Liefkenshoekspoortunnel
2 x 6km de tunnel foré

L'impact des conditions géotechniques sur un tunnelier de grand diamètre

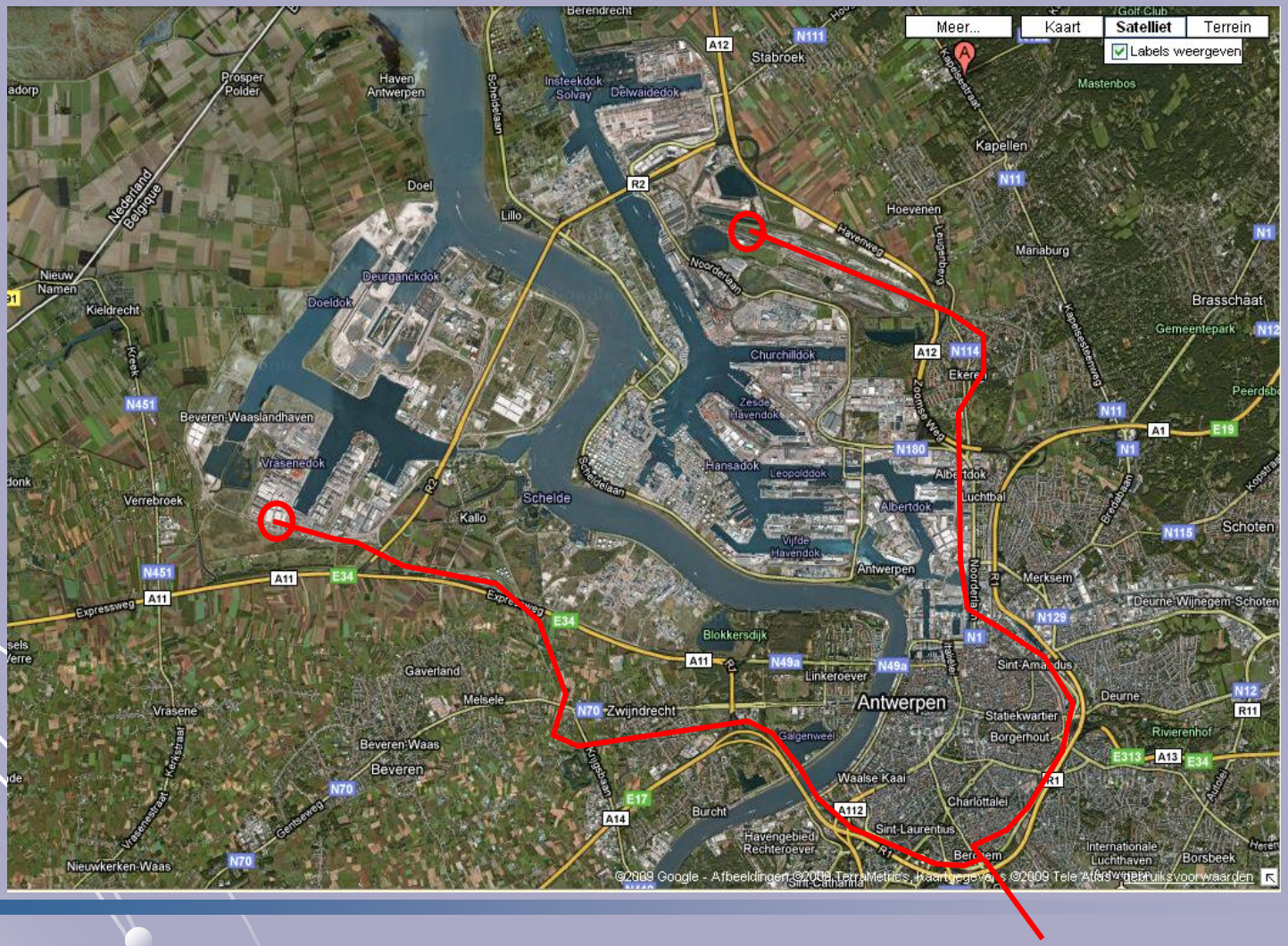
Christian TREVE

CFE Design Department

Design Department

CFE

La problématique



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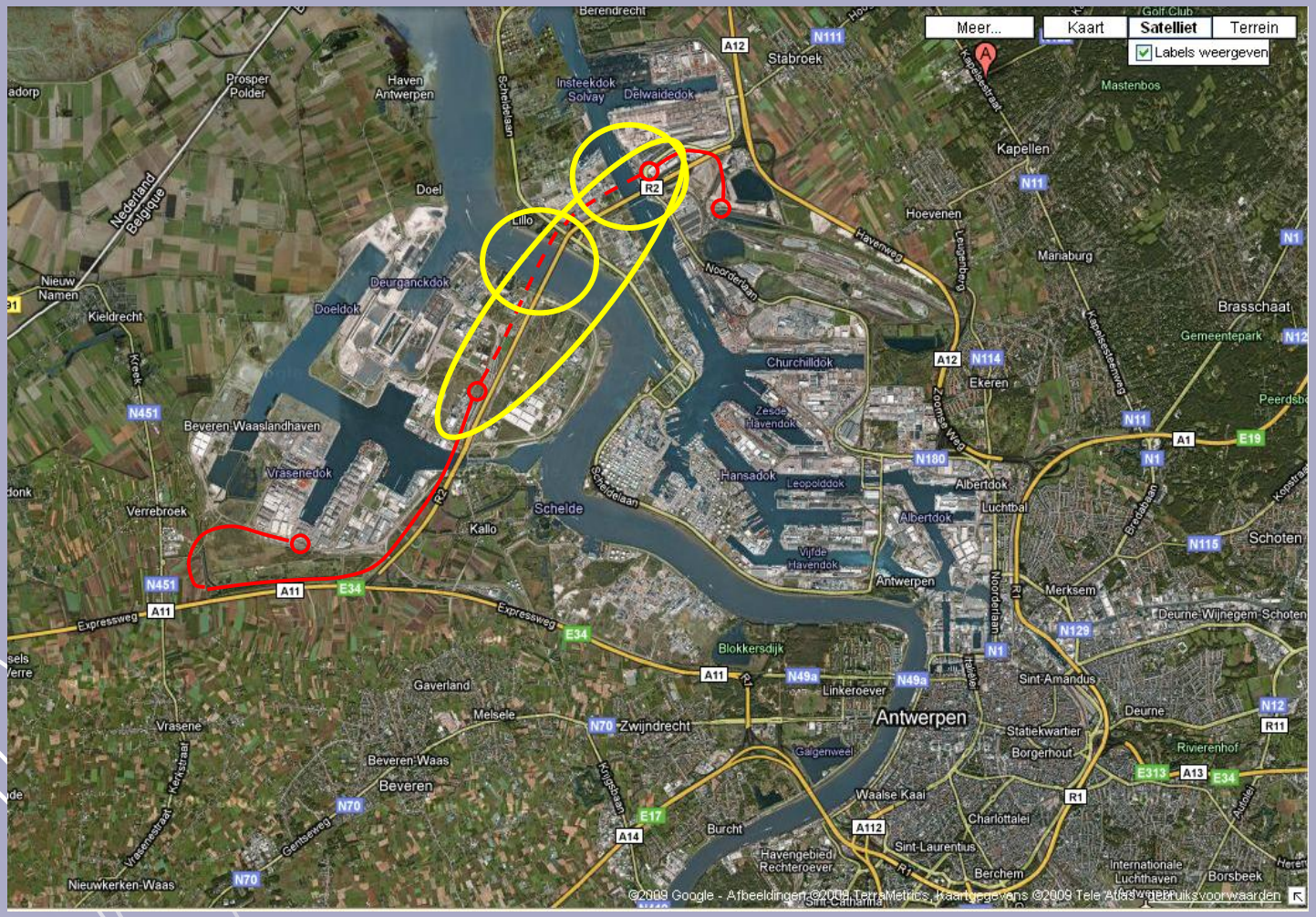
Le chantier


Meer...
Kaart
Satelliet
Terrein
Labels weergeven
Berendrecht
Stabroek
Prosper Polder
Haven Antwerpen
Insteekdok Solvay
Delwaidedok
Mastenbos
Kapellen
Doel
Nederland
Belgique
Lillo
Hoevenen
Mariaburg
Nieuw Namen
Deurganckdok
Doeldok
Kieldrecht
Brasschaat
Gemeentepark
Churchilldok
Ekeren
Beveren-Waaslandhaven
Vrasenedok
Hansadok
Leopolddok
Albertdok
Luchtbal
Verrebroek
Schelde
Kallo
Schoten
Vijfde Havendok
Antwerpen
Merksem
Deurne-Wijnegem-Schoten
Blokkersdijk
Gaverland
Linkeroever
Sint-Amandus
Melsele
Vrasene
Zwijndrecht
Deurne
Statiekwartier
Beveren-Waas
Beveren
Galgenweel
Borgerhout
Rivierenhof
Waalse Kaai
Charlottalei
Burcht
Sint-Laurentius
Havengebied Rechteroever
Berchem
Internationale Luchthaven
Borsbeek
Nieuwkerken-Waas
Sint-Catharina
©2009 Google - Afbeeldingen ©2009 TerraMetrics, Kaartgegevens ©2009 Tele Atlas - Gebruiksvoorwaarden

Les Intervenants

- Maître de l'Ouvrage : Infrabel
- Maître d'Œuvre : TucRail
- Financement, Construction et Exploitation (38ans) : LOCARAIL NV
- Construction : THV Locobouw (690.000.000€)
  - Tunnels Forés
    - Vinci Construction Grands Projets
    - Wayss & Freytag (BAM)
  - Autres ouvrages
    - MBG (Groupe CFE)
    - CEI-De Meyer (BAM)

