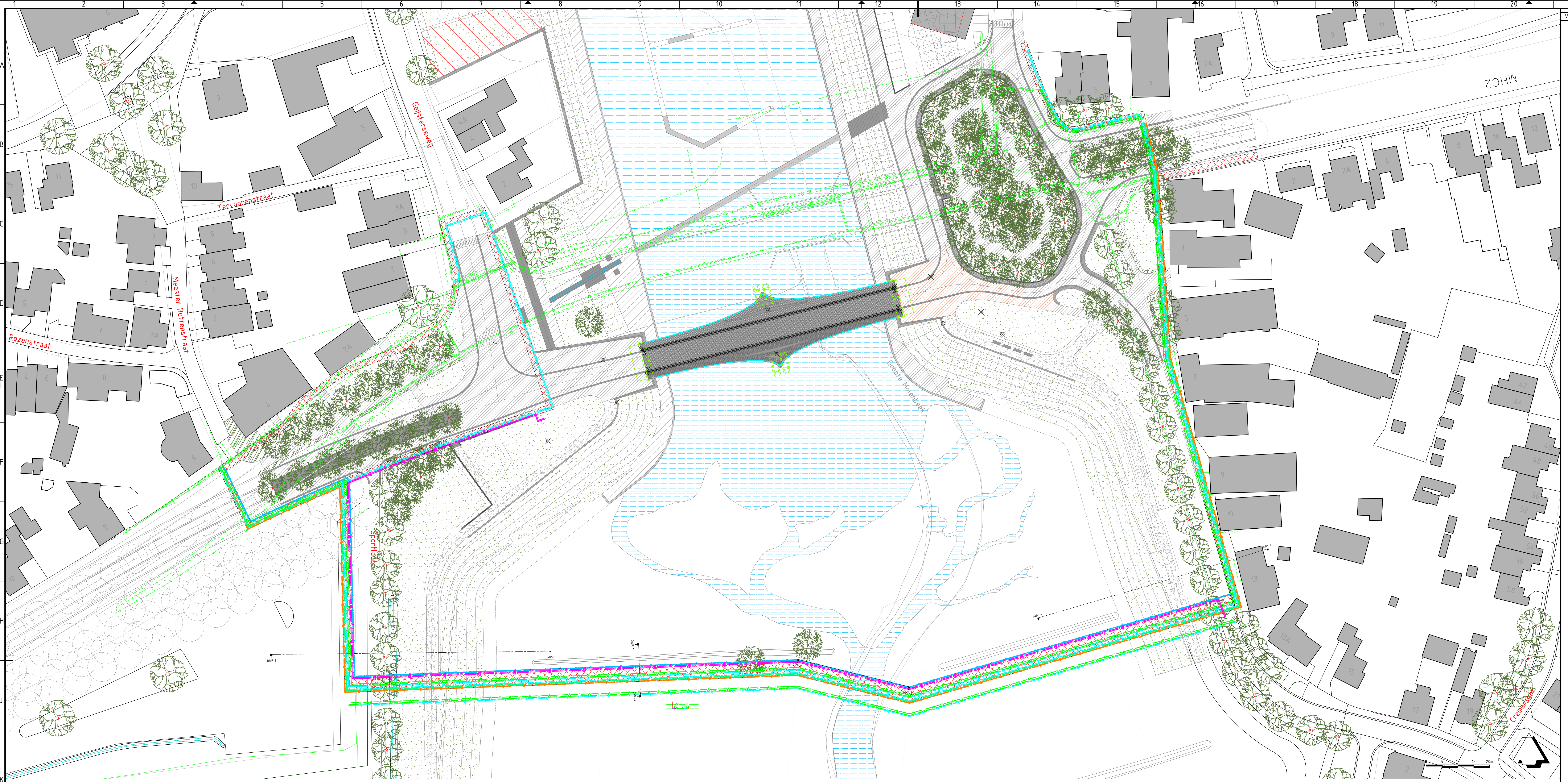
Bladnummer: 1 van 1

Status: concept

DocumentID: 1503332

Versie: 0.1





Verklaring

Reserveringsstrook voor kabels en leidingen

Dwarsprofiel DWP-1  
bij mettering 100.000  
Verticale schaal 1200  
Horizontale schaal 1200  
f.o.v. as ALM - 07-12.112-WK-SPORTLAAN

Afstand	0.00	0.50	1.00	1.50	2.00	2.50	3.00	3.50	4.00	4.50	5.00	5.50	6.00	6.50	7.00	7.50	8.00	8.50	9.00	9.50	10.00	10.50	11.00	11.50	12.00	12.50	13.00	13.50	14.00	14.50	15.00	15.50	16.00	16.50	17.00	17.50	18.00
Bestaande hoogte	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00
Nieuwe hoogte	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00
Hoogteverschil	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

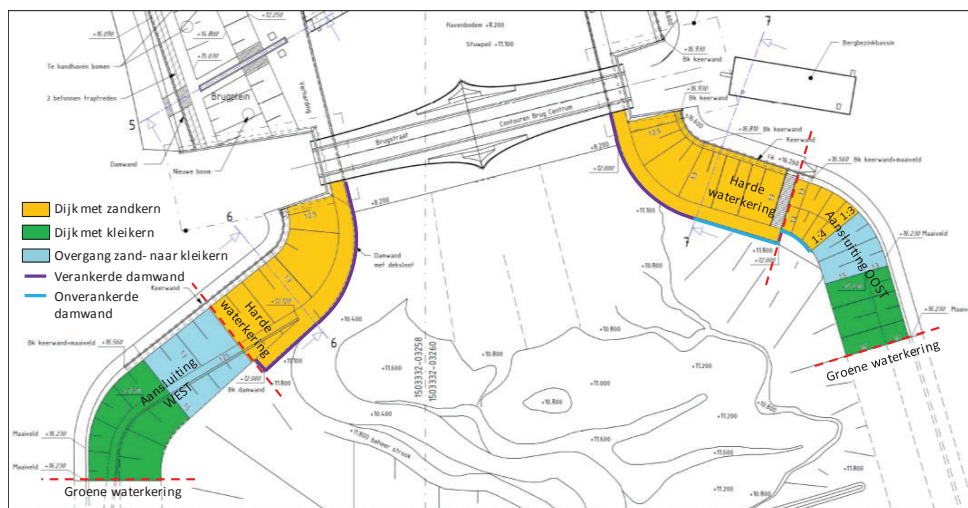
Dwarsprofiel DWP-A  
Horizontale schaal 1200  
Verticale schaal 1200  
Mettering 0.000 tot 16.330

Mettering	0.000	1.000	2.000	3.000	4.000	5.000	6.000	7.000	8.000	9.000	10.000	11.000	12.000	13.000	14.000	15.000	16.000	17.000	18.000	19.000	20.000	21.000	22.000	23.000	24.000	25.000	26.000	27.000	28.000	29.000	30.000	31.000	32.000	33.000	34.000	35.000	36.000	37.000	38.000	39.000	40.000
Bestaande hoogte	12.000	12.000	12.000	12.000	12.000	12.000	12.000	12.000	12.000	12.000	12.000	12.000	12.000	12.000	12.000	12.000	12.000	12.000	12.000	12.000	12.000	12.000	12.000	12.000	12.000	12.000	12.000	12.000	12.000	12.000	12.000	12.000	12.000	12.000	12.000	12.000	12.000	12.000	12.000	12.000	12.000
Ontwerphoogte	12.000	12.000	12.000	12.000	12.000	12.000	12.000	12.000	12.000	12.000	12.000	12.000	12.000	12.000	12.000	12.000	12.000	12.000	12.000	12.000	12.000	12.000	12.000	12.000	12.000	12.000	12.000	12.000	12.000	12.000	12.000	12.000	12.000	12.000	12.000	12.000	12.000	12.000	12.000	12.000	12.000
Hoogteverschil	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	

Dwarsprofiel DWP-3  
bij mettering 550.000  
Verticale schaal 1200  
Horizontale schaal 1200  
f.o.v. as ALM - 07-12.109-WK-MEERLOSEWEG

Afstand																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
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**Figuur 4-2: Ontwerp aansluiting harde kering Dorps haven op groene kering Molenbeek [22]**

De inrichting op basis van de principes van ruimtelijke kwaliteit volgt voor deze dijkkring de basisprincipes zoals vastgelegd in Moeder Maas, Hoofd Stappenplan Dijkenstrategie, 1503332-00344, 28 oktober 2016 [4]. Ten aanzien van deze dijkkring spelen de volgende specifieke technische ontwerpgegevens zoals opgenomen in Tabel 4-1. Deze ontwerpgegevens zijn in deze ontwerpnota nader uitgewerkt.

**Tabel 4-1: Technische ontwerpgegevens groene waterkeringen o.b.v. VRIP [9][10] [11]**

Dijkkring	Ontwerpgegevens DO vanuit VO
Algemeen (alle dijkkringen)	<ul style="list-style-type: none"> <li>- Technische invulling ontwerp waterkeringen op trajectbasis t.a.v. waterkeringseisen</li> <li>- Technisch ontwerp aansluitingen tussen trajecten</li> <li>- Technisch ontwerp natuurpoorten (stapelstenen, aansluiting waterkering, bomen)</li> <li>- Technisch ontwerp op- en afritten</li> <li>- Technisch ontwerp ten aanzien van NWO's*</li> </ul> <p>*) Betreft beplanting, bebouwing en medegebruiksvraagstukken. Kabels en leidingen worden separaat beschouwd.</p>
GWK Grote Molenbeek	<ul style="list-style-type: none"> <li>- Uitwerking recreatieve en beheerroutes Molenbeekdal</li> <li>- Detaillering aansluiting op hoge gronden</li> <li>- Inpassing en ontwerp steunberm t.b.v. stabiliteit</li> <li>- Detaillering dijkovergang sportlaan (cross-bulten)</li> <li>- Detaillering aansluiting op harde kering Dorps haven Wanssum</li> <li>- Detaillering kruising Meerloseweg</li> <li>- Toepassen zandkern (hergebruik oude dijk)</li> <li>- Behouden bomenrij langs Sportlaan</li> </ul>

## 4.2 Duurzaamheid

De duurzaamheidseis die projectbreed is ingezet, betreft de verwijderbaarheid van de gebruikte materialen. Uitgangspunt van het ontwerp van de groene waterkeringen is dat deze, indien mogelijk, van gebiedseigen grond worden opgebouwd. Dit betekent dat in principe geen grond van buiten het projectgebied wordt aangevoerd voor het bouwen van de waterkeringen. Daarnaast kan, wanneer de



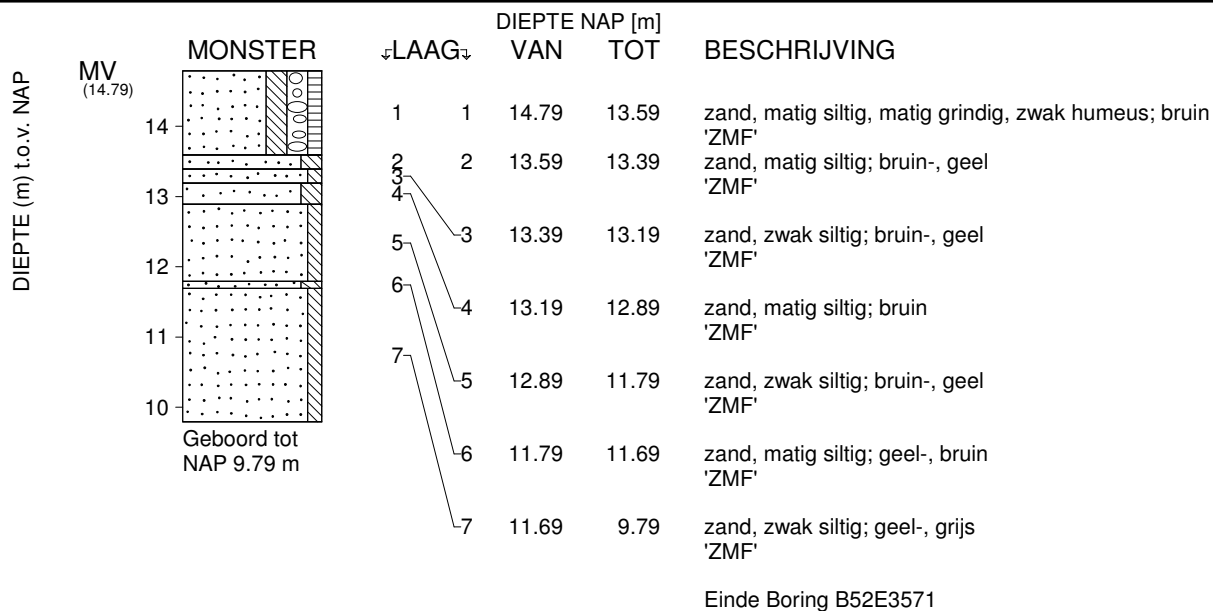


## **Bijlage 2: Grondonderzoek**



DIEPTE (m) t.o.v. NAP	MV (12.10)	MONSTER	DIEPTE NAP [m]		BESCHRIJVING
			↓LAAG↓	VAN TOT	
	12				
	11		1 1	11.40 11.20	zand; ON=??? 'ZMGO'
	10		3 2	11.20 10.60	zand, zwak grindig, sterk humeus; ON=???
	9		4 3	10.60 10.30	ZG1=???; ON=??? 'ZMGO' ZM=230.000 mm
	8		5 4	10.30 8.90	ZG3=???; donker-, grijs 'ZZGO'
	7		6 5	8.90 8.60	ZH2=???; ON=??? 'ZFC'
	6		7 6	8.60 7.90	zand; ON=??? 'ZFC'
	5		8 7	7.90 7.60	ZG=???; ON=??? 'ZMGO' ZM=300.000 mm
	4		9 8	7.60 5.90	ZG=???; ON=??? 'ZZGO'
	3		10 9	5.90 5.10	ZG3=???; rood 'ZZGO'
	2		11 10	5.10 3.60	ZSG=???; ON=??? 'ZZGO'
	1		12 11	3.60 2.50	zand, SG=???; 3=???; ON=??? 'ZZGO'
	0		12 12	2.50 0.60	zand, sterk siltig; donker-, grijs 'ZMGO'
	-1		13 13	0.60 -1.00	zand, zwak siltig; ON=??? 'ZMGO' ZM=250.000 mm
	-2		14 14	-1.00 -2.40	ZG3=???; ON=??? 'ZMGO'
	-3		15 15	-2.40 -3.65	GZS=???; donker-, bruin 'GMG'
	-4		16 16	-3.65 -3.67	klei, sterk zandig, matig humeus; ON=???
	-5		17 17	-3.67 -3.83	zand, kleilig; ON=??? 'ZFC'
	-6		18 18	-3.83 -5.50	zand, sterk siltig, grind; donker-, grijs 'ZZFO' ZM=110.000 mm
	-7		19 19	-5.50 -6.20	niet benoemd; ON=??? 'GC2' ZM=120.000 mm
			20 20	-6.20 -6.80	niet benoemd; ON=??? 'GM' ZM=120.000 mm
			21 21	-6.80 -7.00	ZK3=???; ON=??? 'ZZFO' ZM=120.000 mm
					Einde Boring B52E0068
maaiveld: NAP 12.10 m X = 202980 m Y = 394150 m (RD)					
<Not Registered> <Not Registered>		<Not Registered> <Not Registered> <Not Registered>	Telefoon Telefax	<Not Registered> <Not Registered>	datum 1960-01-01
- [Blad 1 / 2]					gez. DINO-BOR
					form. BIJL. A4



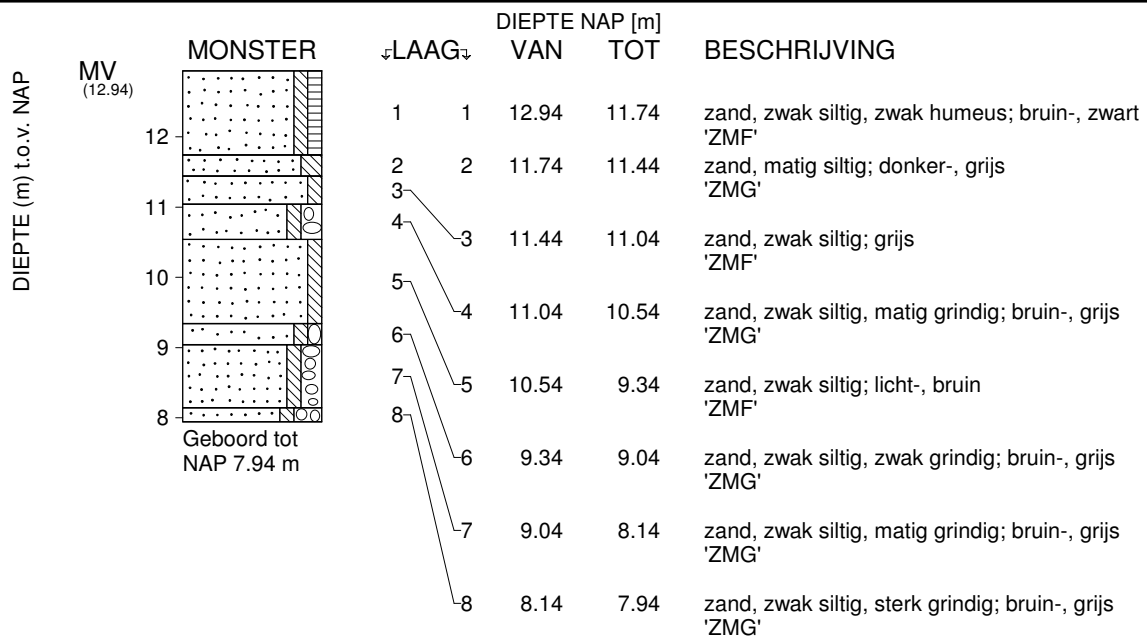


GWS 3.00

X = 202926 m Y = 394323 m (RD)

-	-	-	-	-	datum	get.
					2014-01-08	ES
					DINO-BOR	gez.
-	-	-	-	-	BIJL.	form.
						--



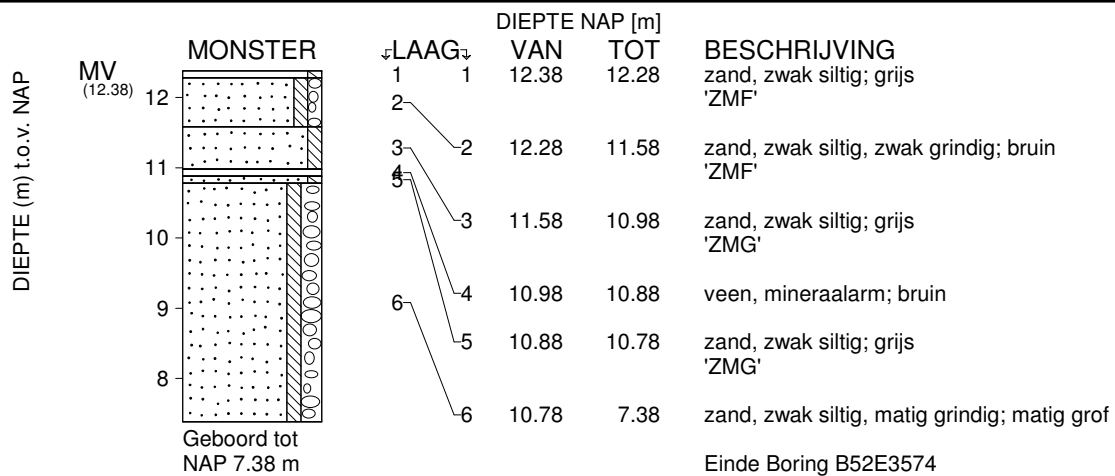


Einde Boring B52E3573

GWS 1.00

X = 202869 m Y = 394215 m (RD)

-	-	-	-	-	datum	get.
					2014-01-08	ES
					DINO-BOR	gez.
-	-	-	-	-	BIJL.	form.
						--



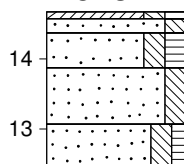
GWS 0.00

X = 202894 m Y = 394144 m (RD)

-	-	-	-	-	datum	get.
					2015-01-07	KG
					DINO-BOR	gez.
-	-	-	-	-	BIJL.	form.
						--

MV  
(14.67)

MONSTER



Geboord tot  
NAP 12.47 m

DIEPTE NAP [m]

↓LAAG↓

VAN

TÖT

## BESCHRIJVING

klei, matig siltig, matig humeus; donker-, bruin  
'KMST'

zand, matig siltig; bruin  
'ZMF'

zand, matig siltig, matig humeus; donker-, bruin  
'ZMF'

zand, matig siltig; licht-, bruin  
'ZMF'

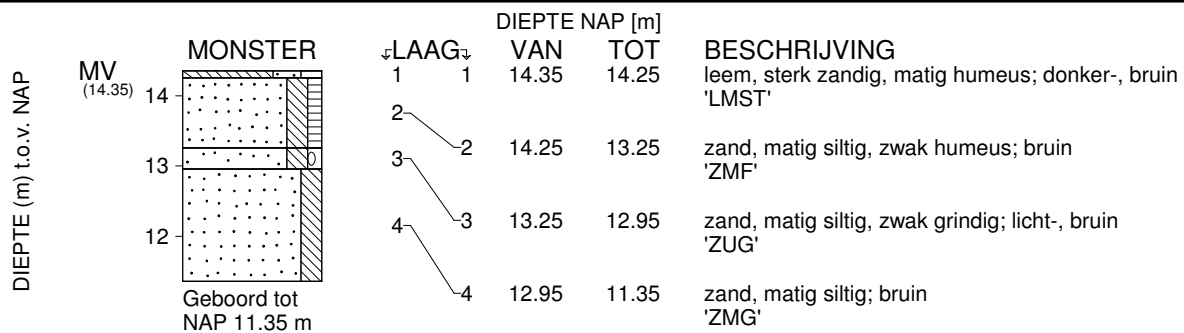
zand, matig siltig, zwak humeus; donker-, bruin  
'ZZF'

Einde Boring B52E3690

X = 203103 m   Y = 394291 m (RD)

<div> <div>&lt;Not Registered&gt;</div> <div>&lt;Not Registered&gt;</div> <div>&lt;Not Registered&gt;</div> <div>&lt;Not Registered&gt;</div> <div>&lt;Not Registered&gt;</div> </div>					datum	get.
					2017-03-22	jmn
-					DINO-BOR	gez.
					BIJL.	form. --





GWS 2.000

X = 203161 m Y = 394140 m (RD)

-	-	-	-	-	datum	get.
					2017-03-21	jmn
					DINO-BOR	gez.
-	-	-	-	-	BIJL.	form.
						--



### **Bijlage 3: Resultaten zettingsberekeningen**



Phone  
Fax

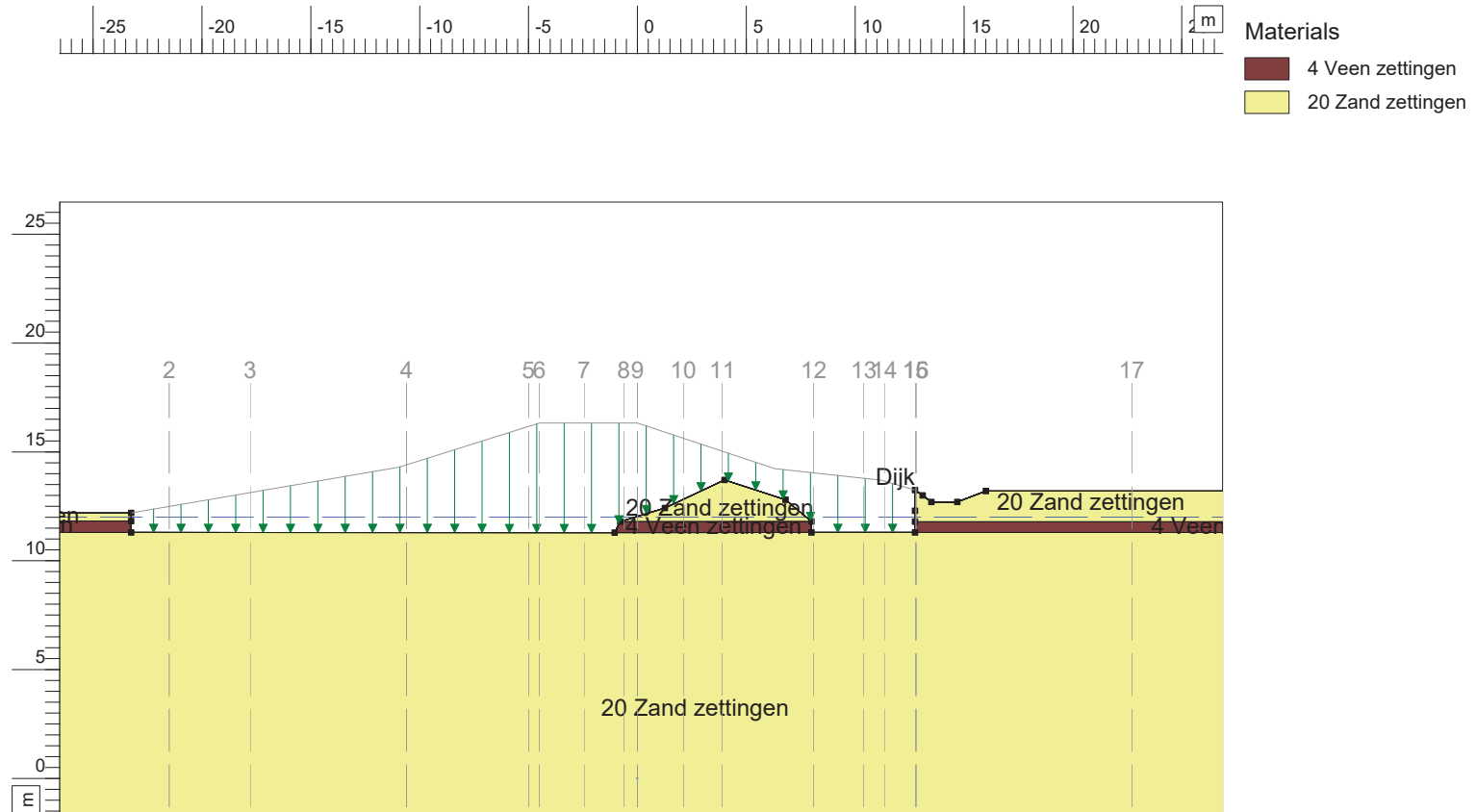
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date  
13-4-2018

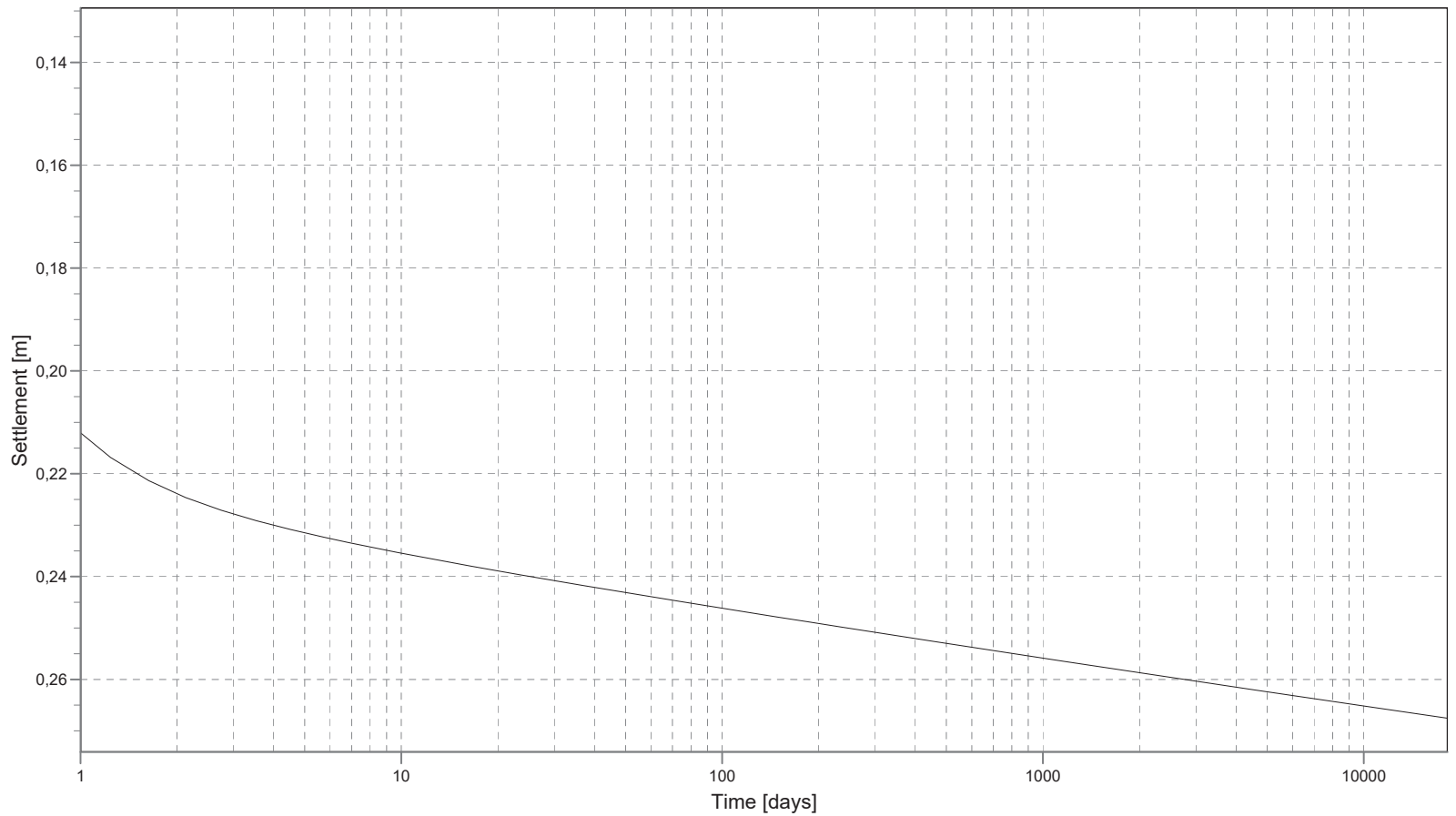
Zettingsberekening  
DO GWK DR61862 Grote Molenbeek  
GMB\_V02

Annex

## Input View



## Time-History



Vertical 8 (X = -0,633 m; Z = 0,000 m)  
Method = Isotache with Darcy (Natural strain)

Depth = 11,850 [m]  
Settlement after 18250 days = 0,268 [m]



Phone  
Fax

D-Settlement 18.1 : ZE\_V02\_DR61862\_K3\_K3.sli

date  
13-4-2018

Zettingsberekening  
DO GWK DR61862 Grote Molenbeek  
GMB\_V02

Annex



Phone  
Fax

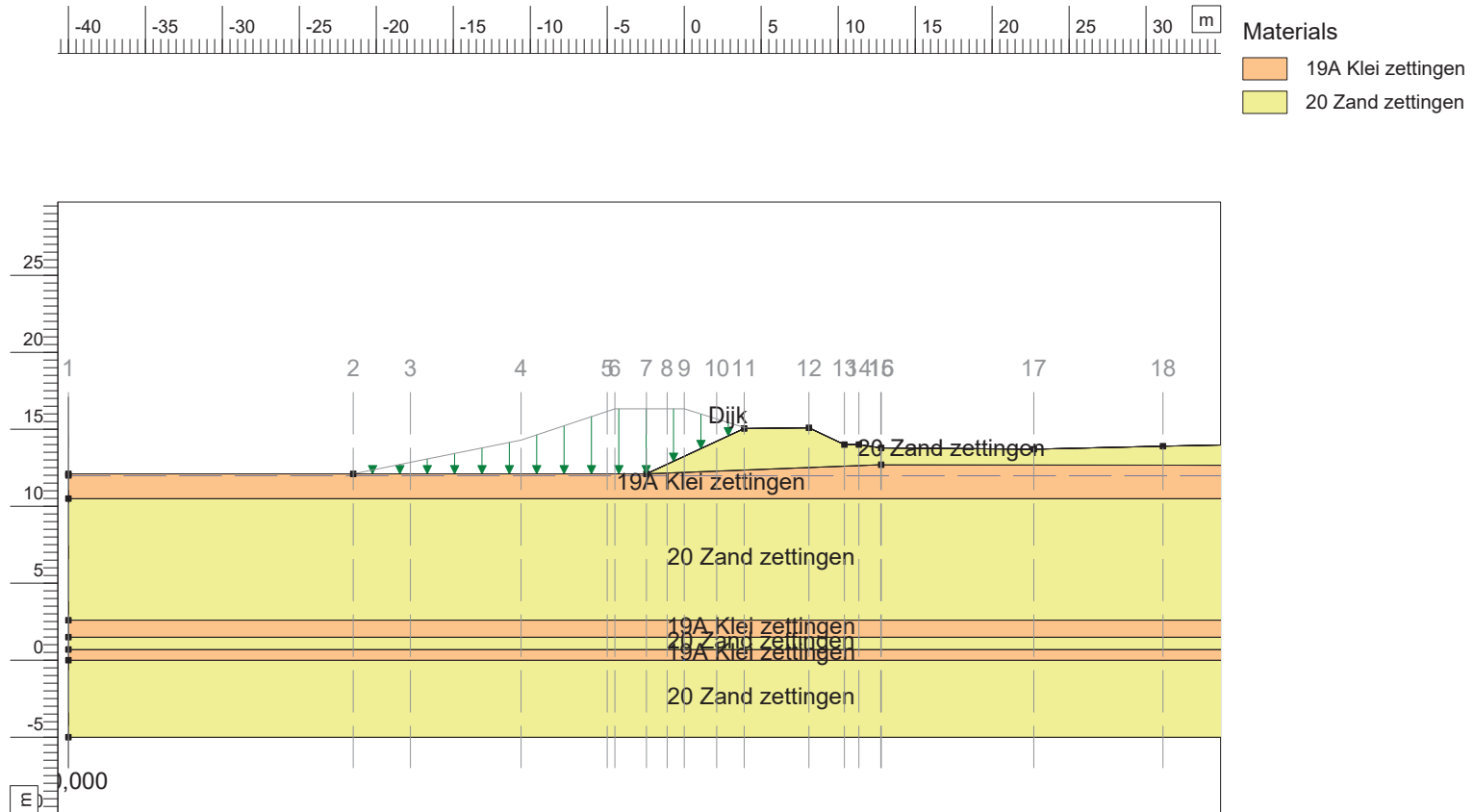
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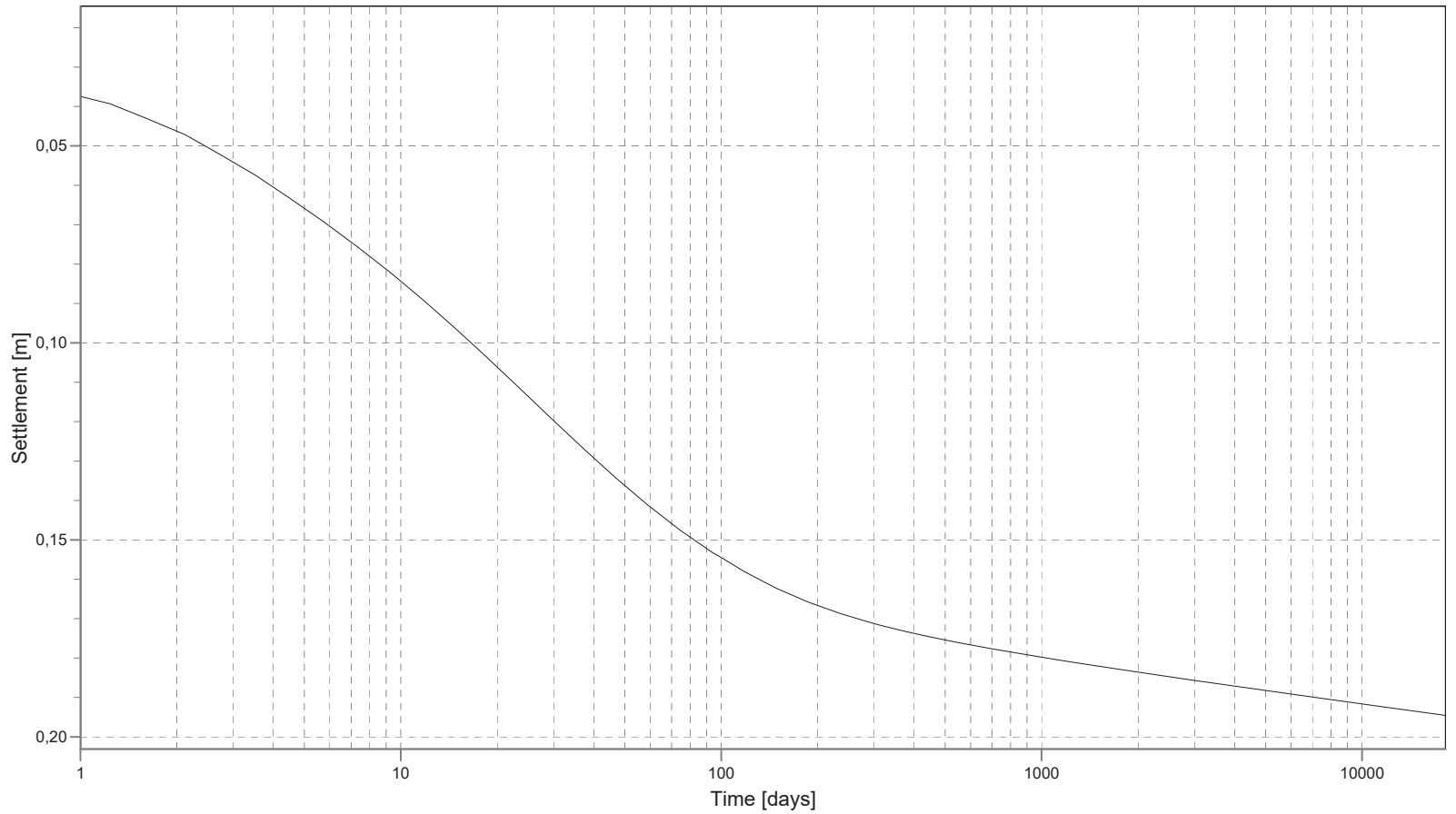
Zettingsberekening  
DO GWK DR61862 Grote Molenbeek  
GMB\_V06a

Annex

## Input View



## Time-History



Vertical 6 (X = -4,500 m; Z = 0,000 m)  
Method = Isotache with Darcy (Natural strain)

Depth = 12,100 [m]  
Settlement after 18250 days = 0,195 [m]



Phone  
Fax

date  
13-4-2018

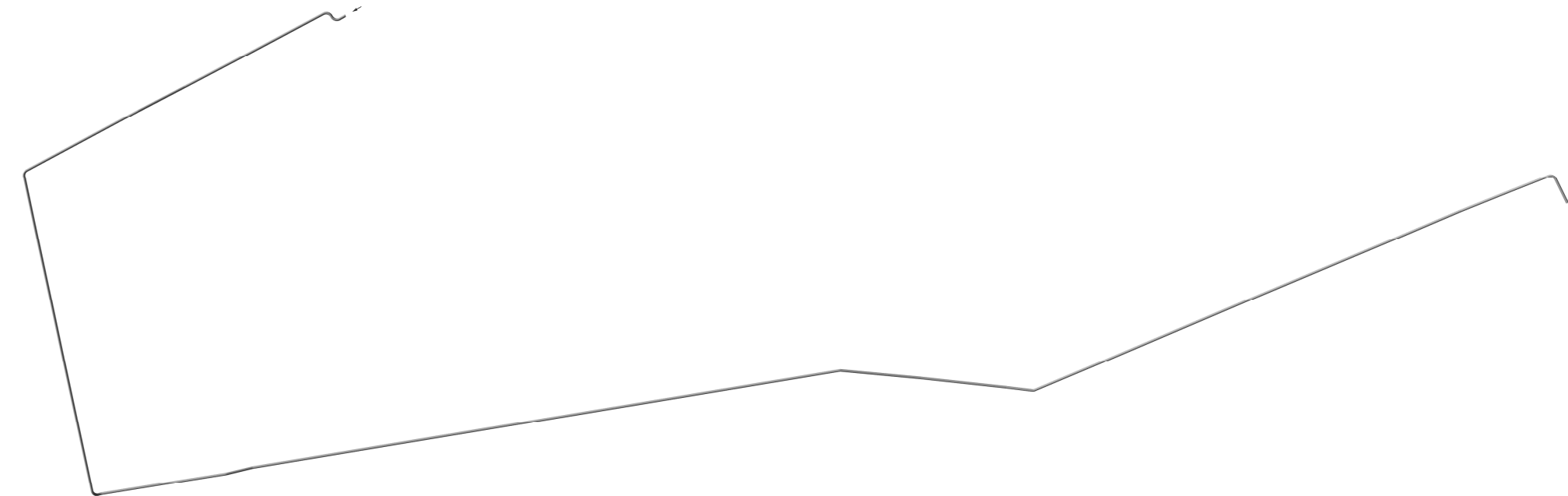
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Zettingsberekening  
DO GWK DR61&62 Grote Molenbeek  
GMB\_V06a

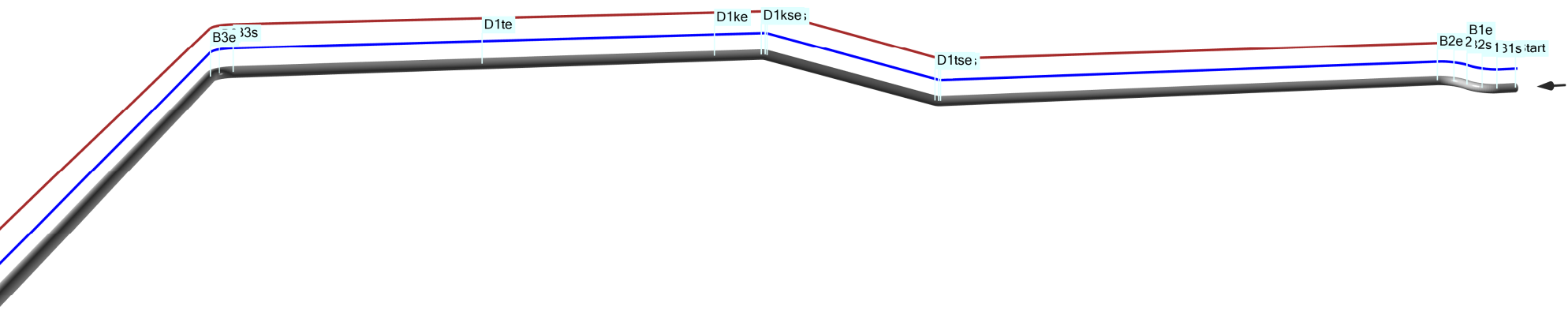
Annex

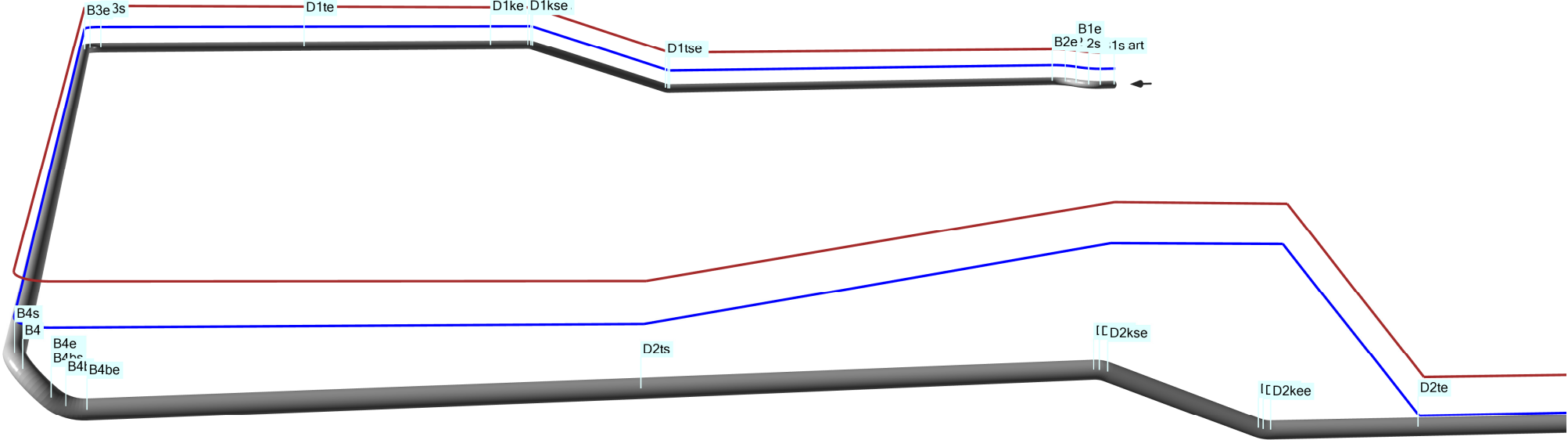


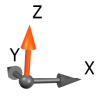
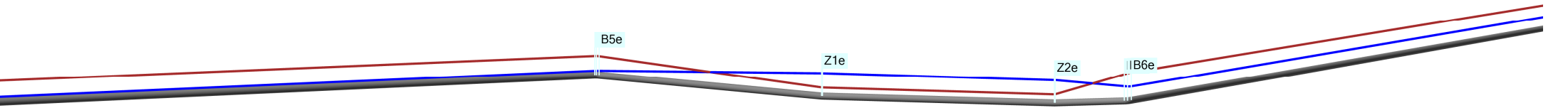
## **Bijlage 4.1: Resultaten PLE berekening BC Kafk**

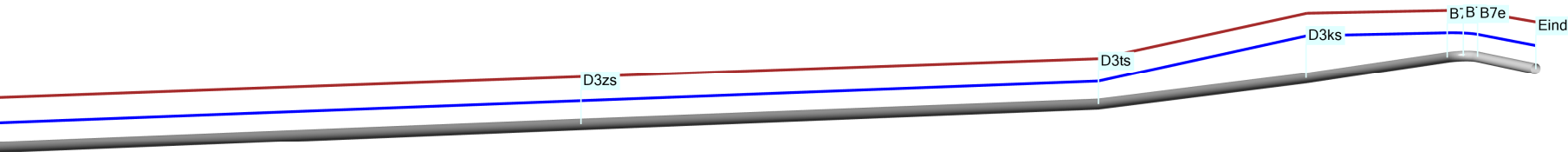












**Pipeline origin**

Ple4Win [96612737]: 'BC3Kafk' [14-5-2018;occ.:6]

	Identification name	X-coordinate	Y-coordinate	Z-coordinate	Start node	Start ax.-coordinate	Start proj.-coordinate
		mm	mm	mm		mm	mm
1	Start	202915198	394270357	10200	1	0	0

**Pipeline polygon points (absolute)**

Ple4Win [96612737]: 'BC3Kafk' [3-9-2018;occ.:33]

	Identification na	X-coordinate	Y-coordinate	Z-coordin	Bend ra	Element type	Max. bend elem. le	Pipe elem. len	Extension eleme
		mm	mm	mm	mm		mm	mm	
1	B1	202913050	394269524	10200	1050	Odd Elements	100	300	10
2	B2	202912360	394271582	10200	1050	Odd Elements	100	300	10
3	D1ts	202884374	394261557	10200	1050	Odd Elements	100	300	10
4	D1ks	202876058	394258501	12700	1050	Odd Elements	100	300	10
5	D1ke	202873820	394257679	12700	1050	Odd Elements	100	300	10
6	D1te	202863895	394254032	12700	1050	Odd Elements	100	300	10
7	B3	202853453	394250195	12700	1050	Odd Elements	100	300	10
8	B4	202855020	394188968	12700	1050	Odd Elements	100	300	10
9	B4b	202856119	394189009	11700	1050	Odd Elements	100	300	10
10	D2ts	202868643	394189477	12000	1050	Odd Elements	100	300	10
11	D2ks	202880042	394189902	12300	1050	Odd Elements	100	300	10
12	D2ke	202884628	394190073	10700	1050	Odd Elements	100	300	10
13	D2te	202888988	394190236	10700	0		100	300	10
14	B5	202995040	394194196	10700	1050	Odd Elements	100	300	10
15	Z1	203009628	394190598	9700	1050	Odd Elements	100	300	10
16	Z2	203025039	394186796	9700	1050	Odd Elements	100	300	10
17	B6	203029967	394185580	10000	1050	Odd Elements	100	300	10
18	D3zs	203104068	394207027	10750	0		100	300	10
19	D3ts	203110791	394208973	11000	0		100	300	10
20	D3ks	203119992	394211636	11900	0		100	300	10
21	B7	203127343	394213763	12800	1050	Odd Elements	100	300	10
22	Eind	203129500	394208253	12800	0		100	300	10

**Ground level**

Ple4Win [96612737]: 'BC3Kafk' [14-5-2018;occ.:9]

	Identifier	Ground level 1	Uncer. value 1	Ground level 2	Uncer. value 2
		mm	mm	mm	mm
1	Start	12200	10		
2	B1	12200	10		
3	B2	12200	10		
4	D1ts	12200	10		
5	D1ks	14700	10		
6	D1ke	14700	10		
7	D1te	14700	10		
8	B3	14700	10		
9	B4	14500	10		
10	D2ts	14500	10		
11	D2ks	16400	10		
12	D2ke	16400	10		
13	D2te	12000	10		
14	B5	12000	10		
15	Z1	10300	10		
16	Z2	10300	10		
17	B6	12000	10		
18	D3ts	13000	10		
19	D3ks	14800	10		
20	B7	14800	10		
21	Eind	14800	10		

**(Ground) water level**

Ple4Win [96612737]: 'BC3Kafk' [14-5-2018;occ.:9]

	Identifier	Z-coord. water level 1	Uncer. value 1	Z-coord. water level 2	Uncer. value 2
		mm	mm	mm	mm
1	Start	11200	10		
2	B1	11200	10		
3	B2	11200	10		
4	D1ts	11200	10		
5	D1ks	13700	10		
6	D1ke	13700	10		
7	D1te	13700	10		
8	B3	13700	10		

**(Ground) water level**

Ple4Win [96612737]: 'BC3Kafk' [14-5-2018;occ.:9]

	Identifier	Z-coord. water level 1	Uncer. value 1	Z-coord. water level 2	Uncer. value 2
		mm	mm	mm	mm
9	B4	13500	10		
10	D2ts	13500	10		
11	D2ks	15400	10		
12	D2ke	15400	10		
13	D2te	11000	10		
14	B5	11000	10		
15	Z1	11300	10		
16	Z2	11300	10		
17	B6	11000	10		
18	D3ts	12000	10		
19	D3ks	13800	10		
20	B7	13800	10		
21	Eind	13800	10		

**Material location**

Ple4Win [96612737]: 'BC3Kafk' [14-5-2018;occ.:2]

	Identifier	Material reference
1	Start	PE100k

**Isotropic materials**

Ple4Win [96612737]: 'BC3Kafk' [14-5-2018;occ.:2]

	Material reference	Young's modulus	Shear modulus	Poisson's ratio	Coeff. thermal expansion	Yield stress	Yield stress at $\theta$ °C
		N/mm <sup>2</sup>	N/mm <sup>2</sup>		1/°C	N/mm <sup>2</sup>	N/mm <sup>2</sup>
1	PE100l	350		0,4	0,00016	10	
2	PE100k	975		0,4	0,00016	10	

**Outer diameter**

Ple4Win [96612737]: 'BC3Kafk' [14-5-2018;occ.:2]

	Identifier	Outer pipe diameter 1	Outer pipe diameter 2
		mm	mm
1	Start	315	

**Wall thicknesses**

Ple4Win [96612737]: 'BC3Kafk' [14-5-2018;occ.:2]

	Identif	Nom. wall thicknes	Corrosion allow	Manufact. tol	Abs. toleranc	Nom. wall thicknes	Corrosion allow	Manufact. tol	Abs. toleranc
		mm	mm	%	mm	mm	mm	%	mm
1	Start	28,6							

**Deadweight**

Ple4Win [96612737]: 'BC3Kafk' [14-5-2018;occ.:2]

	Identifier	Deadweight 1	Deadweight 2	Buoyancy ind.
		N/mm	N/mm	
1	Start	-3,59	0,74	Yes

**Horizontal soil stiffness**

Ple4Win [96612737]: 'BC3Kafk' [14-5-2018;occ.:3]

	Identifier	Hor. soil stiffness 1	Hor. soil stiffness 2	Dividing factor	Multiplication factor	Half band width accuracy
		N/mm <sup>3</sup>	N/mm <sup>3</sup>			%
1	Start	0,029663	0,029663		1,7	5
2	B1	0,029663	0,029663		1,7	5
3	B2	0,029663	0,029663		1,7	5
4	D1ts	0,029596	0,029596		1,7	5
5	D1ks	0,029962	0,029962		1,7	5
6	D1ke	0,029663	0,029663		1,7	5
7	D1te	0,029663	0,029663		1,7	5
8	B3	0,029663	0,029663		1,7	5
9	B4	0,02943	0,02943		1,7	5
10	B4b	0,042126	0,042126		1,7	5
11	D2ts	0,038324	0,025698		1,7	5
12	D2ks	0,053823	0,053823		1,7	5
13	D2ke	0,087542	0,087542		1,7	5
14	D2te	0,010132	0,018776		1,7	5
15	B5	0,018804	0,018804		1,7	5
16	Z1	0,0040441	0,0040441		1,7	5
17	Z1e	0,0040616	0,0040616		1,7	5
18	Z2	0,0040616	0,0040616		1,7	5

**Horizontal soil stiffness**

Ple4Win [96612737]: 'BC3Kafk' [14-5-2018;occ.:3]

	Identifier	Hor. soil stiffness 1	Hor. soil stiffness 2	Dividing factor	Multiplication factor	Half band width accuracy
		N/mm <sup>3</sup>	N/mm <sup>3</sup>			%
19	Z2e	0,0042266	0,0042266		1,7	5
20	B6	0,029746	0,029746		1,7	5
21	D3zs	0,029376	0,018324		1,7	5
22	D3ts	0,018555	0,018555		1,7	5
23	D3ks	0,031992	0,031992		1,7	5
24	B7	0,01904	0,01904		1,7	5
25	Eind	0,018555	0,018555		1,7	5

**Downward vertical soil stiffness**

Ple4Win [96612737]: 'BC3Kafk' [14-5-2018;occ.:3]

	Identifier	vert. soil stiffness 1 (down)	vert. soil stiffness 2 (down)	Dividing factor	Multiplication factor	Half band width accuracy
		N/mm <sup>3</sup>	N/mm <sup>3</sup>			%
1	Start	0,023018	0,023018		2	5
2	B1	0,023018	0,023018		2	5
3	B2	0,023018	0,023018		2	5
4	D1ts	0,022958	0,022958		2	5
5	D1ks	0,023292	0,023292		2	5
6	D1ke	0,023018	0,023018		2	5
7	D1te	0,023018	0,023018		2	5
8	B3	0,023018	0,023018		2	5
9	B4	0,022807	0,022807		2	5
10	B4b	0,034953	0,034953		2	5
11	D2ts	0,031196	0,027983		2	5
12	D2ks	0,061178	0,061178		2	5
13	D2ke	0,10597	0,10597		2	5
14	D2te	0,011736	0,013596		2	5
15	B5	0,01362	0,01362		2	5
16	Z1	0,0014596	0,0014596		2	5
17	Z1e	0,0014684	0,0014684		2	5
18	Z2	0,0014684	0,0014684		2	5
19	Z2e	0,0015521	0,0015521		2	5
20	B6	0,023094	0,023094		2	5
21	D3zs	0,022757	0,020005		2	5
22	D3ts	0,020251	0,020251		2	5
23	D3ks	0,035035	0,035035		2	5
24	B7	0,020768	0,020768		2	5
25	Eind	0,020251	0,020251		2	5

**Upward vertical soil stiffness**

Ple4Win [96612737]: 'BC3Kafk' [14-5-2018;occ.:3]

	Identifier	vert. soil stiffness 1 (up)	vert. soil stiffness 2 (up)	Dividing factor	Multiplication factor	Half band width accuracy
		N/mm <sup>3</sup>	N/mm <sup>3</sup>			%
1	Start	0,0121	0,0121		1,4	5
2	B1	0,0121	0,0121		1,4	5
3	B2	0,0121	0,0121		1,4	5
4	D1ts	0,012046	0,012046		1,4	5
5	D1ks	0,012348	0,012348		1,4	5
6	D1ke	0,0121	0,0121		1,4	5
7	D1te	0,0121	0,0121		1,4	5
8	B3	0,0121	0,0121		1,4	5
9	B4	0,01191	0,01191		1,4	5
10	B4b	0,024417	0,024417		1,4	5
11	D2ts	0,020222	0,012717		1,4	5
12	D2ks	0,046804	0,046804		1,5522	5
13	D2ke	0,11226	0,11226		1,5114	5
14	D2te	0,0027699	0,0047595		1,846	5
15	B5	0,0047746	0,0047746		1,4	5
16	Z1	0,00028367	0,00028367		1,4	5
17	Z1e	0,00028642	0,00028642		1,4	5
18	Z2	0,00028642	0,00028642		1,4	5
19	Z2e	0,00031302	0,00031302		1,4	5
20	B6	0,012169	0,012169		1,4	5
21	D3zs	0,011865	0,0070981		1,4	5
22	D3ts	0,0072525	0,0072525		1,7013	5
23	D3ks	0,018631	0,018631		1,6126	5
24	B7	0,0075811	0,0075811		1,6963	5
25	Eind	0,0072525	0,0072525		1,7013	5



**Pipe-soil friction**

Ple4Win [96612737]: 'BC3Kafk' [14-5-2018;occ.:3]

	Identif	Soil frictio	Soil frictio	Dividing fact	Multiplication fact	Add. ax. friction factor	Add. ax. friction factor	Half band width accurac
		N/mm <sup>2</sup>	N/mm <sup>2</sup>					%
1	Start	0,00769...	0,00769...		1,375			5
2	B1	0,00769...	0,00769...		1,375			5
3	B2	0,00769...	0,00769...		1,375			5
4	D1ts	0,00768...	0,00768...		1,375			5
5	D1ks	0,00774...	0,00774...		1,375			5
6	D1ke	0,00769...	0,00769...		1,375			5
7	D1te	0,00769...	0,00769...		1,375			5
8	B3	0,00769...	0,00769...		1,375			5
9	B4	0,00765...	0,00765...		1,375			5
10	B4b	0,00963...	0,00963...		1,375			5
11	D2ts	0,00906...	0,00855...		1,375			5
12	D2ks	0,012938	0,012938		1,375			5
13	D2ke	0,017153	0,017153		1,375			5
14	D2te	0,00585...	0,00576...		1,865			5
15	B5	0,00577...	0,00577...		1,375			5
16	Z1	0,00168...	0,00168...		1,375			5
17	Z1e	0,00169...	0,00169...		1,375			5
18	Z2	0,00169...	0,00169...		1,375			5
19	Z2e	0,001743	0,001743		1,375			5
20	B6	0,00770...	0,00770...		1,375			5
21	D3zs	0,00764...	0,00713...		1,375			5
22	D3ts	0,00718...	0,00718...		1,375			5
23	D3ks	0,00964...	0,00964...		1,375			5
24	B7	0,00728...	0,00728...		1,375			5
25	Eind	0,00718...	0,00718...		1,375			5

**Displacement at max. soil friction**

Ple4Win [96612737]: 'BC3Kafk' [14-5-2018;occ.:3]

	Identifier	Soil friction displ. 1	Soil friction displ. 2	Dividing factor	Multiplication factor
		mm	mm		
1	Start	4	4		1,6
2	B1	4	4		1,6
3	B2	4	4		1,6
4	D1ts	4	4		1,6
5	D1ks	4	4		1,6
6	D1ke	4	4		1,6
7	D1te	4	4		1,6
8	B3	4	4		1,6
9	B4	4	4		1,6
10	B4b	4	4		1,6
11	D2ts	4	4		1,6
12	D2ks	4	4		1,6
13	D2ke	4	4		1,6
14	D2te	4,5	4		1,55
15	B5	4	4		1,6
16	Z1	4	4		1,6
17	Z1e	4	4		1,6
18	Z2	4	4		1,6
19	Z2e	4	4		1,6
20	B6	4	4		1,6
21	D3zs	4	4		1,6
22	D3ts	4	4		1,6
23	D3ks	4	4		1,6
24	B7	4	4		1,6
25	Eind	4	4		1,6

**Sub-soil bearing capacity**

Ple4Win [96612737]: 'BC3Kafk' [14-5-2018;occ.:3]

	Identifier	Vert. bearing capacity 1	Vert. bearing capacity 2	Dividing factor	Multiplication factor	Half band width accuracy
		N/mm <sup>2</sup>	N/mm <sup>2</sup>			%
1	Start	0,72532	0,72532		2	5
2	B1	0,72532	0,72532		2	5
3	B2	0,72532	0,72532		2	5
4	D1ts	0,72408	0,72408		2	5
5	D1ks	0,73093	0,73093		2	5
6	D1ke	0,72532	0,72532		2	5
7	D1te	0,72532	0,72532		2	5

**Sub-soil bearing capacity**

Ple4Win [96612737]: 'BC3Kafk' [14-5-2018;occ.:3]

	Identifier	Vert. bearing capacity 1	Vert. bearing capacity 2	Dividing factor	Multiplication factor	Half band width accuracy
		N/mm <sup>2</sup>	N/mm <sup>2</sup>			%
8	B3	0,72532	0,72532		2	5
9	B4	0,72097	0,72097		2	5
10	B4b	0,95246	0,95246		2	5
11	D2ts	0,88433	0,82358		2	5
12	D2ks	1,3735	1,3735		2	5
13	D2ke	1,9722	1,9722		2	5
14	D2te	0,47107	0,51464		2	5
15	B5	0,51522	0,51522		2	5
16	Z1	0,11389	0,11389		2	5
17	Z1e	0,11437	0,11437		2	5
18	Z2	0,11437	0,11437		2	5
19	Z2e	0,11892	0,11892		2	5
20	B6	0,72688	0,72688		2	5
21	D3zs	0,71994	0,66163		2	5
22	D3ts	0,66692	0,66692		2	5
23	D3ks	0,95372	0,95372		2	5
24	B7	0,67797	0,67797		2	5
25	Eind	0,66692	0,66692		2	5

**Ultimate top-soil reaction**

Ple4Win [96612737]: 'BC3Kafk' [14-5-2018;occ.:3]

	Identifier	Passive topsoil reac. 1	Passive topsoil reac. 2	Dividing factor	Multiplication factor	Half band width accuracy
		N/mm <sup>2</sup>	N/mm <sup>2</sup>			%
1	Start	0,073236	0,073236		1,5	5
2	B1	0,073236	0,073236		1,5	5
3	B2	0,073236	0,073236		1,5	5
4	D1ts	0,073022	0,073022		1,5	5
5	D1ks	0,0742	0,0742		1,5	5
6	D1ke	0,073236	0,073236		1,5	5
7	D1te	0,073236	0,073236		1,5	5
8	B3	0,073236	0,073236		1,5	5
9	B4	0,07249	0,07249		1,5	5
10	B4b	0,1159	0,1159		1,5	5
11	D2ts	0,10236	0,096218		1,5	5
12	D2ks	0,22023	0,22023		1,5	5
13	D2ke	0,38912	0,38912		1,5	5
14	D2te	0,037637	0,040618		1,5	5
15	B5	0,040697	0,040697		1,5	5
16	Z1	0,0063718	0,0063718		1,5	5
17	Z1e	0,0064093	0,0064093		1,5	5
18	Z2	0,0064093	0,0064093		1,5	5
19	Z2e	0,0067655	0,0067655		1,5	5
20	B6	0,073503	0,073503		1,5	5
21	D3zs	0,072315	0,067113		1,5	5
22	D3ts	0,068002	0,068002		1,5	5
23	D3ks	0,12228	0,12228		1,5	5
24	B7	0,069871	0,069871		1,5	5
25	Eind	0,068002	0,068002		1,5	5

**Ultimate hor. soil reaction**

Ple4Win [96612737]: 'BC3Kafk' [14-5-2018;occ.:3]

	Identif	Horizontal soil reacti	Horizontal soil reacti	Dividing f	Multiplication f	Add. lat. friction fac	Add. lat. friction fac	Half band width acc
		N/mm <sup>2</sup>	N/mm <sup>2</sup>					%
1	Start	0,28314	0,28314		1,6			5
2	B1	0,28314	0,28314		1,6			5
3	B2	0,28314	0,28314		1,6			5
4	D1ts	0,28251	0,28251		1,6			5
5	D1ks	0,286	0,286		1,6			5
6	D1ke	0,28314	0,28314		1,6			5
7	D1te	0,28314	0,28314		1,6			5
8	B3	0,28314	0,28314		1,6			5
9	B4	0,28093	0,28093		1,6			5
10	B4b	0,40211	0,40211		1,6			5
11	D2ts	0,36582	0,2453		1,6			5
12	D2ks	0,51376	0,51376		1,7218			5
13	D2ke	0,83563	0,83563		1,6891			5
14	D2te	0,096718	0,17922		1,9568			5

**Ultimate hor. soil reaction**

Ple4Win [96612737]: 'BC3Kafk' [14-5-2018;occ.:3]

	Identif	Horizontal soil reacti	Horizontal soil reacti	Dividing f	Multiplication f	Add. lat. friction fac	Add. lat. friction fac	Half band width acc
		N/mm <sup>2</sup>	N/mm <sup>2</sup>					%
15	B5	0,1795	0,1795		1,6			5
16	Z1	0,038603	0,038603		1,6			5
17	Z1e	0,038769	0,038769		1,6			5
18	Z2	0,038769	0,038769		1,6			5
19	Z2e	0,040345	0,040345		1,6			5
20	B6	0,28394	0,28394		1,6			5
21	D3zs	0,2804	0,17491		1,6			5
22	D3ts	0,17712	0,17712		1,841			5
23	D3ks	0,30538	0,30538		1,7701			5
24	B7	0,18175	0,18175		1,8371			5
25	Eind	0,17712	0,17712		1,841			5

**Uncertainty factors**

Ple4Win [96612737]: 'BC3Kafk' [14-5-2018;occ.:4]

	KLH-uncer. fact	KLS-uncer. fact	KLT-uncer. fact	Friction uncer. fact	UF-uncer. fact	RVS-uncer. fact	RVT-uncer. fact	RH-uncer. fact
1	High	High	High	High	High	High	High	High

**Start/end nodes boundary conditions**

Ple4Win [96612737]: 'BC3Kafk' [14-5-2018;occ.:3]

	Identification name	Boundary nodes cond.	Boundary node state
1	Start	Fixed	Open
2	Eind	Fixed	Open

**Internal overpressure**

Ple4Win [96612737]: 'BC3Kafk' [14-5-2018;occ.:3]

	Identifier	Internal pressure 1	Internal pressure 2
		N/mm <sup>2</sup>	N/mm <sup>2</sup>
1	Start	0,26	

**Temperature differences**

Ple4Win [96612737]: 'BC3Kafk' [14-5-2018;occ.:2]

	Identifier	Abs. temp. 1	Ref. temp. 1	Abs. temp. 2	Ref. temp. 2
		°C	°C	°C	°C
1	Start	10	20		

**Soil displacement in Z-direction**

Ple4Win [96612737]: 'BC3Kafk' [3-9-2018;occ.:7]

	Identifier	Z-settlement 1	Uncer. factor 1	Z-settlement 2	Uncer. factor 2
		mm		mm	
1					

**Vertical soil subsidence**

Ple4Win [96612737]: 'BC3Kafk' [3-9-2018;occ.:2]

	Identifier	Max. soil subsidence	Uncertainty factor	Subsidence length	Subsidence shape
		mm		mm	
1	B3	-5	1,5	20000	Double
2	B4	-5	1,5	20000	Double
3	B5	-5	1,5	20000	Double
4	B6	-5	1,5	20000	Double

**Loading combinations**

Ple4Win [96612737]: 'BC3Kafk' [3-9-2018;occ.:5]

	Identification	General load	Pressure load	Temp. load	Deadweight load	Settlement load	Nodal load	Elast. bend load	Wave/current load
1	Kafk	1	0	1	1	1	0	0	0

**Non-linear elastic soil iteration control**

Ple4Win [96612737]: 'BC3Kafk' [14-5-2018;occ.:1]

	Max. no. soil iter.	Max. no error points	Max. no error fields
1	20	0	0

**Geometrically non-linear iteration control**

Ple4Win [96612737]: 'BC3Kafk' [14-5-2018;occ.:1]

	Max. no. geometry iter.	Relative disequilibrium	Abs. disequilibrium	Rotation increment
				RAD
1	50	1E-05	1E-07	0,1

**Neutral or real top-soil load**

Ple4Win [96612737]: 'BC3Kafk' [14-5-2018;occ.:3]

	Identifier	Neutral/Real top-soil load 1	Uncer. factor 1	Load factor 1	Neutral/Real top-soil load 2	Uncer. factor 2	Load factor 2
		N/mm <sup>2</sup>			N/mm <sup>2</sup>		
1	Start	0,068585	1,1	1	0,068585	1,1	1
2	B1	0,068585	1,1	1	0,068585	1,1	1
3	B2	0,068585	1,1	1	0,068585	1,1	1
4	D1ts	0,068484	1,1	1	0,068484	1,1	1
5	D1ks	0,069035	1,1	1	0,069035	1,1	1
6	D1ke	0,068585	1,1	1	0,068585	1,1	1
7	D1te	0,068585	1,1	1	0,068585	1,1	1
8	B3	0,068585	1,1	1	0,068585	1,1	1
9	B4	0,068231	1,1	1	0,068231	1,1	1
10	B4b	0,083458	1,1	1	0,083458	1,1	1
11	D2ts	0,079602	1,1	1	0,096218	1,1	1
12	D2ks	0,12474	1,1	1	0,12474	1,1	1
13	D2ke	0,138	1,1	1	0,138	1,1	1
14	D2te	0,037637	1,1	1	0,040618	1,1	1
15	B5	0,040697	1,1	1	0,040697	1,1	1
16	Z1	0,0063056	1,1	1	0,0063056	1,1	1
17	Z1e	0,0063481	1,1	1	0,0063481	1,1	1
18	Z2	0,0063481	1,1	1	0,0063481	1,1	1
19	Z2e	0,0067548	1,1	1	0,0067548	1,1	1
20	B6	0,06871	1,1	1	0,06871	1,1	1
21	D3zs	0,068147	1,1	1	0,067113	1,1	1
22	D3ts	0,068002	1,1	1	0,068002	1,1	1
23	D3ks	0,11221	1,1	1	0,11221	1,1	1
24	B7	0,069871	1,1	1	0,069871	1,1	1
25	Eind	0,068002	1,1	1	0,068002	1,1	1

**Extra loads on top-soil**

Ple4Win [96612737]: 'BC3Kafk' [14-5-2018;occ.:1]

	Identifier	Topload 1	Load factor 1	Topload 2	Load factor 2
		N/mm <sup>2</sup>		N/mm <sup>2</sup>	
1	B3	0,016	1,35		1,35
2	B4	0,016	1,35	0	1,35
3	D2ks	0	1,35	0,032	1,35
4	D2ke	0,032	1,35	0	1,35
5	D3ks	0	1,35	0,032	1,35
6	B7	0,032	1,35	0	1,35

**Horizontal soil support / Vertical soil load**

Ple4Win [96612737]: 'BC3Kafk' [14-5-2018;occ.:1]

	Identifier	Hor./vert. soil coeff. 1	Hor./vert. soil coeff. 2
1	Start	0,5	

**Soil support angle functions**

Ple4Win [96612737]: 'BC3Kafk' [14-5-2018;occ.:1]

	Identifier	Min. support angle	Max. support angle	Ratio calc. / max. bearing (low)	Ratio calc. / max. bearing (high)	Curve shape
		°	°	%	%	
1	Start	70	180	50	100	Sinus

**Cross-sections to be calculated**

Ple4Win [96612737]: 'BC3Kafk' [14-5-2018;occ.:1]

	Start Identifier	End Identifier	Topload ind.	Allowable stress
				N/mm <sup>2</sup>
1	Start	Eind	Yes	

**Weighing factors stress components**

Ple4Win [96612737]: 'BC3Kafk' [14-5-2018;occ.:1]

	Identi	Stre	Stress due	Stress due to higher ha	Weighing fact. a	Weighing fact. cir	Weighin	Weighing fact. c	Weighing fa	Weighing fac
1	Start	1	0,65	0,65	0,65	0,65	1	1	0,65	0,65

Polygon point data

Ple4Win [96612737]: 'BC3Kafk' [3-9-2018;occ.:18]

	Identification name	X-coordinat	Y-coordinat	Z-coordinat	Bend angl	Hor. bend angle	Angle Z-axis - leaving polygon line	Bend radiu
		mm	mm	mm	°	°	°	mm
1	Start	2,029E+8	3,943E+8	1,020E+4			90,00	
2	B1	2,029E+8	3,943E+8	1,020E+4	92,66	92,66	90,00	1.050
3	B2	2,029E+8	3,943E+8	1,020E+4	91,17	91,17	90,00	1.050
4	D1ts	2,029E+8	3,943E+8	1,020E+4	15,76	,47	74,24	1.050
5	D1ks	2,029E+8	3,943E+8	1,270E+4	15,76	,01	90,00	1.050
6	D1ke	2,029E+8	3,943E+8	1,270E+4	,01	,01	90,00	0
7	D1te	2,029E+8	3,943E+8	1,270E+4	,00	,00	90,00	0
8	B3	2,029E+8	3,943E+8	1,270E+4	71,29	71,29	90,00	1.050
9	B4	2,029E+8	3,942E+8	1,270E+4	90,50	90,67	132,28	1.050
10	B4b	2,029E+8	3,942E+8	1,170E+4	43,65	,00	88,63	1.050
11	D2ts	2,029E+8	3,942E+8	1,200E+4	,14	,00	88,49	0
12	D2ks	2,029E+8	3,942E+8	1,230E+4	20,73	,00	109,22	1.050
13	D2ke	2,029E+8	3,942E+8	1,070E+4	19,22	,01	90,00	1.050
14	D2te	2,029E+8	3,942E+8	1,070E+4	,00	,00	90,00	0
15	B5	2,030E+8	3,942E+8	1,070E+4	16,43	15,99	93,81	1.050
16	Z1	2,030E+8	3,942E+8	9,700E+3	3,81	,00	90,00	1.050
17	Z2	2,030E+8	3,942E+8	9,700E+3	3,38	,00	86,62	1.050
18	B6	2,030E+8	3,942E+8	1,000E+4	30,11	30,00	89,44	1.050
19	D3zs	2,031E+8	3,942E+8	1,075E+4	1,49	,00	87,95	0
20	D3ts	2,031E+8	3,942E+8	1,100E+4	3,32	,00	84,63	0
21	D3ks	2,031E+8	3,942E+8	1,190E+4	1,34	,00	83,29	0
22	B7	2,031E+8	3,942E+8	1,280E+4	84,79	84,76	90,00	1.050
23	Eind	2,031E+8	3,942E+8	1,280E+4				

Identification names

Ple4Win [96612737]: 'BC3Kafk' [3-9-2018;occ.:18]