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1- Passage d'un estuaire à marées

Scheldt passage

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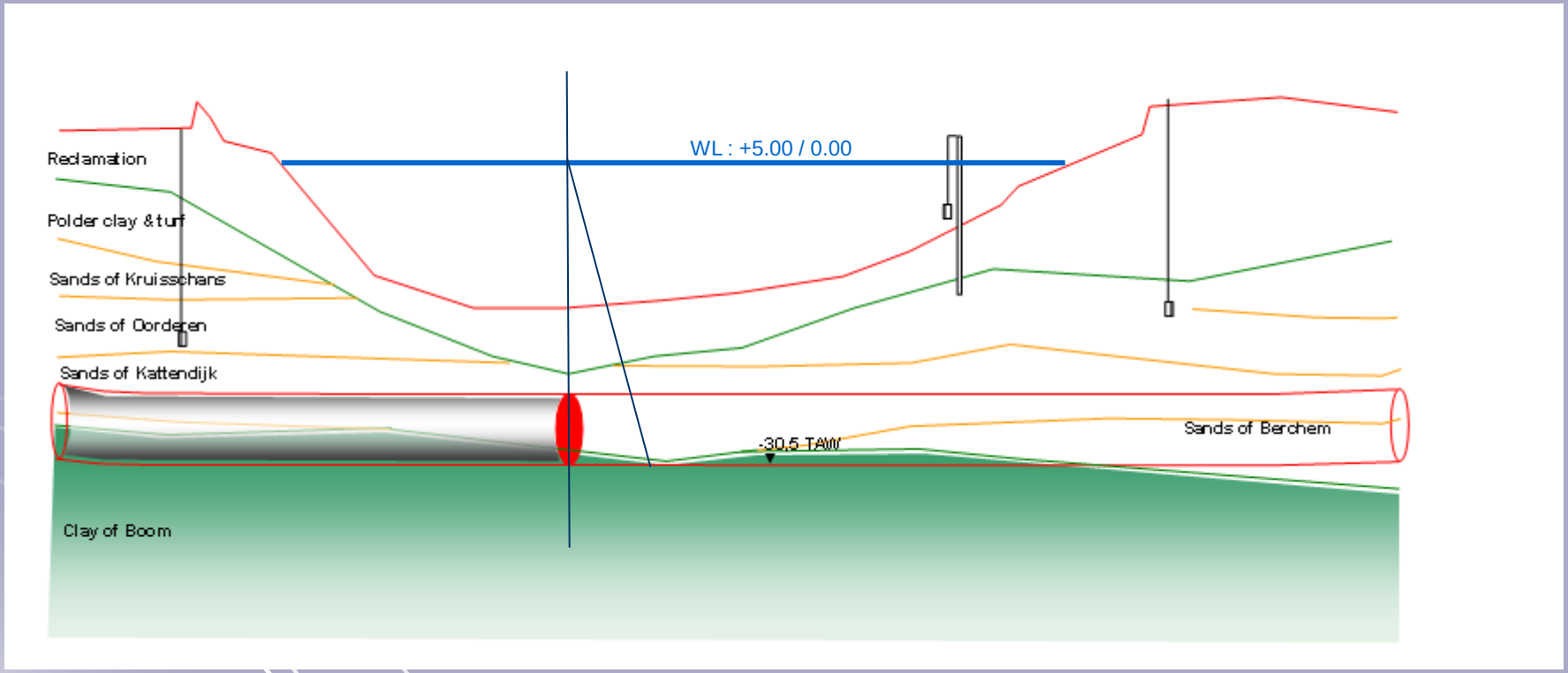
Longitudinal Section