	Identification name	Node number	X-coordinate	x_pipeline axis	x_projected pipe axis
			mm	mm	mm
1	Start	1	2,029E+8	0	0
2	B1s	12	2,029E+8	1,204E+3	1,204E+3
3	B1	20	2,029E+8	2,003E+3	2,330E+3
4	B1e	29	2,029E+8	2,901E+3	3,539E+3
5	B2s	29	2,029E+8	2,901E+3	3,539E+3
6	B2	37	2,029E+8	3,687E+3	4,633E+3
7	B2e	46	2,029E+8	4,572E+3	5,810E+3
8	D1tss	155	2,029E+8	3,308E+4	3,432E+4
9	D1ts	156	2,029E+8	3,318E+4	3,442E+4
10	D1tse	158	2,029E+8	3,337E+4	3,461E+4
11	D1kss	202	2,029E+8	4,229E+4	4,319E+4
12	D1ks	203	2,029E+8	4,238E+4	4,328E+4
13	D1kse	205	2,029E+8	4,257E+4	4,347E+4
14	D1ke	226	2,029E+8	4,481E+4	4,571E+4
15	D1te	275	2,029E+8	5,539E+4	5,628E+4
16	B3s	324	2,029E+8	6,576E+4	6,666E+4
17	B3	331	2,029E+8	6,637E+4	6,740E+4
18	B3e	339	2,029E+8	6,707E+4	6,822E+4
19	B4s	551	2,029E+8	1,265E+5	1,277E+5
20	B4	559	2,029E+8	1,273E+5	1,287E+5
21	B4e	568	2,029E+8	1,282E+5	1,296E+5
22	B4bs	568	2,029E+8	1,282E+5	1,296E+5
23	B4b	572	2,029E+8	1,285E+5	1,298E+5
24	B4be	577	2,029E+8	1,290E+5	1,303E+5
25	D2ts	632	2,029E+8	1,411E+5	1,424E+5
26	D2kss	684	2,029E+8	1,523E+5	1,536E+5
27	D2ks	686	2,029E+8	1,525E+5	1,538E+5
28	D2kse	689	2,029E+8	1,527E+5	1,540E+5
29	D2kes	720	2,029E+8	1,572E+5	1,583E+5
30	D2ke	722	2,029E+8	1,573E+5	1,584E+5
31	D2kee	725	2,029E+8	1,575E+5	1,586E+5
32	D2te	754	2,029E+8	1,617E+5	1,628E+5
33	B5s	1122	2,030E+8	2,677E+5	2,688E+5
34	B5	1124	2,030E+8	2,678E+5	2,689E+5
35	B5e	1127	2,030E+8	2,680E+5	2,691E+5
36	Z1	1193	2,030E+8	2,829E+5	2,839E+5
37	Z1e	1194	2,030E+8	2,829E+5	2,840E+5
38	Z2	1263	2,030E+8	2,987E+5	2,998E+5
39	Z2e	1264	2,030E+8	2,988E+5	2,999E+5

### Identification names

Ple4Win [96612737]: 'BC3Kafk' [3-9-2018;occ.:18]

	Identification name	Node number	X-coordinate	x_pipeline axis	x_projected pipe axis
			mm	mm	mm
40	B6s	1296	2,030E+8	3,036E+5	3,046E+5
41	B6	1299	2,030E+8	3,038E+5	3,049E+5
42	B6e	1303	2,030E+8	3,041E+5	3,052E+5
43	D3zs	1574	2,031E+8	3,810E+5	3,820E+5
44	D3ts	1611	2,031E+8	3,880E+5	3,890E+5
45	D3ks	1657	2,031E+8	3,976E+5	3,986E+5
46	B7s	1694	2,031E+8	4,044E+5	4,053E+5
47	B7	1702	2,031E+8	4,051E+5	4,063E+5
48	B7e	1711	2,031E+8	4,059E+5	4,073E+5
49	Eind	1742	2,031E+8	4,109E+5	4,123E+5

### Soil layers

Ple4Win [96612737]: 'BC3Kafk' [14-5-2018;occ.:3]

	Layer name	Laye	Laye	(Mea	Volu	Angl	Angl	Drai	Undr	Pac	Shrin	Shrin	Shrin	Shea	Ulti	Youn	De
				N/m	N/m	°	°	N/m	N/m		N/m			N/m	mm	N/m	
1	Clay; clean; moderate	Clay		1...E-	1...E-	17,5	11,7	,005	,05	,3	,6	,175	,088	,72	5	2,1	
2	Sand; clean; moderate	Sand	Clea	1...E-	2...E-	32,5	20,0	0		,3	2,4	,075	,020	16,...	4	45,0	

### Soil profiles

Ple4Win [96612737]: 'BC3Kafk' [14-5-2018;occ.:3]

	Profile name	Fixed top	Top of profile	Description
			mm	
1	Dijk	No		
2	Sleuf	No		

### Soil profile layers

Ple4Win [96612737]: 'BC3Kafk' [14-5-2018;occ.:3]

	Profile name	Layer name	Layer height
			mm
1	Dijk	Clay; clean; moderate	1.300
2	Dijk	Sand; clean; moderate	3.000
3	Sleuf	Sand; clean; moderate	4.300

### Soil profile locations

Ple4Win [96612737]: 'BC3Kafk' [14-5-2018;occ.:3]

	Ident	Profile na	Profile na	Top soil lo	Top soil lo	Installation method 1	Installation method 2	Deformation spe	Deformation spe
1	Start	Sleuf	Sleuf	Real	Real	TrenchUnCompressed	TrenchUnCompressed	Slow	Slow
2	B1	Sleuf	Sleuf	Real	Real	TrenchUnCompressed	TrenchUnCompressed	Slow	Slow
3	B2	Sleuf	Sleuf	Real	Real	TrenchUnCompressed	TrenchUnCompressed	Slow	Slow
4	D1ts	Sleuf	Sleuf	Real	Real	TrenchUnCompressed	TrenchUnCompressed	Slow	Slow
5	D1ks	Sleuf	Sleuf	Real	Real	TrenchUnCompressed	TrenchUnCompressed	Slow	Slow
6	D1ke	Sleuf	Sleuf	Real	Real	TrenchUnCompressed	TrenchUnCompressed	Slow	Slow
7	D1te	Sleuf	Sleuf	Real	Real	TrenchUnCompressed	TrenchUnCompressed	Slow	Slow
8	B3	Sleuf	Sleuf	Real	Real	TrenchUnCompressed	TrenchUnCompressed	Slow	Slow
9	B4	Sleuf	Sleuf	Real	Real	TrenchUnCompressed	TrenchUnCompressed	Slow	Slow
10	B4b	Sleuf	Sleuf	Real	Real	TrenchUnCompressed	TrenchUnCompressed	Slow	Slow
11	D2ts	Sleuf	Dijk	Real	Real	TrenchUnCompressed	TrenchUnCompressed	Slow	Slow
12	D2ks	Dijk	Dijk	Real	Real	TrenchUnCompressed	TrenchUnCompressed	Slow	Slow
13	D2ke	Dijk	Dijk	Real	Real	TrenchUnCompressed	TrenchUnCompressed	Slow	Slow
14	D2te	Dijk	Sleuf	Real	Real	TrenchUnCompressed	TrenchUnCompressed	Slow	Slow
15	B5	Sleuf	Sleuf	Real	Real	TrenchUnCompressed	TrenchUnCompressed	Slow	Slow
16	Z1	Sleuf	Sleuf	Real	Real	TrenchUnCompressed	TrenchUnCompressed	Slow	Slow
17	Z1e	Sleuf	Sleuf	Real	Real	TrenchUnCompressed	TrenchUnCompressed	Slow	Slow
18	Z2	Sleuf	Sleuf	Real	Real	TrenchUnCompressed	TrenchUnCompressed	Slow	Slow
19	Z2e	Sleuf	Sleuf	Real	Real	TrenchUnCompressed	TrenchUnCompressed	Slow	Slow
20	B6	Sleuf	Sleuf	Real	Real	TrenchUnCompressed	TrenchUnCompressed	Slow	Slow
21	D3zs	Sleuf	Dijk	Real	Real	TrenchUnCompressed	TrenchUnCompressed	Slow	Slow
22	D3ts	Dijk	Dijk	Real	Real	TrenchUnCompressed	TrenchUnCompressed	Slow	Slow
23	D3ks	Dijk	Dijk	Real	Real	TrenchUnCompressed	TrenchUnCompressed	Slow	Slow
24	B7	Dijk	Dijk	Real	Real	TrenchUnCompressed	TrenchUnCompressed	Slow	Slow
25	Eind	Dijk	Dijk	Real	Real	TrenchUnCompressed	TrenchUnCompressed	Slow	Slow

### General soil settings

Ple4Win [96612737]: 'BC3Kafk' [14-5-2018;occ.:3]

Property	Value
1 Volume weight of water (Default: 9,81E-06 N/mm³)	0.00000981
2 Half band width (h.b.w.) accuracy percentage (Default: 5%)	5
3 Pipeline operational temperature	Cold
4 State of soil compression	Well packed
5 Calculation methodology	Use updated NEN3650-1:2012

### Warnings

Ple4Win [96612737]: 'BC3Kafk' [occ.:0]

Program session	Function mnemonic	Identification name	Message
1	39	FUNCT200	W200/4
2	39	FUNCT310	W310/1
3	39	SOIL-WIZ	W320/7
4	39	FUNCT320	W320/1
5	43	FUNCT500	W500/24

### Program status summary

Ple4Win [96612737]: 'BC3Kafk' [occ.:0]

Property	Value
Program	Ple4Win
Version	V4.4.2.17072
License	96612737 [CmDongle 2-1601491]
Modules included	KSAGNLFERCYQOJUZX0X1
Project name	
Project location & filename	F:\Projecten\TE16353 - Wanssum\Kafk\BC3Kafk
Project description	
Analysis type	General
Project phase	Initial
Project parent	- - -
Secondary project	- - -
Units	Millimeter, Newton, Second
Separators	Thousands: '.'Decimal: ','
Bend angle	Limited
Geometry model	Non-linear
Section model	Ovalising
Material model	Linear
Soil ring-stiffening	Applied
Soil model	Standard
Ovalisation redistribution	Allowed
Loading redistribution	Applied
Warning table	5 items (warnings and messages)
2 Pipeline Configuration (occurrence 18)	Pipeline origin (status 'Locked Data', occurrence 6, last modified 14-5-2018 01:00:00) Pipeline polygon points (status 'Locked Data', occurrence 33, last modified 14-5-2018 01:00:00) Ground level (status 'Locked Data', occurrence 9, last modified 14-5-2018 01:00:00) (Ground) water level (status 'Locked Data', occurrence 9, last modified 14-5-2018 01:00:00) Polygon point data (status 'Locked Data', occurrence 18, last modified 14-5-2018 01:00:00) Bend location data (status 'Locked Data', occurrence 18, last modified 14-5-2018 01:00:00) Polygon subdivision data (status 'Locked Data', occurrence 18, last modified 14-5-2018 01:00:00) Nodes (status 'Locked Data', occurrence 18, last modified 14-5-2018 01:00:00) Elements of pipeline (status 'Locked Data', occurrence 18, last modified 14-5-2018 01:00:00) Vertical profile data (status 'Locked Data', occurrence 18, last modified 14-5-2018 01:00:00) Identification names (status 'Locked Data', occurrence 18, last modified 14-5-2018 01:00:00) Element/node groups (status 'Locked Data', occurrence 18, last modified 14-5-2018 01:00:00)
3,1 Pipe Data (occurrence 7)	Material location (status 'Locked Data', occurrence 2, last modified 14-5-2018 01:00:00) Isotropic materials (status 'Locked Data', occurrence 2, last modified 14-5-2018 01:00:00) Outer diameter (status 'Locked Data', occurrence 2, last modified 14-5-2018 01:00:00) Wall thicknesses (status 'Locked Data', occurrence 2, last modified 14-5-2018 01:00:00) Deadweight (status 'Locked Data', occurrence 2, last modified 14-5-2018 01:00:00) Pipe material data (status 'Locked Data', occurrence 7, last modified 14-5-2018 01:00:00) Pipe dimension data (status 'Locked Data', occurrence 7, last modified 14-5-2018 01:00:00)
3,2 Soil Data (occurrence 8)	Horizontal soil stiffness (status 'Locked Data', occurrence 3, last modified 14-5-2018 01:00:00) Downward vertical soil stiffness (status 'Locked Data', occurrence 3, last modified 14-5-2018 01:00:00) Upward vertical soil stiffness (status 'Locked Data', occurrence 3, last modified 14-5-2018 01:00:00) Pipe-soil friction (status 'Locked Data', occurrence 3, last modified 14-5-2018 01:00:00)



Property	Value
	Displacement at max. soil friction (status 'Locked Data', occurrence 3, la
	Sub-soil bearing capacity (status 'Locked Data', occurrence 3, last modi
	Ultimate top-soil reaction (status 'Locked Data', occurrence 3, last modif
	Ultimate hor. soil reaction (status 'Locked Data', occurrence 3, last modi
	Uncertainty factors (status 'Locked Data', occurrence 4, last modified 14
	Lateral soil mechanical data (status 'Locked Data', occurrence 8, last m
	Pipe-soil friction data (status 'Locked Data', occurrence 8, last modified
	Soil layers (status 'Locked Data', occurrence 3, last modified 14-5-2018
	Soil profiles (status 'Locked Data', occurrence 3, last modified 14-5-201
	Soil profile layers (status 'Locked Data', occurrence 3, last modified 14-
	Soil profile locations (status 'Locked Data', occurrence 3, last modified 1
	General soil settings (status 'Locked Data', occurrence 3, last modified
3,3 Model Boundary (occurrence 5)	Start/end nodes boundary conditions (status 'Locked Data', occurrence
	Conditions along pipe axis (status 'Locked Data', occurrence 5, last mod
4,2 Pipeline Loading (occurrence 13)	Internal overpressure (status 'Locked Data', occurrence 3, last modified
	Temperature differences (status 'Locked Data', occurrence 2, last modifi
	Vertical soil subsidence (status 'Locked Data', occurrence 2, last modifi
	Specified pipeline loads (status 'Locked Data', occurrence 13, last modif
5 Pipeline Behaviour (occurrence 13)	Loading combinations (status 'Locked Data', occurrence 5, last modified
	Non-linear elastic soil iteration control (status 'Locked Data', occurrence
	Geometrically non-linear iteration control (status 'Locked Data', occure
	Displacements (status 'Locked Data', occurrence 13, last modified 3-9-2
	Overall internal forces (status 'Locked Data', occurrence 13, last modifie
	Overall soil reaction forces (status 'Locked Data', occurrence 13, last m
	Overall external support reaction forces (status 'Locked Data', occuren
	Bend stiffness reduction & stress intensification (status 'Locked Data',
	Global node coordinates of displaced pipeline (status 'Locked Data', oc
	Primary cross-sectional deformations (status 'Locked Data', occurrence
	Iteration data (status 'Locked Data', occurrence 13, last modified 3-9-20
	Iteration check list (status 'Locked Data', occurrence 13, last modified 3-
	Specified loads active on elements (status 'Locked Data', occurrence 13
	Applied settlement loads (status 'Locked Data', occurrence 13, last mod
6,1 Cross-Section Data (occurrence 13)	Neutral or real top-soil load (status 'Locked Data', occurrence 3, last mo
	Extra loads on top-soil (status 'Locked Data', occurrence 1, last modifie
	Horizontal soil support / Vertical soil load (status 'Locked Data', occure
	Soil support angle functions (status 'Locked Data', occurrence 1, last m
	Cross-sectional data (status 'Locked Data', occurrence 13, last modified
	Additional cross-sectional loads (status 'Locked Data', occurrence 13, la
	Additional support forces (status 'Locked Data', occurrence 13, last mod
	Resulting pipeline spans (status 'Locked Data', occurrence 13, last modi
	Deformation redistribution (soil loads ) (status 'Locked Data', occurenc
	Deformation redistribution (soil loads w. toploads) (status 'Locked Data'
	Deformation redistribution (bend ovalisation) (status 'Locked Data', occ
6,2 Cross-Section Behaviour (General, Material Linear) (occurrence 12)	Cross-sections to be calculated (status 'Locked Data', occurrence 1, last
	Weighing factors stress components (status 'Locked Data', occurrence
	General cross-sectional data (status 'Locked Data', occurrence 12, last
	Cross-sectional loading data (status 'Locked Data', occurrence 12, last
	Weighing multiplication factors (status 'Locked Data', occurrence 12, las
	Maximum radial deformations (status 'Locked Data', occurrence 12, last
	Maximum check stresses (status 'Locked Data', occurrence 12, last mo
	Maximum stresses in straight pipe sections (status 'Locked Data', occu
	Maximum stresses in bends (status 'Locked Data', occurrence 12, last
	Maximum stresses (lateral loadings) (status 'Locked Data', occurrence
	Maximum total stresses (status 'Locked Data', occurrence 12, last modif
	Maximum principal stresses (status 'Locked Data', occurrence 12, last
	Detailed radial deformations (status 'Locked Data', occurrence 12, last
	Detailed check stresses (status 'Locked Data', occurrence 12, last modif
	Detailed stresses in straight pipe sections (status 'Locked Data', occure
	Detailed stresses in bends (status 'Locked Data', occurrence 12, last m
	Detailed stresses (lateral loadings) (status 'Locked Data', occurrence 12
	Detailed total stresses (status 'Locked Data', occurrence 12, last modifi
	Detailed principal stresses (status 'Locked Data', occurrence 12, last m

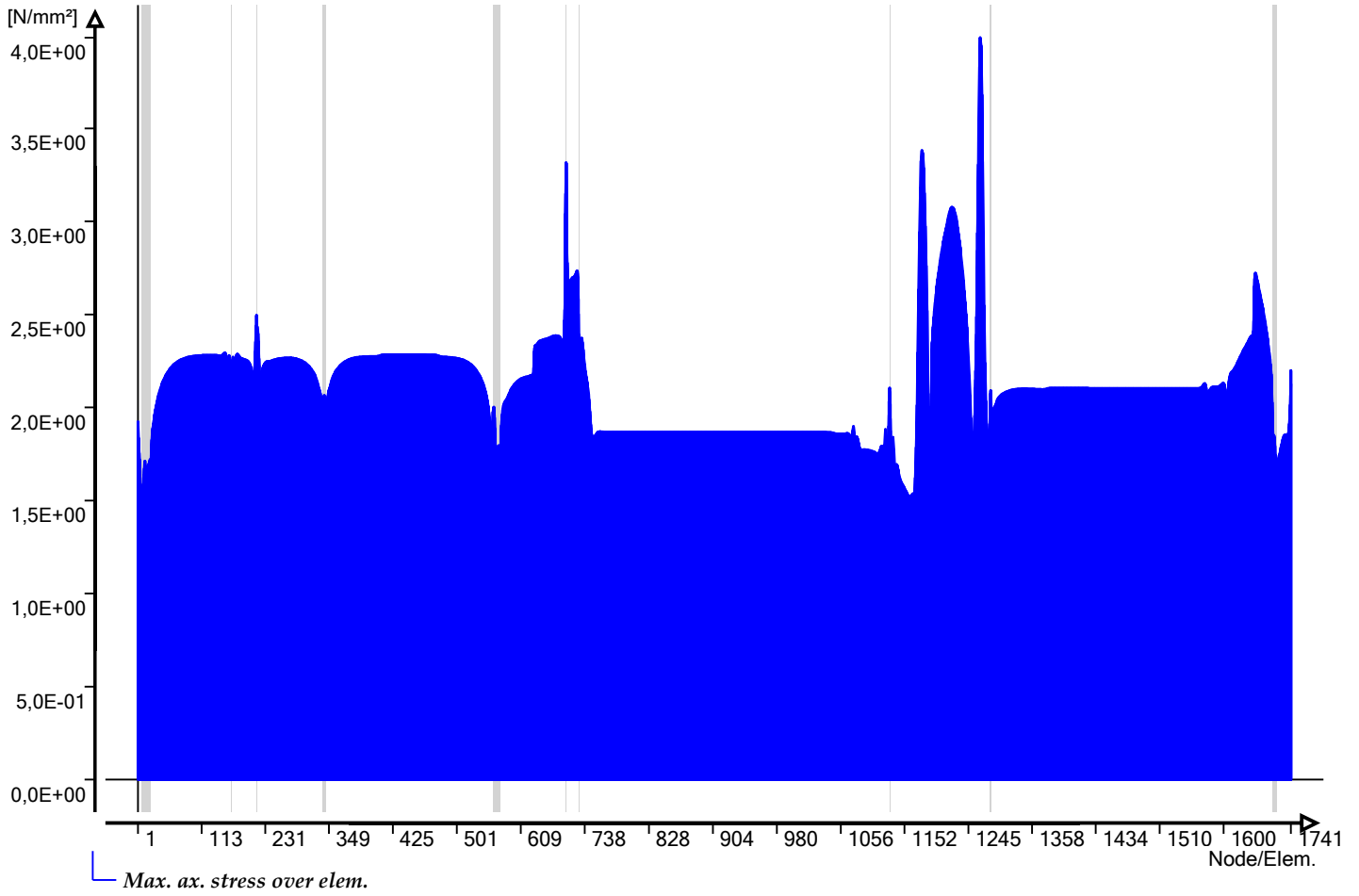


Maximum check stresses (loadcase kafk weighing factors used redistrib... Ple4Win [96612737]: 'BC3Kafk' [3-9-2018;occ.:12]

	Ele...	Max. principal str...	Max. principal str...	Max. Tresca shear...	Max. Von Mises...	Max. ax. stress over...	Max. circ....	Max. hoop...
		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>	N/mm <sup>2</sup>	N/mm <sup>2</sup>
12	12	1,492	-1,57945	1,1489	2,033	1,447	-1,57667	
13	13	1,491	-1,56238	1,1838	2,085	1,489	-1,56071	
688	688	3,314	-3,92466	2,3394	4,351	3,314	-3,92466	
690	690	2,889	-4,00554	2,1092	4,116	2,889	-4,00554	
1164	1164	1,524	-,30537	,8161	1,503	1,524	-,30190	
1196	1196	2,368	-,05533	1,2020	2,380	2,368	-,05504	
1276	1276	3,987	-1,11067	2,0026	3,914	3,987	-,45917	

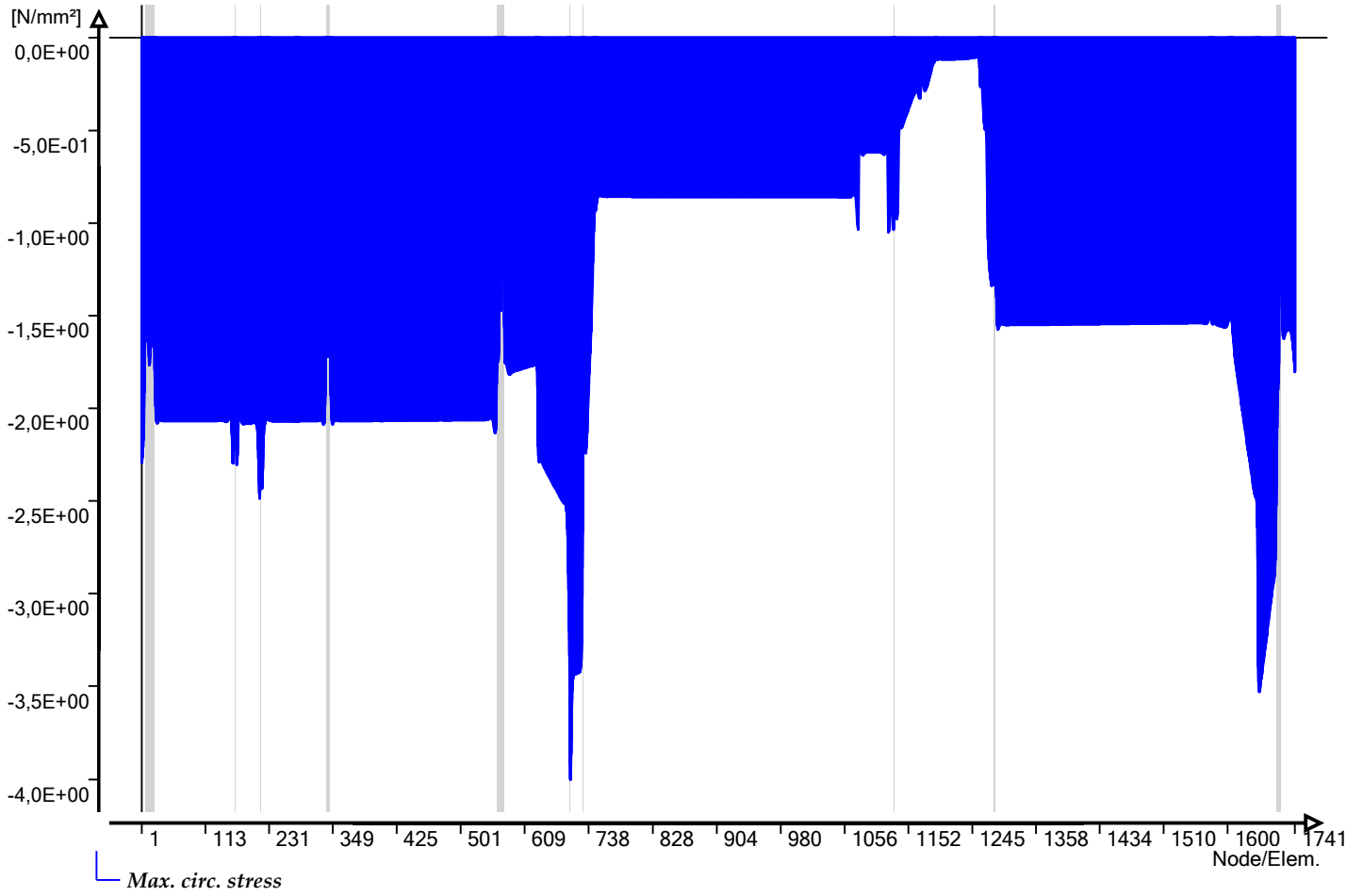
Graphs of table 'Maximum check stresses'

Ple4Win [96612737]: 'BC3Kafk'



Graphs of table 'Maximum check stresses'

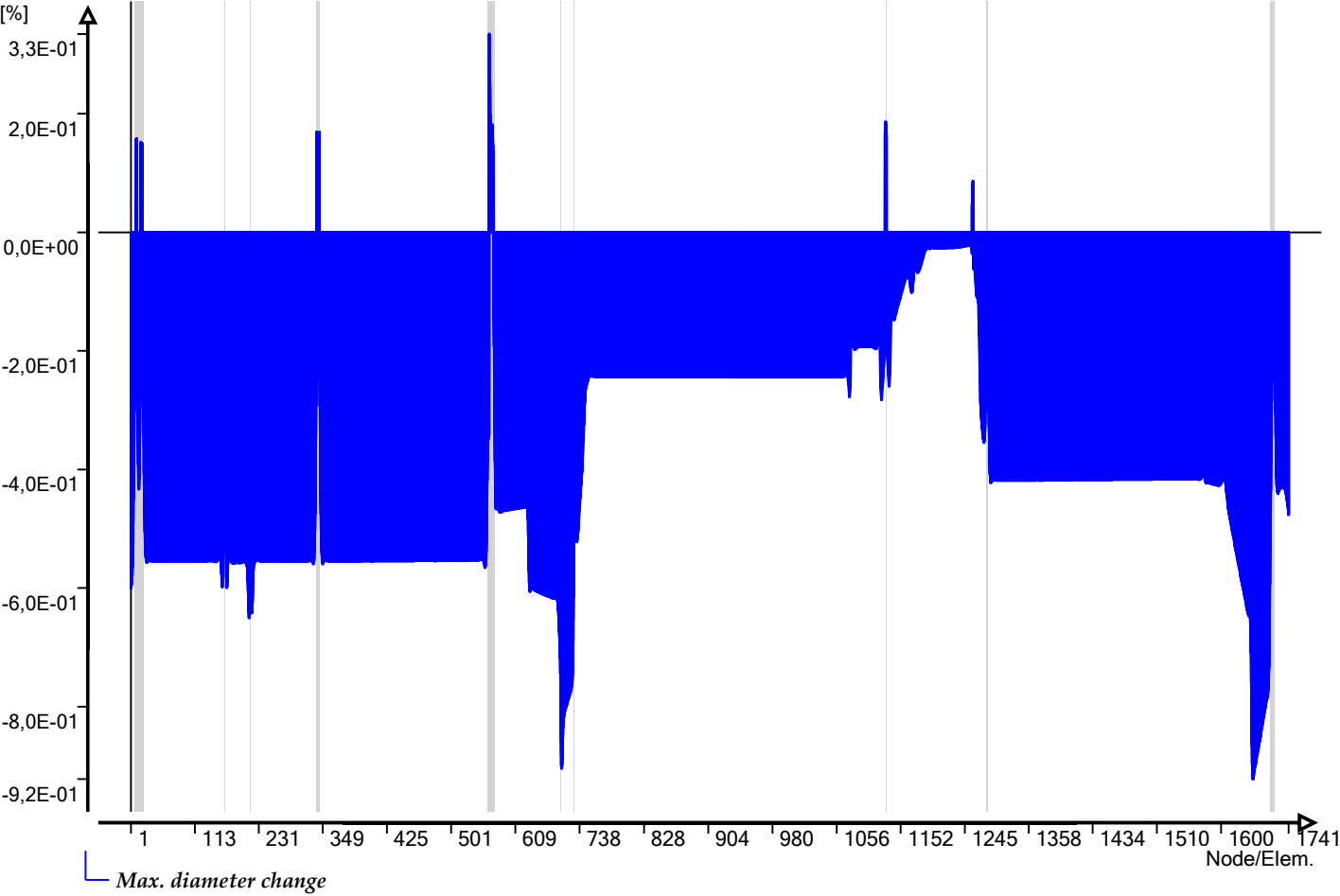
Ple4Win [96612737]: 'BC3Kafk'



	Eleme...	Max. radial deform. due to...	Radial bend def...	Max. diameter ch...	Max. total radial def...	Elast. soil impres...	Max. hor. soil su...
		mm	mm	%	mm	mm	N/mm <sup>3</sup>
25	25	-,47422	-1,481E-01	-,35	-,619719	8,063	1,756E-2
555	555	,61050	-7,173E-02	-,35	-,576117	8,092	1,736E-2
556	556	,60945	-6,041E-02	-,34	,558348	8,092	1,736E-2
557	557	,59063	-4,779E-02	,33	,549149	8,092	1,736E-2
686	686	-1,42159	3,449E-02	-,78	-1,387096	4,773	5,382E-2
690	690	-1,61701	1,059E-02	-,90	-1,606417	4,773	5,593E-2
691	691	-1,61314	5,154E-03	-,90	-1,607983	4,773	5,646E-2
721	721	-,79862	1,029E-02	-,47	-,788322	4,773	8,705E-2
1192	1192	-,03806	-7,025E-02	-,02	,039042	22,144	8,716E-4
1263	1263	-,04151	9,930E-02	,09	-,140260	22,093	8,774E-4
1662	1662	-1,58086	-1,966E-07	-,92	-1,580857	5,722	2,582E-2

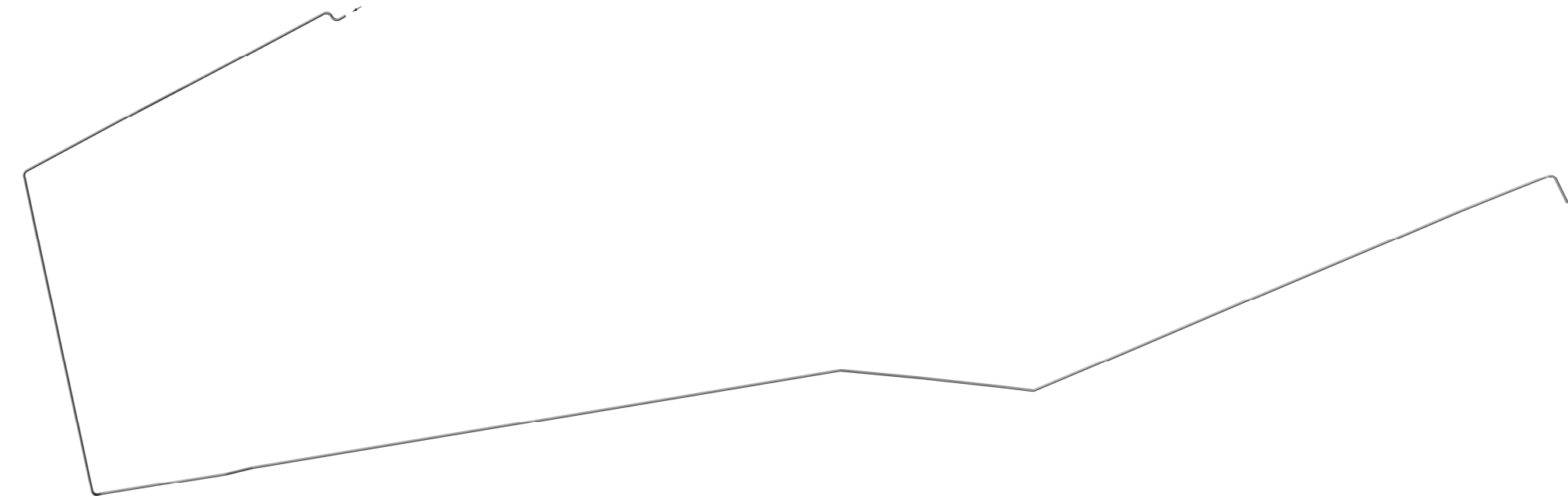
Graphs of table 'Maximum radial deformations'

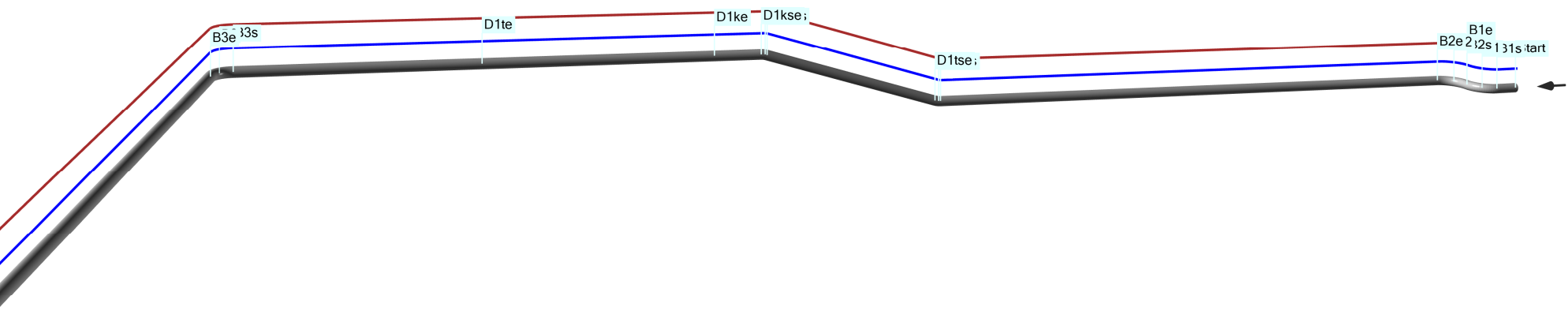
Ple4Win [96612737]: 'BC3Kafk'



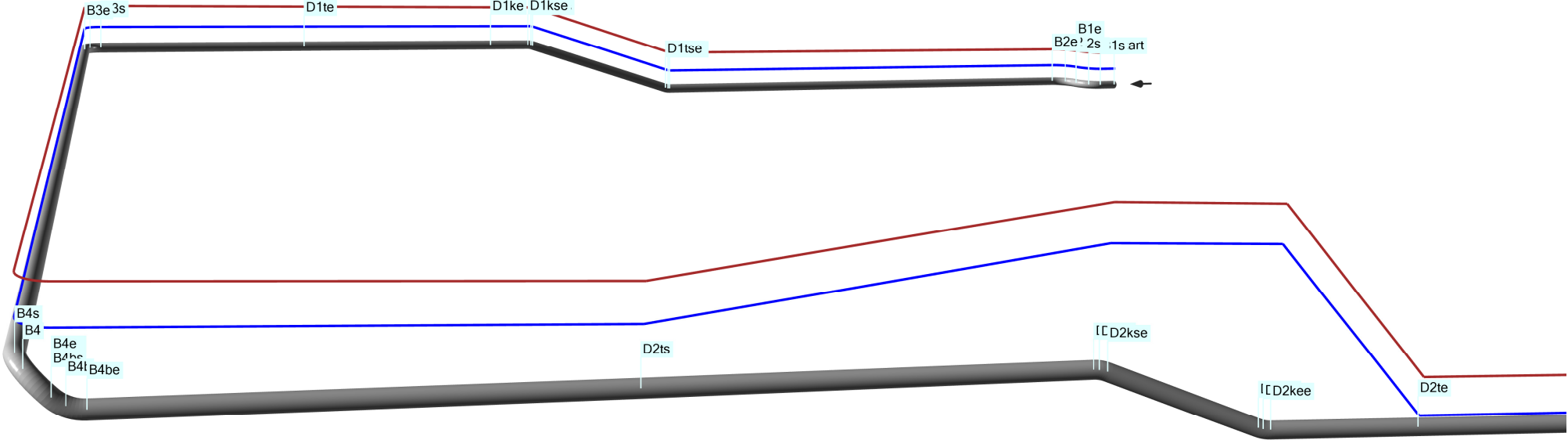


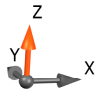
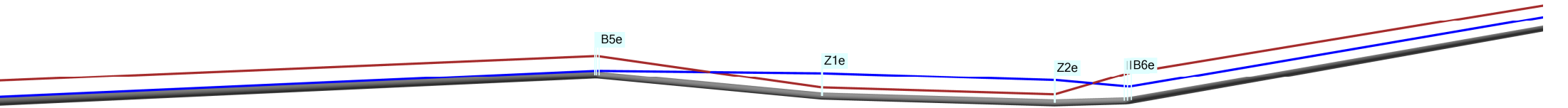
## **Bijlage 4.2: Resultaten PLE berekening BC Kopw**

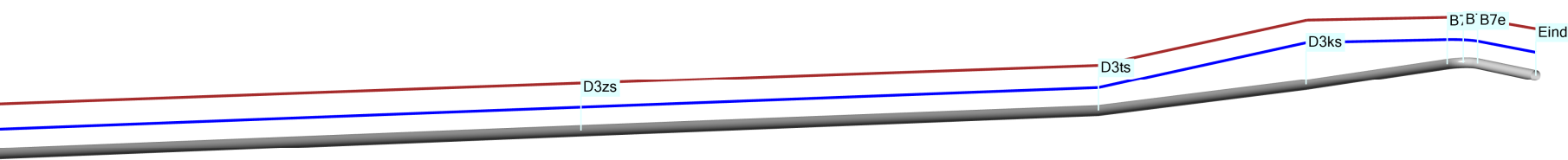












**Pipeline origin**

Ple4Win [96612737]: 'BC3Kopw' [14-5-2018;occ.:6]

	Identification name	X-coordinate	Y-coordinate	Z-coordinate	Start node	Start ax.-coordinate	Start proj.-coordinate
		mm	mm	mm		mm	mm
1	Start	202915198	394270357	10200	1	0	0

**Pipeline polygon points (absolute)**

Ple4Win [96612737]: 'BC3Kopw' [3-9-2018;occ.:33]

	Identification na	X-coordinate	Y-coordinate	Z-coordin	Bend ra	Element type	Max. bend elem. le	Pipe elem. len	Extension eleme
		mm	mm	mm	mm		mm	mm	
1	B1	202913050	394269524	10200	1050	Odd Elements	100	300	10
2	B2	202912360	394271582	10200	1050	Odd Elements	100	300	10
3	D1ts	202884374	394261557	10200	1050	Odd Elements	100	300	10
4	D1ks	202876058	394258501	12700	1050	Odd Elements	100	300	10
5	D1ke	202873820	394257679	12700	1050	Odd Elements	100	300	10
6	D1te	202863895	394254032	12700	1050	Odd Elements	100	300	10
7	B3	202853453	394250195	12700	1050	Odd Elements	100	300	10
8	B4	202855020	394188968	12700	1050	Odd Elements	100	300	10
9	B4b	202856119	394189009	11700	1050	Odd Elements	100	300	10
10	D2ts	202868643	394189477	12000	1050	Odd Elements	100	300	10
11	D2ks	202880042	394189902	12300	1050	Odd Elements	100	300	10
12	D2ke	202884628	394190073	10700	1050	Odd Elements	100	300	10
13	D2te	202888988	394190236	10700	0		100	300	10
14	B5	202995040	394194196	10700	1050	Odd Elements	100	300	10
15	Z1	203009628	394190598	9700	1050	Odd Elements	100	300	10
16	Z2	203025039	394186796	9700	1050	Odd Elements	100	300	10
17	B6	203029967	394185580	10000	1050	Odd Elements	100	300	10
18	D3zs	203104068	394207027	10750	0		100	300	10
19	D3ts	203110791	394208973	11000	0		100	300	10
20	D3ks	203119992	394211636	11900	0		100	300	10
21	B7	203127343	394213763	12800	1050	Odd Elements	100	300	10
22	Eind	203129500	394208253	12800	0		100	300	10

**Ground level**

Ple4Win [96612737]: 'BC3Kopw' [14-5-2018;occ.:9]

	Identifier	Ground level 1	Uncer. value 1	Ground level 2	Uncer. value 2
		mm	mm	mm	mm
1	Start	12200	10		
2	B1	12200	10		
3	B2	12200	10		
4	D1ts	12200	10		
5	D1ks	14700	10		
6	D1ke	14700	10		
7	D1te	14700	10		
8	B3	14700	10		
9	B4	14500	10		
10	D2ts	14500	10		
11	D2ks	16400	10		
12	D2ke	16400	10		
13	D2te	12000	10		
14	B5	12000	10		
15	Z1	10300	10		
16	Z2	10300	10		
17	B6	12000	10		
18	D3ts	13000	10		
19	D3ks	14800	10		
20	B7	14800	10		
21	Eind	14800	10		

**(Ground) water level**

Ple4Win [96612737]: 'BC3Kopw' [14-5-2018;occ.:9]

	Identifier	Z-coord. water level 1	Uncer. value 1	Z-coord. water level 2	Uncer. value 2
		mm	mm	mm	mm
1	Start	11200	10		
2	B1	11200	10		
3	B2	11200	10		
4	D1ts	11200	10		
5	D1ks	13700	10		
6	D1ke	13700	10		
7	D1te	13700	10		
8	B3	13700	10		

**(Ground) water level**

Ple4Win [96612737]: 'BC3Kopw' [14-5-2018;occ.:9]

	Identifier	Z-coord. water level 1	Uncer. value 1	Z-coord. water level 2	Uncer. value 2
		mm	mm	mm	mm
9	B4	13500	10		
10	D2ts	13500	10		
11	D2ks	15400	10		
12	D2ke	15400	10		
13	D2te	11000	10		
14	B5	11000	10		
15	Z1	11300	10		
16	Z2	11300	10		
17	B6	11000	10		
18	D3ts	12000	10		
19	D3ks	13800	10		
20	B7	13800	10		
21	Eind	13800	10		

**Material location**

Ple4Win [96612737]: 'BC3Kopw' [14-5-2018;occ.:2]

	Identifier	Material reference
1	Start	PE100k

**Isotropic materials**

Ple4Win [96612737]: 'BC3Kopw' [14-5-2018;occ.:2]

	Material reference	Young's modulus	Shear modulus	Poisson's ratio	Coeff. thermal expansion	Yield stress	Yield stress at $\theta$ °C
		N/mm <sup>2</sup>	N/mm <sup>2</sup>		1/°C	N/mm <sup>2</sup>	N/mm <sup>2</sup>
1	PE100l	350		0,4	0,00016	10	
2	PE100k	975		0,4	0,00016	10	

**Outer diameter**

Ple4Win [96612737]: 'BC3Kopw' [14-5-2018;occ.:2]

	Identifier	Outer pipe diameter 1	Outer pipe diameter 2
		mm	mm
1	Start	315	

**Wall thicknesses**

Ple4Win [96612737]: 'BC3Kopw' [14-5-2018;occ.:2]

	Identif	Nom. wall thicknes	Corrosion allow	Manufact. tol	Abs. toleranc	Nom. wall thicknes	Corrosion allow	Manufact. tol	Abs. toleranc
		mm	mm	%	mm	mm	mm	%	mm
1	Start	28,6							

**Deadweight**

Ple4Win [96612737]: 'BC3Kopw' [14-5-2018;occ.:2]

	Identifier	Deadweight 1	Deadweight 2	Buoyancy ind.
		N/mm	N/mm	
1	Start	-3,59	0,74	Yes

**Horizontal soil stiffness**

Ple4Win [96612737]: 'BC3Kopw' [14-5-2018;occ.:3]

	Identifier	Hor. soil stiffness 1	Hor. soil stiffness 2	Dividing factor	Multiplication factor	Half band width accuracy
		N/mm <sup>3</sup>	N/mm <sup>3</sup>			%
1	Start	0,029663	0,029663		1,7	5
2	B1	0,029663	0,029663		1,7	5
3	B2	0,029663	0,029663		1,7	5
4	D1ts	0,029596	0,029596		1,7	5
5	D1ks	0,029962	0,029962		1,7	5
6	D1ke	0,029663	0,029663		1,7	5
7	D1te	0,029663	0,029663		1,7	5
8	B3	0,029663	0,029663		1,7	5
9	B4	0,02943	0,02943		1,7	5
10	B4b	0,042126	0,042126		1,7	5
11	D2ts	0,038324	0,025698		1,7	5
12	D2ks	0,053823	0,053823		1,7	5
13	D2ke	0,087542	0,087542		1,7	5
14	D2te	0,010132	0,018776		1,7	5
15	B5	0,018804	0,018804		1,7	5
16	Z1	0,0040441	0,0040441		1,7	5
17	Z1e	0,0040616	0,0040616		1,7	5
18	Z2	0,0040616	0,0040616		1,7	5

**Horizontal soil stiffness**

Ple4Win [96612737]: 'BC3Kopw' [14-5-2018;occ.:3]

	Identifier	Hor. soil stiffness 1	Hor. soil stiffness 2	Dividing factor	Multiplication factor	Half band width accuracy
		N/mm <sup>3</sup>	N/mm <sup>3</sup>			%
19	Z2e	0,0042266	0,0042266		1,7	5
20	B6	0,029746	0,029746		1,7	5
21	D3zs	0,029376	0,018324		1,7	5
22	D3ts	0,018555	0,018555		1,7	5
23	D3ks	0,031992	0,031992		1,7	5
24	B7	0,01904	0,01904		1,7	5
25	Eind	0,018555	0,018555		1,7	5

**Downward vertical soil stiffness**

Ple4Win [96612737]: 'BC3Kopw' [14-5-2018;occ.:3]

	Identifier	vert. soil stiffness 1 (down)	vert. soil stiffness 2 (down)	Dividing factor	Multiplication factor	Half band width accuracy
		N/mm <sup>3</sup>	N/mm <sup>3</sup>			%
1	Start	0,023018	0,023018		2	5
2	B1	0,023018	0,023018		2	5
3	B2	0,023018	0,023018		2	5
4	D1ts	0,022958	0,022958		2	5
5	D1ks	0,023292	0,023292		2	5
6	D1ke	0,023018	0,023018		2	5
7	D1te	0,023018	0,023018		2	5
8	B3	0,023018	0,023018		2	5
9	B4	0,022807	0,022807		2	5
10	B4b	0,034953	0,034953		2	5
11	D2ts	0,031196	0,027983		2	5
12	D2ks	0,061178	0,061178		2	5
13	D2ke	0,10597	0,10597		2	5
14	D2te	0,011736	0,013596		2	5
15	B5	0,01362	0,01362		2	5
16	Z1	0,0014596	0,0014596		2	5
17	Z1e	0,0014684	0,0014684		2	5
18	Z2	0,0014684	0,0014684		2	5
19	Z2e	0,0015521	0,0015521		2	5
20	B6	0,023094	0,023094		2	5
21	D3zs	0,022757	0,020005		2	5
22	D3ts	0,020251	0,020251		2	5
23	D3ks	0,035035	0,035035		2	5
24	B7	0,020768	0,020768		2	5
25	Eind	0,020251	0,020251		2	5

**Upward vertical soil stiffness**

Ple4Win [96612737]: 'BC3Kopw' [14-5-2018;occ.:3]

	Identifier	vert. soil stiffness 1 (up)	vert. soil stiffness 2 (up)	Dividing factor	Multiplication factor	Half band width accuracy
		N/mm <sup>3</sup>	N/mm <sup>3</sup>			%
1	Start	0,0121	0,0121		1,4	5
2	B1	0,0121	0,0121		1,4	5
3	B2	0,0121	0,0121		1,4	5
4	D1ts	0,012046	0,012046		1,4	5
5	D1ks	0,012348	0,012348		1,4	5
6	D1ke	0,0121	0,0121		1,4	5
7	D1te	0,0121	0,0121		1,4	5
8	B3	0,0121	0,0121		1,4	5
9	B4	0,01191	0,01191		1,4	5
10	B4b	0,024417	0,024417		1,4	5
11	D2ts	0,020222	0,012717		1,4	5
12	D2ks	0,046804	0,046804		1,5522	5
13	D2ke	0,11226	0,11226		1,5114	5
14	D2te	0,0027699	0,0047595		1,846	5
15	B5	0,0047746	0,0047746		1,4	5
16	Z1	0,00028367	0,00028367		1,4	5
17	Z1e	0,00028642	0,00028642		1,4	5
18	Z2	0,00028642	0,00028642		1,4	5
19	Z2e	0,00031302	0,00031302		1,4	5
20	B6	0,012169	0,012169		1,4	5
21	D3zs	0,011865	0,0070981		1,4	5
22	D3ts	0,0072525	0,0072525		1,7013	5
23	D3ks	0,018631	0,018631		1,6126	5
24	B7	0,0075811	0,0075811		1,6963	5
25	Eind	0,0072525	0,0072525		1,7013	5

**Pipe-soil friction**

Ple4Win [96612737]: 'BC3Kopw' [14-5-2018;occ.:3]

	Identif	Soil frictio	Soil frictio	Dividing fact	Multiplication fact	Add. ax. friction factor	Add. ax. friction factor	Half band width accurac
		N/mm <sup>2</sup>	N/mm <sup>2</sup>					%
1	Start	0,00769...	0,00769...		1,375			5
2	B1	0,00769...	0,00769...		1,375			5
3	B2	0,00769...	0,00769...		1,375			5
4	D1ts	0,00768...	0,00768...		1,375			5
5	D1ks	0,00774...	0,00774...		1,375			5
6	D1ke	0,00769...	0,00769...		1,375			5
7	D1te	0,00769...	0,00769...		1,375			5
8	B3	0,00769...	0,00769...		1,375			5
9	B4	0,00765...	0,00765...		1,375			5
10	B4b	0,00963...	0,00963...		1,375			5
11	D2ts	0,00906...	0,00855...		1,375			5
12	D2ks	0,012938	0,012938		1,375			5
13	D2ke	0,017153	0,017153		1,375			5
14	D2te	0,00585...	0,00576...		1,865			5
15	B5	0,00577...	0,00577...		1,375			5
16	Z1	0,00168...	0,00168...		1,375			5
17	Z1e	0,00169...	0,00169...		1,375			5
18	Z2	0,00169...	0,00169...		1,375			5
19	Z2e	0,001743	0,001743		1,375			5
20	B6	0,00770...	0,00770...		1,375			5
21	D3zs	0,00764...	0,00713...		1,375			5
22	D3ts	0,00718...	0,00718...		1,375			5
23	D3ks	0,00964...	0,00964...		1,375			5
24	B7	0,00728...	0,00728...		1,375			5
25	Eind	0,00718...	0,00718...		1,375			5

**Displacement at max. soil friction**

Ple4Win [96612737]: 'BC3Kopw' [14-5-2018;occ.:3]

	Identifier	Soil friction displ. 1	Soil friction displ. 2	Dividing factor	Multiplication factor
		mm	mm		
1	Start	4	4		1,6
2	B1	4	4		1,6
3	B2	4	4		1,6
4	D1ts	4	4		1,6
5	D1ks	4	4		1,6
6	D1ke	4	4		1,6
7	D1te	4	4		1,6
8	B3	4	4		1,6
9	B4	4	4		1,6
10	B4b	4	4		1,6
11	D2ts	4	4		1,6
12	D2ks	4	4		1,6
13	D2ke	4	4		1,6
14	D2te	4,5	4		1,55
15	B5	4	4		1,6
16	Z1	4	4		1,6
17	Z1e	4	4		1,6
18	Z2	4	4		1,6
19	Z2e	4	4		1,6
20	B6	4	4		1,6
21	D3zs	4	4		1,6
22	D3ts	4	4		1,6
23	D3ks	4	4		1,6
24	B7	4	4		1,6
25	Eind	4	4		1,6

**Sub-soil bearing capacity**

Ple4Win [96612737]: 'BC3Kopw' [14-5-2018;occ.:3]

	Identifier	Vert. bearing capacity 1	Vert. bearing capacity 2	Dividing factor	Multiplication factor	Half band width accuracy
		N/mm <sup>2</sup>	N/mm <sup>2</sup>			%
1	Start	0,72532	0,72532		2	5
2	B1	0,72532	0,72532		2	5
3	B2	0,72532	0,72532		2	5
4	D1ts	0,72408	0,72408		2	5
5	D1ks	0,73093	0,73093		2	5
6	D1ke	0,72532	0,72532		2	5
7	D1te	0,72532	0,72532		2	5

**Sub-soil bearing capacity**

Ple4Win [96612737]: 'BC3Kopw' [14-5-2018;occ.:3]

	Identifier	Vert. bearing capacity 1	Vert. bearing capacity 2	Dividing factor	Multiplication factor	Half band width accuracy
		N/mm <sup>2</sup>	N/mm <sup>2</sup>			%
8	B3	0,72532	0,72532		2	5
9	B4	0,72097	0,72097		2	5
10	B4b	0,95246	0,95246		2	5
11	D2ts	0,88433	0,82358		2	5
12	D2ks	1,3735	1,3735		2	5
13	D2ke	1,9722	1,9722		2	5
14	D2te	0,47107	0,51464		2	5
15	B5	0,51522	0,51522		2	5
16	Z1	0,11389	0,11389		2	5
17	Z1e	0,11437	0,11437		2	5
18	Z2	0,11437	0,11437		2	5
19	Z2e	0,11892	0,11892		2	5
20	B6	0,72688	0,72688		2	5
21	D3zs	0,71994	0,66163		2	5
22	D3ts	0,66692	0,66692		2	5
23	D3ks	0,95372	0,95372		2	5
24	B7	0,67797	0,67797		2	5
25	Eind	0,66692	0,66692		2	5

**Ultimate top-soil reaction**

Ple4Win [96612737]: 'BC3Kopw' [14-5-2018;occ.:3]

	Identifier	Passive topsoil reac. 1	Passive topsoil reac. 2	Dividing factor	Multiplication factor	Half band width accuracy
		N/mm <sup>2</sup>	N/mm <sup>2</sup>			%
1	Start	0,073236	0,073236		1,5	5
2	B1	0,073236	0,073236		1,5	5
3	B2	0,073236	0,073236		1,5	5
4	D1ts	0,073022	0,073022		1,5	5
5	D1ks	0,0742	0,0742		1,5	5
6	D1ke	0,073236	0,073236		1,5	5
7	D1te	0,073236	0,073236		1,5	5
8	B3	0,073236	0,073236		1,5	5
9	B4	0,07249	0,07249		1,5	5
10	B4b	0,1159	0,1159		1,5	5
11	D2ts	0,10236	0,096218		1,5	5
12	D2ks	0,22023	0,22023		1,5	5
13	D2ke	0,38912	0,38912		1,5	5
14	D2te	0,037637	0,040618		1,5	5
15	B5	0,040697	0,040697		1,5	5
16	Z1	0,0063718	0,0063718		1,5	5
17	Z1e	0,0064093	0,0064093		1,5	5
18	Z2	0,0064093	0,0064093		1,5	5
19	Z2e	0,0067655	0,0067655		1,5	5
20	B6	0,073503	0,073503		1,5	5
21	D3zs	0,072315	0,067113		1,5	5
22	D3ts	0,068002	0,068002		1,5	5
23	D3ks	0,12228	0,12228		1,5	5
24	B7	0,069871	0,069871		1,5	5
25	Eind	0,068002	0,068002		1,5	5

**Ultimate hor. soil reaction**

Ple4Win [96612737]: 'BC3Kopw' [14-5-2018;occ.:3]

	Identif	Horizontal soil reacti	Horizontal soil reacti	Dividing f	Multiplication f	Add. lat. friction fac	Add. lat. friction fac	Half band width acc
		N/mm <sup>2</sup>	N/mm <sup>2</sup>					%
1	Start	0,28314	0,28314		1,6			5
2	B1	0,28314	0,28314		1,6			5
3	B2	0,28314	0,28314		1,6			5
4	D1ts	0,28251	0,28251		1,6			5
5	D1ks	0,286	0,286		1,6			5
6	D1ke	0,28314	0,28314		1,6			5
7	D1te	0,28314	0,28314		1,6			5
8	B3	0,28314	0,28314		1,6			5
9	B4	0,28093	0,28093		1,6			5
10	B4b	0,40211	0,40211		1,6			5
11	D2ts	0,36582	0,2453		1,6			5
12	D2ks	0,51376	0,51376		1,7218			5
13	D2ke	0,83563	0,83563		1,6891			5
14	D2te	0,096718	0,17922		1,9568			5



**Ultimate hor. soil reaction**

Ple4Win [96612737]: 'BC3Kopw' [14-5-2018;occ.:3]

	Identif	Horizontal soil reacti	Horizontal soil reacti	Dividing f	Multiplication f	Add. lat. friction fac	Add. lat. friction fac	Half band width acc
		N/mm <sup>2</sup>	N/mm <sup>2</sup>					%
15	B5	0,1795	0,1795		1,6			5
16	Z1	0,038603	0,038603		1,6			5
17	Z1e	0,038769	0,038769		1,6			5
18	Z2	0,038769	0,038769		1,6			5
19	Z2e	0,040345	0,040345		1,6			5
20	B6	0,28394	0,28394		1,6			5
21	D3zs	0,2804	0,17491		1,6			5
22	D3ts	0,17712	0,17712		1,841			5
23	D3ks	0,30538	0,30538		1,7701			5
24	B7	0,18175	0,18175		1,8371			5
25	Eind	0,17712	0,17712		1,841			5

**Uncertainty factors**

Ple4Win [96612737]: 'BC3Kopw' [14-5-2018;occ.:4]

	KLH-uncer. fact	KLS-uncer. fact	KLT-uncer. fact	Friction uncer. fact	UF-uncer. fact	RVS-uncer. fact	RVT-uncer. fact	RH-uncer. fact
1	High	High	High	High	High	High	High	High

**Start/end nodes boundary conditions**

Ple4Win [96612737]: 'BC3Kopw' [14-5-2018;occ.:3]

	Identification name	Boundary nodes cond.	Boundary node state
1	Start	Fixed	Open
2	Eind	Fixed	Open

**Internal overpressure**

Ple4Win [96612737]: 'BC3Kopw' [14-5-2018;occ.:3]

	Identifier	Internal pressure 1	Internal pressure 2
		N/mm <sup>2</sup>	N/mm <sup>2</sup>
1	Start	0,26	

**Temperature differences**

Ple4Win [96612737]: 'BC3Kopw' [3-9-2018;occ.:3]

	Identifier	Abs. temp. 1	Ref. temp. 1	Abs. temp. 2	Ref. temp. 2
		°C	°C	°C	°C
1	Start	20	10		

**Soil displacement in Z-direction**

Ple4Win [96612737]: 'BC3Kopw' [3-9-2018;occ.:7]

	Identifier	Z-settlement 1	Uncer. factor 1	Z-settlement 2	Uncer. factor 2
		mm		mm	
1					

**Vertical soil subsidence**

Ple4Win [96612737]: 'BC3Kopw' [3-9-2018;occ.:2]

	Identifier	Max. soil subsidence	Uncertainty factor	Subsidence length	Subsidence shape
		mm		mm	
1	B3	-5	1,5	20000	Double
2	B4	-5	1,5	20000	Double
3	B5	-5	1,5	20000	Double
4	B6	-5	1,5	20000	Double

**Loading combinations**

Ple4Win [96612737]: 'BC3Kopw' [3-9-2018;occ.:6]

	Identification	General load	Pressure load	Temp. load	Deadweight load	Settlement load	Nodal load	Elast. bend load	Wave/current load
1	Kopw	1	0	1	1	1	0	0	0

**Non-linear elastic soil iteration control**

Ple4Win [96612737]: 'BC3Kopw' [14-5-2018;occ.:1]

	Max. no. soil iter.	Max. no error points	Max. no error fields
1	20	0	0

# Geometrically non-linear iteration control

Ple4Win [96612737]: 'BC3Kopw' [14-5-2018;occ.:1]

	Max. no. geometry iter.	Relative disequilibrium	Abs. disequilibrium	Rotation increment
				RAD
1	50	1E-05	1E-07	0,1

# Neutral or real top-soil load

Ple4Win [96612737]: 'BC3Kopw' [14-5-2018;occ.:3]

	Identifier	Neutral/Real top-soil load 1	Uncer. factor 1	Load factor 1	Neutral/Real top-soil load 2	Uncer. factor 2	Load factor 2
		N/mm²			N/mm²		
1	Start	0,068585	1,1	1	0,068585	1,1	1
2	B1	0,068585	1,1	1	0,068585	1,1	1
3	B2	0,068585	1,1	1	0,068585	1,1	1
4	D1ts	0,068484	1,1	1	0,068484	1,1	1
5	D1ks	0,069035	1,1	1	0,069035	1,1	1
6	D1ke	0,068585	1,1	1	0,068585	1,1	1
7	D1te	0,068585	1,1	1	0,068585	1,1	1
8	B3	0,068585	1,1	1	0,068585	1,1	1
9	B4	0,068231	1,1	1	0,068231	1,1	1
10	B4b	0,083458	1,1	1	0,083458	1,1	1
11	D2ts	0,079602	1,1	1	0,096218	1,1	1
12	D2ks	0,12474	1,1	1	0,12474	1,1	1
13	D2ke	0,138	1,1	1	0,138	1,1	1
14	D2te	0,037637	1,1	1	0,040618	1,1	1
15	B5	0,040697	1,1	1	0,040697	1,1	1
16	Z1	0,0063056	1,1	1	0,0063056	1,1	1
17	Z1e	0,0063481	1,1	1	0,0063481	1,1	1
18	Z2	0,0063481	1,1	1	0,0063481	1,1	1
19	Z2e	0,0067548	1,1	1	0,0067548	1,1	1
20	B6	0,06871	1,1	1	0,06871	1,1	1
21	D3zs	0,068147	1,1	1	0,067113	1,1	1
22	D3ts	0,068002	1,1	1	0,068002	1,1	1
23	D3ks	0,11221	1,1	1	0,11221	1,1	1
24	B7	0,069871	1,1	1	0,069871	1,1	1
25	Eind	0,068002	1,1	1	0,068002	1,1	1

# Extra loads on top-soil

Ple4Win [96612737]: 'BC3Kopw' [14-5-2018;occ.:1]

	Identifier	Topload 1	Load factor 1	Topload 2	Load factor 2
		N/mm²		N/mm²	
1	B3	0,016	1,35		1,35
2	B4	0,016	1,35	0	1,35
3	D2ks	0	1,35	0,032	1,35
4	D2ke	0,032	1,35	0	1,35
5	D3ks	0	1,35	0,032	1,35
6	B7	0,032	1,35	0	1,35

# Horizontal soil support / Vertical soil load

Ple4Win [96612737]: 'BC3Kopw' [14-5-2018;occ.:1]

	Identifier	Hor./vert. soil coeff. 1	Hor./vert. soil coeff. 2
1	Start	0,5	

# Soil support angle functions

Ple4Win [96612737]: 'BC3Kopw' [14-5-2018;occ.:1]

	Identifier	Min. support angle	Max. support angle	Ratio calc. / max. bearing (low)	Ratio calc. / max. bearing (high)	Curve shape
		°	°	%	%	
1	Start	70	180	50	100	Sinus

# Cross-sections to be calculated

Ple4Win [96612737]: 'BC3Kopw' [14-5-2018;occ.:1]

	Start Identifier	End Identifier	Topload ind.	Allowable stress
				N/mm²
1	Start	Eind	Yes	

# Weighing factors stress components

Ple4Win [96612737]: 'BC3Kopw' [14-5-2018;occ.:1]

	Identi	Stre	Stress due	Stress due to higher ha	Weighing fact. a	Weighing fact. cir	Weighin	Weighing fact. c	Weighing fa	Weighing fac
1	Start	1	0,65	0,65	0,65	0,65	1	1	0,65	0,65

**Polygon point data**

Ple4Win [96612737]: 'BC3Kopw' [3-9-2018;occ.:18]

	Identification name	X-coordinat	Y-coordinat	Z-coordinat	Bend angl	Hor. bend angle	Angle Z-axis - leaving polygon line	Bend radiu
		mm	mm	mm	°	°	°	mm
1	Start	2,029E+8	3,943E+8	1,020E+4			90,00	
2	B1	2,029E+8	3,943E+8	1,020E+4	92,66	92,66	90,00	1.050
3	B2	2,029E+8	3,943E+8	1,020E+4	91,17	91,17	90,00	1.050
4	D1ts	2,029E+8	3,943E+8	1,020E+4	15,76	,47	74,24	1.050
5	D1ks	2,029E+8	3,943E+8	1,270E+4	15,76	,01	90,00	1.050
6	D1ke	2,029E+8	3,943E+8	1,270E+4	,01	,01	90,00	0
7	D1te	2,029E+8	3,943E+8	1,270E+4	,00	,00	90,00	0
8	B3	2,029E+8	3,943E+8	1,270E+4	71,29	71,29	90,00	1.050
9	B4	2,029E+8	3,942E+8	1,270E+4	90,50	90,67	132,28	1.050
10	B4b	2,029E+8	3,942E+8	1,170E+4	43,65	,00	88,63	1.050
11	D2ts	2,029E+8	3,942E+8	1,200E+4	,14	,00	88,49	0
12	D2ks	2,029E+8	3,942E+8	1,230E+4	20,73	,00	109,22	1.050
13	D2ke	2,029E+8	3,942E+8	1,070E+4	19,22	,01	90,00	1.050
14	D2te	2,029E+8	3,942E+8	1,070E+4	,00	,00	90,00	0
15	B5	2,030E+8	3,942E+8	1,070E+4	16,43	15,99	93,81	1.050
16	Z1	2,030E+8	3,942E+8	9,700E+3	3,81	,00	90,00	1.050
17	Z2	2,030E+8	3,942E+8	9,700E+3	3,38	,00	86,62	1.050
18	B6	2,030E+8	3,942E+8	1,000E+4	30,11	30,00	89,44	1.050
19	D3zs	2,031E+8	3,942E+8	1,075E+4	1,49	,00	87,95	0
20	D3ts	2,031E+8	3,942E+8	1,100E+4	3,32	,00	84,63	0
21	D3ks	2,031E+8	3,942E+8	1,190E+4	1,34	,00	83,29	0
22	B7	2,031E+8	3,942E+8	1,280E+4	84,79	84,76	90,00	1.050
23	Eind	2,031E+8	3,942E+8	1,280E+4				

**Identification names**

Ple4Win [96612737]: 'BC3Kopw' [3-9-2018;occ.:18]

	Identification name	Node number	X-coordinate	x_pipeline axis	x_projected pipe axis
			mm	mm	mm
1	Start	1	2,029E+8	0	0
2	B1s	12	2,029E+8	1,204E+3	1,204E+3
3	B1	20	2,029E+8	2,003E+3	2,330E+3
4	B1e	29	2,029E+8	2,901E+3	3,539E+3
5	B2s	29	2,029E+8	2,901E+3	3,539E+3
6	B2	37	2,029E+8	3,687E+3	4,633E+3
7	B2e	46	2,029E+8	4,572E+3	5,810E+3
8	D1tss	155	2,029E+8	3,308E+4	3,432E+4
9	D1ts	156	2,029E+8	3,318E+4	3,442E+4
10	D1tse	158	2,029E+8	3,337E+4	3,461E+4
11	D1kss	202	2,029E+8	4,229E+4	4,319E+4
12	D1ks	203	2,029E+8	4,238E+4	4,328E+4
13	D1kse	205	2,029E+8	4,257E+4	4,347E+4
14	D1ke	226	2,029E+8	4,481E+4	4,571E+4
15	D1te	275	2,029E+8	5,539E+4	5,628E+4
16	B3s	324	2,029E+8	6,576E+4	6,666E+4
17	B3	331	2,029E+8	6,637E+4	6,740E+4
18	B3e	339	2,029E+8	6,707E+4	6,822E+4
19	B4s	551	2,029E+8	1,265E+5	1,277E+5
20	B4	559	2,029E+8	1,273E+5	1,287E+5
21	B4e	568	2,029E+8	1,282E+5	1,296E+5
22	B4bs	568	2,029E+8	1,282E+5	1,296E+5
23	B4b	572	2,029E+8	1,285E+5	1,298E+5
24	B4be	577	2,029E+8	1,290E+5	1,303E+5
25	D2ts	632	2,029E+8	1,411E+5	1,424E+5
26	D2kss	684	2,029E+8	1,523E+5	1,536E+5
27	D2ks	686	2,029E+8	1,525E+5	1,538E+5
28	D2kse	689	2,029E+8	1,527E+5	1,540E+5
29	D2kes	720	2,029E+8	1,572E+5	1,583E+5
30	D2ke	722	2,029E+8	1,573E+5	1,584E+5
31	D2kee	725	2,029E+8	1,575E+5	1,586E+5
32	D2te	754	2,029E+8	1,617E+5	1,628E+5
33	B5s	1122	2,030E+8	2,677E+5	2,688E+5
34	B5	1124	2,030E+8	2,678E+5	2,689E+5
35	B5e	1127	2,030E+8	2,680E+5	2,691E+5
36	Z1	1193	2,030E+8	2,829E+5	2,839E+5
37	Z1e	1194	2,030E+8	2,829E+5	2,840E+5
38	Z2	1263	2,030E+8	2,987E+5	2,998E+5
39	Z2e	1264	2,030E+8	2,988E+5	2,999E+5

### Identification names

Ple4Win [96612737]: 'BC3Kopw' [3-9-2018;occ.:18]

	Identification name	Node number	X-coordinate	x_pipeline axis	x_projected pipe axis
			mm	mm	mm
40	B6s	1296	2,030E+8	3,036E+5	3,046E+5
41	B6	1299	2,030E+8	3,038E+5	3,049E+5
42	B6e	1303	2,030E+8	3,041E+5	3,052E+5
43	D3zs	1574	2,031E+8	3,810E+5	3,820E+5
44	D3ts	1611	2,031E+8	3,880E+5	3,890E+5
45	D3ks	1657	2,031E+8	3,976E+5	3,986E+5
46	B7s	1694	2,031E+8	4,044E+5	4,053E+5
47	B7	1702	2,031E+8	4,051E+5	4,063E+5
48	B7e	1711	2,031E+8	4,059E+5	4,073E+5
49	Eind	1742	2,031E+8	4,109E+5	4,123E+5

### Soil layers

Ple4Win [96612737]: 'BC3Kopw' [14-5-2018;occ.:3]

	Layer name	Laye	Laye	(Mea	Volu	Angl	Angl	Drai	Undr	Pac	Shrin	Shrin	Shrin	Shea	Ulti	Youn	De
				N/m	N/m	°	°	N/m	N/m		N/m			N/m	mm	N/m	
1	Clay; clean; moderate	Clay		1...E-	1...E-	17,5	11,7	,005	,05	,3	,6	,175	,088	,72	5	2,1	
2	Sand; clean; moderate	Sand	Clea	1...E-	2...E-	32,5	20,0	0		,3	2,4	,075	,020	16,...	4	45,0	

### Soil profiles

Ple4Win [96612737]: 'BC3Kopw' [14-5-2018;occ.:3]

	Profile name	Fixed top	Top of profile	Description
			mm	
1	Dijk	No		
2	Sleuf	No		

### Soil profile layers

Ple4Win [96612737]: 'BC3Kopw' [14-5-2018;occ.:3]

	Profile name	Layer name	Layer height
			mm
1	Dijk	Clay; clean; moderate	1.300
2	Dijk	Sand; clean; moderate	3.000
3	Sleuf	Sand; clean; moderate	4.300

### Soil profile locations

Ple4Win [96612737]: 'BC3Kopw' [14-5-2018;occ.:3]

	Ident	Profile na	Profile na	Top soil lo	Top soil lo	Installation method 1	Installation method 2	Deformation spe	Deformation spe
1	Start	Sleuf	Sleuf	Real	Real	TrenchUnCompressed	TrenchUnCompressed	Slow	Slow
2	B1	Sleuf	Sleuf	Real	Real	TrenchUnCompressed	TrenchUnCompressed	Slow	Slow
3	B2	Sleuf	Sleuf	Real	Real	TrenchUnCompressed	TrenchUnCompressed	Slow	Slow
4	D1ts	Sleuf	Sleuf	Real	Real	TrenchUnCompressed	TrenchUnCompressed	Slow	Slow
5	D1ks	Sleuf	Sleuf	Real	Real	TrenchUnCompressed	TrenchUnCompressed	Slow	Slow
6	D1ke	Sleuf	Sleuf	Real	Real	TrenchUnCompressed	TrenchUnCompressed	Slow	Slow
7	D1te	Sleuf	Sleuf	Real	Real	TrenchUnCompressed	TrenchUnCompressed	Slow	Slow
8	B3	Sleuf	Sleuf	Real	Real	TrenchUnCompressed	TrenchUnCompressed	Slow	Slow
9	B4	Sleuf	Sleuf	Real	Real	TrenchUnCompressed	TrenchUnCompressed	Slow	Slow
10	B4b	Sleuf	Sleuf	Real	Real	TrenchUnCompressed	TrenchUnCompressed	Slow	Slow
11	D2ts	Sleuf	Dijk	Real	Real	TrenchUnCompressed	TrenchUnCompressed	Slow	Slow
12	D2ks	Dijk	Dijk	Real	Real	TrenchUnCompressed	TrenchUnCompressed	Slow	Slow
13	D2ke	Dijk	Dijk	Real	Real	TrenchUnCompressed	TrenchUnCompressed	Slow	Slow
14	D2te	Dijk	Sleuf	Real	Real	TrenchUnCompressed	TrenchUnCompressed	Slow	Slow
15	B5	Sleuf	Sleuf	Real	Real	TrenchUnCompressed	TrenchUnCompressed	Slow	Slow
16	Z1	Sleuf	Sleuf	Real	Real	TrenchUnCompressed	TrenchUnCompressed	Slow	Slow
17	Z1e	Sleuf	Sleuf	Real	Real	TrenchUnCompressed	TrenchUnCompressed	Slow	Slow
18	Z2	Sleuf	Sleuf	Real	Real	TrenchUnCompressed	TrenchUnCompressed	Slow	Slow
19	Z2e	Sleuf	Sleuf	Real	Real	TrenchUnCompressed	TrenchUnCompressed	Slow	Slow
20	B6	Sleuf	Sleuf	Real	Real	TrenchUnCompressed	TrenchUnCompressed	Slow	Slow
21	D3zs	Sleuf	Dijk	Real	Real	TrenchUnCompressed	TrenchUnCompressed	Slow	Slow
22	D3ts	Dijk	Dijk	Real	Real	TrenchUnCompressed	TrenchUnCompressed	Slow	Slow
23	D3ks	Dijk	Dijk	Real	Real	TrenchUnCompressed	TrenchUnCompressed	Slow	Slow
24	B7	Dijk	Dijk	Real	Real	TrenchUnCompressed	TrenchUnCompressed	Slow	Slow
25	Eind	Dijk	Dijk	Real	Real	TrenchUnCompressed	TrenchUnCompressed	Slow	Slow

# General soil settings

Ple4Win [96612737]: 'BC3Kopw' [14-5-2018;occ.:3]

Property	Value
1 Volume weight of water (Default: 9,81E-06 N/mm³)	0.00000981
2 Half band width (h.b.w.) accuracy percentage (Default: 5%)	5
3 Pipeline operational temperature	Cold
4 State of soil compression	Well packed
5 Calculation methodology	Use updated NEN3650-1:2012

# Warnings

Ple4Win [96612737]: 'BC3Kopw' [occ.:0]

Program session	Function mnemonic	Identification name	Message
1	39	FUNCT200	W200/4
2	39	FUNCT310	W310/1
3	39	SOIL-WIZ	W320/7
4	39	FUNCT320	W320/1
5	46	FUNCT500	W500/24
6	46	FUNCT610	W610/18

# Program status summary

Ple4Win [96612737]: 'BC3Kopw' [occ.:0]