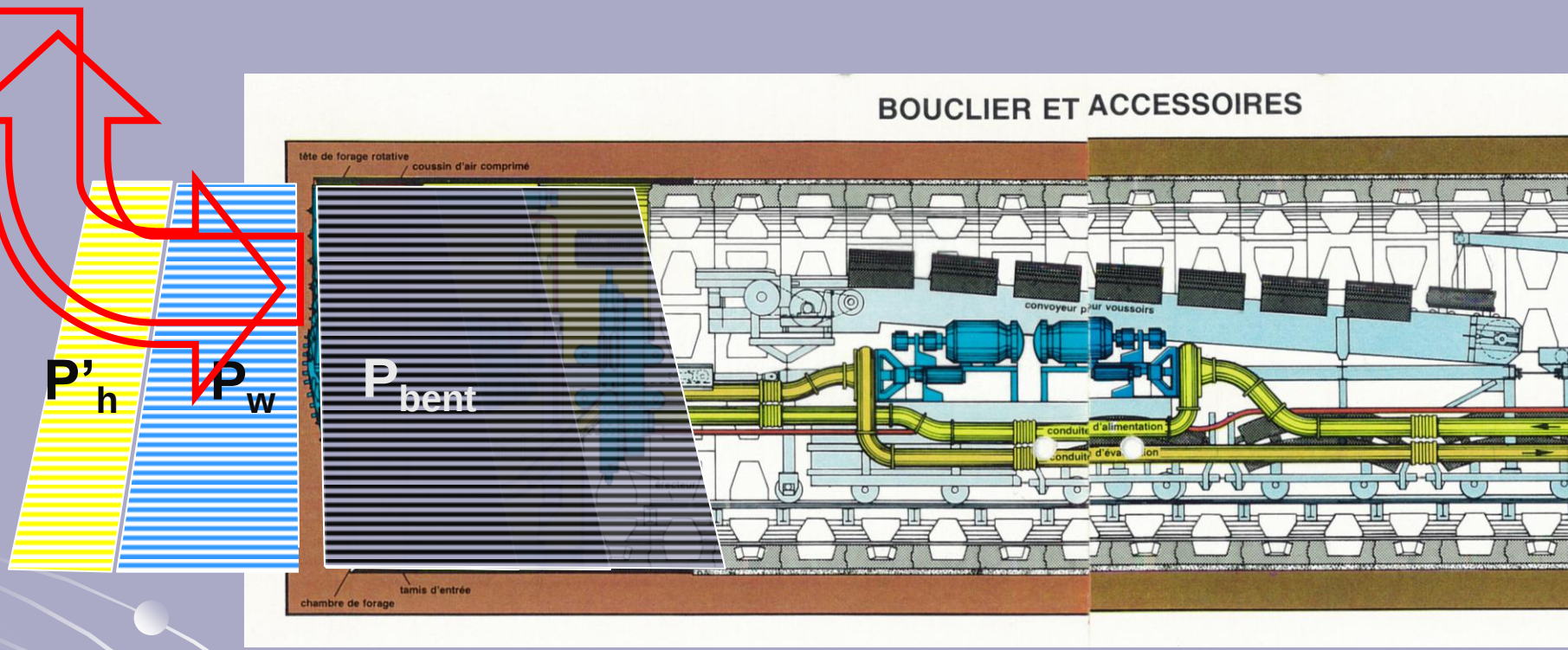
Design Department

Bouclier à pression de boue

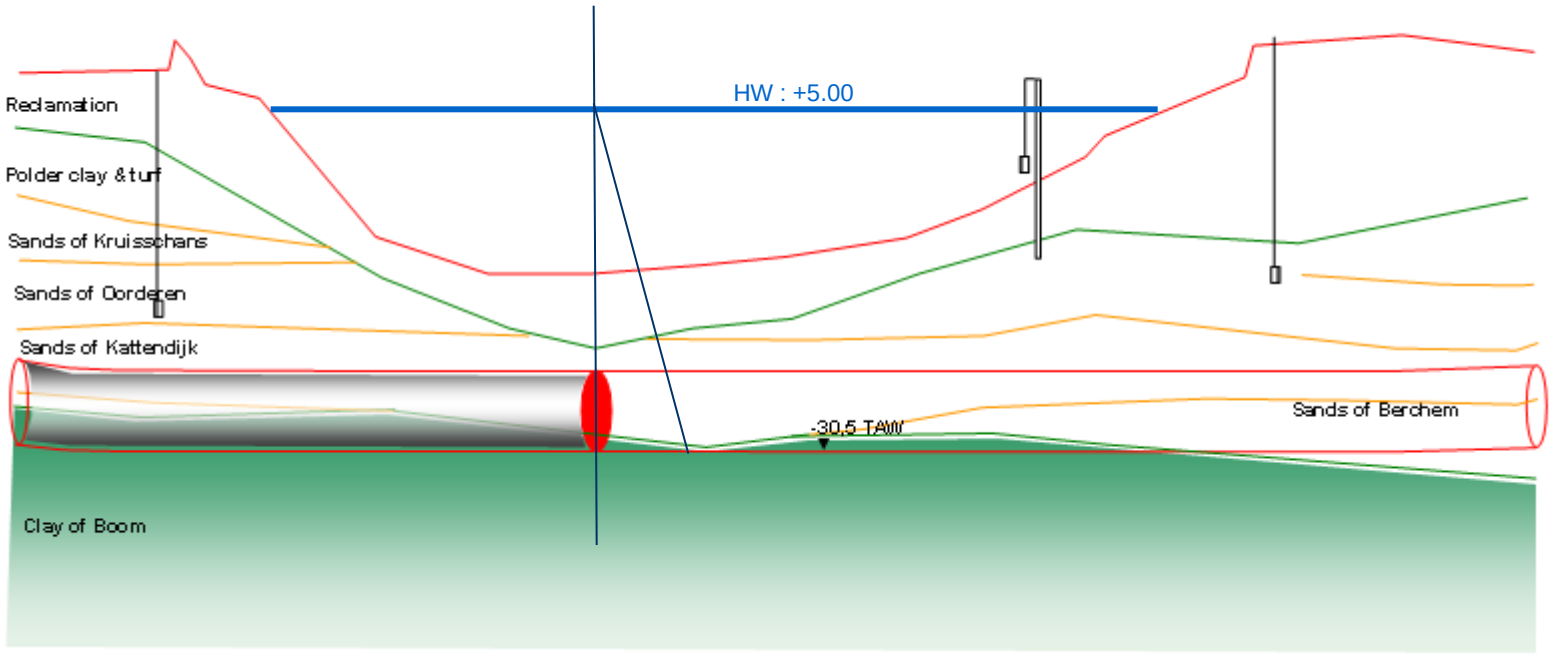
Design Department

CFE

Bouclier à pression de boue



Design Department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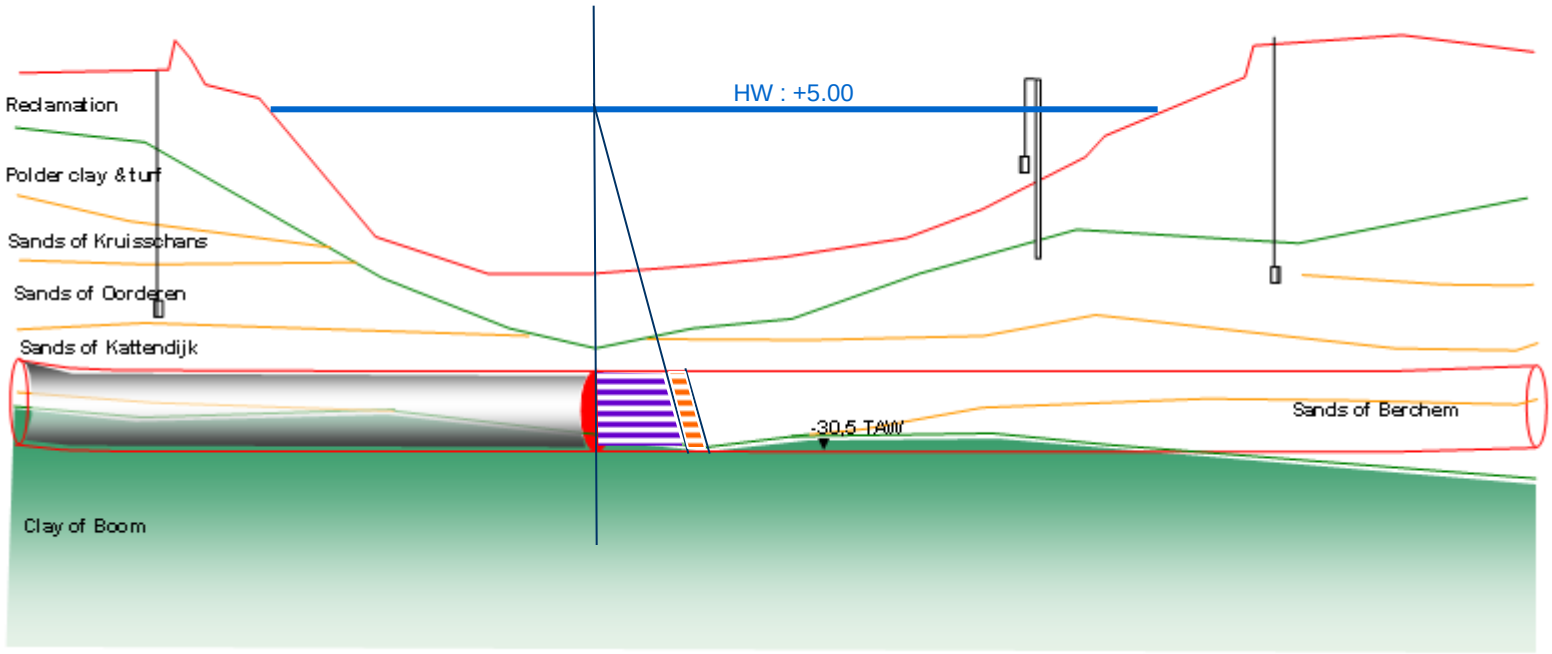
Sands of Oordegen
Sands of Kattendijk
-30.5 TAW
Sands of Berchem