Property	Value
Program	Ple4Win
Version	V4.4.2.17072
License	96612737 [CmDongle 2-1601491]
Modules included	KSAGNLFERCYQOJUZX0X1
Project name	
Project location & filename	F:\Projecten\TE16353 - Wanssum\Kopw\BC3Kopw
Project description	
Analysis type	General
Project phase	Initial
Project parent	- - -
Secondary project	- - -
Units	Millimeter, Newton, Second
Separators	Thousands: '.'Decimal: ','
Bend angle	Limited
Geometry model	Non-linear
Section model	Ovalising
Material model	Linear
Soil ring-stiffening	Applied
Soil model	Standard
Ovalisation redistribution	Allowed
Loading redistribution	Applied
Warning table	6 items (warnings and messages)
2 Pipeline Configuration (occurrence 18)	Pipeline origin (status 'Locked Data', occurrence 6, last modified 14-5-2018 01:01:00)
	Pipeline polygon points (status 'Locked Data', occurrence 33, last modified 14-5-2018 01:01:00)
	Ground level (status 'Locked Data', occurrence 9, last modified 14-5-2018 01:01:00)
	(Ground) water level (status 'Locked Data', occurrence 9, last modified 14-5-2018 01:01:00)
	Polygon point data (status 'Locked Data', occurrence 18, last modified 14-5-2018 01:01:00)
	Bend location data (status 'Locked Data', occurrence 18, last modified 14-5-2018 01:01:00)
	Polygon subdivision data (status 'Locked Data', occurrence 18, last modified 14-5-2018 01:01:00)
	Nodes (status 'Locked Data', occurrence 18, last modified 14-5-2018 01:01:00)
	Elements of pipeline (status 'Locked Data', occurrence 18, last modified 14-5-2018 01:01:00)
	Vertical profile data (status 'Locked Data', occurrence 18, last modified 14-5-2018 01:01:00)
	Identification names (status 'Locked Data', occurrence 18, last modified 14-5-2018 01:01:00)
	Element/node groups (status 'Locked Data', occurrence 18, last modified 14-5-2018 01:01:00)
3,1 Pipe Data (occurrence 7)	Material location (status 'Locked Data', occurrence 2, last modified 14-5-2018 01:01:00)
	Isotropic materials (status 'Locked Data', occurrence 2, last modified 14-5-2018 01:01:00)
	Outer diameter (status 'Locked Data', occurrence 2, last modified 14-5-2018 01:01:00)
	Wall thicknesses (status 'Locked Data', occurrence 2, last modified 14-5-2018 01:01:00)
	Deadweight (status 'Locked Data', occurrence 2, last modified 14-5-2018 01:01:00)
	Pipe material data (status 'Locked Data', occurrence 7, last modified 14-5-2018 01:01:00)
	Pipe dimension data (status 'Locked Data', occurrence 7, last modified 14-5-2018 01:01:00)
3,2 Soil Data (occurrence 8)	Horizontal soil stiffness (status 'Locked Data', occurrence 3, last modified 14-5-2018 01:01:00)
	Downward vertical soil stiffness (status 'Locked Data', occurrence 3, last modified 14-5-2018 01:01:00)
	Upward vertical soil stiffness (status 'Locked Data', occurrence 3, last modified 14-5-2018 01:01:00)

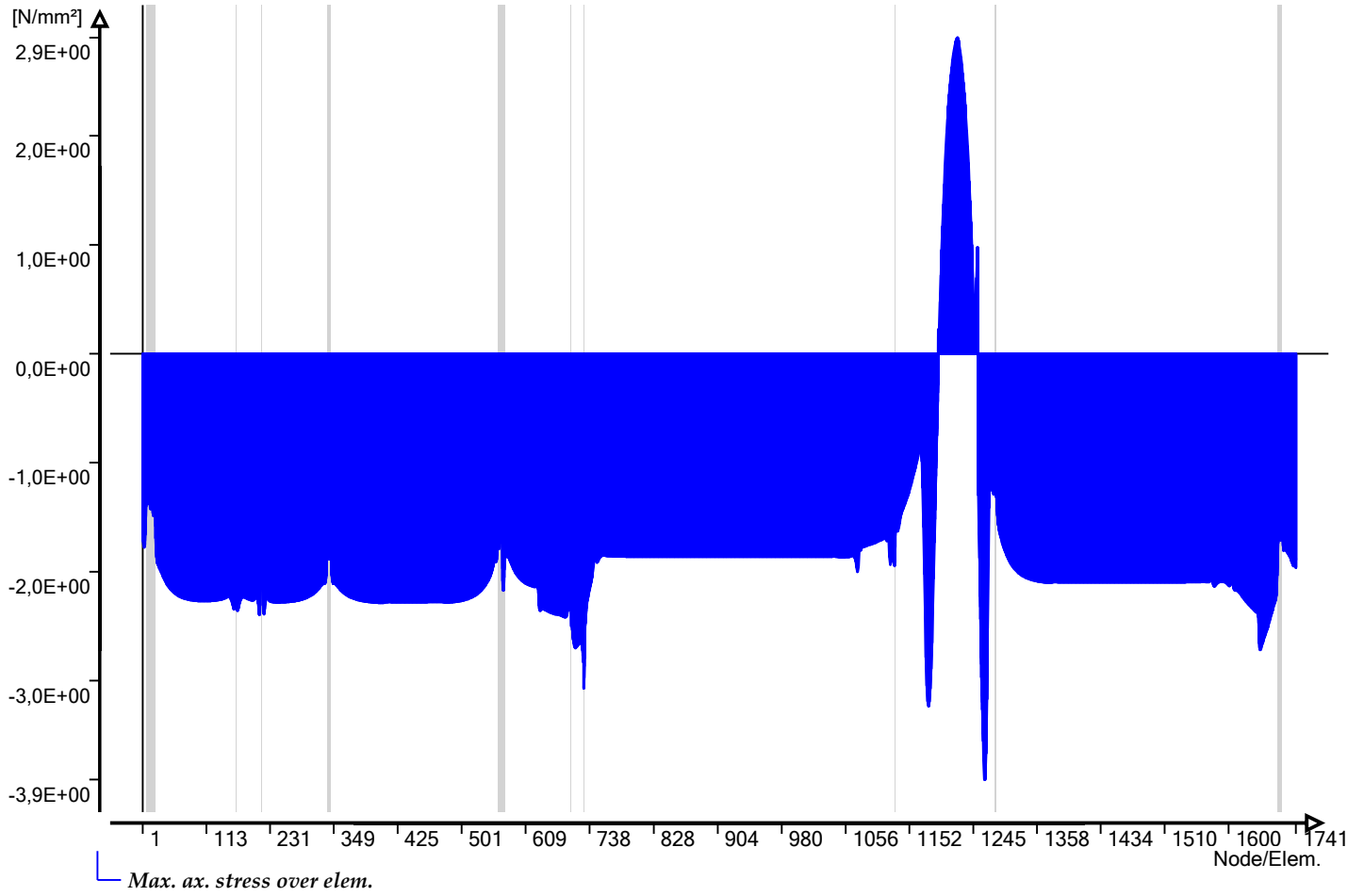
Property	Value
	Pipe-soil friction (status 'Locked Data', occurrence 3, last modified 14-5-
	Displacement at max. soil friction (status 'Locked Data', occurrence 3, la
	Sub-soil bearing capacity (status 'Locked Data', occurrence 3, last modi
	Ultimate top-soil reaction (status 'Locked Data', occurrence 3, last modif
	Ultimate hor. soil reaction (status 'Locked Data', occurrence 3, last modi
	Uncertainty factors (status 'Locked Data', occurrence 4, last modified 14
	Lateral soil mechanical data (status 'Locked Data', occurrence 8, last m
	Pipe-soil friction data (status 'Locked Data', occurrence 8, last modified
	Soil layers (status 'Locked Data', occurrence 3, last modified 14-5-2018
	Soil profiles (status 'Locked Data', occurrence 3, last modified 14-5-201
	Soil profile layers (status 'Locked Data', occurrence 3, last modified 14-
	Soil profile locations (status 'Locked Data', occurrence 3, last modified 1
	General soil settings (status 'Locked Data', occurrence 3, last modified
3,3 Model Boundary (occurrence 5)	Start/end nodes boundary conditions (status 'Locked Data', occurrence
	Conditions along pipe axis (status 'Locked Data', occurrence 5, last mod
4,2 Pipeline Loading (occurrence 14)	Internal overpressure (status 'Locked Data', occurrence 3, last modified
	Temperature differences (status 'Locked Data', occurrence 3, last modifi
	Vertical soil subsidence (status 'Locked Data', occurrence 2, last modifi
	Specified pipeline loads (status 'Locked Data', occurrence 14, last modif
5 Pipeline Behaviour (occurrence 14)	Loading combinations (status 'Locked Data', occurrence 6, last modified
	Non-linear elastic soil iteration control (status 'Locked Data', occurrence
	Geometrically non-linear iteration control (status 'Locked Data', occure
	Displacements (status 'Locked Data', occurrence 14, last modified 3-9-2
	Overall internal forces (status 'Locked Data', occurrence 14, last modifie
	Overall soil reaction forces (status 'Locked Data', occurrence 14, last m
	Overall external support reaction forces (status 'Locked Data', occuren
	Bend stiffness reduction & stress intensification (status 'Locked Data',
	Global node coordinates of displaced pipeline (status 'Locked Data', oc
	Primary cross-sectional deformations (status 'Locked Data', occurrence
	Iteration data (status 'Locked Data', occurrence 14, last modified 3-9-20
	Iteration check list (status 'Locked Data', occurrence 14, last modified 3-
	Specified loads active on elements (status 'Locked Data', occurrence 14
	Applied settlement loads (status 'Locked Data', occurrence 14, last mod
6,1 Cross-Section Data (occurrence 14)	Neutral or real top-soil load (status 'Locked Data', occurrence 3, last mo
	Extra loads on top-soil (status 'Locked Data', occurrence 1, last modifie
	Horizontal soil support / Vertical soil load (status 'Locked Data', occure
	Soil support angle functions (status 'Locked Data', occurrence 1, last m
	Cross-sectional data (status 'Locked Data', occurrence 14, last modified
	Additional cross-sectional loads (status 'Locked Data', occurrence 14, la
	Additional support forces (status 'Locked Data', occurrence 14, last mod
	Resulting pipeline spans (status 'Locked Data', occurrence 14, last modi
	Deformation redistribution (soil loads ) (status 'Locked Data', occurenc
	Deformation redistribution (soil loads w. toploads) (status 'Locked Data'
	Deformation redistribution (bend ovalisation) (status 'Locked Data', occ
6,2 Cross-Section Behaviour {General, Material Linear} (occurrence 13)	Cross-sections to be calculated (status 'Locked Data', occurrence 1, last
	Weighing factors stress components (status 'Locked Data', occurrence
	General cross-sectional data (status 'Locked Data', occurrence 13, last
	Cross-sectional loading data (status 'Locked Data', occurrence 13, last
	Weighing multiplication factors (status 'Locked Data', occurrence 13, las
	Maximum radial deformations (status 'Locked Data', occurrence 13, last
	Maximum check stresses (status 'Locked Data', occurrence 13, last mo
	Maximum stresses in straight pipe sections (status 'Locked Data', occu
	Maximum stresses in bends (status 'Locked Data', occurrence 13, last
	Maximum stresses (lateral loadings) (status 'Locked Data', occurrence
	Maximum total stresses (status 'Locked Data', occurrence 13, last modif
	Maximum principal stresses (status 'Locked Data', occurrence 13, last
	Detailed radial deformations (status 'Locked Data', occurrence 13, last
	Detailed check stresses (status 'Locked Data', occurrence 13, last modif
	Detailed stresses in straight pipe sections (status 'Locked Data', occure
	Detailed stresses in bends (status 'Locked Data', occurrence 13, last m
	Detailed stresses (lateral loadings) (status 'Locked Data', occurrence 13
	Detailed total stresses (status 'Locked Data', occurrence 13, last modifi
	Detailed principal stresses (status 'Locked Data', occurrence 13, last m

Maximum check stresses (loadcase kopw weighing factors used redistrib... Ple4Win [96612737]: 'BC3Kopw' [3-9-2018;occ.:13]

	Ele...	Max. principal str...	Max. principal str...	Max. Tresca shear...	Max. Von Mises...	Max. ax. stress over...	Max. circ....	Max. hoop...
		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>	N/mm <sup>2</sup>	N/mm <sup>2</sup>
37	37	2,323E-4	-1,6957	,8478	1,5254	-1,46490	-1,69176	
720	720	2,437E+0	-4,0521	2,0261	3,6605	-3,06739	-4,05211	
1202	1202	2,289E-1	-,2474	,2005	,3492	,10646	-,09990	
1204	1204	2,467E-1	-,2231	,1949	,3386	,21338	-,10394	
1226	1226	2,899E+0	-1,7935	1,4794	2,8780	2,89862	-,16913	
1246	1246	2,866E-1	-,2004	,2048	,3549	,28232	-,10567	
1275	1275	3,392E+0	-3,9073	1,9536	3,7492	-3,90726	-,48013	
1276	1276	3,292E+0	-3,9085	1,9542	3,7340	-3,90850	-,52289	

Graphs of table 'Maximum check stresses'

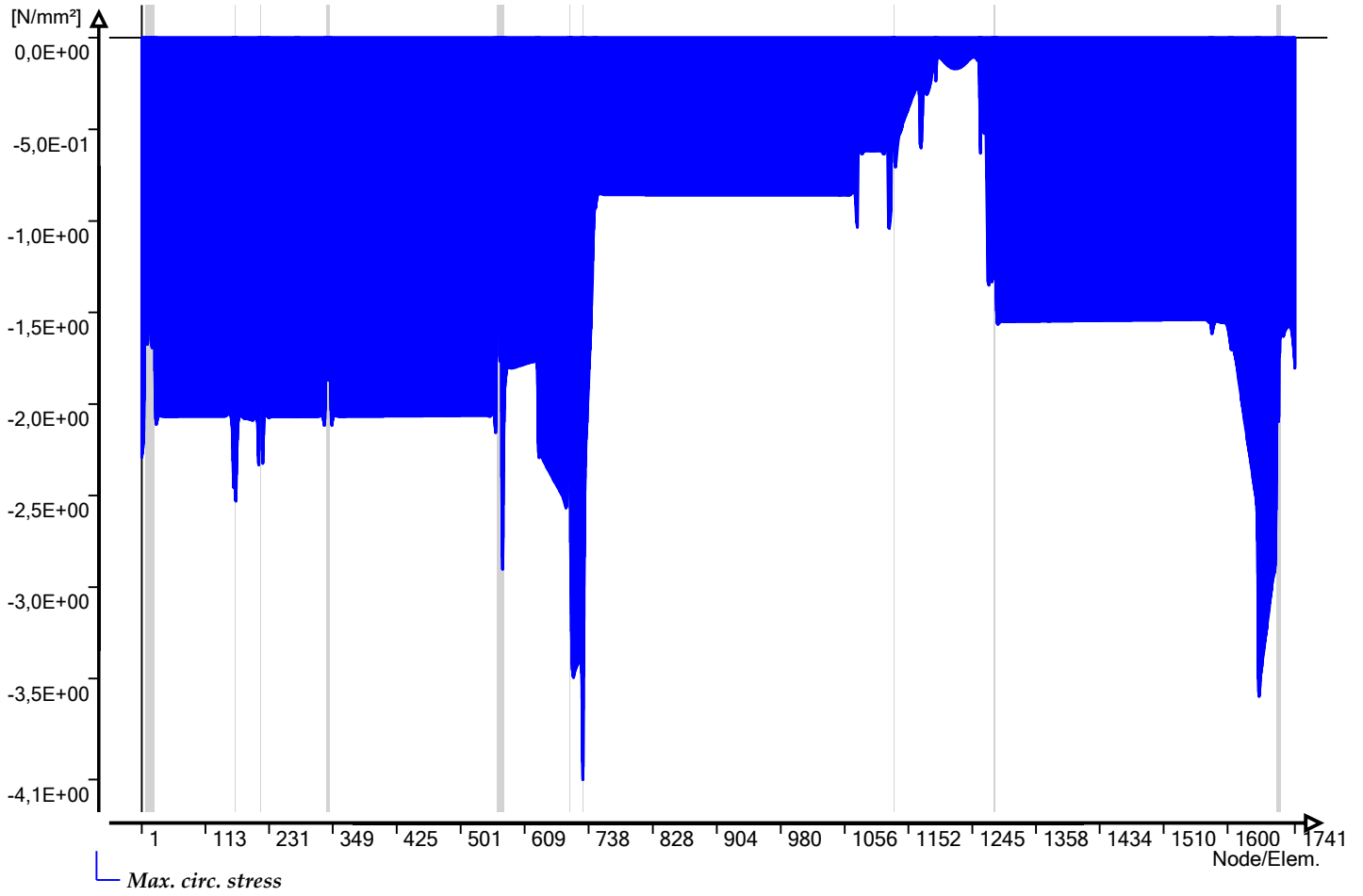
Ple4Win [96612737]: 'BC3Kopw'





Graphs of table 'Maximum check stresses'

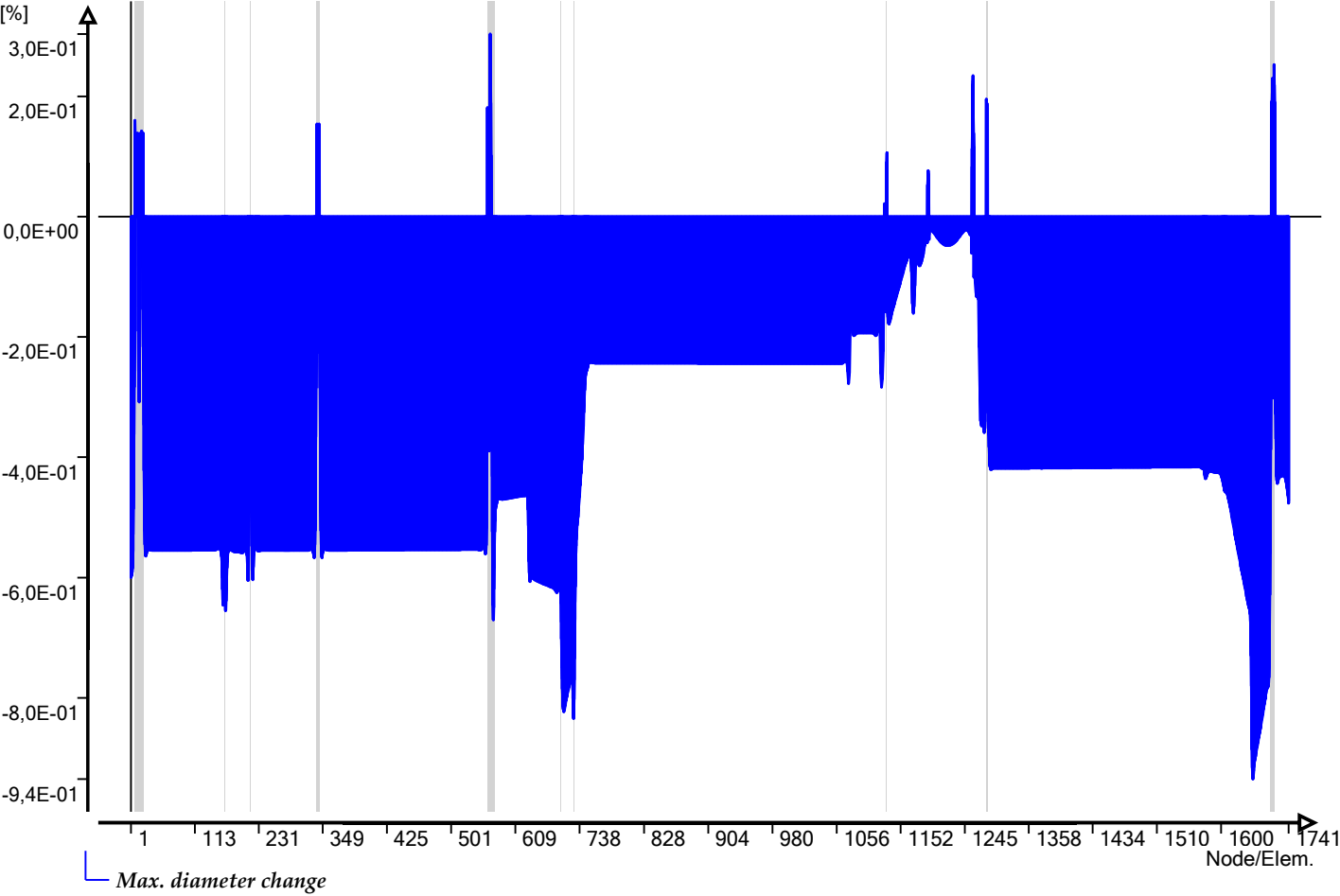
Ple4Win [96612737]: 'BC3Kopw'



	Eleme...	Max. radial deform. due to...	Radial bend def...	Max. diameter ch...	Max. total radial def...	Elast. soil impres...	Max. hor. soil su...
		mm	mm	%	mm	mm	N/mm <sup>3</sup>
561	561	-,40456	1,298E-01	,30	,52124	7,773	1,930E-2
573	573	-1,02743	-1,566E-01	-,67	-1,16846	6,777	2,963E-2
686	686	-,81069	-1,376E-01	-,58	-,94832	4,773	5,382E-2
721	721	-1,38554	-6,185E-02	-,80	-1,44739	4,773	8,705E-2
1192	1192	-,03816	8,041E-02	,07	-,11811	22,144	8,716E-4
1263	1263	-,04167	3,320E-01	,23	-,37191	22,093	8,774E-4
1661	1661	-1,60546	-5,453E-07	-,94	-1,60546	5,717	2,599E-2
1711	1711	-,41569	3,824E-02	-,22	,40877	6,416	1,411E-2

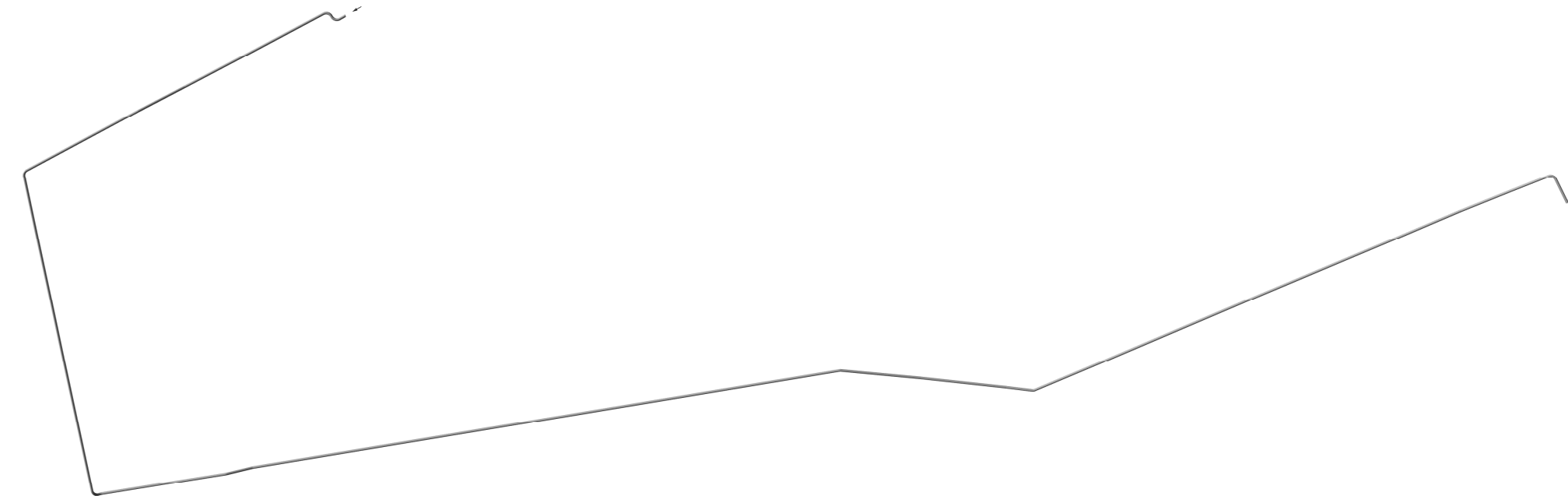
Graphs of table 'Maximum radial deformations'

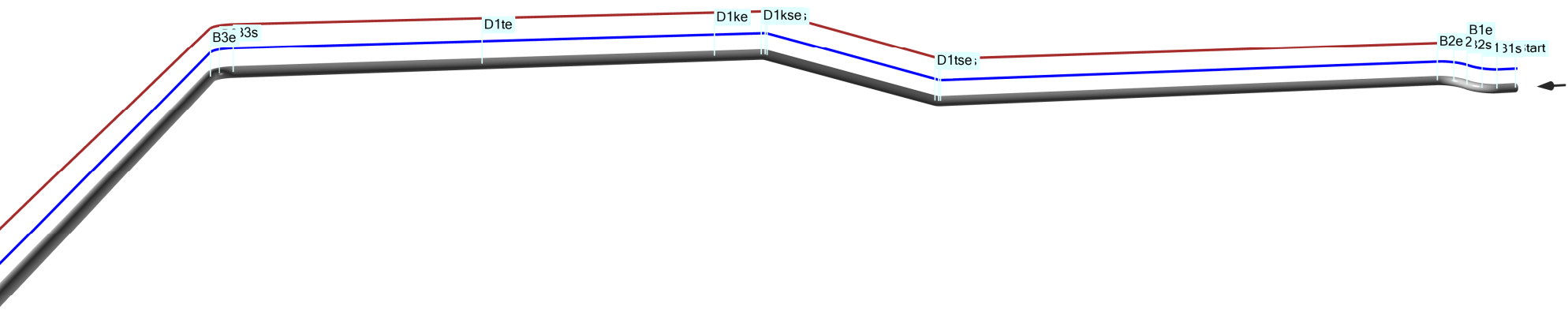
Ple4Win [96612737]: 'BC3Kopw'

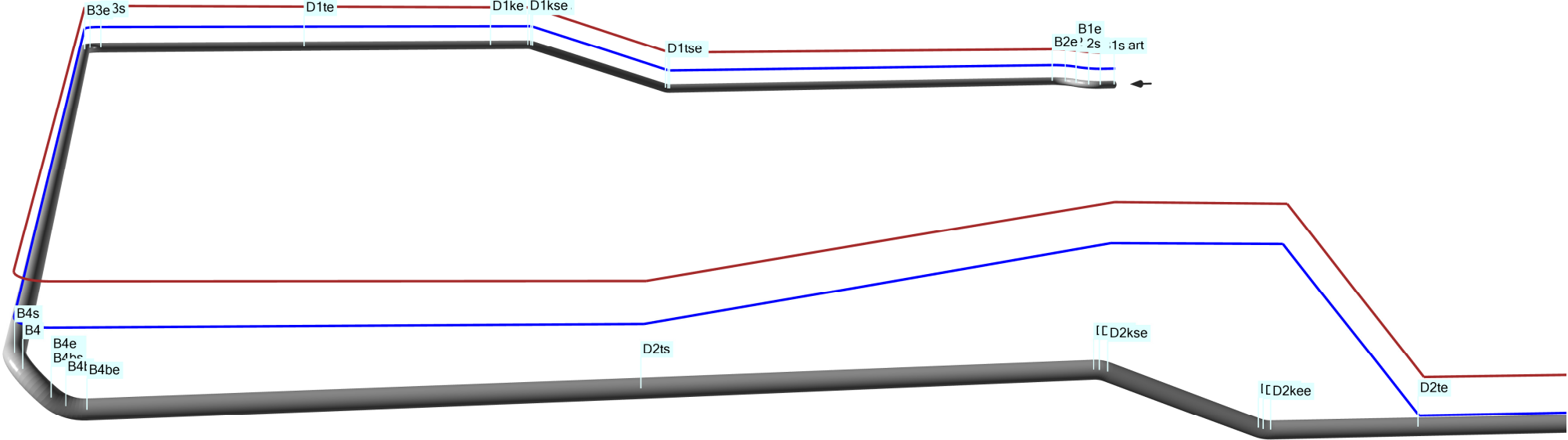


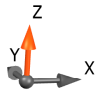
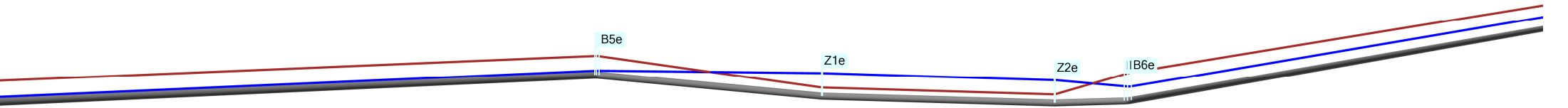


## **Bijlage 4.3: Resultaten PLE berekening BC Lafk**

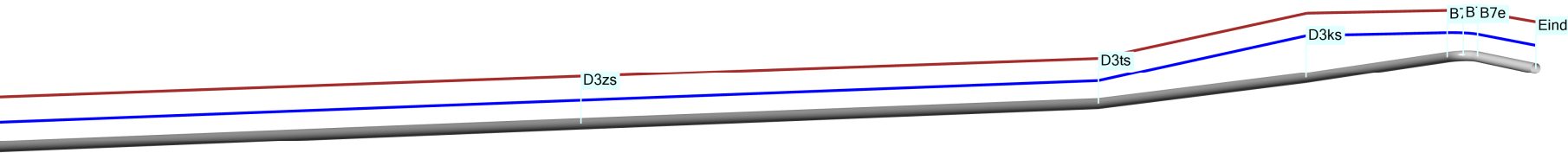












**Pipeline origin**

Ple4Win [96612737]: 'BC3Lafk' [14-5-2018;occ.:6]

	Identification name	X-coordinate	Y-coordinate	Z-coordinate	Start node	Start ax.-coordinate	Start proj.-coordinate
		mm	mm	mm		mm	mm
1	Start	202915198	394270357	10200	1	0	0

**Pipeline polygon points (absolute)**

Ple4Win [96612737]: 'BC3Lafk' [14-5-2018;occ.:32]

	Identification na	X-coordinate	Y-coordinate	Z-coordin	Bend ra	Element type	Max. bend elem. le	Pipe elem. len	Extension eleme
		mm	mm	mm	mm		mm	mm	
1	B1	202913050	394269524	10200	1050	Odd Elements	100	300	10
2	B2	202912360	394271582	10200	1050	Odd Elements	100	300	10
3	D1ts	202884374	394261557	10200	1050	Odd Elements	100	300	10
4	D1ks	202876058	394258501	12700	1050	Odd Elements	100	300	10
5	D1ke	202873820	394257679	12700	1050	Odd Elements	100	300	10
6	D1te	202863895	394254032	12700	1050	Odd Elements	100	300	10
7	B3	202853453	394250195	12700	1050	Odd Elements	100	300	10
8	B4	202855020	394188968	12700	1050	Odd Elements	100	300	10
9	B4b	202856119	394189009	11700	1050	Odd Elements	100	300	10
10	D2ts	202868643	394189477	12000	1050	Odd Elements	100	300	10
11	D2ks	202880042	394189902	12300	1050	Odd Elements	100	300	10
12	D2ke	202884628	394190073	10700	1050	Odd Elements	100	300	10
13	D2te	202888988	394190236	10700	0		100	300	10
14	B5	202995040	394194196	10700	1050	Odd Elements	100	300	10
15	Z1	203009628	394190598	9700	1050	Odd Elements	100	300	10
16	Z2	203025039	394186796	9700	1050	Odd Elements	100	300	10
17	B6	203029967	394185580	10000	1050	Odd Elements	100	300	10
18	D3zs	203089179	394202718	10750	0		100	300	10
19	D3ts	203110791	394208973	11000	0		100	300	10
20	D3ks	203119992	394211636	11900	0		100	300	10
21	B7	203127343	394213763	12800	1050	Odd Elements	100	300	10
22	Eind	203129500	394208253	12800	0		100	300	10

**Ground level**

Ple4Win [96612737]: 'BC3Lafk' [14-5-2018;occ.:9]

	Identifier	Ground level 1	Uncer. value 1	Ground level 2	Uncer. value 2
		mm	mm	mm	mm
1	Start	12200	10		
2	B1	12200	10		
3	B2	12200	10		
4	D1ts	12200	10		
5	D1ks	14700	10		
6	D1ke	14700	10		
7	D1te	14700	10		
8	B3	14700	10		
9	B4	14500	10		
10	D2ts	14500	10		
11	D2ks	16400	10		
12	D2ke	16400	10		
13	D2te	12000	10		
14	B5	12000	10		
15	Z1	10300	10		
16	Z2	10300	10		
17	B6	12000	10		
18	D3ts	13000	10		
19	D3ks	14800	10		
20	B7	14800	10		
21	Eind	14800	10		

**(Ground) water level**

Ple4Win [96612737]: 'BC3Lafk' [14-5-2018;occ.:9]

	Identifier	Z-coord. water level 1	Uncer. value 1	Z-coord. water level 2	Uncer. value 2
		mm	mm	mm	mm
1	Start	11200	10		
2	B1	11200	10		
3	B2	11200	10		
4	D1ts	11200	10		
5	D1ks	13700	10		
6	D1ke	13700	10		
7	D1te	13700	10		
8	B3	13700	10		

**(Ground) water level**

Ple4Win [96612737]: 'BC3Lafk' [14-5-2018;occ.:9]

	Identifier	Z-coord. water level 1	Uncer. value 1	Z-coord. water level 2	Uncer. value 2
		mm	mm	mm	mm
9	B4	13500	10		
10	D2ts	13500	10		
11	D2ks	15400	10		
12	D2ke	15400	10		
13	D2te	11000	10		
14	B5	11000	10		
15	Z1	11300	10		
16	Z2	11300	10		
17	B6	11000	10		
18	D3ts	12000	10		
19	D3ks	13800	10		
20	B7	13800	10		
21	Eind	13800	10		

**Material location**

Ple4Win [96612737]: 'BC3Lafk' [14-5-2018;occ.:3]

	Identifier	Material reference
1	Start	PE100I

**Isotropic materials**

Ple4Win [96612737]: 'BC3Lafk' [14-5-2018;occ.:2]

	Material reference	Young's modulus	Shear modulus	Poisson's ratio	Coeff. thermal expansion	Yield stress	Yield stress at $\theta$ °C
		N/mm <sup>2</sup>	N/mm <sup>2</sup>		1/°C	N/mm <sup>2</sup>	N/mm <sup>2</sup>
1	PE100I	350		0,4	0,00016	10	
2	PE100k	975		0,4	0,00016	10	

**Outer diameter**

Ple4Win [96612737]: 'BC3Lafk' [14-5-2018;occ.:2]

	Identifier	Outer pipe diameter 1	Outer pipe diameter 2
		mm	mm
1	Start	315	

**Wall thicknesses**

Ple4Win [96612737]: 'BC3Lafk' [14-5-2018;occ.:2]

	Identif	Nom. wall thicknes	Corrosion allow	Manufact. tol	Abs. toleranc	Nom. wall thicknes	Corrosion allow	Manufact. tol	Abs. toleranc
		mm	mm	%	mm	mm	mm	%	mm
1	Start	28,6							

**Deadweight**

Ple4Win [96612737]: 'BC3Lafk' [14-5-2018;occ.:2]

	Identifier	Deadweight 1	Deadweight 2	Buoyancy ind.
		N/mm	N/mm	
1	Start	-3,59	0,74	Yes

**Horizontal soil stiffness**

Ple4Win [96612737]: 'BC3Lafk' [14-5-2018;occ.:4]

	Identifier	Hor. soil stiffness 1	Hor. soil stiffness 2	Dividing factor	Multiplication factor	Half band width accuracy
		N/mm <sup>3</sup>	N/mm <sup>3</sup>			%
1	Start	0,029663	0,029663		1,7	5
2	B1	0,029663	0,029663		1,7	5
3	B2	0,029663	0,029663		1,7	5
4	D1ts	0,029596	0,029596		1,7	5
5	D1ks	0,029962	0,029962		1,7	5
6	D1ke	0,029663	0,029663		1,7	5
7	D1te	0,029663	0,029663		1,7	5
8	B3	0,029663	0,029663		1,7	5
9	B4	0,02943	0,02943		1,7	5
10	B4b	0,042126	0,042126		1,7	5
11	D2ts	0,038324	0,025698		1,7	5
12	D2ks	0,053823	0,053823		1,7	5
13	D2ke	0,087542	0,087542		1,7	5
14	D2te	0,010132	0,018776		1,7	5
15	B5	0,018804	0,018804		1,7	5
16	Z1	0,0040441	0,0040441		1,7	5
17	Z1e	0,0040616	0,0040616		1,7	5
18	Z2	0,0040616	0,0040616		1,7	5

**Horizontal soil stiffness**

Ple4Win [96612737]: 'BC3Lafk' [14-5-2018;occ.:4]

	Identifier	Hor. soil stiffness 1	Hor. soil stiffness 2	Dividing factor	Multiplication factor	Half band width accuracy
		N/mm <sup>3</sup>	N/mm <sup>3</sup>			%
19	Z2e	0,0042266	0,0042266		1,7	5
20	B6	0,029746	0,029746		1,7	5
21	D3zs	0,029376	0,018324		1,7	5
22	D3ts	0,018555	0,018555		1,7	5
23	D3ks	0,031992	0,031992		1,7	5
24	B7	0,01904	0,01904		1,7	5
25	Eind	0,018555	0,018555		1,7	5

**Downward vertical soil stiffness**

Ple4Win [96612737]: 'BC3Lafk' [14-5-2018;occ.:4]

	Identifier	vert. soil stiffness 1 (down)	vert. soil stiffness 2 (down)	Dividing factor	Multiplication factor	Half band width accuracy
		N/mm <sup>3</sup>	N/mm <sup>3</sup>			%
1	Start	0,023018	0,023018		2	5
2	B1	0,023018	0,023018		2	5
3	B2	0,023018	0,023018		2	5
4	D1ts	0,022958	0,022958		2	5
5	D1ks	0,023292	0,023292		2	5
6	D1ke	0,023018	0,023018		2	5
7	D1te	0,023018	0,023018		2	5
8	B3	0,023018	0,023018		2	5
9	B4	0,022807	0,022807		2	5
10	B4b	0,034953	0,034953		2	5
11	D2ts	0,031196	0,027983		2	5
12	D2ks	0,061178	0,061178		2	5
13	D2ke	0,10597	0,10597		2	5
14	D2te	0,011736	0,013596		2	5
15	B5	0,01362	0,01362		2	5
16	Z1	0,0014596	0,0014596		2	5
17	Z1e	0,0014684	0,0014684		2	5
18	Z2	0,0014684	0,0014684		2	5
19	Z2e	0,0015521	0,0015521		2	5
20	B6	0,023094	0,023094		2	5
21	D3zs	0,022757	0,020005		2	5
22	D3ts	0,020251	0,020251		2	5
23	D3ks	0,035035	0,035035		2	5
24	B7	0,020768	0,020768		2	5
25	Eind	0,020251	0,020251		2	5