Clay of Boom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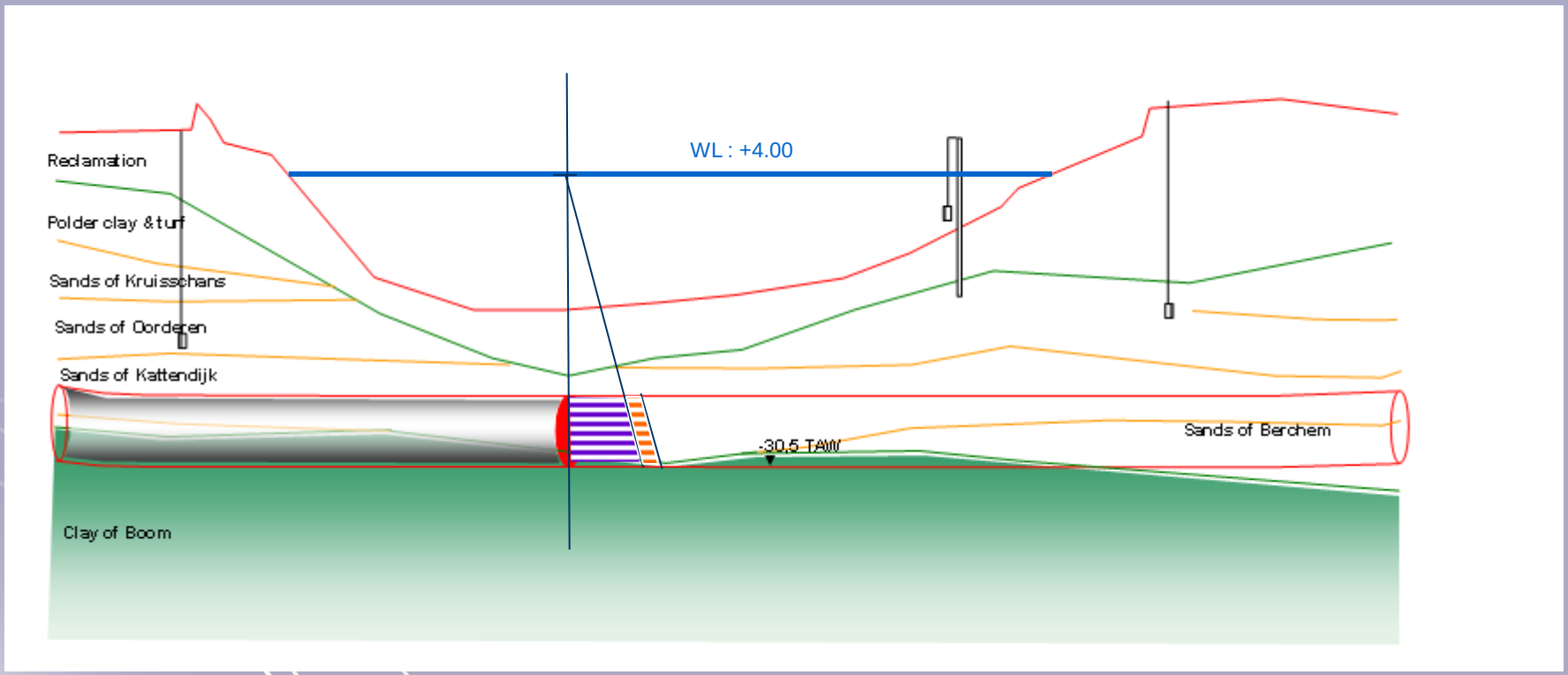
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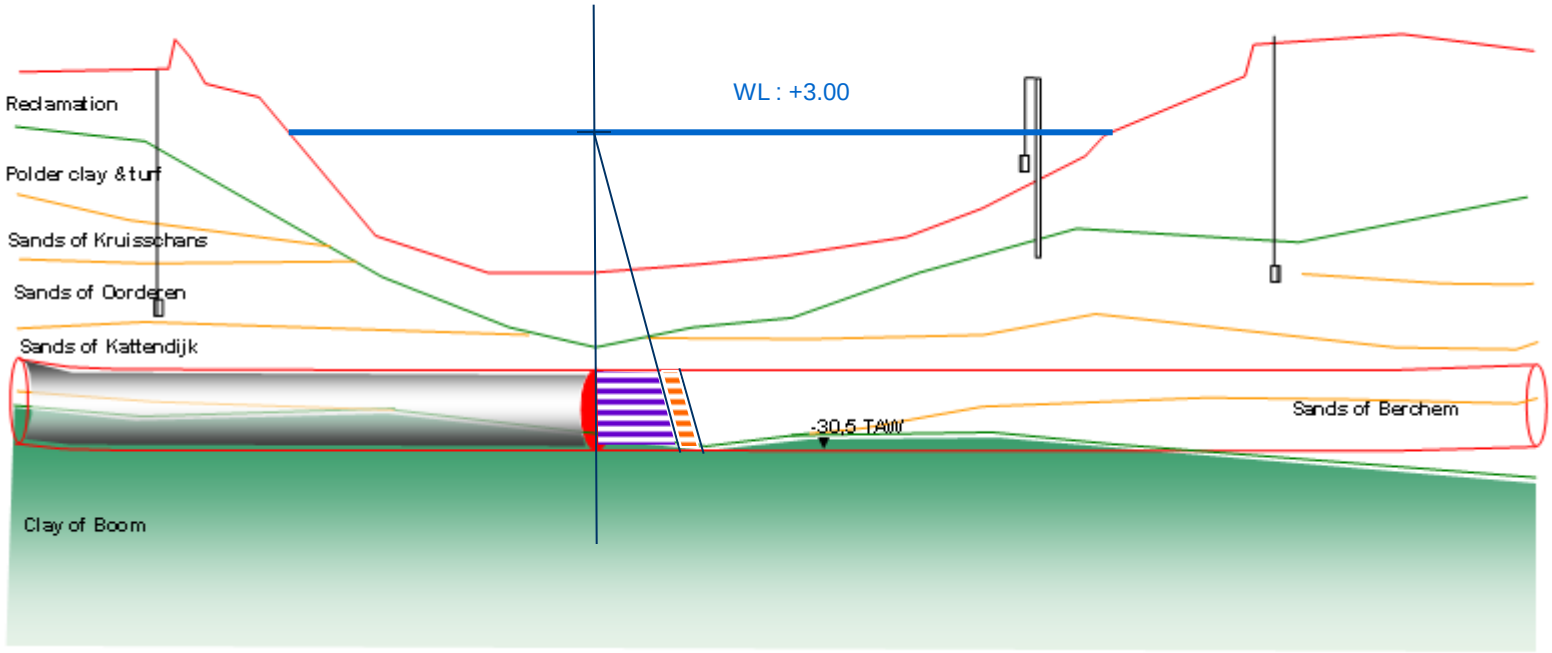
Clay of Boom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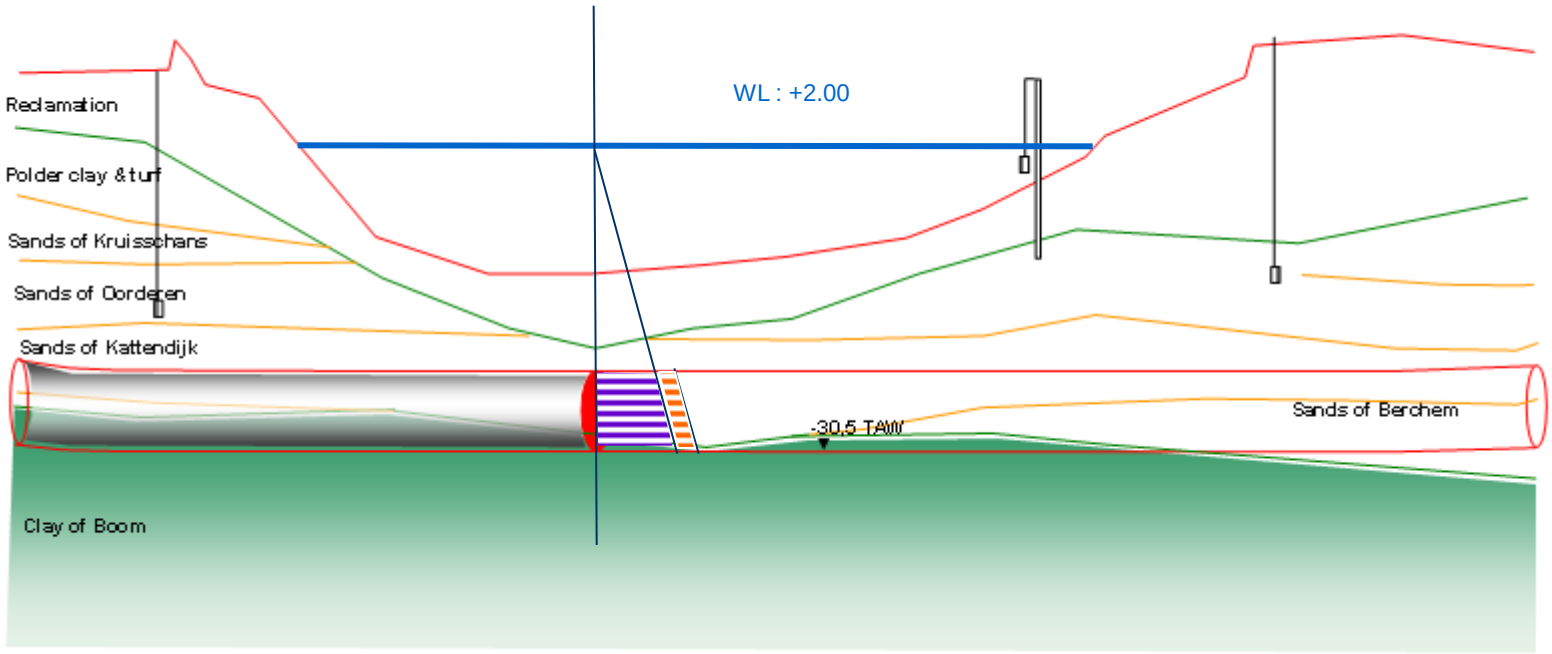
Sands of Berchem
Clay of Boom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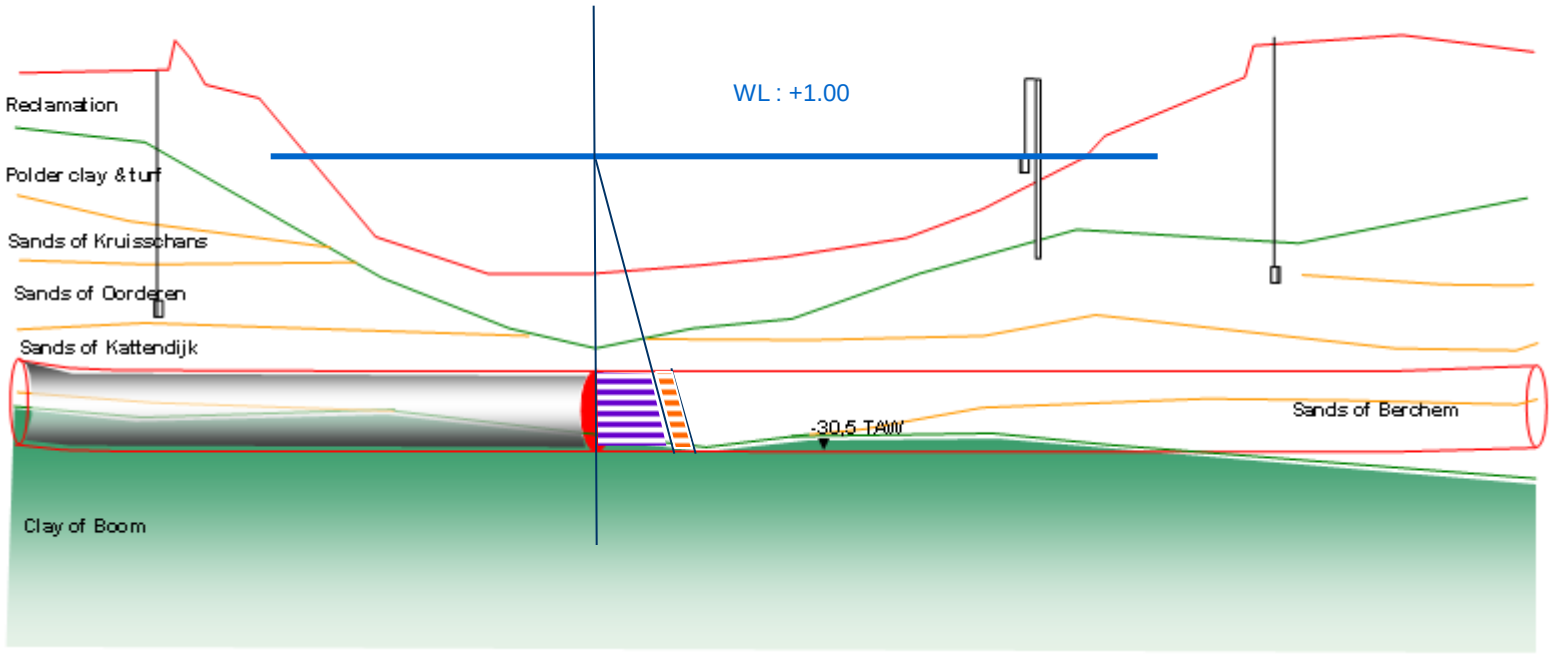