**Upward vertical soil stiffness**

Ple4Win [96612737]: 'BC3Lafk' [14-5-2018;occ.:4]

	Identifier	vert. soil stiffness 1 (up)	vert. soil stiffness 2 (up)	Dividing factor	Multiplication factor	Half band width accuracy
		N/mm <sup>3</sup>	N/mm <sup>3</sup>			%
1	Start	0,0121	0,0121		1,4	5
2	B1	0,0121	0,0121		1,4	5
3	B2	0,0121	0,0121		1,4	5
4	D1ts	0,012046	0,012046		1,4	5
5	D1ks	0,012348	0,012348		1,4	5
6	D1ke	0,0121	0,0121		1,4	5
7	D1te	0,0121	0,0121		1,4	5
8	B3	0,0121	0,0121		1,4	5
9	B4	0,01191	0,01191		1,4	5
10	B4b	0,024417	0,024417		1,4	5
11	D2ts	0,020222	0,012717		1,4	5
12	D2ks	0,046804	0,046804		1,5522	5
13	D2ke	0,11226	0,11226		1,5114	5
14	D2te	0,0027699	0,0047595		1,846	5
15	B5	0,0047746	0,0047746		1,4	5
16	Z1	0,00028367	0,00028367		1,4	5
17	Z1e	0,00028642	0,00028642		1,4	5
18	Z2	0,00028642	0,00028642		1,4	5
19	Z2e	0,00031302	0,00031302		1,4	5
20	B6	0,012169	0,012169		1,4	5
21	D3zs	0,011865	0,0070981		1,4	5
22	D3ts	0,0072525	0,0072525		1,7013	5
23	D3ks	0,018631	0,018631		1,6126	5
24	B7	0,0075811	0,0075811		1,6963	5
25	Eind	0,0072525	0,0072525		1,7013	5

**Pipe-soil friction**

Ple4Win [96612737]: 'BC3Lafk' [14-5-2018;occ.:4]

	Identif	Soil frictio	Soil frictio	Dividing fact	Multiplication fact	Add. ax. friction factor	Add. ax. friction factor	Half band width accurac
		N/mm <sup>2</sup>	N/mm <sup>2</sup>					%
1	Start	0,00769...	0,00769...		1,375			5
2	B1	0,00769...	0,00769...		1,375			5
3	B2	0,00769...	0,00769...		1,375			5
4	D1ts	0,00768...	0,00768...		1,375			5
5	D1ks	0,00774...	0,00774...		1,375			5
6	D1ke	0,00769...	0,00769...		1,375			5
7	D1te	0,00769...	0,00769...		1,375			5
8	B3	0,00769...	0,00769...		1,375			5
9	B4	0,00765...	0,00765...		1,375			5
10	B4b	0,00963...	0,00963...		1,375			5
11	D2ts	0,00906...	0,00855...		1,375			5
12	D2ks	0,012938	0,012938		1,375			5
13	D2ke	0,017153	0,017153		1,375			5
14	D2te	0,00585...	0,00576...		1,865			5
15	B5	0,00577...	0,00577...		1,375			5
16	Z1	0,00168...	0,00168...		1,375			5
17	Z1e	0,00169...	0,00169...		1,375			5
18	Z2	0,00169...	0,00169...		1,375			5
19	Z2e	0,001743	0,001743		1,375			5
20	B6	0,00770...	0,00770...		1,375			5
21	D3zs	0,00764...	0,00713...		1,375			5
22	D3ts	0,00718...	0,00718...		1,375			5
23	D3ks	0,00964...	0,00964...		1,375			5
24	B7	0,00728...	0,00728...		1,375			5
25	Eind	0,00718...	0,00718...		1,375			5

**Displacement at max. soil friction**

Ple4Win [96612737]: 'BC3Lafk' [14-5-2018;occ.:4]

	Identifier	Soil friction displ. 1	Soil friction displ. 2	Dividing factor	Multiplication factor
		mm	mm		
1	Start	4	4		1,6
2	B1	4	4		1,6
3	B2	4	4		1,6
4	D1ts	4	4		1,6
5	D1ks	4	4		1,6
6	D1ke	4	4		1,6
7	D1te	4	4		1,6
8	B3	4	4		1,6
9	B4	4	4		1,6
10	B4b	4	4		1,6
11	D2ts	4	4		1,6
12	D2ks	4	4		1,6
13	D2ke	4	4		1,6
14	D2te	4,5	4		1,55
15	B5	4	4		1,6
16	Z1	4	4		1,6
17	Z1e	4	4		1,6
18	Z2	4	4		1,6
19	Z2e	4	4		1,6
20	B6	4	4		1,6
21	D3zs	4	4		1,6
22	D3ts	4	4		1,6
23	D3ks	4	4		1,6
24	B7	4	4		1,6
25	Eind	4	4		1,6

**Sub-soil bearing capacity**

Ple4Win [96612737]: 'BC3Lafk' [14-5-2018;occ.:4]

	Identifier	Vert. bearing capacity 1	Vert. bearing capacity 2	Dividing factor	Multiplication factor	Half band width accuracy
		N/mm <sup>2</sup>	N/mm <sup>2</sup>			%
1	Start	0,72532	0,72532		2	5
2	B1	0,72532	0,72532		2	5
3	B2	0,72532	0,72532		2	5
4	D1ts	0,72408	0,72408		2	5
5	D1ks	0,73093	0,73093		2	5
6	D1ke	0,72532	0,72532		2	5
7	D1te	0,72532	0,72532		2	5

**Sub-soil bearing capacity**

Ple4Win [96612737]: 'BC3Lafk' [14-5-2018;occ.:4]

	Identifier	Vert. bearing capacity 1	Vert. bearing capacity 2	Dividing factor	Multiplication factor	Half band width accuracy
		N/mm <sup>2</sup>	N/mm <sup>2</sup>			%
8	B3	0,72532	0,72532		2	5
9	B4	0,72097	0,72097		2	5
10	B4b	0,95246	0,95246		2	5
11	D2ts	0,88433	0,82358		2	5
12	D2ks	1,3735	1,3735		2	5
13	D2ke	1,9722	1,9722		2	5
14	D2te	0,47107	0,51464		2	5
15	B5	0,51522	0,51522		2	5
16	Z1	0,11389	0,11389		2	5
17	Z1e	0,11437	0,11437		2	5
18	Z2	0,11437	0,11437		2	5
19	Z2e	0,11892	0,11892		2	5
20	B6	0,72688	0,72688		2	5
21	D3zs	0,71994	0,66163		2	5
22	D3ts	0,66692	0,66692		2	5
23	D3ks	0,95372	0,95372		2	5
24	B7	0,67797	0,67797		2	5
25	Eind	0,66692	0,66692		2	5

**Ultimate top-soil reaction**

Ple4Win [96612737]: 'BC3Lafk' [14-5-2018;occ.:4]

	Identifier	Passive topsoil reac. 1	Passive topsoil reac. 2	Dividing factor	Multiplication factor	Half band width accuracy
		N/mm <sup>2</sup>	N/mm <sup>2</sup>			%
1	Start	0,073236	0,073236		1,5	5
2	B1	0,073236	0,073236		1,5	5
3	B2	0,073236	0,073236		1,5	5
4	D1ts	0,073022	0,073022		1,5	5
5	D1ks	0,0742	0,0742		1,5	5
6	D1ke	0,073236	0,073236		1,5	5
7	D1te	0,073236	0,073236		1,5	5
8	B3	0,073236	0,073236		1,5	5
9	B4	0,07249	0,07249		1,5	5
10	B4b	0,1159	0,1159		1,5	5
11	D2ts	0,10236	0,096218		1,5	5
12	D2ks	0,22023	0,22023		1,5	5
13	D2ke	0,38912	0,38912		1,5	5
14	D2te	0,037637	0,040618		1,5	5
15	B5	0,040697	0,040697		1,5	5
16	Z1	0,0063718	0,0063718		1,5	5
17	Z1e	0,0064093	0,0064093		1,5	5
18	Z2	0,0064093	0,0064093		1,5	5
19	Z2e	0,0067655	0,0067655		1,5	5
20	B6	0,073503	0,073503		1,5	5
21	D3zs	0,072315	0,067113		1,5	5
22	D3ts	0,068002	0,068002		1,5	5
23	D3ks	0,12228	0,12228		1,5	5
24	B7	0,069871	0,069871		1,5	5
25	Eind	0,068002	0,068002		1,5	5

**Ultimate hor. soil reaction**

Ple4Win [96612737]: 'BC3Lafk' [14-5-2018;occ.:4]

	Identif	Horizontal soil reacti	Horizontal soil reacti	Dividing f	Multiplication f	Add. lat. friction fac	Add. lat. friction fac	Half band width acc
		N/mm <sup>2</sup>	N/mm <sup>2</sup>					%
1	Start	0,28314	0,28314		1,6			5
2	B1	0,28314	0,28314		1,6			5
3	B2	0,28314	0,28314		1,6			5
4	D1ts	0,28251	0,28251		1,6			5
5	D1ks	0,286	0,286		1,6			5
6	D1ke	0,28314	0,28314		1,6			5
7	D1te	0,28314	0,28314		1,6			5
8	B3	0,28314	0,28314		1,6			5
9	B4	0,28093	0,28093		1,6			5
10	B4b	0,40211	0,40211		1,6			5
11	D2ts	0,36582	0,2453		1,6			5
12	D2ks	0,51376	0,51376		1,7218			5
13	D2ke	0,83563	0,83563		1,6891			5
14	D2te	0,096718	0,17922		1,9568			5

**Ultimate hor. soil reaction**

Ple4Win [96612737]: 'BC3Lafk' [14-5-2018;occ.:4]

	Identif	Horizontal soil reacti	Horizontal soil reacti	Dividing f	Multiplication f	Add. lat. friction fac	Add. lat. friction fac	Half band width acc
		N/mm <sup>2</sup>	N/mm <sup>2</sup>					%
15	B5	0,1795	0,1795		1,6			5
16	Z1	0,038603	0,038603		1,6			5
17	Z1e	0,038769	0,038769		1,6			5
18	Z2	0,038769	0,038769		1,6			5
19	Z2e	0,040345	0,040345		1,6			5
20	B6	0,28394	0,28394		1,6			5
21	D3zs	0,2804	0,17491		1,6			5
22	D3ts	0,17712	0,17712		1,841			5
23	D3ks	0,30538	0,30538		1,7701			5
24	B7	0,18175	0,18175		1,8371			5
25	Eind	0,17712	0,17712		1,841			5

**Uncertainty factors**

Ple4Win [96612737]: 'BC3Lafk' [14-5-2018;occ.:5]

	KLH-uncer. fact	KLS-uncer. fact	KLT-uncer. fact	Friction uncer. fact	UF-uncer. fact	RVS-uncer. fact	RVT-uncer. fact	RH-uncer. fact
1	High	High	High	High	High	High	High	High

**Start/end nodes boundary conditions**

Ple4Win [96612737]: 'BC3Lafk' [14-5-2018;occ.:3]

	Identification name	Boundary nodes cond.	Boundary node state
1	Start	Fixed	Open
2	Eind	Fixed	Open

**Internal overpressure**

Ple4Win [96612737]: 'BC3Lafk' [14-5-2018;occ.:3]

	Identifier	Internal pressure 1	Internal pressure 2
		N/mm <sup>2</sup>	N/mm <sup>2</sup>
1	Start	0,26	

**Temperature differences**

Ple4Win [96612737]: 'BC3Lafk' [14-5-2018;occ.:2]

	Identifier	Abs. temp. 1	Ref. temp. 1	Abs. temp. 2	Ref. temp. 2
		°C	°C	°C	°C
1	Start	10	20		

**Soil displacement in Z-direction**

Ple4Win [96612737]: 'BC3Lafk' [3-9-2018;occ.:6]

	Identifier	Z-settlement 1	Uncer. factor 1	Z-settlement 2	Uncer. factor 2
		mm		mm	
1	D3zs	0	1,5		
2	D3ks	-200	1,5		
3	B7	0	1,5		

**Vertical soil subsidence**

Ple4Win [96612737]: 'BC3Lafk' [3-9-2018;occ.:2]

	Identifier	Max. soil subsidence	Uncertainty factor	Subsidence length	Subsidence shape
		mm		mm	
1	B3	-5	1,5	20000	Double
2	B4	-5	1,5	20000	Double
3	B5	-5	1,5	20000	Double
4	B6	-5	1,5	20000	Double

**Loading combinations**

Ple4Win [96612737]: 'BC3Lafk' [3-9-2018;occ.:6]

	Identification	General load	Pressure load	Temp. load	Deadweight load	Settlement load	Nodal load	Elast. bend load	Wave/current load
1	Lafk	1	0	1	1	1	0	0	0

**Non-linear elastic soil iteration control**

Ple4Win [96612737]: 'BC3Lafk' [14-5-2018;occ.:1]

	Max. no. soil iter.	Max. no error points	Max. no error fields
1	20	0	0

**Geometrically non-linear iteration control**

Ple4Win [96612737]: 'BC3Lafk' [14-5-2018;occ.:1]

	Max. no. geometry iter.	Relative disequilibrium	Abs. disequilibrium	Rotation increment
				RAD
1	50	1E-05	1E-07	0,1

**Neutral or real top-soil load**

Ple4Win [96612737]: 'BC3Lafk' [14-5-2018;occ.:4]

	Identifier	Neutral/Real top-soil load 1	Uncer. factor 1	Load factor 1	Neutral/Real top-soil load 2	Uncer. factor 2	Load factor 2
		N/mm <sup>2</sup>			N/mm <sup>2</sup>		
1	Start	0,026585	1,1	1	0,026585	1,1	1
2	B1	0,026585	1,1	1	0,026585	1,1	1
3	B2	0,026585	1,1	1	0,026585	1,1	1
4	D1ts	0,026544	1,1	1	0,026544	1,1	1
5	D1ks	0,026768	1,1	1	0,026768	1,1	1
6	D1ke	0,026585	1,1	1	0,026585	1,1	1
7	D1te	0,026585	1,1	1	0,026585	1,1	1
8	B3	0,026585	1,1	1	0,026585	1,1	1
9	B4	0,026442	1,1	1	0,026442	1,1	1
10	B4b	0,0338	1,1	1	0,0338	1,1	1
11	D2ts	0,03168	1,1	1	0,02978	1,1	1
12	D2ks	0,046206	1,1	1	0,046206	1,1	1
13	D2ke	0,062174	1,1	1	0,062174	1,1	1
14	D2te	0,018025	1,1	1	0,019452	1,1	1
15	B5	0,019472	1,1	1	0,019472	1,1	1
16	Z1	0,0044887	1,1	1	0,0044887	1,1	1
17	Z1e	0,0045091	1,1	1	0,0045091	1,1	1
18	Z2	0,0045091	1,1	1	0,0045091	1,1	1
19	Z2e	0,0047005	1,1	1	0,0047005	1,1	1
20	B6	0,026636	1,1	1	0,026636	1,1	1
21	D3zs	0,026409	1,1	1	0,024509	1,1	1
22	D3ts	0,024685	1,1	1	0,024685	1,1	1
23	D3ks	0,033856	1,1	1	0,033856	1,1	1
24	B7	0,025052	1,1	1	0,025052	1,1	1
25	Eind	0,024685	1,1	1	0,024685	1,1	1

**Extra loads on top-soil**

Ple4Win [96612737]: 'BC3Lafk' [14-5-2018;occ.:1]

	Identifier	Topload 1	Load factor 1	Topload 2	Load factor 2
		N/mm <sup>2</sup>		N/mm <sup>2</sup>	
1	B3	0,016	1,35		1,35
2	B4	0,016	1,35	0	1,35
3	D2ks	0	1,35	0,032	1,35
4	D2ke	0,032	1,35	0	1,35
5	D3ks	0	1,35	0,032	1,35
6	B7	0,032	1,35	0	1,35

**Horizontal soil support / Vertical soil load**

Ple4Win [96612737]: 'BC3Lafk' [14-5-2018;occ.:1]

	Identifier	Hor./vert. soil coeff. 1	Hor./vert. soil coeff. 2
1	Start	0,5	

**Soil support angle functions**

Ple4Win [96612737]: 'BC3Lafk' [14-5-2018;occ.:1]

	Identifier	Min. support angle	Max. support angle	Ratio calc. / max. bearing (low)	Ratio calc. / max. bearing (high)	Curve shape
		°	°	%	%	
1	Start	70	180	50	100	Sinus

**Cross-sections to be calculated**

Ple4Win [96612737]: 'BC3Lafk' [14-5-2018;occ.:1]

	Start Identifier	End Identifier	Topload ind.	Allowable stress
				N/mm <sup>2</sup>
1	Start	Eind	Yes	

**Weighing factors stress components**

Ple4Win [96612737]: 'BC3Lafk' [14-5-2018;occ.:1]

	Identi	Stre	Stress due	Stress due to higher ha	Weighing fact. a	Weighing fact. cir	Weighin	Weighing fact. c	Weighing fa	Weighing fac
1	Start	1	0,65	0,65	0,65	0,65	1	1	0,65	0,65



Polygon point data

Ple4Win [96612737]: 'BC3Lafk' [3-9-2018;occ.:16]

	Identification name	X-coordinat	Y-coordinat	Z-coordinat	Bend angl	Hor. bend angle	Angle Z-axis - leaving polygon line	Bend radiu
		mm	mm	mm	°	°	°	mm
1	Start	2,029E+8	3,943E+8	1,020E+4			90,00	
2	B1	2,029E+8	3,943E+8	1,020E+4	92,66	92,66	90,00	1.050
3	B2	2,029E+8	3,943E+8	1,020E+4	91,17	91,17	90,00	1.050
4	D1ts	2,029E+8	3,943E+8	1,020E+4	15,76	,47	74,24	1.050
5	D1ks	2,029E+8	3,943E+8	1,270E+4	15,76	,01	90,00	1.050
6	D1ke	2,029E+8	3,943E+8	1,270E+4	,01	,01	90,00	0
7	D1te	2,029E+8	3,943E+8	1,270E+4	,00	,00	90,00	0
8	B3	2,029E+8	3,943E+8	1,270E+4	71,29	71,29	90,00	1.050
9	B4	2,029E+8	3,942E+8	1,270E+4	90,50	90,67	132,28	1.050
10	B4b	2,029E+8	3,942E+8	1,170E+4	43,65	,00	88,63	1.050
11	D2ts	2,029E+8	3,942E+8	1,200E+4	,14	,00	88,49	0
12	D2ks	2,029E+8	3,942E+8	1,230E+4	20,73	,00	109,22	1.050
13	D2ke	2,029E+8	3,942E+8	1,070E+4	19,22	,01	90,00	1.050
14	D2te	2,029E+8	3,942E+8	1,070E+4	,00	,00	90,00	0
15	B5	2,030E+8	3,942E+8	1,070E+4	16,43	15,99	93,81	1.050
16	Z1	2,030E+8	3,942E+8	9,700E+3	3,81	,00	90,00	1.050
17	Z2	2,030E+8	3,942E+8	9,700E+3	3,38	,00	86,62	1.050
18	B6	2,030E+8	3,942E+8	1,000E+4	30,10	30,00	89,30	1.050
19	D3zs	2,031E+8	3,942E+8	1,075E+4	,06	,00	89,36	0
20	D3ts	2,031E+8	3,942E+8	1,100E+4	4,73	,00	84,63	0
21	D3ks	2,031E+8	3,942E+8	1,190E+4	1,34	,00	83,29	0
22	B7	2,031E+8	3,942E+8	1,280E+4	84,79	84,76	90,00	1.050
23	Eind	2,031E+8	3,942E+8	1,280E+4				

Identification names

Ple4Win [96612737]: 'BC3Lafk' [3-9-2018;occ.:16]

	Identification name	Node number	X-coordinate	x_pipeline axis	x_projected pipe axis
			mm	mm	mm
1	Start	1	2,029E+8	0	0
2	B1s	12	2,029E+8	1,204E+3	1,204E+3
3	B1	20	2,029E+8	2,003E+3	2,330E+3
4	B1e	29	2,029E+8	2,901E+3	3,539E+3
5	B2s	29	2,029E+8	2,901E+3	3,539E+3
6	B2	37	2,029E+8	3,687E+3	4,633E+3
7	B2e	46	2,029E+8	4,572E+3	5,810E+3
8	D1tss	155	2,029E+8	3,308E+4	3,432E+4
9	D1ts	156	2,029E+8	3,318E+4	3,442E+4
10	D1tse	158	2,029E+8	3,337E+4	3,461E+4
11	D1kss	202	2,029E+8	4,229E+4	4,319E+4
12	D1ks	203	2,029E+8	4,238E+4	4,328E+4
13	D1kse	205	2,029E+8	4,257E+4	4,347E+4
14	D1ke	226	2,029E+8	4,481E+4	4,571E+4
15	D1te	275	2,029E+8	5,539E+4	5,628E+4
16	B3s	324	2,029E+8	6,576E+4	6,666E+4
17	B3	331	2,029E+8	6,637E+4	6,740E+4
18	B3e	339	2,029E+8	6,707E+4	6,822E+4
19	B4s	551	2,029E+8	1,265E+5	1,277E+5
20	B4	559	2,029E+8	1,273E+5	1,287E+5
21	B4e	568	2,029E+8	1,282E+5	1,296E+5
22	B4bs	568	2,029E+8	1,282E+5	1,296E+5
23	B4b	572	2,029E+8	1,285E+5	1,298E+5
24	B4be	577	2,029E+8	1,290E+5	1,303E+5
25	D2ts	632	2,029E+8	1,411E+5	1,424E+5
26	D2kss	684	2,029E+8	1,523E+5	1,536E+5
27	D2ks	686	2,029E+8	1,525E+5	1,538E+5
28	D2kse	689	2,029E+8	1,527E+5	1,540E+5
29	D2kes	720	2,029E+8	1,572E+5	1,583E+5
30	D2ke	722	2,029E+8	1,573E+5	1,584E+5
31	D2kee	725	2,029E+8	1,575E+5	1,586E+5
32	D2te	754	2,029E+8	1,617E+5	1,628E+5
33	B5s	1122	2,030E+8	2,677E+5	2,688E+5
34	B5	1124	2,030E+8	2,678E+5	2,689E+5
35	B5e	1127	2,030E+8	2,680E+5	2,691E+5
36	Z1	1193	2,030E+8	2,829E+5	2,839E+5
37	Z1e	1194	2,030E+8	2,829E+5	2,840E+5
38	Z2	1263	2,030E+8	2,987E+5	2,998E+5
39	Z2e	1264	2,030E+8	2,988E+5	2,999E+5

**Identification names**

Ple4Win [96612737]: 'BC3Lafk' [3-9-2018;occ.:16]

	Identification name	Node number	X-coordinate	x_pipeline axis	x_projected pipe axis
			mm	mm	mm
40	B6s	1296	2,030E+8	3,036E+5	3,046E+5
41	B6	1299	2,030E+8	3,038E+5	3,049E+5
42	B6e	1303	2,030E+8	3,041E+5	3,052E+5
43	D3zs	1522	2,031E+8	3,655E+5	3,665E+5
44	D3ts	1611	2,031E+8	3,880E+5	3,890E+5
45	D3ks	1657	2,031E+8	3,976E+5	3,986E+5
46	B7s	1694	2,031E+8	4,043E+5	4,053E+5
47	B7	1702	2,031E+8	4,051E+5	4,063E+5
48	B7e	1711	2,031E+8	4,059E+5	4,073E+5
49	Eind	1742	2,031E+8	4,109E+5	4,123E+5

**Soil layers**

Ple4Win [96612737]: 'BC3Lafk' [14-5-2018;occ.:4]

	Layer name	Laye	Laye	(Mea	Volu	Angl	Angl	Drai	Undr	Pac	Shrin	Shrin	Shrin	Shea	Ulti	Youn	De
				N/m	N/m	°	°	N/m	N/m		N/m			N/m	mm	N/m	
1	Clay; clean; moderate	Clay		1...E-	1...E-	17,5	11,7	,005	,05	,3	,6	,175	,088	,72	5	2,1	
2	Sand; clean; moderate	Sand	Clea	1...E-	2...E-	32,5	20,0	0		,3	2,4	,075	,020	16,...	4	45,0	

**Soil profiles**

Ple4Win [96612737]: 'BC3Lafk' [14-5-2018;occ.:4]

	Profile name	Fixed top	Top of profile	Description
			mm	
1	Dijk	No		
2	Sleuf	No		

**Soil profile layers**

Ple4Win [96612737]: 'BC3Lafk' [14-5-2018;occ.:4]

	Profile name	Layer name	Layer height
			mm
1	Dijk	Clay; clean; moderate	1.300
2	Dijk	Sand; clean; moderate	3.000
3	Sleuf	Sand; clean; moderate	4.300

**Soil profile locations**

Ple4Win [96612737]: 'BC3Lafk' [14-5-2018;occ.:4]

	Ident	Profile na	Profile na	Top soil lo	Top soil lo	Installation method 1	Installation method 2	Deformation spe	Deformation spe
1	Start	Sleuf	Sleuf	Neutral	Neutral	TrenchUnCompressed	TrenchUnCompressed	Slow	Slow
2	B1	Sleuf	Sleuf	Neutral	Neutral	TrenchUnCompressed	TrenchUnCompressed	Slow	Slow
3	B2	Sleuf	Sleuf	Neutral	Neutral	TrenchUnCompressed	TrenchUnCompressed	Slow	Slow
4	D1ts	Sleuf	Sleuf	Neutral	Neutral	TrenchUnCompressed	TrenchUnCompressed	Slow	Slow
5	D1ks	Sleuf	Sleuf	Neutral	Neutral	TrenchUnCompressed	TrenchUnCompressed	Slow	Slow
6	D1ke	Sleuf	Sleuf	Neutral	Neutral	TrenchUnCompressed	TrenchUnCompressed	Slow	Slow
7	D1te	Sleuf	Sleuf	Neutral	Neutral	TrenchUnCompressed	TrenchUnCompressed	Slow	Slow
8	B3	Sleuf	Sleuf	Neutral	Neutral	TrenchUnCompressed	TrenchUnCompressed	Slow	Slow
9	B4	Sleuf	Sleuf	Neutral	Neutral	TrenchUnCompressed	TrenchUnCompressed	Slow	Slow
10	B4b	Sleuf	Sleuf	Neutral	Neutral	TrenchUnCompressed	TrenchUnCompressed	Slow	Slow
11	D2ts	Sleuf	Dijk	Neutral	Neutral	TrenchUnCompressed	TrenchUnCompressed	Slow	Slow
12	D2ks	Dijk	Dijk	Neutral	Neutral	TrenchUnCompressed	TrenchUnCompressed	Slow	Slow
13	D2ke	Dijk	Dijk	Neutral	Neutral	TrenchUnCompressed	TrenchUnCompressed	Slow	Slow
14	D2te	Dijk	Sleuf	Neutral	Neutral	TrenchUnCompressed	TrenchUnCompressed	Slow	Slow
15	B5	Sleuf	Sleuf	Neutral	Neutral	TrenchUnCompressed	TrenchUnCompressed	Slow	Slow
16	Z1	Sleuf	Sleuf	Neutral	Neutral	TrenchUnCompressed	TrenchUnCompressed	Slow	Slow
17	Z1e	Sleuf	Sleuf	Neutral	Neutral	TrenchUnCompressed	TrenchUnCompressed	Slow	Slow
18	Z2	Sleuf	Sleuf	Neutral	Neutral	TrenchUnCompressed	TrenchUnCompressed	Slow	Slow
19	Z2e	Sleuf	Sleuf	Neutral	Neutral	TrenchUnCompressed	TrenchUnCompressed	Slow	Slow
20	B6	Sleuf	Sleuf	Neutral	Neutral	TrenchUnCompressed	TrenchUnCompressed	Slow	Slow
21	D3zs	Sleuf	Dijk	Neutral	Neutral	TrenchUnCompressed	TrenchUnCompressed	Slow	Slow
22	D3ts	Dijk	Dijk	Neutral	Neutral	TrenchUnCompressed	TrenchUnCompressed	Slow	Slow
23	D3ks	Dijk	Dijk	Neutral	Neutral	TrenchUnCompressed	TrenchUnCompressed	Slow	Slow
24	B7	Dijk	Dijk	Neutral	Neutral	TrenchUnCompressed	TrenchUnCompressed	Slow	Slow
25	Eind	Dijk	Dijk	Neutral	Neutral	TrenchUnCompressed	TrenchUnCompressed	Slow	Slow

### General soil settings

Ple4Win [96612737]: 'BC3Lafk' [14-5-2018;occ.:4]

Property	Value
1 Volume weight of water (Default: 9,81E-06 N/mm³)	0.00000981
2 Half band width (h.b.w.) accuracy percentage (Default: 5%)	5
3 Pipeline operational temperature	Cold
4 State of soil compression	Well packed
5 Calculation methodology	Use updated NEN3650-1:2012

### Warnings

Ple4Win [96612737]: 'BC3Lafk' [occ.:0]

	Program session	Function mnemonic	Identification name	Message
1	40	FUNCT200	W200/4	Zero bend angle with radius
2	40	FUNCT310	W310/1	Small diameter/wallthickness ratio
3	40	SOIL-WIZ	W320/7	Wizard generated data may be out-of-date
4	40	FUNCT320	W320/1	Large klh/(klt,kls) ratio
5	47	FUNCT500	W500/2	Iteration criterion not satisfied
6	47	FUNCT500	W500/24	Elem-l/adv-l 4.00, 709 (1 - 1731)
7	47	FUNCT610	W610/18	Addcross stop at iter.101 diseq .16552e-4

### Program status summary

Ple4Win [96612737]: 'BC3Lafk' [occ.:0]

Property	Value
Program	Ple4Win
Version	V4.4.2.17072
License	96612737 [CmDongle 2-1601491]
Modules included	KSAGNLFERCYQOJUZX0X1
Project name	
Project location & filename	F:\Projecten\TE16353 - Wanssum\Lafk\BC3Lafk
Project description	
Analysis type	General
Project phase	Initial
Project parent	- - -
Secondary project	- - -
Units	Millimeter, Newton, Second
Separators	Thousands: '.'Decimal: ','
Bend angle	Limited
Geometry model	Non-linear
Section model	Ovalising
Material model	Linear
Soil ring-stiffening	Ignored
Soil model	Standard
Ovalisation redistribution	Allowed
Loading redistribution	Applied
Warning table	7 items (warnings and messages)
2 Pipeline Configuration (occurrence 16)	Pipeline origin (status 'Locked Data', occurrence 6, last modified 14-5-2018 00:00:00)
	Pipeline polygon points (status 'Locked Data', occurrence 32, last modified 14-5-2018 00:00:00)
	Ground level (status 'Locked Data', occurrence 9, last modified 14-5-2018 00:00:00)
	(Ground) water level (status 'Locked Data', occurrence 9, last modified 14-5-2018 00:00:00)
	Polygon point data (status 'Locked Data', occurrence 16, last modified 14-5-2018 00:00:00)
	Bend location data (status 'Locked Data', occurrence 16, last modified 14-5-2018 00:00:00)
	Polygon subdivision data (status 'Locked Data', occurrence 16, last modified 14-5-2018 00:00:00)
	Nodes (status 'Locked Data', occurrence 16, last modified 14-5-2018 00:00:00)
	Elements of pipeline (status 'Locked Data', occurrence 16, last modified 14-5-2018 00:00:00)
	Vertical profile data (status 'Locked Data', occurrence 16, last modified 14-5-2018 00:00:00)
	Identification names (status 'Locked Data', occurrence 16, last modified 14-5-2018 00:00:00)
	Element/node groups (status 'Locked Data', occurrence 16, last modified 14-5-2018 00:00:00)
3,1 Pipe Data (occurrence 6)	Material location (status 'Locked Data', occurrence 3, last modified 14-5-2018 00:00:00)
	Isotropic materials (status 'Locked Data', occurrence 2, last modified 14-5-2018 00:00:00)
	Outer diameter (status 'Locked Data', occurrence 2, last modified 14-5-2018 00:00:00)
	Wall thicknesses (status 'Locked Data', occurrence 2, last modified 14-5-2018 00:00:00)
	Deadweight (status 'Locked Data', occurrence 2, last modified 14-5-2018 00:00:00)
	Pipe material data (status 'Locked Data', occurrence 6, last modified 14-5-2018 00:00:00)
	Pipe dimension data (status 'Locked Data', occurrence 6, last modified 14-5-2018 00:00:00)
3,2 Soil Data (occurrence 7)	Horizontal soil stiffness (status 'Locked Data', occurrence 4, last modified 14-5-2018 00:00:00)
	Downward vertical soil stiffness (status 'Locked Data', occurrence 4, last modified 14-5-2018 00:00:00)

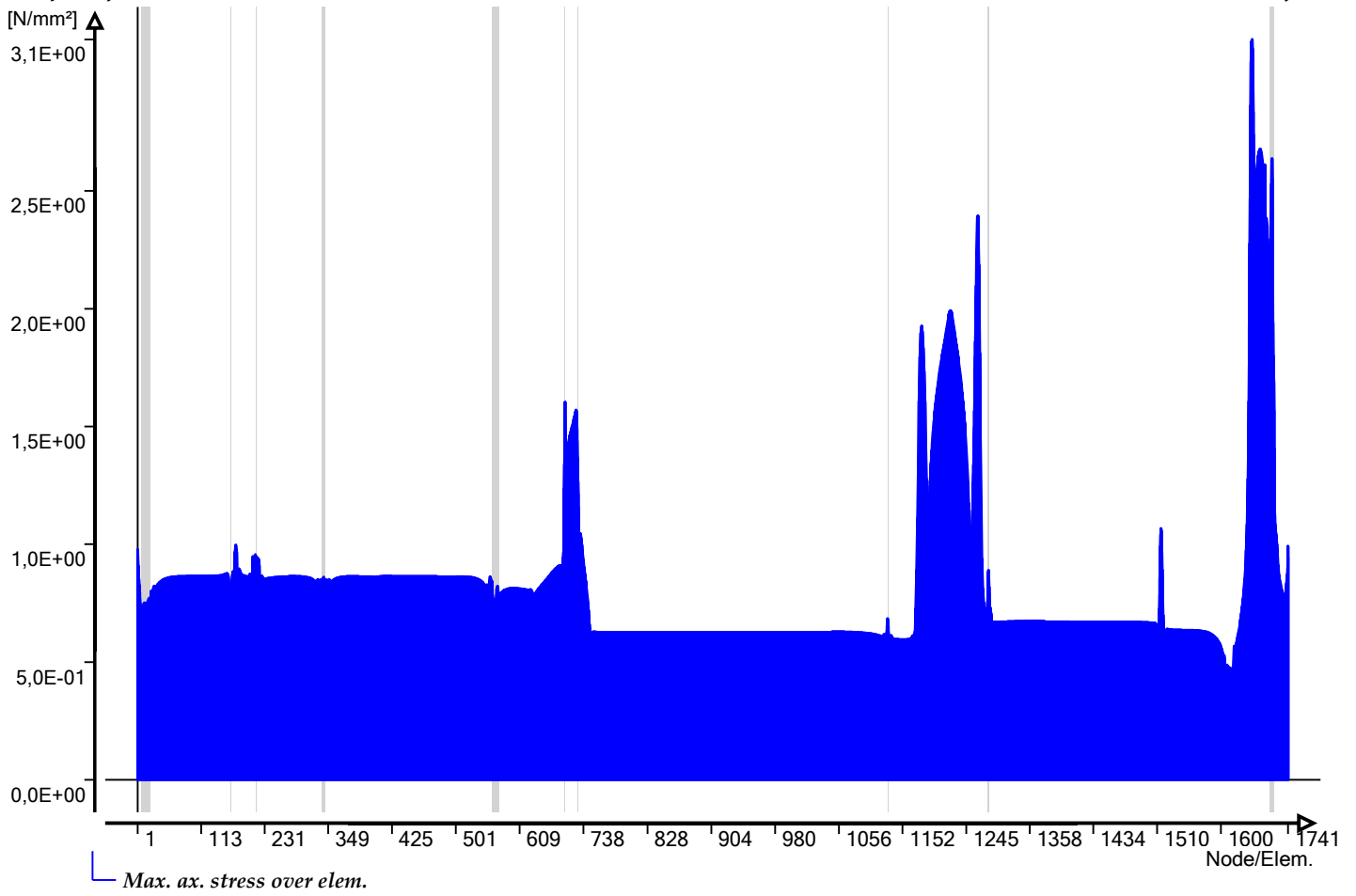
Property	Value
	Upward vertical soil stiffness (status 'Locked Data', occurrence 4, last m
	Pipe-soil friction (status 'Locked Data', occurrence 4, last modified 14-5-
	Displacement at max. soil friction (status 'Locked Data', occurrence 4, la
	Sub-soil bearing capacity (status 'Locked Data', occurrence 4, last modi
	Ultimate top-soil reaction (status 'Locked Data', occurrence 4, last modif
	Ultimate hor. soil reaction (status 'Locked Data', occurrence 4, last modi
	Uncertainty factors (status 'Locked Data', occurrence 5, last modified 14
	Lateral soil mechanical data (status 'Locked Data', occurrence 7, last m
	Pipe-soil friction data (status 'Locked Data', occurrence 7, last modified
	Soil layers (status 'Locked Data', occurrence 4, last modified 14-5-2018
	Soil profiles (status 'Locked Data', occurrence 4, last modified 14-5-201
	Soil profile layers (status 'Locked Data', occurrence 4, last modified 14-
	Soil profile locations (status 'Locked Data', occurrence 4, last modified 1
	General soil settings (status 'Locked Data', occurrence 4, last modified
3,3 Model Boundary (occurrence 4)	Start/end nodes boundary conditions (status 'Locked Data', occurrence
	Conditions along pipe axis (status 'Locked Data', occurrence 4, last mod
4,2 Pipeline Loading (occurrence 13)	Internal overpressure (status 'Locked Data', occurrence 3, last modified
	Temperature differences (status 'Locked Data', occurrence 2, last modifi
	Soil displacement in Z-direction (status 'Locked Data', occurrence 6, las
	Vertical soil subsidence (status 'Locked Data', occurrence 2, last modifi
	Specified pipeline loads (status 'Locked Data', occurrence 13, last modif
5 Pipeline Behaviour (occurrence 13)	Loading combinations (status 'Locked Data', occurrence 6, last modified
	Non-linear elastic soil iteration control (status 'Locked Data', occurrence
	Geometrically non-linear iteration control (status 'Locked Data', occure
	Displacements (status 'Locked Data', occurrence 13, last modified 3-9-2
	Overall internal forces (status 'Locked Data', occurrence 13, last modifie
	Overall soil reaction forces (status 'Locked Data', occurrence 13, last m
	Overall external support reaction forces (status 'Locked Data', occuren
	Bend stiffness reduction & stress intensification (status 'Locked Data',
	Global node coordinates of displaced pipeline (status 'Locked Data', oc
	Primary cross-sectional deformations (status 'Locked Data', occurrence
	Iteration data (status 'Locked Data', occurrence 13, last modified 3-9-20
	Iteration check list (status 'Locked Data', occurrence 13, last modified 3-
	Specified loads active on elements (status 'Locked Data', occurrence 13
	Applied settlement loads (status 'Locked Data', occurrence 13, last mod
6,1 Cross-Section Data (occurrence 12)	Neutral or real top-soil load (status 'Locked Data', occurrence 4, last mo
	Extra loads on top-soil (status 'Locked Data', occurrence 1, last modifie
	Horizontal soil support / Vertical soil load (status 'Locked Data', occure
	Soil support angle functions (status 'Locked Data', occurrence 1, last m
	Cross-sectional data (status 'Locked Data', occurrence 12, last modified
	Additional cross-sectional loads (status 'Locked Data', occurrence 12, la
	Additional support forces (status 'Locked Data', occurrence 12, last mod
	Resulting pipeline spans (status 'Locked Data', occurrence 12, last modi
	Deformation redistribution (soil loads ) (status 'Locked Data', occurenc
	Deformation redistribution (soil loads w. toloads) (status 'Locked Data'
	Deformation redistribution (bend ovalisation) (status 'Locked Data', occ
6,2 Cross-Section Behaviour {General, Material Linear} (occurrence 11)	Cross-sections to be calculated (status 'Locked Data', occurrence 1, last
	Weighing factors stress components (status 'Locked Data', occurrence
	General cross-sectional data (status 'Locked Data', occurrence 11, last
	Cross-sectional loading data (status 'Locked Data', occurrence 11, last
	Weighing multiplication factors (status 'Locked Data', occurrence 11, las
	Maximum radial deformations (status 'Locked Data', occurrence 11, last
	Maximum check stresses (status 'Locked Data', occurrence 11, last mo
	Maximum stresses in straight pipe sections (status 'Locked Data', occu
	Maximum stresses in bends (status 'Locked Data', occurrence 11, last
	Maximum stresses (lateral loadings) (status 'Locked Data', occurrence
	Maximum total stresses (status 'Locked Data', occurrence 11, last modif
	Maximum principal stresses (status 'Locked Data', occurrence 11, last
	Detailed radial deformations (status 'Locked Data', occurrence 11, last
	Detailed check stresses (status 'Locked Data', occurrence 11, last modif
	Detailed stresses in straight pipe sections (status 'Locked Data', occure
	Detailed stresses in bends (status 'Locked Data', occurrence 11, last m
	Detailed stresses (lateral loadings) (status 'Locked Data', occurrence 11
	Detailed total stresses (status 'Locked Data', occurrence 11, last modifi
	Detailed principal stresses (status 'Locked Data', occurrence 11, last m

Maximum check stresses (loadcase lafk weighing factors used redistrib... Ple4Win [96612737]: 'BC3Lafk' [3-9-2018;occ.:11]

	Ele...	Max. principal str...	Max. principal str...	Max. Tresca shear...	Max. Von Mises...	Max. ax. stress over...	Max. circ....	Max. hoop...
		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>	N/mm <sup>2</sup>	N/mm <sup>2</sup>
711	711	2,1858	-2,77954	1,3898	2,5966	1,5699	-2,77954	
1193	1193	1,2206	-,06176	,6287	1,2319	1,2206	-,05558	
1194	1194	1,2479	-,05927	,6428	1,2578	1,2479	-,05839	
1627	1627	,4693	-,36165	,2999	,5206	,4693	-,36165	
1660	1660	3,1419	-1,82277	1,8502	3,2048	3,1419	-1,82277	
1661	1661	3,1044	-2,26289	1,8957	3,3040	3,1044	-2,26289	
1662	1662	3,0265	-2,50846	1,8931	3,3362	3,0265	-2,50846	

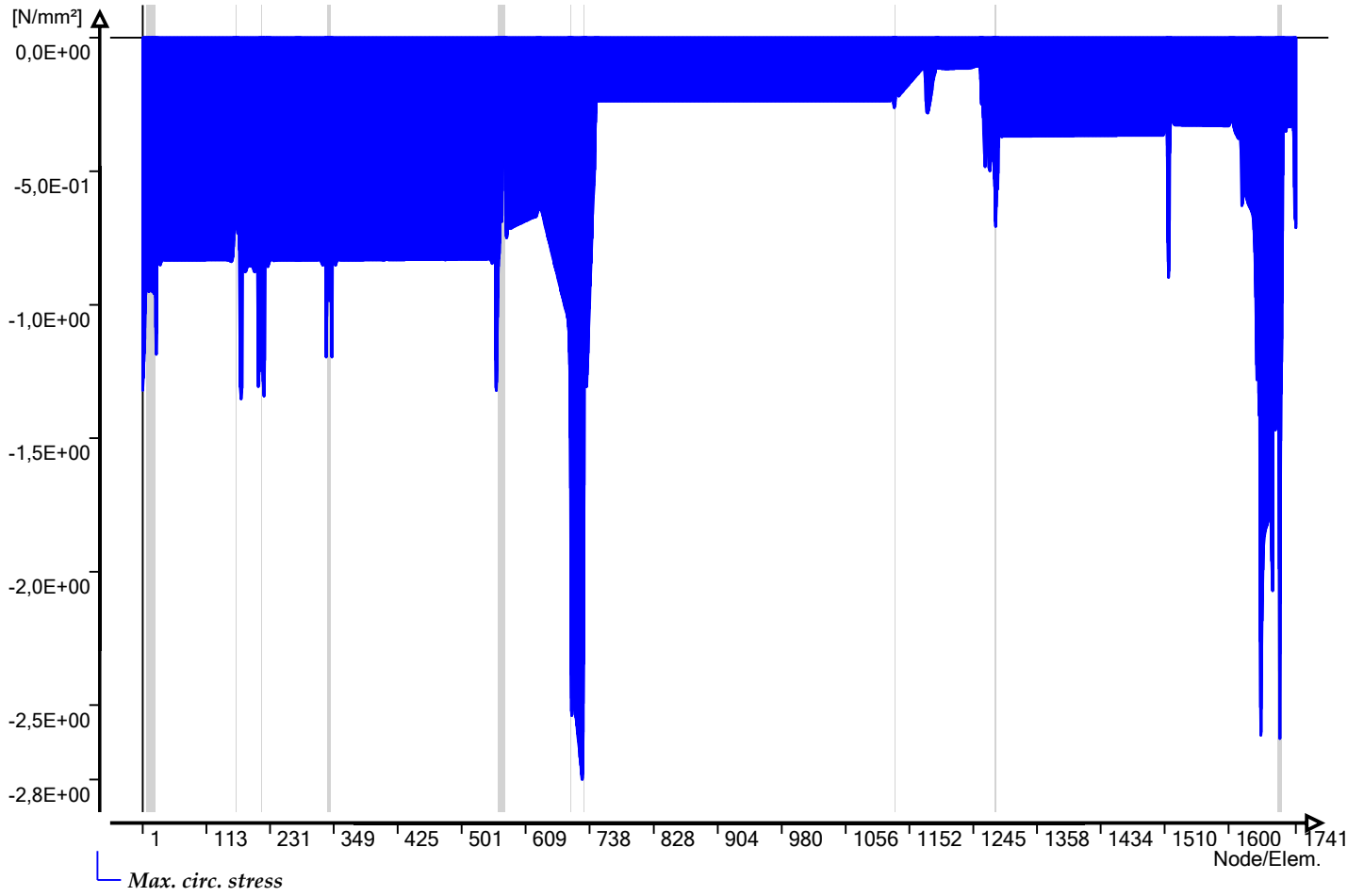
Graphs of table 'Maximum check stresses'

Ple4Win [96612737]: 'BC3Lafk'



Graphs of table 'Maximum check stresses'

Ple4Win [96612737]: 'BC3Lafk'

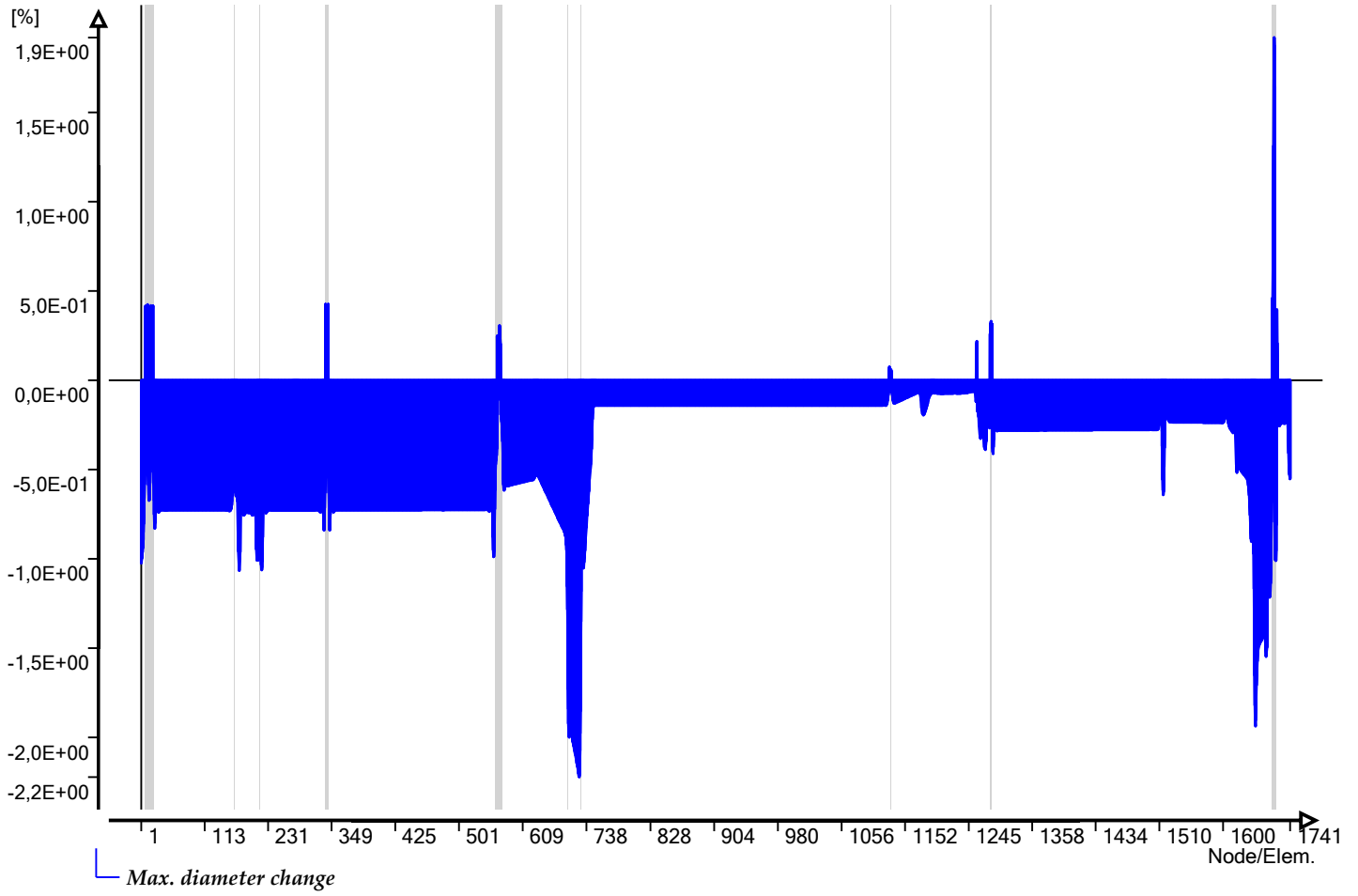


	Eleme...	Max. radial deform. due to...	Radial bend def...	Max. diameter ch...	Max. total radial def...	Elast. soil impres...	Max. hor. soil su...
		mm	mm	%	mm	mm	N/mm <sup>3</sup>
711	711	-3,73294	-2,487E-03	-2,22	-3,73047		
1701	1701	1,61348	-1,529E+00	1,92	3,03340		
1703	1703	-1,58293	1,283E+00	1,64	2,64935		



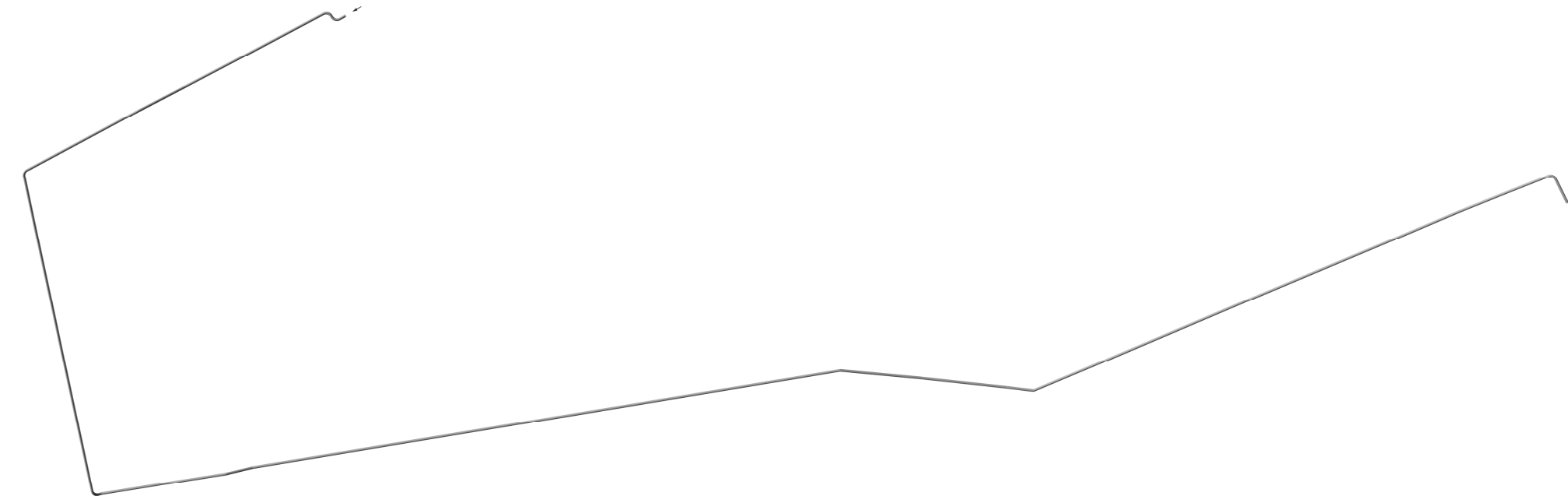
Graphs of table 'Maximum radial deformations'

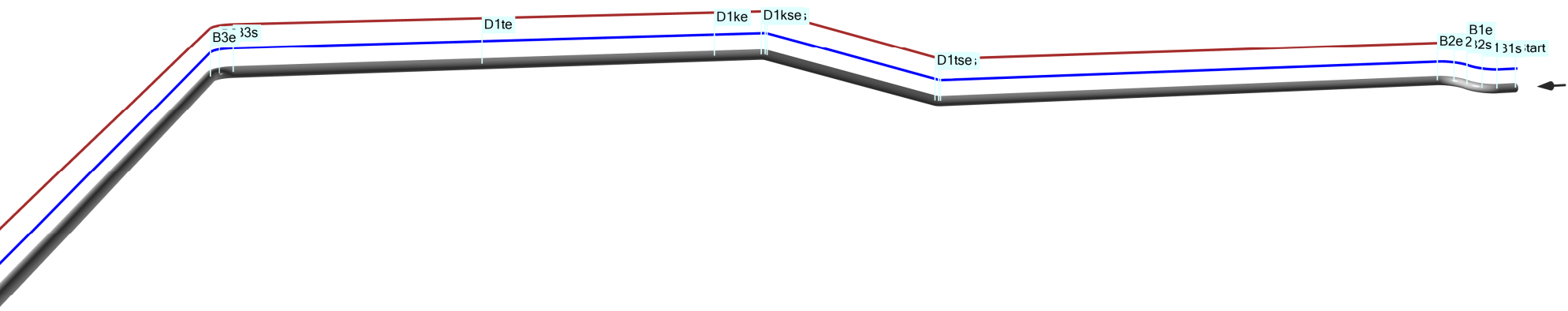
Ple4Win [96612737]: 'BC3Lafk'

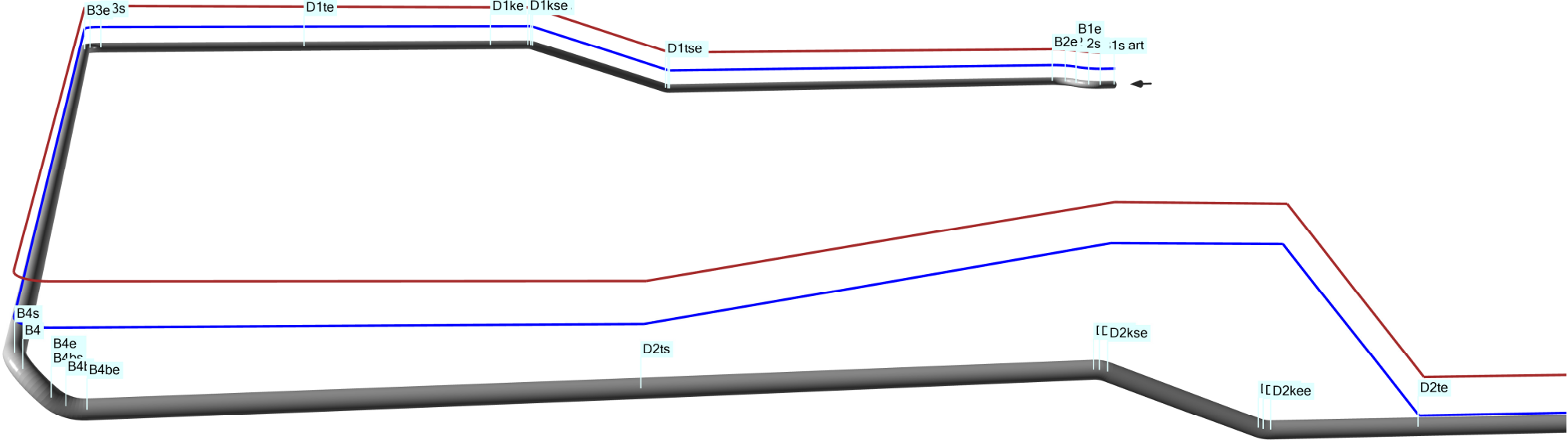


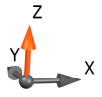
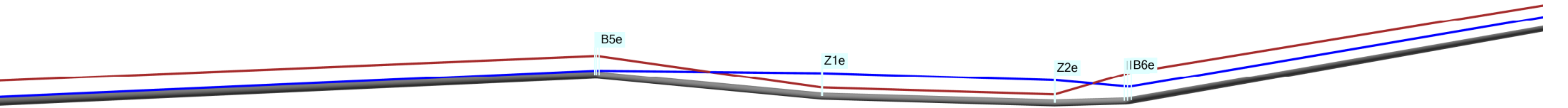


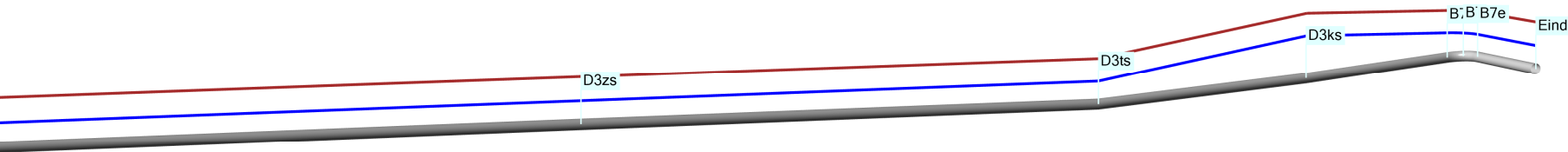
## **Bijlage 4.4: Resultaten PLE berekening BC Lopw**











**Pipeline origin**

Ple4Win [96612737]: 'BC3Lopw' [14-5-2018;occ.:6]

	Identification name	X-coordinate	Y-coordinate	Z-coordinate	Start node	Start ax.-coordinate	Start proj.-coordinate
		mm	mm	mm		mm	mm
1	Start	202915198	394270357	10200	1	0	0

**Pipeline polygon points (absolute)**

Ple4Win [96612737]: 'BC3Lopw' [14-5-2018;occ.:32]

	Identification na	X-coordinate	Y-coordinate	Z-coordin	Bend ra	Element type	Max. bend elem. le	Pipe elem. len	Extension eleme
		mm	mm	mm	mm		mm	mm	
1	B1	202913050	394269524	10200	1050	Odd Elements	100	300	10
2	B2	202912360	394271582	10200	1050	Odd Elements	100	300	10
3	D1ts	202884374	394261557	10200	1050	Odd Elements	100	300	10
4	D1ks	202876058	394258501	12700	1050	Odd Elements	100	300	10
5	D1ke	202873820	394257679	12700	1050	Odd Elements	100	300	10
6	D1te	202863895	394254032	12700	1050	Odd Elements	100	300	10
7	B3	202853453	394250195	12700	1050	Odd Elements	100	300	10
8	B4	202855020	394188968	12700	1050	Odd Elements	100	300	10
9	B4b	202856119	394189009	11700	1050	Odd Elements	100	300	10
10	D2ts	202868643	394189477	12000	1050	Odd Elements	100	300	10
11	D2ks	202880042	394189902	12300	1050	Odd Elements	100	300	10
12	D2ke	202884628	394190073	10700	1050	Odd Elements	100	300	10
13	D2te	202888988	394190236	10700	0		100	300	10
14	B5	202995040	394194196	10700	1050	Odd Elements	100	300	10
15	Z1	203009628	394190598	9700	1050	Odd Elements	100	300	10
16	Z2	203025039	394186796	9700	1050	Odd Elements	100	300	10
17	B6	203029967	394185580	10000	1050	Odd Elements	100	300	10
18	D3zs	203089179	394202718	10750	0		100	300	10
19	D3ts	203110791	394208973	11000	0		100	300	10
20	D3ks	203119992	394211636	11900	0		100	300	10
21	B7	203127343	394213763	12800	1050	Odd Elements	100	300	10
22	Eind	203129500	394208253	12800	0		100	300	10

**Ground level**

Ple4Win [96612737]: 'BC3Lopw' [14-5-2018;occ.:9]

	Identifier	Ground level 1	Uncer. value 1	Ground level 2	Uncer. value 2
		mm	mm	mm	mm
1	Start	12200	10		
2	B1	12200	10		
3	B2	12200	10		
4	D1ts	12200	10		
5	D1ks	14700	10		
6	D1ke	14700	10		
7	D1te	14700	10		
8	B3	14700	10		
9	B4	14500	10		
10	D2ts	14500	10		
11	D2ks	16400	10		
12	D2ke	16400	10		
13	D2te	12000	10		
14	B5	12000	10		
15	Z1	10300	10		
16	Z2	10300	10		
17	B6	12000	10		
18	D3ts	13000	10		
19	D3ks	14800	10		
20	B7	14800	10		
21	Eind	14800	10		

**(Ground) water level**

Ple4Win [96612737]: 'BC3Lopw' [14-5-2018;occ.:9]

	Identifier	Z-coord. water level 1	Uncer. value 1	Z-coord. water level 2	Uncer. value 2
		mm	mm	mm	mm
1	Start	11200	10		
2	B1	11200	10		
3	B2	11200	10		
4	D1ts	11200	10		
5	D1ks	13700	10		
6	D1ke	13700	10		
7	D1te	13700	10		
8	B3	13700	10		



**(Ground) water level**

Ple4Win [96612737]: 'BC3Lopw' [14-5-2018;occ.:9]

	Identifier	Z-coord. water level 1	Uncer. value 1	Z-coord. water level 2	Uncer. value 2
		mm	mm	mm	mm
9	B4	13500	10		
10	D2ts	13500	10		
11	D2ks	15400	10		
12	D2ke	15400	10		
13	D2te	11000	10		
14	B5	11000	10		
15	Z1	11300	10		
16	Z2	11300	10		
17	B6	11000	10		
18	D3ts	12000	10		
19	D3ks	13800	10		
20	B7	13800	10		
21	Eind	13800	10		

**Material location**

Ple4Win [96612737]: 'BC3Lopw' [14-5-2018;occ.:3]

	Identifier	Material reference
1	Start	PE100I

**Isotropic materials**

Ple4Win [96612737]: 'BC3Lopw' [14-5-2018;occ.:2]

	Material reference	Young's modulus	Shear modulus	Poisson's ratio	Coeff. thermal expansion	Yield stress	Yield stress at $\theta$ °C
		N/mm <sup>2</sup>	N/mm <sup>2</sup>		1/°C	N/mm <sup>2</sup>	N/mm <sup>2</sup>
1	PE100I	350		0,4	0,00016	10	
2	PE100k	975		0,4	0,00016	10	

**Outer diameter**

Ple4Win [96612737]: 'BC3Lopw' [14-5-2018;occ.:2]

	Identifier	Outer pipe diameter 1	Outer pipe diameter 2
		mm	mm
1	Start	315	

**Wall thicknesses**

Ple4Win [96612737]: 'BC3Lopw' [14-5-2018;occ.:2]

	Identif	Nom. wall thicknes	Corrosion allow	Manufact. tol	Abs. toleranc	Nom. wall thicknes	Corrosion allow	Manufact. tol	Abs. toleranc
		mm	mm	%	mm	mm	mm	%	mm
1	Start	28,6							

**Deadweight**

Ple4Win [96612737]: 'BC3Lopw' [14-5-2018;occ.:2]

	Identifier	Deadweight 1	Deadweight 2	Buoyancy ind.
		N/mm	N/mm	
1	Start	-3,59	0,74	Yes

**Horizontal soil stiffness**

Ple4Win [96612737]: 'BC3Lopw' [14-5-2018;occ.:4]

	Identifier	Hor. soil stiffness 1	Hor. soil stiffness 2	Dividing factor	Multiplication factor	Half band width accuracy
		N/mm <sup>3</sup>	N/mm <sup>3</sup>			%
1	Start	0,029663	0,029663		1,7	5
2	B1	0,029663	0,029663		1,7	5
3	B2	0,029663	0,029663		1,7	5
4	D1ts	0,029596	0,029596		1,7	5
5	D1ks	0,029962	0,029962		1,7	5
6	D1ke	0,029663	0,029663		1,7	5
7	D1te	0,029663	0,029663		1,7	5
8	B3	0,029663	0,029663		1,7	5
9	B4	0,02943	0,02943		1,7	5
10	B4b	0,042126	0,042126		1,7	5
11	D2ts	0,038324	0,025698		1,7	5
12	D2ks	0,053823	0,053823		1,7	5
13	D2ke	0,087542	0,087542		1,7	5
14	D2te	0,010132	0,018776		1,7	5
15	B5	0,018804	0,018804		1,7	5
16	Z1	0,0040441	0,0040441		1,7	5
17	Z1e	0,0040616	0,0040616		1,7	5
18	Z2	0,0040616	0,0040616		1,7	5

### Horizontal soil stiffness

Ple4Win [96612737]: 'BC3Lopw' [14-5-2018;occ.:4]

	Identifier	Hor. soil stiffness 1	Hor. soil stiffness 2	Dividing factor	Multiplication factor	Half band width accuracy
		N/mm <sup>3</sup>	N/mm <sup>3</sup>			%
19	Z2e	0,0042266	0,0042266		1,7	5
20	B6	0,029746	0,029746		1,7	5
21	D3zs	0,029376	0,018324		1,7	5
22	D3ts	0,018555	0,018555		1,7	5
23	D3ks	0,031992	0,031992		1,7	5
24	B7	0,01904	0,01904		1,7	5
25	Eind	0,018555	0,018555		1,7	5

### Downward vertical soil stiffness

Ple4Win [96612737]: 'BC3Lopw' [14-5-2018;occ.:4]

	Identifier	vert. soil stiffness 1 (down)	vert. soil stiffness 2 (down)	Dividing factor	Multiplication factor	Half band width accuracy
		N/mm <sup>3</sup>	N/mm <sup>3</sup>			%
1	Start	0,023018	0,023018		2	5
2	B1	0,023018	0,023018		2	5
3	B2	0,023018	0,023018		2	5
4	D1ts	0,022958	0,022958		2	5
5	D1ks	0,023292	0,023292		2	5
6	D1ke	0,023018	0,023018		2	5
7	D1te	0,023018	0,023018		2	5
8	B3	0,023018	0,023018		2	5
9	B4	0,022807	0,022807		2	5
10	B4b	0,034953	0,034953		2	5
11	D2ts	0,031196	0,027983		2	5
12	D2ks	0,061178	0,061178		2	5
13	D2ke	0,10597	0,10597		2	5
14	D2te	0,011736	0,013596		2	5
15	B5	0,01362	0,01362		2	5
16	Z1	0,0014596	0,0014596		2	5
17	Z1e	0,0014684	0,0014684		2	5
18	Z2	0,0014684	0,0014684		2	5
19	Z2e	0,0015521	0,0015521		2	5
20	B6	0,023094	0,023094		2	5
21	D3zs	0,022757	0,020005		2	5
22	D3ts	0,020251	0,020251		2	5
23	D3ks	0,035035	0,035035		2	5
24	B7	0,020768	0,020768		2	5
25	Eind	0,020251	0,020251		2	5

### Upward vertical soil stiffness

Ple4Win [96612737]: 'BC3Lopw' [14-5-2018;occ.:4]

	Identifier	vert. soil stiffness 1 (up)	vert. soil stiffness 2 (up)	Dividing factor	Multiplication factor	Half band width accuracy
		N/mm <sup>3</sup>	N/mm <sup>3</sup>			%
1	Start	0,0121	0,0121		1,4	5
2	B1	0,0121	0,0121		1,4	5
3	B2	0,0121	0,0121		1,4	5
4	D1ts	0,012046	0,012046		1,4	5
5	D1ks	0,012348	0,012348		1,4	5
6	D1ke	0,0121	0,0121		1,4	5
7	D1te	0,0121	0,0121		1,4	5
8	B3	0,0121	0,0121		1,4	5
9	B4	0,01191	0,01191		1,4	5
10	B4b	0,024417	0,024417		1,4	5
11	D2ts	0,020222	0,012717		1,4	5
12	D2ks	0,046804	0,046804		1,5522	5
13	D2ke	0,11226	0,11226		1,5114	5
14	D2te	0,0027699	0,0047595		1,846	5
15	B5	0,0047746	0,0047746		1,4	5
16	Z1	0,00028367	0,00028367		1,4	5
17	Z1e	0,00028642	0,00028642		1,4	5
18	Z2	0,00028642	0,00028642		1,4	5
19	Z2e	0,00031302	0,00031302		1,4	5
20	B6	0,012169	0,012169		1,4	5
21	D3zs	0,011865	0,0070981		1,4	5
22	D3ts	0,0072525	0,0072525		1,7013	5
23	D3ks	0,018631	0,018631		1,6126	5
24	B7	0,0075811	0,0075811		1,6963	5
25	Eind	0,0072525	0,0072525		1,7013	5

**Pipe-soil friction**

Ple4Win [96612737]: 'BC3Lopw' [14-5-2018;occ.:4]

	Identif	Soil frictio	Soil frictio	Dividing fact	Multiplication fact	Add. ax. friction factor	Add. ax. friction factor	Half band width accurac
		N/mm <sup>2</sup>	N/mm <sup>2</sup>					%
1	Start	0,00769...	0,00769...		1,375			5
2	B1	0,00769...	0,00769...		1,375			5
3	B2	0,00769...	0,00769...		1,375			5
4	D1ts	0,00768...	0,00768...		1,375			5
5	D1ks	0,00774...	0,00774...		1,375			5
6	D1ke	0,00769...	0,00769...		1,375			5
7	D1te	0,00769...	0,00769...		1,375			5
8	B3	0,00769...	0,00769...		1,375			5
9	B4	0,00765...	0,00765...		1,375			5
10	B4b	0,00963...	0,00963...		1,375			5
11	D2ts	0,00906...	0,00855...		1,375			5
12	D2ks	0,012938	0,012938		1,375			5
13	D2ke	0,017153	0,017153		1,375			5
14	D2te	0,00585...	0,00576...		1,865			5
15	B5	0,00577...	0,00577...		1,375			5
16	Z1	0,00168...	0,00168...		1,375			5
17	Z1e	0,00169...	0,00169...		1,375			5
18	Z2	0,00169...	0,00169...		1,375			5
19	Z2e	0,001743	0,001743		1,375			5
20	B6	0,00770...	0,00770...		1,375			5
21	D3zs	0,00764...	0,00713...		1,375			5
22	D3ts	0,00718...	0,00718...		1,375			5
23	D3ks	0,00964...	0,00964...		1,375			5
24	B7	0,00728...	0,00728...		1,375			5
25	Eind	0,00718...	0,00718...		1,375			5

**Displacement at max. soil friction**

Ple4Win [96612737]: 'BC3Lopw' [14-5-2018;occ.:4]

	Identifier	Soil friction displ. 1	Soil friction displ. 2	Dividing factor	Multiplication factor
		mm	mm		
1	Start	4	4		1,6
2	B1	4	4		1,6
3	B2	4	4		1,6
4	D1ts	4	4		1,6
5	D1ks	4	4		1,6
6	D1ke	4	4		1,6
7	D1te	4	4		1,6
8	B3	4	4		1,6
9	B4	4	4		1,6
10	B4b	4	4		1,6
11	D2ts	4	4		1,6
12	D2ks	4	4		1,6
13	D2ke	4	4		1,6
14	D2te	4,5	4		1,55
15	B5	4	4		1,6
16	Z1	4	4		1,6
17	Z1e	4	4		1,6
18	Z2	4	4		1,6
19	Z2e	4	4		1,6
20	B6	4	4		1,6
21	D3zs	4	4		1,6
22	D3ts	4	4		1,6
23	D3ks	4	4		1,6
24	B7	4	4		1,6
25	Eind	4	4		1,6

**Sub-soil bearing capacity**

Ple4Win [96612737]: 'BC3Lopw' [14-5-2018;occ.:4]

	Identifier	Vert. bearing capacity 1	Vert. bearing capacity 2	Dividing factor	Multiplication factor	Half band width accuracy
		N/mm <sup>2</sup>	N/mm <sup>2</sup>			%
1	Start	0,72532	0,72532		2	5
2	B1	0,72532	0,72532		2	5
3	B2	0,72532	0,72532		2	5
4	D1ts	0,72408	0,72408		2	5
5	D1ks	0,73093	0,73093		2	5
6	D1ke	0,72532	0,72532		2	5
7	D1te	0,72532	0,72532		2	5

**Sub-soil bearing capacity**

Ple4Win [96612737]: 'BC3Lopw' [14-5-2018;occ.:4]

	Identifier	Vert. bearing capacity 1	Vert. bearing capacity 2	Dividing factor	Multiplication factor	Half band width accuracy
		N/mm <sup>2</sup>	N/mm <sup>2</sup>			%
8	B3	0,72532	0,72532		2	5
9	B4	0,72097	0,72097		2	5
10	B4b	0,95246	0,95246		2	5
11	D2ts	0,88433	0,82358		2	5
12	D2ks	1,3735	1,3735		2	5
13	D2ke	1,9722	1,9722		2	5
14	D2te	0,47107	0,51464		2	5
15	B5	0,51522	0,51522		2	5
16	Z1	0,11389	0,11389		2	5
17	Z1e	0,11437	0,11437		2	5
18	Z2	0,11437	0,11437		2	5
19	Z2e	0,11892	0,11892		2	5
20	B6	0,72688	0,72688		2	5
21	D3zs	0,71994	0,66163		2	5
22	D3ts	0,66692	0,66692		2	5
23	D3ks	0,95372	0,95372		2	5
24	B7	0,67797	0,67797		2	5
25	Eind	0,66692	0,66692		2	5

**Ultimate top-soil reaction**

Ple4Win [96612737]: 'BC3Lopw' [14-5-2018;occ.:4]

	Identifier	Passive topsoil reac. 1	Passive topsoil reac. 2	Dividing factor	Multiplication factor	Half band width accuracy
		N/mm <sup>2</sup>	N/mm <sup>2</sup>			%
1	Start	0,073236	0,073236		1,5	5
2	B1	0,073236	0,073236		1,5	5
3	B2	0,073236	0,073236		1,5	5
4	D1ts	0,073022	0,073022		1,5	5
5	D1ks	0,0742	0,0742		1,5	5
6	D1ke	0,073236	0,073236		1,5	5
7	D1te	0,073236	0,073236		1,5	5
8	B3	0,073236	0,073236		1,5	5
9	B4	0,07249	0,07249		1,5	5
10	B4b	0,1159	0,1159		1,5	5
11	D2ts	0,10236	0,096218		1,5	5
12	D2ks	0,22023	0,22023		1,5	5
13	D2ke	0,38912	0,38912		1,5	5
14	D2te	0,037637	0,040618		1,5	5
15	B5	0,040697	0,040697		1,5	5
16	Z1	0,0063718	0,0063718		1,5	5
17	Z1e	0,0064093	0,0064093		1,5	5
18	Z2	0,0064093	0,0064093		1,5	5
19	Z2e	0,0067655	0,0067655		1,5	5
20	B6	0,073503	0,073503		1,5	5
21	D3zs	0,072315	0,067113		1,5	5
22	D3ts	0,068002	0,068002		1,5	5
23	D3ks	0,12228	0,12228		1,5	5
24	B7	0,069871	0,069871		1,5	5
25	Eind	0,068002	0,068002		1,5	5

**Ultimate hor. soil reaction**

Ple4Win [96612737]: 'BC3Lopw' [14-5-2018;occ.:4]