Sands of Berchem
Clay of Boom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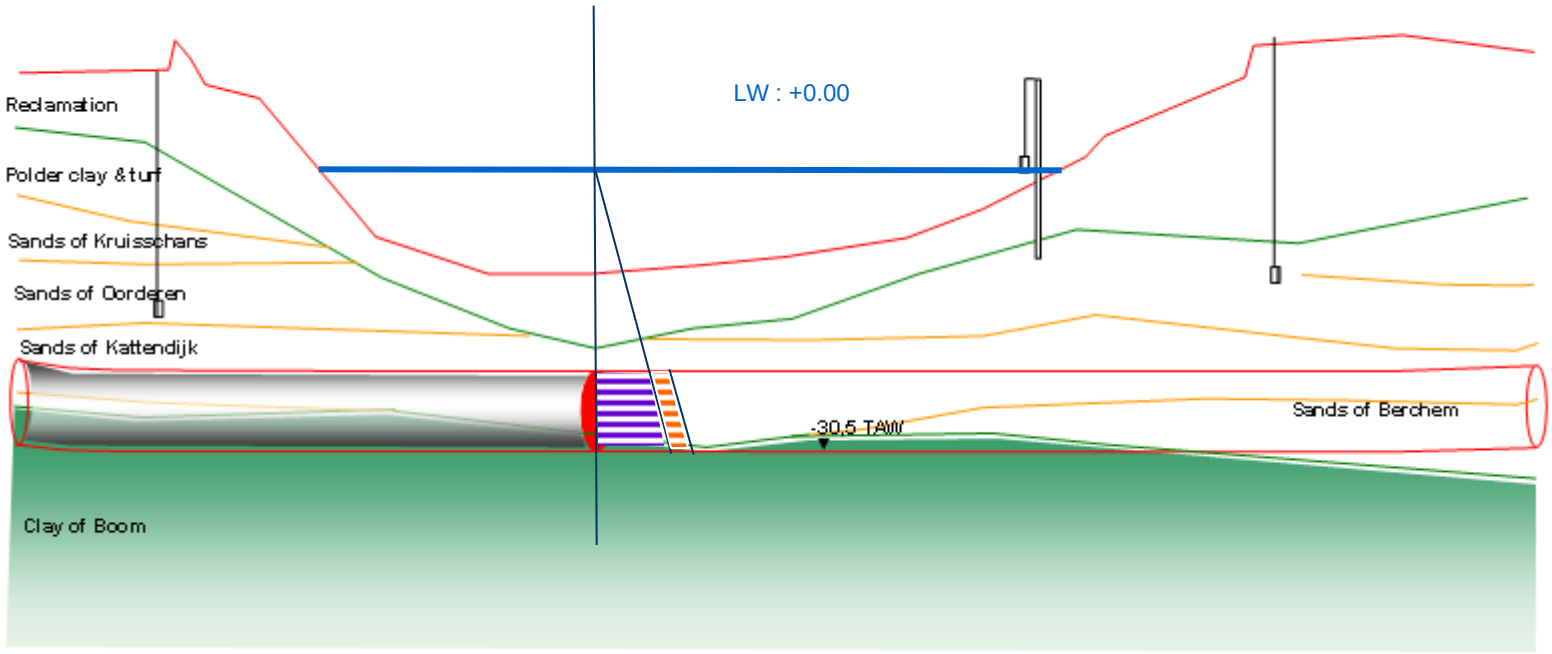
Sands of Berchem
Clay of Boom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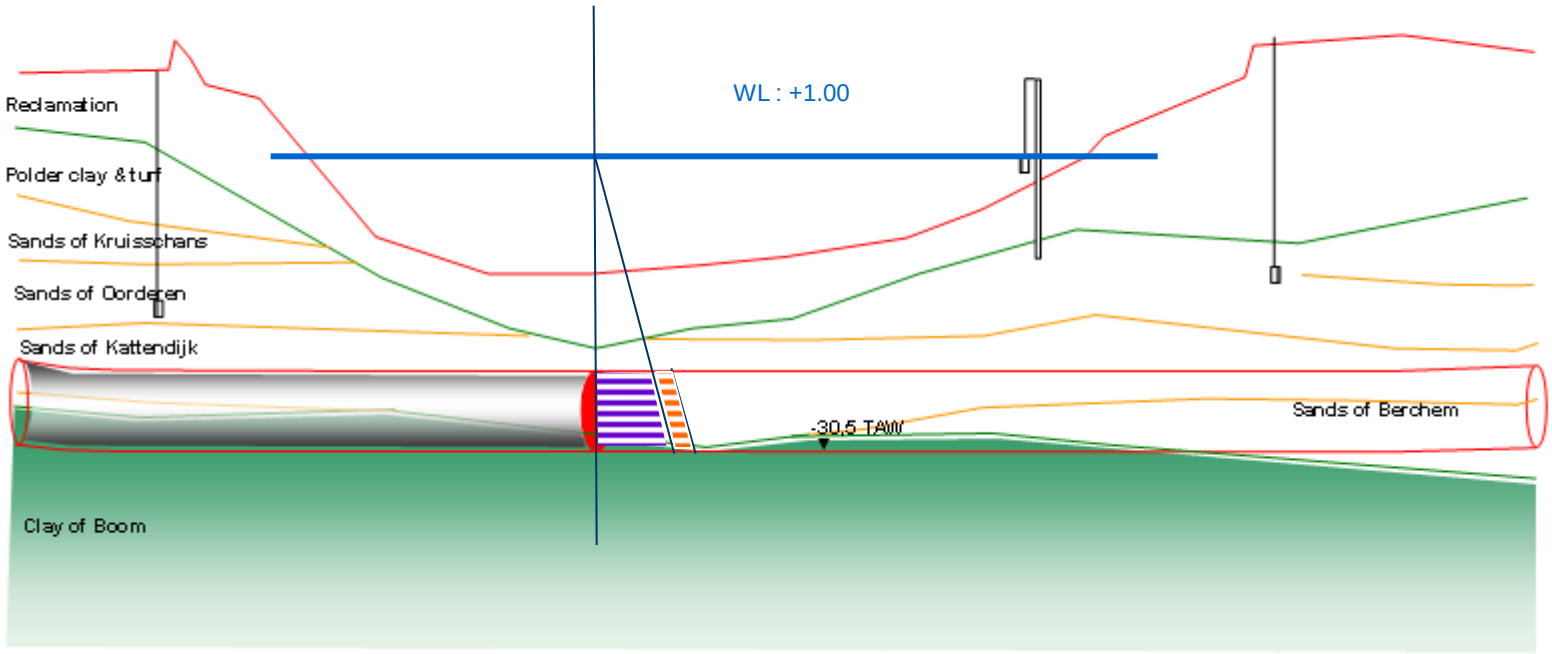
Clay of Boom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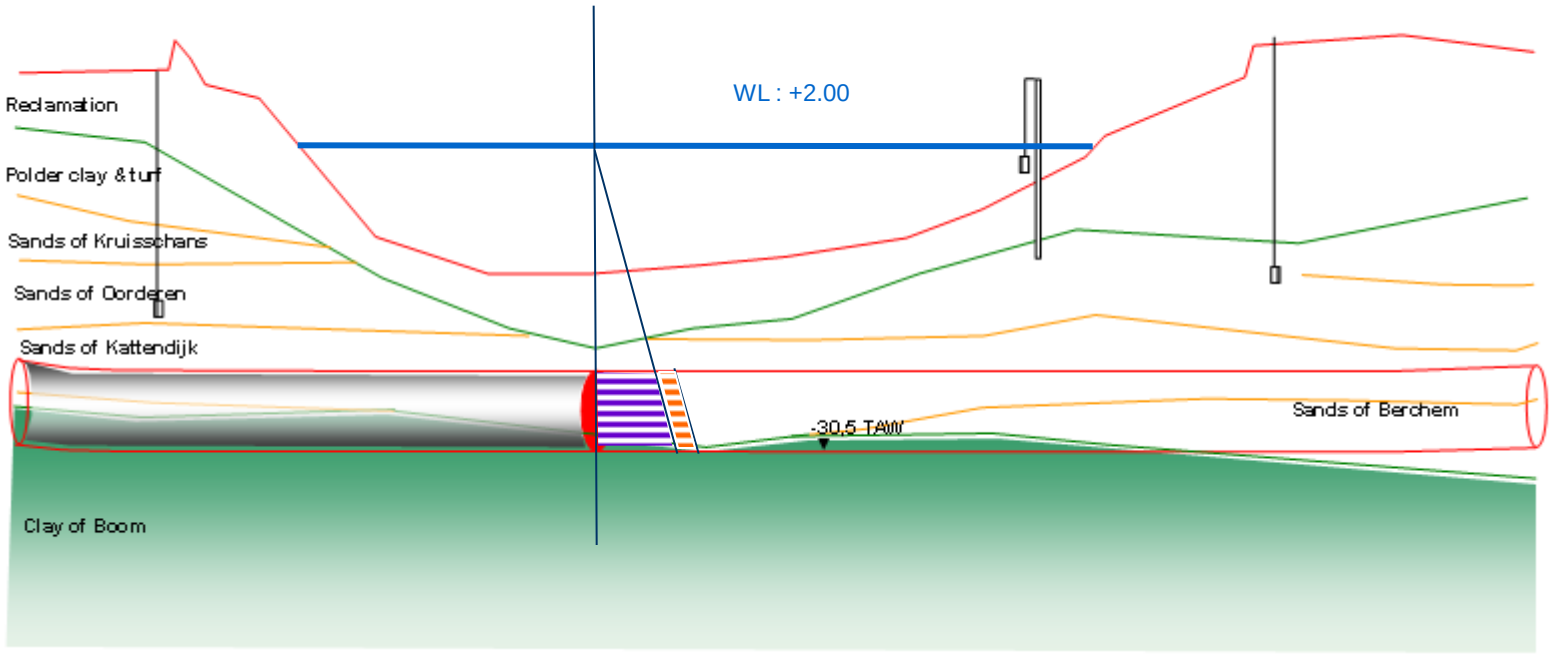
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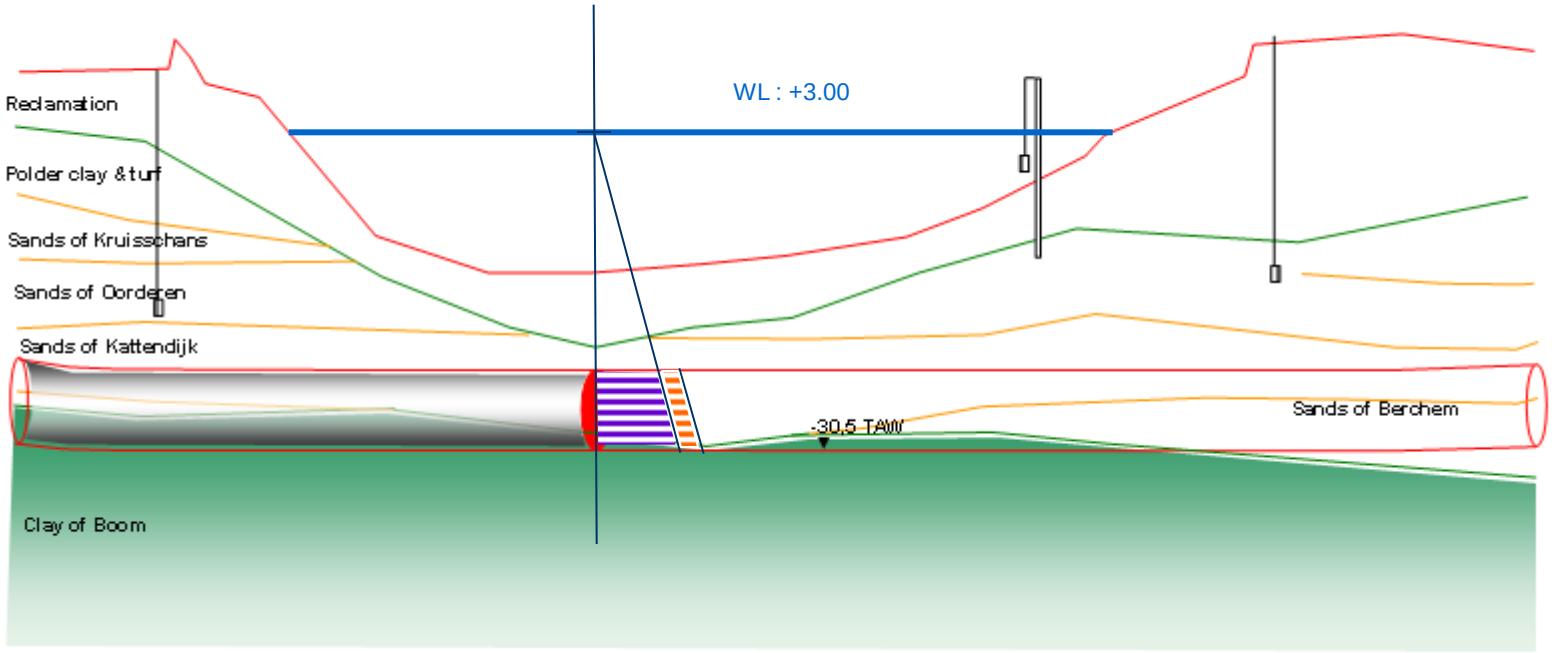
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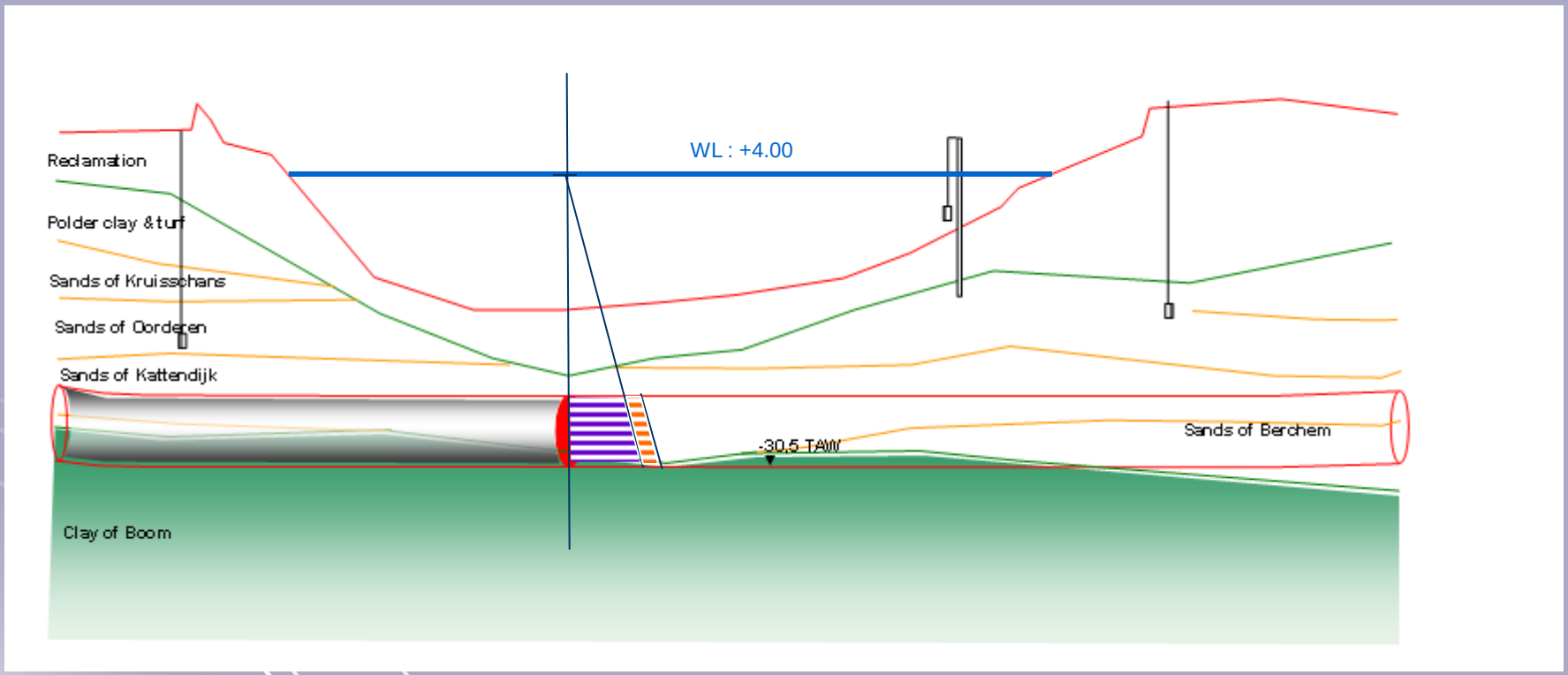
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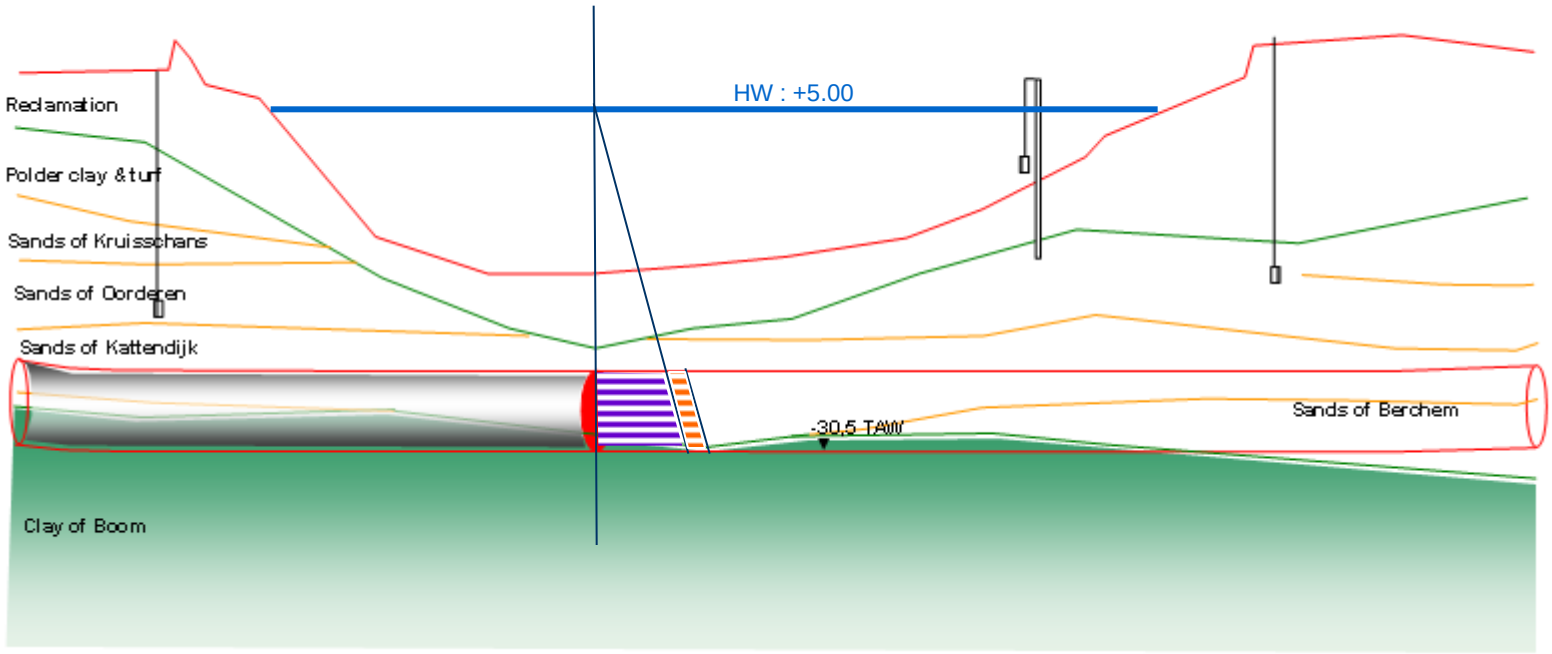
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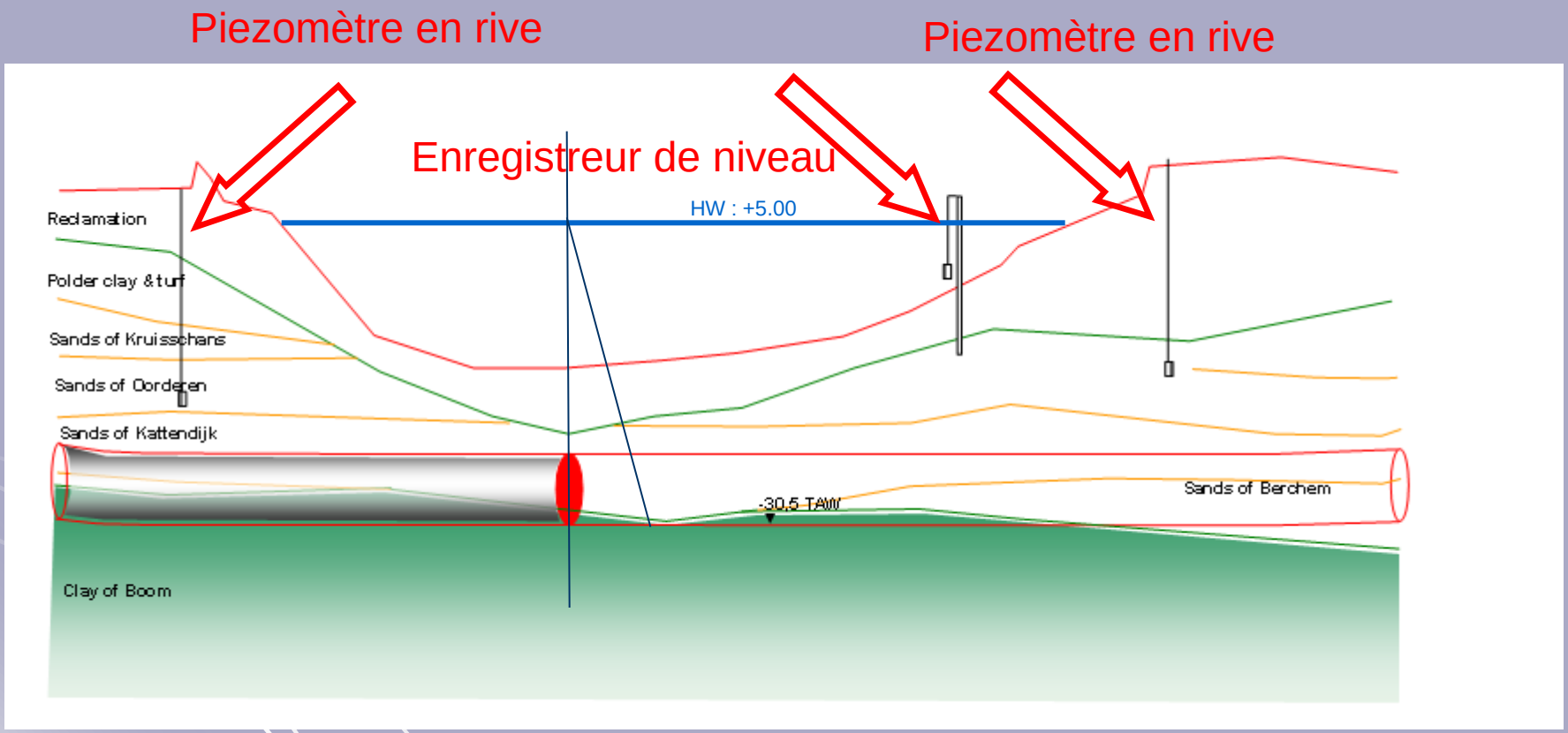
Clay of Boom