	Identif	Horizontal soil reacti	Horizontal soil reacti	Dividing f	Multiplication f	Add. lat. friction fac	Add. lat. friction fac	Half band width acc
		N/mm <sup>2</sup>	N/mm <sup>2</sup>					%
1	Start	0,28314	0,28314		1,6			5
2	B1	0,28314	0,28314		1,6			5
3	B2	0,28314	0,28314		1,6			5
4	D1ts	0,28251	0,28251		1,6			5
5	D1ks	0,286	0,286		1,6			5
6	D1ke	0,28314	0,28314		1,6			5
7	D1te	0,28314	0,28314		1,6			5
8	B3	0,28314	0,28314		1,6			5
9	B4	0,28093	0,28093		1,6			5
10	B4b	0,40211	0,40211		1,6			5
11	D2ts	0,36582	0,2453		1,6			5
12	D2ks	0,51376	0,51376		1,7218			5
13	D2ke	0,83563	0,83563		1,6891			5
14	D2te	0,096718	0,17922		1,9568			5

### Ultimate hor. soil reaction

Ple4Win [96612737]: 'BC3Lopw' [14-5-2018;occ.:4]

	Identif	Horizontal soil reacti	Horizontal soil reacti	Dividing f	Multiplication f	Add. lat. friction fac	Add. lat. friction fac	Half band width acc
		N/mm <sup>2</sup>	N/mm <sup>2</sup>					%
15	B5	0,1795	0,1795		1,6			5
16	Z1	0,038603	0,038603		1,6			5
17	Z1e	0,038769	0,038769		1,6			5
18	Z2	0,038769	0,038769		1,6			5
19	Z2e	0,040345	0,040345		1,6			5
20	B6	0,28394	0,28394		1,6			5
21	D3zs	0,2804	0,17491		1,6			5
22	D3ts	0,17712	0,17712		1,841			5
23	D3ks	0,30538	0,30538		1,7701			5
24	B7	0,18175	0,18175		1,8371			5
25	Eind	0,17712	0,17712		1,841			5

### Uncertainty factors

Ple4Win [96612737]: 'BC3Lopw' [14-5-2018;occ.:5]

	KLH-uncer. fact	KLS-uncer. fact	KLT-uncer. fact	Friction uncer. fact	UF-uncer. fact	RVS-uncer. fact	RVT-uncer. fact	RH-uncer. fact
1	High	High	High	High	High	High	High	High

### Start/end nodes boundary conditions

Ple4Win [96612737]: 'BC3Lopw' [14-5-2018;occ.:3]

	Identification name	Boundary nodes cond.	Boundary node state
1	Start	Fixed	Open
2	Eind	Fixed	Open

### Internal overpressure

Ple4Win [96612737]: 'BC3Lopw' [14-5-2018;occ.:3]

	Identifier	Internal pressure 1	Internal pressure 2
		N/mm <sup>2</sup>	N/mm <sup>2</sup>
1	Start	0,26	

### Temperature differences

Ple4Win [96612737]: 'BC3Lopw' [3-9-2018;occ.:3]

	Identifier	Abs. temp. 1	Ref. temp. 1	Abs. temp. 2	Ref. temp. 2
		°C	°C	°C	°C
1	Start	20	10		

### Soil displacement in Z-direction

Ple4Win [96612737]: 'BC3Lopw' [3-9-2018;occ.:6]

	Identifier	Z-settlement 1	Uncer. factor 1	Z-settlement 2	Uncer. factor 2
		mm		mm	
1	D3zs	0	1,5		
2	D3ks	-200	1,5		
3	B7	0	1,5		

### Vertical soil subsidence

Ple4Win [96612737]: 'BC3Lopw' [3-9-2018;occ.:2]

	Identifier	Max. soil subsidence	Uncertainty factor	Subsidence length	Subsidence shape
		mm		mm	
1	B3	-5	1,5	20000	Double
2	B4	-5	1,5	20000	Double
3	B5	-5	1,5	20000	Double
4	B6	-5	1,5	20000	Double

### Loading combinations

Ple4Win [96612737]: 'BC3Lopw' [3-9-2018;occ.:6]

	Identification	General load	Pressure load	Temp. load	Deadweight load	Settlement load	Nodal load	Elast. bend load	Wave/current load
1	Lopw	1	0	1	1	1	0	0	0

### Non-linear elastic soil iteration control

Ple4Win [96612737]: 'BC3Lopw' [14-5-2018;occ.:1]

	Max. no. soil iter.	Max. no error points	Max. no error fields
1	20	0	0

# Geometrically non-linear iteration control

Ple4Win [96612737]: 'BC3Lopw' [14-5-2018;occ.:1]

	Max. no. geometry iter.	Relative disequilibrium	Abs. disequilibrium	Rotation increment
				RAD
1	50	1E-05	1E-07	0,1

# Neutral or real top-soil load

Ple4Win [96612737]: 'BC3Lopw' [14-5-2018;occ.:4]

	Identifier	Neutral/Real top-soil load 1	Uncer. factor 1	Load factor 1	Neutral/Real top-soil load 2	Uncer. factor 2	Load factor 2
		N/mm²			N/mm²		
1	Start	0,026585	1,1	1	0,026585	1,1	1
2	B1	0,026585	1,1	1	0,026585	1,1	1
3	B2	0,026585	1,1	1	0,026585	1,1	1
4	D1ts	0,026544	1,1	1	0,026544	1,1	1
5	D1ks	0,026768	1,1	1	0,026768	1,1	1
6	D1ke	0,026585	1,1	1	0,026585	1,1	1
7	D1te	0,026585	1,1	1	0,026585	1,1	1
8	B3	0,026585	1,1	1	0,026585	1,1	1
9	B4	0,026442	1,1	1	0,026442	1,1	1
10	B4b	0,0338	1,1	1	0,0338	1,1	1
11	D2ts	0,03168	1,1	1	0,02978	1,1	1
12	D2ks	0,046206	1,1	1	0,046206	1,1	1
13	D2ke	0,062174	1,1	1	0,062174	1,1	1
14	D2te	0,018025	1,1	1	0,019452	1,1	1
15	B5	0,019472	1,1	1	0,019472	1,1	1
16	Z1	0,0044887	1,1	1	0,0044887	1,1	1
17	Z1e	0,0045091	1,1	1	0,0045091	1,1	1
18	Z2	0,0045091	1,1	1	0,0045091	1,1	1
19	Z2e	0,0047005	1,1	1	0,0047005	1,1	1
20	B6	0,026636	1,1	1	0,026636	1,1	1
21	D3zs	0,026409	1,1	1	0,024509	1,1	1
22	D3ts	0,024685	1,1	1	0,024685	1,1	1
23	D3ks	0,033856	1,1	1	0,033856	1,1	1
24	B7	0,025052	1,1	1	0,025052	1,1	1
25	Eind	0,024685	1,1	1	0,024685	1,1	1

# Extra loads on top-soil

Ple4Win [96612737]: 'BC3Lopw' [14-5-2018;occ.:1]

	Identifier	Topload 1	Load factor 1	Topload 2	Load factor 2
		N/mm²		N/mm²	
1	B3	0,016	1,35		1,35
2	B4	0,016	1,35	0	1,35
3	D2ks	0	1,35	0,032	1,35
4	D2ke	0,032	1,35	0	1,35
5	D3ks	0	1,35	0,032	1,35
6	B7	0,032	1,35	0	1,35

# Horizontal soil support / Vertical soil load

Ple4Win [96612737]: 'BC3Lopw' [14-5-2018;occ.:1]

	Identifier	Hor./vert. soil coeff. 1	Hor./vert. soil coeff. 2
1	Start	0,5	

# Soil support angle functions

Ple4Win [96612737]: 'BC3Lopw' [14-5-2018;occ.:1]

	Identifier	Min. support angle	Max. support angle	Ratio calc. / max. bearing (low)	Ratio calc. / max. bearing (high)	Curve shape
		°	°	%	%	
1	Start	70	180	50	100	Sinus

# Cross-sections to be calculated

Ple4Win [96612737]: 'BC3Lopw' [14-5-2018;occ.:1]

	Start Identifier	End Identifier	Topload ind.	Allowable stress
				N/mm²
1	Start	Eind	Yes	

# Weighing factors stress components

Ple4Win [96612737]: 'BC3Lopw' [14-5-2018;occ.:1]

	Identi	Stre	Stress due	Stress due to higher ha	Weighing fact. a	Weighing fact. cir	Weighin	Weighing fact. c	Weighing fa	Weighing fac
1	Start	1	0,65	0,65	0,65	0,65	1	1	0,65	0,65

**Polygon point data**

Ple4Win [96612737]: 'BC3Lopw' [3-9-2018;occ.:16]

	Identification name	X-coordinat	Y-coordinat	Z-coordinat	Bend angl	Hor. bend angle	Angle Z-axis - leaving polygon line	Bend radiu
		mm	mm	mm	°	°	°	mm
1	Start	2,029E+8	3,943E+8	1,020E+4			90,00	
2	B1	2,029E+8	3,943E+8	1,020E+4	92,66	92,66	90,00	1.050
3	B2	2,029E+8	3,943E+8	1,020E+4	91,17	91,17	90,00	1.050
4	D1ts	2,029E+8	3,943E+8	1,020E+4	15,76	,47	74,24	1.050
5	D1ks	2,029E+8	3,943E+8	1,270E+4	15,76	,01	90,00	1.050
6	D1ke	2,029E+8	3,943E+8	1,270E+4	,01	,01	90,00	0
7	D1te	2,029E+8	3,943E+8	1,270E+4	,00	,00	90,00	0
8	B3	2,029E+8	3,943E+8	1,270E+4	71,29	71,29	90,00	1.050
9	B4	2,029E+8	3,942E+8	1,270E+4	90,50	90,67	132,28	1.050
10	B4b	2,029E+8	3,942E+8	1,170E+4	43,65	,00	88,63	1.050
11	D2ts	2,029E+8	3,942E+8	1,200E+4	,14	,00	88,49	0
12	D2ks	2,029E+8	3,942E+8	1,230E+4	20,73	,00	109,22	1.050
13	D2ke	2,029E+8	3,942E+8	1,070E+4	19,22	,01	90,00	1.050
14	D2te	2,029E+8	3,942E+8	1,070E+4	,00	,00	90,00	0
15	B5	2,030E+8	3,942E+8	1,070E+4	16,43	15,99	93,81	1.050
16	Z1	2,030E+8	3,942E+8	9,700E+3	3,81	,00	90,00	1.050
17	Z2	2,030E+8	3,942E+8	9,700E+3	3,38	,00	86,62	1.050
18	B6	2,030E+8	3,942E+8	1,000E+4	30,10	30,00	89,30	1.050
19	D3zs	2,031E+8	3,942E+8	1,075E+4	,06	,00	89,36	0
20	D3ts	2,031E+8	3,942E+8	1,100E+4	4,73	,00	84,63	0
21	D3ks	2,031E+8	3,942E+8	1,190E+4	1,34	,00	83,29	0
22	B7	2,031E+8	3,942E+8	1,280E+4	84,79	84,76	90,00	1.050
23	Eind	2,031E+8	3,942E+8	1,280E+4				

**Identification names**

Ple4Win [96612737]: 'BC3Lopw' [3-9-2018;occ.:16]

	Identification name	Node number	X-coordinate	x_pipeline axis	x_projected pipe axis
			mm	mm	mm
1	Start	1	2,029E+8	0	0
2	B1s	12	2,029E+8	1,204E+3	1,204E+3
3	B1	20	2,029E+8	2,003E+3	2,330E+3
4	B1e	29	2,029E+8	2,901E+3	3,539E+3
5	B2s	29	2,029E+8	2,901E+3	3,539E+3
6	B2	37	2,029E+8	3,687E+3	4,633E+3
7	B2e	46	2,029E+8	4,572E+3	5,810E+3
8	D1tss	155	2,029E+8	3,308E+4	3,432E+4
9	D1ts	156	2,029E+8	3,318E+4	3,442E+4
10	D1tse	158	2,029E+8	3,337E+4	3,461E+4
11	D1kss	202	2,029E+8	4,229E+4	4,319E+4
12	D1ks	203	2,029E+8	4,238E+4	4,328E+4
13	D1kse	205	2,029E+8	4,257E+4	4,347E+4
14	D1ke	226	2,029E+8	4,481E+4	4,571E+4
15	D1te	275	2,029E+8	5,539E+4	5,628E+4
16	B3s	324	2,029E+8	6,576E+4	6,666E+4
17	B3	331	2,029E+8	6,637E+4	6,740E+4
18	B3e	339	2,029E+8	6,707E+4	6,822E+4
19	B4s	551	2,029E+8	1,265E+5	1,277E+5
20	B4	559	2,029E+8	1,273E+5	1,287E+5
21	B4e	568	2,029E+8	1,282E+5	1,296E+5
22	B4bs	568	2,029E+8	1,282E+5	1,296E+5
23	B4b	572	2,029E+8	1,285E+5	1,298E+5
24	B4be	577	2,029E+8	1,290E+5	1,303E+5
25	D2ts	632	2,029E+8	1,411E+5	1,424E+5
26	D2kss	684	2,029E+8	1,523E+5	1,536E+5
27	D2ks	686	2,029E+8	1,525E+5	1,538E+5
28	D2kse	689	2,029E+8	1,527E+5	1,540E+5
29	D2kes	720	2,029E+8	1,572E+5	1,583E+5
30	D2ke	722	2,029E+8	1,573E+5	1,584E+5
31	D2kee	725	2,029E+8	1,575E+5	1,586E+5
32	D2te	754	2,029E+8	1,617E+5	1,628E+5
33	B5s	1122	2,030E+8	2,677E+5	2,688E+5
34	B5	1124	2,030E+8	2,678E+5	2,689E+5
35	B5e	1127	2,030E+8	2,680E+5	2,691E+5
36	Z1	1193	2,030E+8	2,829E+5	2,839E+5
37	Z1e	1194	2,030E+8	2,829E+5	2,840E+5
38	Z2	1263	2,030E+8	2,987E+5	2,998E+5
39	Z2e	1264	2,030E+8	2,988E+5	2,999E+5



**Identification names**

Ple4Win [96612737]: 'BC3Lopw' [3-9-2018;occ.:16]

	Identification name	Node number	X-coordinate	x_pipeline axis	x_projected pipe axis
			mm	mm	mm
40	B6s	1296	2,030E+8	3,036E+5	3,046E+5
41	B6	1299	2,030E+8	3,038E+5	3,049E+5
42	B6e	1303	2,030E+8	3,041E+5	3,052E+5
43	D3zs	1522	2,031E+8	3,655E+5	3,665E+5
44	D3ts	1611	2,031E+8	3,880E+5	3,890E+5
45	D3ks	1657	2,031E+8	3,976E+5	3,986E+5
46	B7s	1694	2,031E+8	4,043E+5	4,053E+5
47	B7	1702	2,031E+8	4,051E+5	4,063E+5
48	B7e	1711	2,031E+8	4,059E+5	4,073E+5
49	Eind	1742	2,031E+8	4,109E+5	4,123E+5

**Soil layers**

Ple4Win [96612737]: 'BC3Lopw' [14-5-2018;occ.:4]

	Layer name	Laye	Laye	(Mea	Volu	Angl	Angl	Drai	Undr	Pac	Shrin	Shrin	Shrin	Shea	Ulti	Youn	De
				N/m	N/m	°	°	N/m	N/m		N/m			N/m	mm	N/m	
1	Clay; clean; moderate	Clay		1...E-	1...E-	17,5	11,7	,005	,05	,3	,6	,175	,088	,72	5	2,1	
2	Sand; clean; moderate	Sand	Clea	1...E-	2...E-	32,5	20,0	0		,3	2,4	,075	,020	16,...	4	45,0	

**Soil profiles**

Ple4Win [96612737]: 'BC3Lopw' [14-5-2018;occ.:4]

	Profile name	Fixed top	Top of profile	Description
			mm	
1	Dijk	No		
2	Sleuf	No		

**Soil profile layers**

Ple4Win [96612737]: 'BC3Lopw' [14-5-2018;occ.:4]

	Profile name	Layer name	Layer height
			mm
1	Dijk	Clay; clean; moderate	1.300
2	Dijk	Sand; clean; moderate	3.000
3	Sleuf	Sand; clean; moderate	4.300

**Soil profile locations**

Ple4Win [96612737]: 'BC3Lopw' [14-5-2018;occ.:4]

	Ident	Profile na	Profile na	Top soil lo	Top soil lo	Installation method 1	Installation method 2	Deformation spe	Deformation spe
1	Start	Sleuf	Sleuf	Neutral	Neutral	TrenchUnCompressed	TrenchUnCompressed	Slow	Slow
2	B1	Sleuf	Sleuf	Neutral	Neutral	TrenchUnCompressed	TrenchUnCompressed	Slow	Slow
3	B2	Sleuf	Sleuf	Neutral	Neutral	TrenchUnCompressed	TrenchUnCompressed	Slow	Slow
4	D1ts	Sleuf	Sleuf	Neutral	Neutral	TrenchUnCompressed	TrenchUnCompressed	Slow	Slow
5	D1ks	Sleuf	Sleuf	Neutral	Neutral	TrenchUnCompressed	TrenchUnCompressed	Slow	Slow
6	D1ke	Sleuf	Sleuf	Neutral	Neutral	TrenchUnCompressed	TrenchUnCompressed	Slow	Slow
7	D1te	Sleuf	Sleuf	Neutral	Neutral	TrenchUnCompressed	TrenchUnCompressed	Slow	Slow
8	B3	Sleuf	Sleuf	Neutral	Neutral	TrenchUnCompressed	TrenchUnCompressed	Slow	Slow
9	B4	Sleuf	Sleuf	Neutral	Neutral	TrenchUnCompressed	TrenchUnCompressed	Slow	Slow
10	B4b	Sleuf	Sleuf	Neutral	Neutral	TrenchUnCompressed	TrenchUnCompressed	Slow	Slow
11	D2ts	Sleuf	Dijk	Neutral	Neutral	TrenchUnCompressed	TrenchUnCompressed	Slow	Slow
12	D2ks	Dijk	Dijk	Neutral	Neutral	TrenchUnCompressed	TrenchUnCompressed	Slow	Slow
13	D2ke	Dijk	Dijk	Neutral	Neutral	TrenchUnCompressed	TrenchUnCompressed	Slow	Slow
14	D2te	Dijk	Sleuf	Neutral	Neutral	TrenchUnCompressed	TrenchUnCompressed	Slow	Slow
15	B5	Sleuf	Sleuf	Neutral	Neutral	TrenchUnCompressed	TrenchUnCompressed	Slow	Slow
16	Z1	Sleuf	Sleuf	Neutral	Neutral	TrenchUnCompressed	TrenchUnCompressed	Slow	Slow
17	Z1e	Sleuf	Sleuf	Neutral	Neutral	TrenchUnCompressed	TrenchUnCompressed	Slow	Slow
18	Z2	Sleuf	Sleuf	Neutral	Neutral	TrenchUnCompressed	TrenchUnCompressed	Slow	Slow
19	Z2e	Sleuf	Sleuf	Neutral	Neutral	TrenchUnCompressed	TrenchUnCompressed	Slow	Slow
20	B6	Sleuf	Sleuf	Neutral	Neutral	TrenchUnCompressed	TrenchUnCompressed	Slow	Slow
21	D3zs	Sleuf	Dijk	Neutral	Neutral	TrenchUnCompressed	TrenchUnCompressed	Slow	Slow
22	D3ts	Dijk	Dijk	Neutral	Neutral	TrenchUnCompressed	TrenchUnCompressed	Slow	Slow
23	D3ks	Dijk	Dijk	Neutral	Neutral	TrenchUnCompressed	TrenchUnCompressed	Slow	Slow
24	B7	Dijk	Dijk	Neutral	Neutral	TrenchUnCompressed	TrenchUnCompressed	Slow	Slow
25	Eind	Dijk	Dijk	Neutral	Neutral	TrenchUnCompressed	TrenchUnCompressed	Slow	Slow



### General soil settings

Ple4Win [96612737]: 'BC3Lopw' [14-5-2018;occ.:4]

Property	Value
1 Volume weight of water (Default: 9,81E-06 N/mm³)	0.00000981
2 Half band width (h.b.w.) accuracy percentage (Default: 5%)	5
3 Pipeline operational temperature	Cold
4 State of soil compression	Well packed
5 Calculation methodology	Use updated NEN3650-1:2012

### Warnings

Ple4Win [96612737]: 'BC3Lopw' [occ.:0]

	Program session	Function mnemonic	Identification name	Message
1	40	FUNCT200	W200/4	Zero bend angle with radius
2	40	FUNCT310	W310/1	Small diameter/wallthickness ratio
3	40	SOIL-WIZ	W320/7	Wizard generated data may be out-of-date
4	40	FUNCT320	W320/1	Large klh/(klr,klr) ratio
5	47	FUNCT500	W500/24	Elem-l/adv-l 4.00, 709 (1 - 1731)

### Program status summary

Ple4Win [96612737]: 'BC3Lopw' [occ.:0]

Property	Value
Program	Ple4Win
Version	V4.4.2.17072
License	96612737 [CmDongle 2-1601491]
Modules included	KSAGNLFERCYQOJUZX0X1
Project name	
Project location & filename	F:\Projecten\TE16353 - Wanssum\Lopw\BC3Lopw
Project description	
Analysis type	General
Project phase	Initial
Project parent	- - -
Secondary project	- - -
Units	Millimeter, Newton, Second
Separators	Thousands: '.'Decimal: ','
Bend angle	Limited
Geometry model	Non-linear
Section model	Ovalising
Material model	Linear
Soil ring-stiffening	Ignored
Soil model	Standard
Ovalisation redistribution	Allowed
Loading redistribution	Applied
Warning table	5 items (warnings and messages)
2 Pipeline Configuration (occurrence 16)	Pipeline origin (status 'Locked Data', occurrence 6, last modified 14-5-2018 00:00:00) Pipeline polygon points (status 'Locked Data', occurrence 32, last modified 14-5-2018 00:00:00) Ground level (status 'Locked Data', occurrence 9, last modified 14-5-2018 00:00:00) (Ground) water level (status 'Locked Data', occurrence 9, last modified 14-5-2018 00:00:00) Polygon point data (status 'Locked Data', occurrence 16, last modified 14-5-2018 00:00:00) Bend location data (status 'Locked Data', occurrence 16, last modified 14-5-2018 00:00:00) Polygon subdivision data (status 'Locked Data', occurrence 16, last modified 14-5-2018 00:00:00) Nodes (status 'Locked Data', occurrence 16, last modified 14-5-2018 00:00:00) Elements of pipeline (status 'Locked Data', occurrence 16, last modified 14-5-2018 00:00:00) Vertical profile data (status 'Locked Data', occurrence 16, last modified 14-5-2018 00:00:00) Identification names (status 'Locked Data', occurrence 16, last modified 14-5-2018 00:00:00) Element/node groups (status 'Locked Data', occurrence 16, last modified 14-5-2018 00:00:00)
3,1 Pipe Data (occurrence 6)	Material location (status 'Locked Data', occurrence 3, last modified 14-5-2018 00:00:00) Isotropic materials (status 'Locked Data', occurrence 2, last modified 14-5-2018 00:00:00) Outer diameter (status 'Locked Data', occurrence 2, last modified 14-5-2018 00:00:00) Wall thicknesses (status 'Locked Data', occurrence 2, last modified 14-5-2018 00:00:00) Deadweight (status 'Locked Data', occurrence 2, last modified 14-5-2018 00:00:00) Pipe material data (status 'Locked Data', occurrence 6, last modified 14-5-2018 00:00:00) Pipe dimension data (status 'Locked Data', occurrence 6, last modified 14-5-2018 00:00:00)
3,2 Soil Data (occurrence 7)	Horizontal soil stiffness (status 'Locked Data', occurrence 4, last modified 14-5-2018 00:00:00) Downward vertical soil stiffness (status 'Locked Data', occurrence 4, last modified 14-5-2018 00:00:00) Upward vertical soil stiffness (status 'Locked Data', occurrence 4, last modified 14-5-2018 00:00:00) Pipe-soil friction (status 'Locked Data', occurrence 4, last modified 14-5-2018 00:00:00)

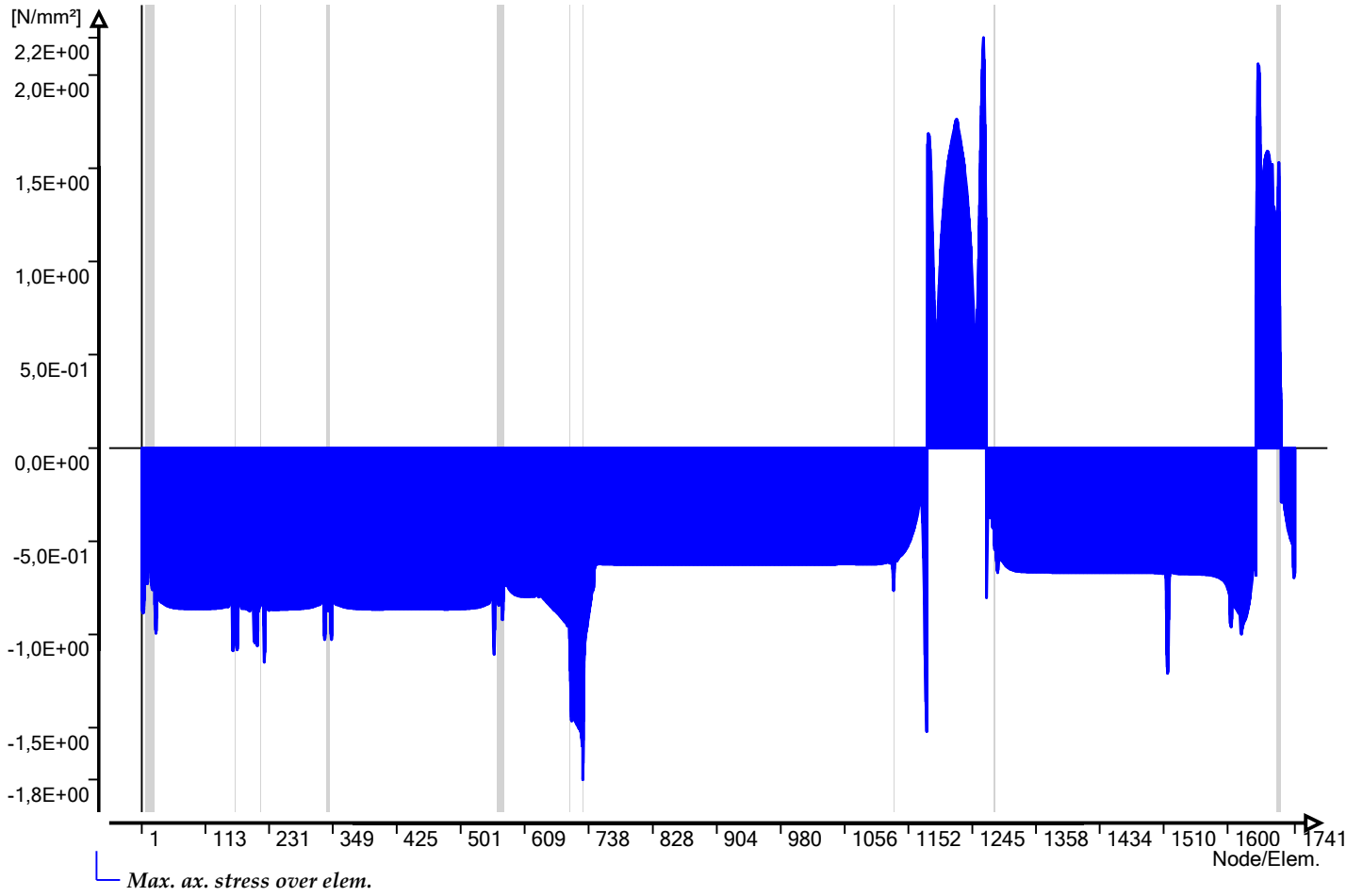
Property	Value
	Displacement at max. soil friction (status 'Locked Data', occurrence 4, la
	Sub-soil bearing capacity (status 'Locked Data', occurrence 4, last modi
	Ultimate top-soil reaction (status 'Locked Data', occurrence 4, last modif
	Ultimate hor. soil reaction (status 'Locked Data', occurrence 4, last modi
	Uncertainty factors (status 'Locked Data', occurrence 5, last modified 14
	Lateral soil mechanical data (status 'Locked Data', occurrence 7, last m
	Pipe-soil friction data (status 'Locked Data', occurrence 7, last modified
	Soil layers (status 'Locked Data', occurrence 4, last modified 14-5-2018
	Soil profiles (status 'Locked Data', occurrence 4, last modified 14-5-201
	Soil profile layers (status 'Locked Data', occurrence 4, last modified 14-
	Soil profile locations (status 'Locked Data', occurrence 4, last modified 1
	General soil settings (status 'Locked Data', occurrence 4, last modified
3,3 Model Boundary (occurrence 4)	Start/end nodes boundary conditions (status 'Locked Data', occurrence
	Conditions along pipe axis (status 'Locked Data', occurrence 4, last mod
4,2 Pipeline Loading (occurrence 13)	Internal overpressure (status 'Locked Data', occurrence 3, last modified
	Temperature differences (status 'Locked Data', occurrence 3, last modifi
	Soil displacement in Z-direction (status 'Locked Data', occurrence 6, las
	Vertical soil subsidence (status 'Locked Data', occurrence 2, last modifi
	Specified pipeline loads (status 'Locked Data', occurrence 13, last modif
5 Pipeline Behaviour (occurrence 12)	Loading combinations (status 'Locked Data', occurrence 6, last modified
	Non-linear elastic soil iteration control (status 'Locked Data', occurrence
	Geometrically non-linear iteration control (status 'Locked Data', occure
	Displacements (status 'Locked Data', occurrence 12, last modified 3-9-2
	Overall internal forces (status 'Locked Data', occurrence 12, last modifie
	Overall soil reaction forces (status 'Locked Data', occurrence 12, last m
	Overall external support reaction forces (status 'Locked Data', occuren
	Bend stiffness reduction & stress intensification (status 'Locked Data',
	Global node coordinates of displaced pipeline (status 'Locked Data', oc
	Primary cross-sectional deformations (status 'Locked Data', occurrence
	Iteration data (status 'Locked Data', occurrence 12, last modified 3-9-20
	Iteration check list (status 'Locked Data', occurrence 12, last modified 3-
	Specified loads active on elements (status 'Locked Data', occurrence 12
	Applied settlement loads (status 'Locked Data', occurrence 12, last mod
6,1 Cross-Section Data (occurrence 11)	Neutral or real top-soil load (status 'Locked Data', occurrence 4, last mo
	Extra loads on top-soil (status 'Locked Data', occurrence 1, last modifie
	Horizontal soil support / Vertical soil load (status 'Locked Data', occure
	Soil support angle functions (status 'Locked Data', occurrence 1, last m
	Cross-sectional data (status 'Locked Data', occurrence 11, last modified
	Additional cross-sectional loads (status 'Locked Data', occurrence 11, la
	Additional support forces (status 'Locked Data', occurrence 11, last mod
	Resulting pipeline spans (status 'Locked Data', occurrence 11, last modi
	Deformation redistribution (soil loads ) (status 'Locked Data', occurenc
	Deformation redistribution (soil loads w. toploads) (status 'Locked Data'
	Deformation redistribution (bend ovalisation) (status 'Locked Data', occ
6,2 Cross-Section Behaviour {General, Material Linear} (occurrence 10)	Cross-sections to be calculated (status 'Locked Data', occurrence 1, last
	Weighing factors stress components (status 'Locked Data', occurrence
	General cross-sectional data (status 'Locked Data', occurrence 10, last
	Cross-sectional loading data (status 'Locked Data', occurrence 10, last
	Weighing multiplication factors (status 'Locked Data', occurrence 10, las
	Maximum radial deformations (status 'Locked Data', occurrence 10, last
	Maximum check stresses (status 'Locked Data', occurrence 10, last mo
	Maximum stresses in straight pipe sections (status 'Locked Data', occu
	Maximum stresses in bends (status 'Locked Data', occurrence 10, last
	Maximum stresses (lateral loadings) (status 'Locked Data', occurrence
	Maximum total stresses (status 'Locked Data', occurrence 10, last modif
	Maximum principal stresses (status 'Locked Data', occurrence 10, last
	Detailed radial deformations (status 'Locked Data', occurrence 10, last
	Detailed check stresses (status 'Locked Data', occurrence 10, last modif
	Detailed stresses in straight pipe sections (status 'Locked Data', occure
	Detailed stresses in bends (status 'Locked Data', occurrence 10, last m
	Detailed stresses (lateral loadings) (status 'Locked Data', occurrence 10
	Detailed total stresses (status 'Locked Data', occurrence 10, last modifi
	Detailed principal stresses (status 'Locked Data', occurrence 10, last m

Maximum check stresses (loadcase lopw weighing factors used redistri... Ple4Win [96612737]: 'BC3Lopw' [3-9-2018;occ.:10]

	Ele...	Max. principal str...	Max. principal str...	Max. Tresca shear...	Max. Von Mises...	Max. ax. stress over...	Max. circ....	Max. hoop...
		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>	N/mm <sup>2</sup>	N/mm <sup>2</sup>
551	551	,03881	-,6806	,3403	,5911	-,6726	-,3932	
717	717	2,27109	-2,9196	1,4598	2,5323	-1,5994	-2,9196	
718	718	2,24711	-2,9335	1,4667	2,5438	-1,5966	-2,9335	
720	720	2,04776	-2,8729	1,4365	2,5115	-1,7789	-2,8729	
1167	1167	,05487	-,2653	,1326	,2358	-,2611	-,1196	
1247	1247	,66375	-,1072	,3558	,6645	,6637	-,1072	
1249	1249	,47333	-,1160	,2534	,4649	,4733	-,1061	
1275	1275	2,19984	-1,9546	1,1165	2,1197	2,1998	-,4774	
1662	1662	1,93148	-2,5956	1,3614	2,6615	1,9315	-2,5956	

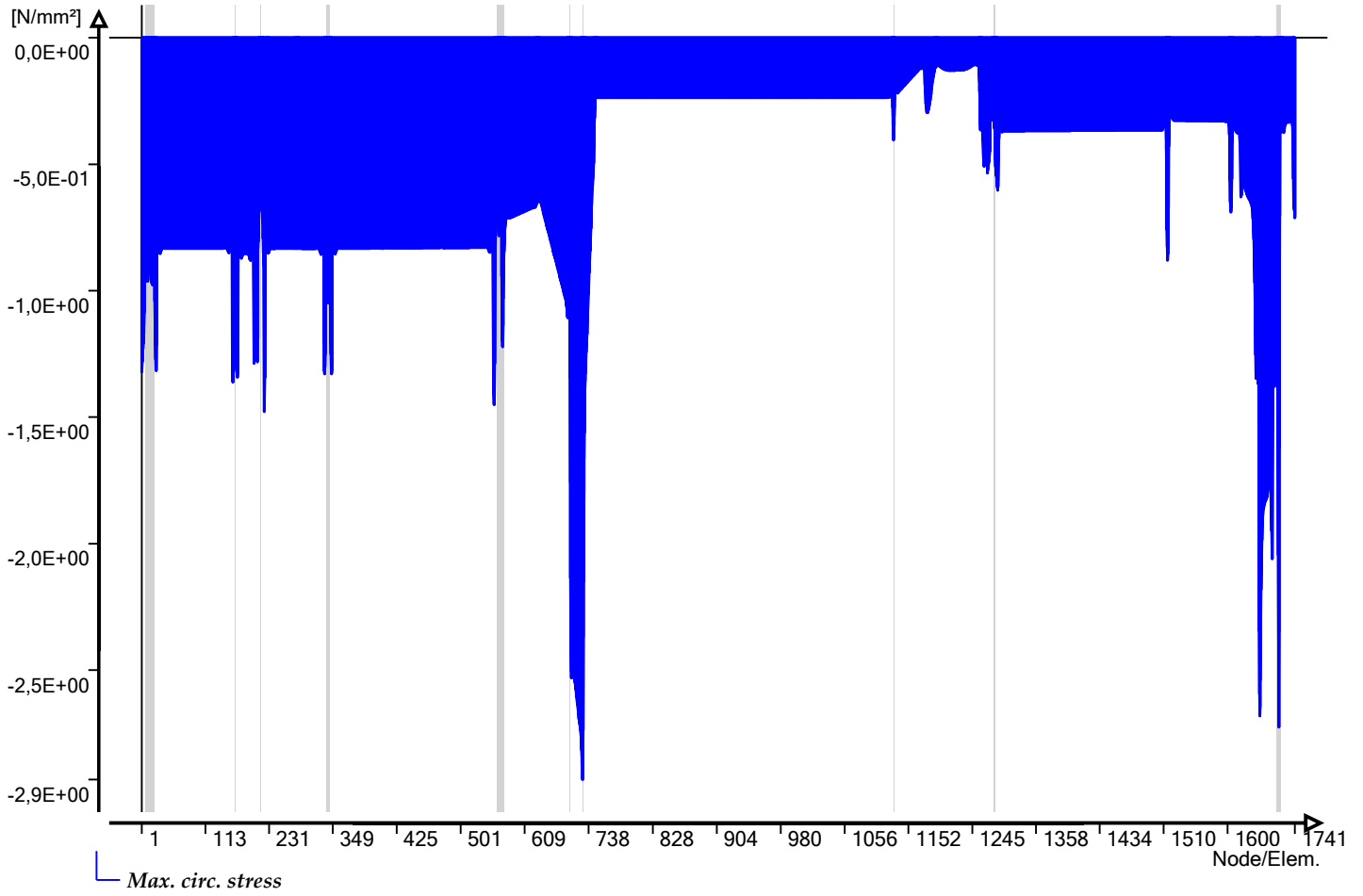
Graphs of table 'Maximum check stresses'

Ple4Win [96612737]: 'BC3Lopw'



Graphs of table 'Maximum check stresses'

Ple4Win [96612737]: 'BC3Lopw'



	Eleme...	Max. radial deform. due to...	Radial bend def...	Max. diameter ch...	Max. total radial def...	Elast. soil impres...	Max. hor. soil su...
		mm	mm	%	mm	mm	N/mm <sup>3</sup>
716	716	-3,8556	9,809E-03	-2,30	-3,86532		
1698	1698	1,4095	-8,334E-01	-1,36	-2,19270		
1701	1701	-2,0857	-1,364E+00	-1,86	-3,16440		
1703	1703	-1,2913	1,177E+00	1,40	2,26679		

Graphs of table 'Maximum radial deformations'

Ple4Win [96612737]: 'BC3Lopw'