Vérification de la loi hydrostatique



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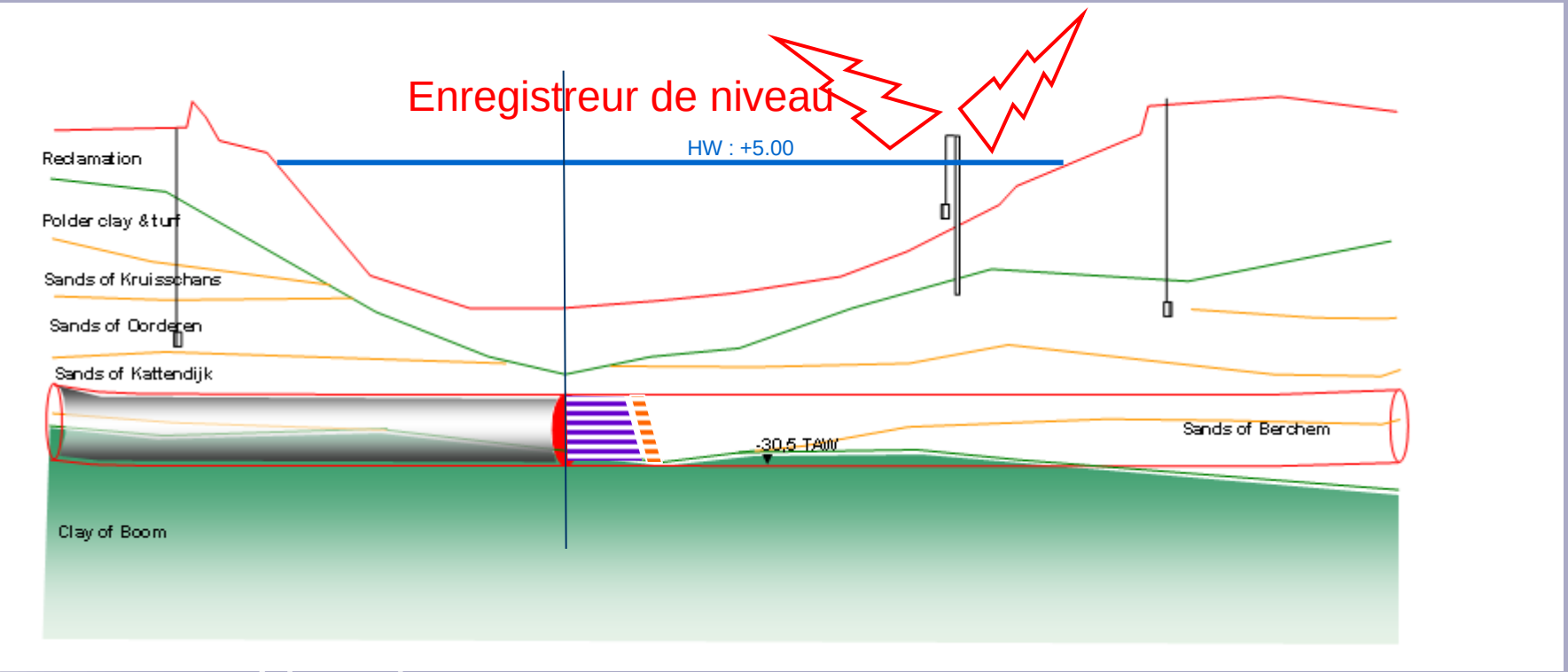

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2- Passage du Kanaaldok

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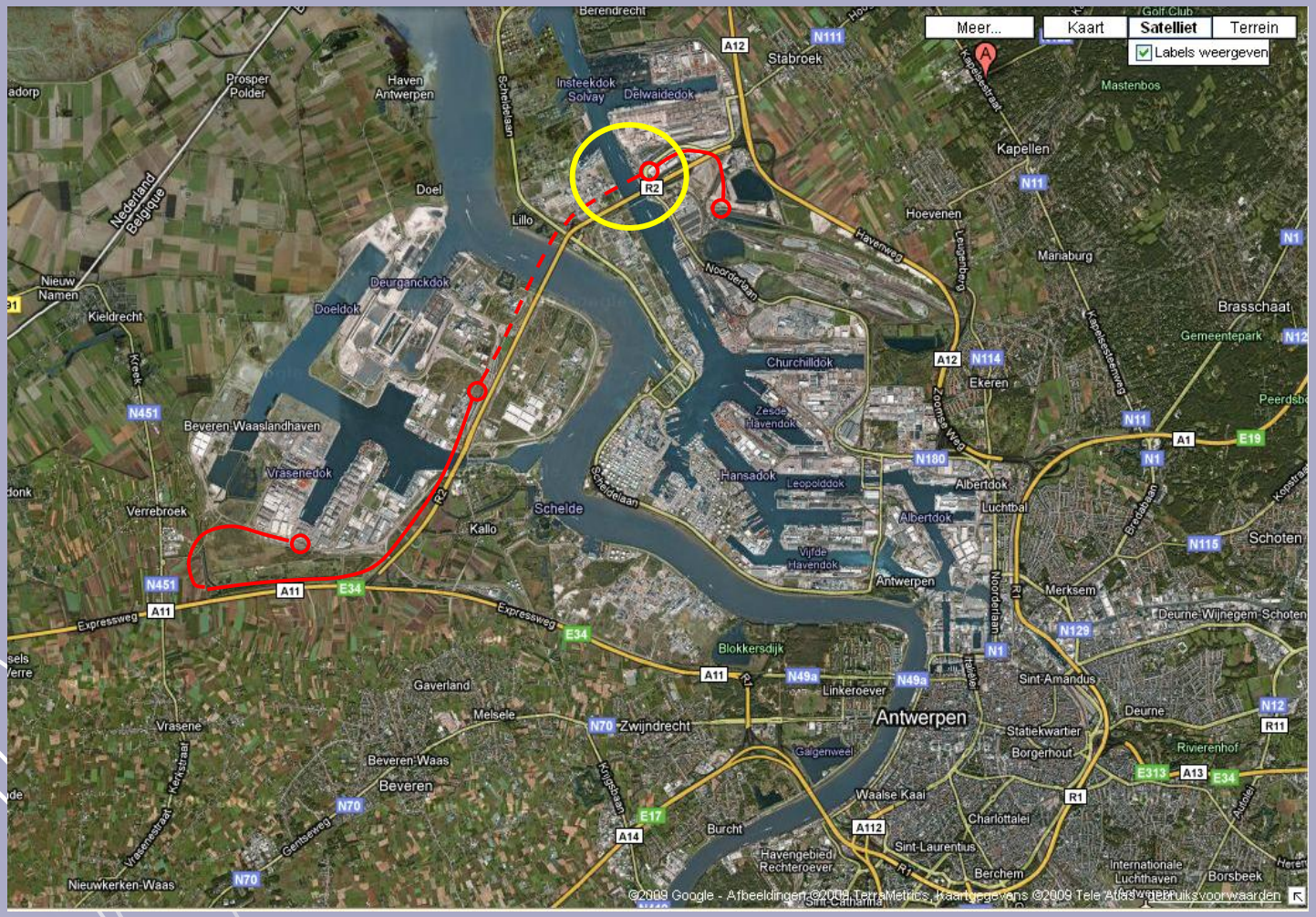
Le Kanaaldok



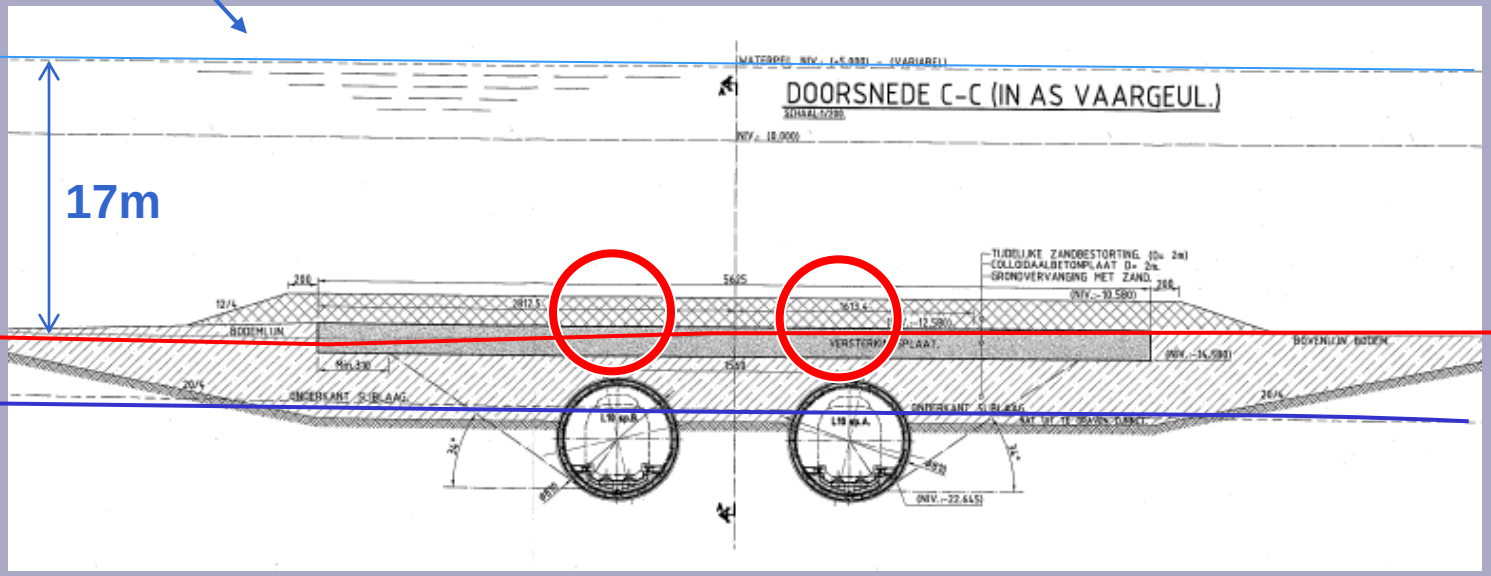
Le chantier

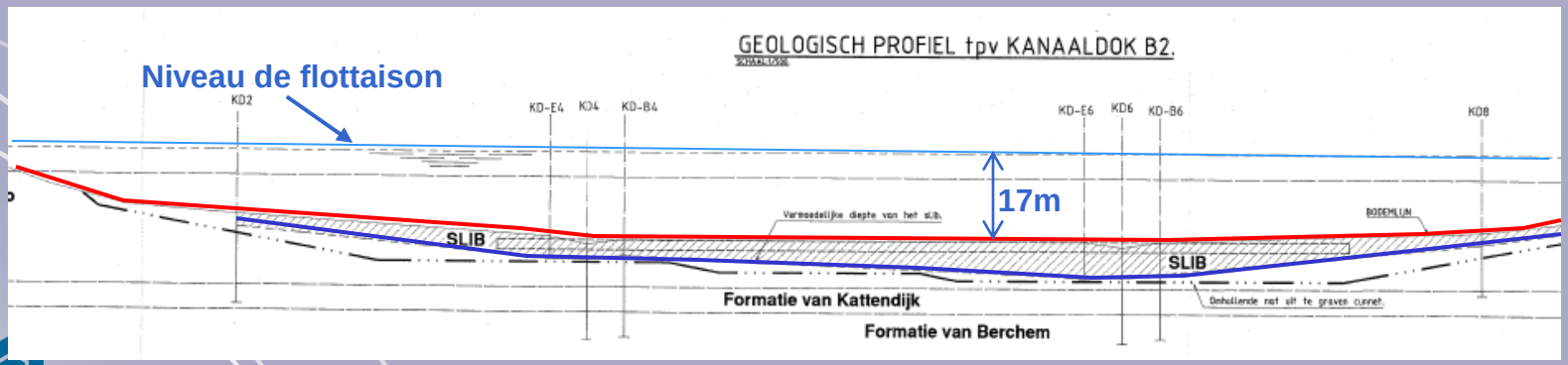
Design Department

CFE

Le problème

Niveau de flottaison

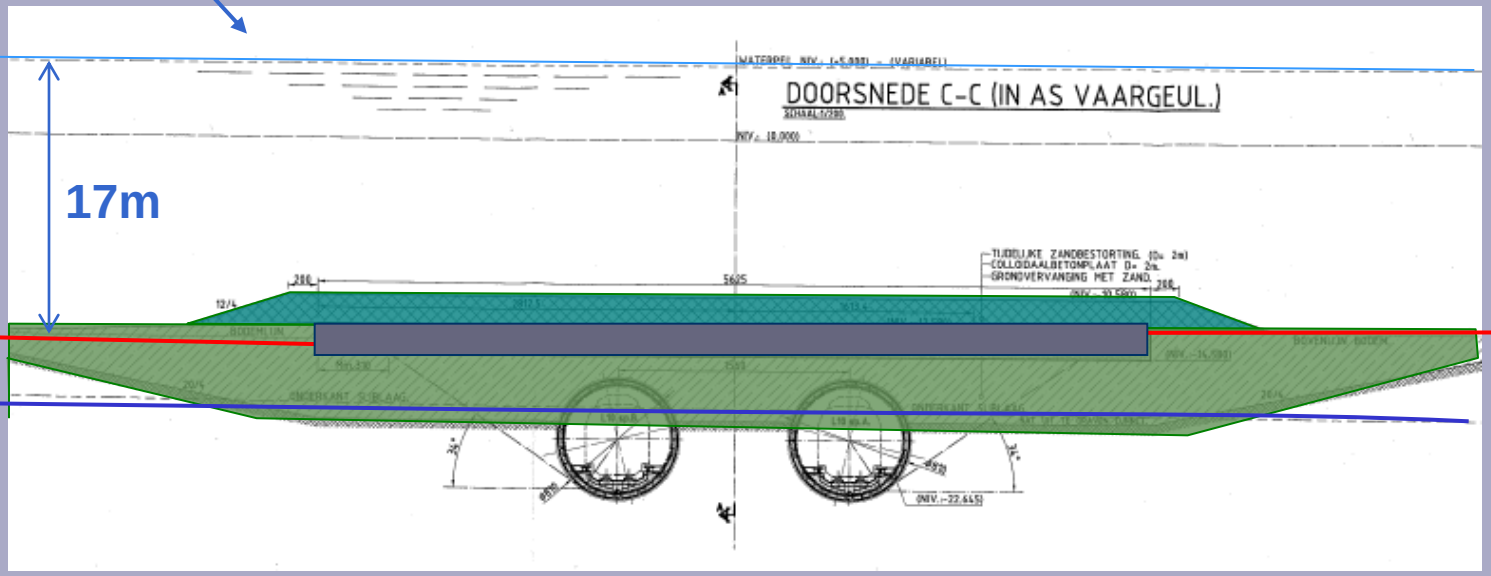


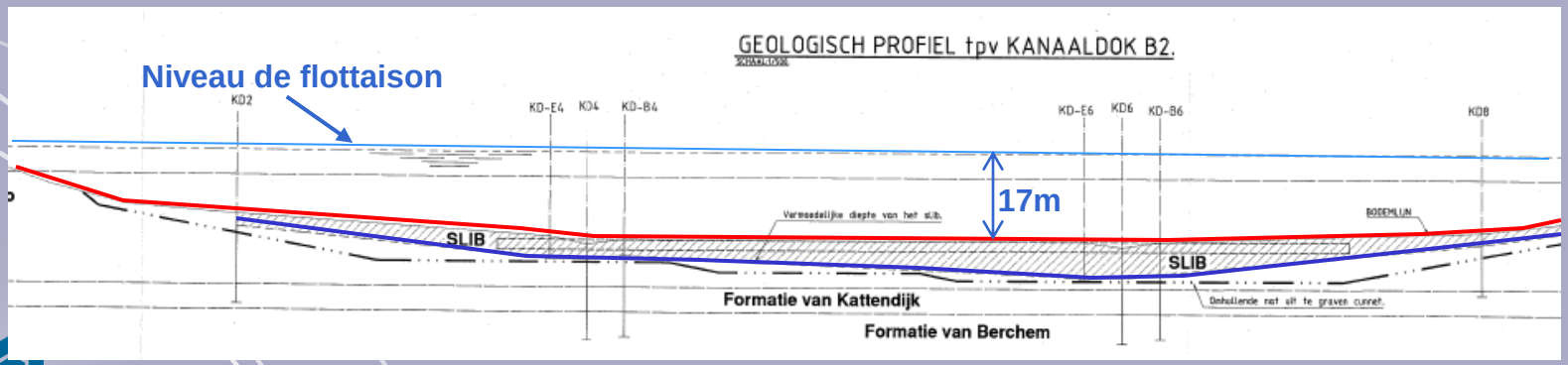


Design Department

La solution de base

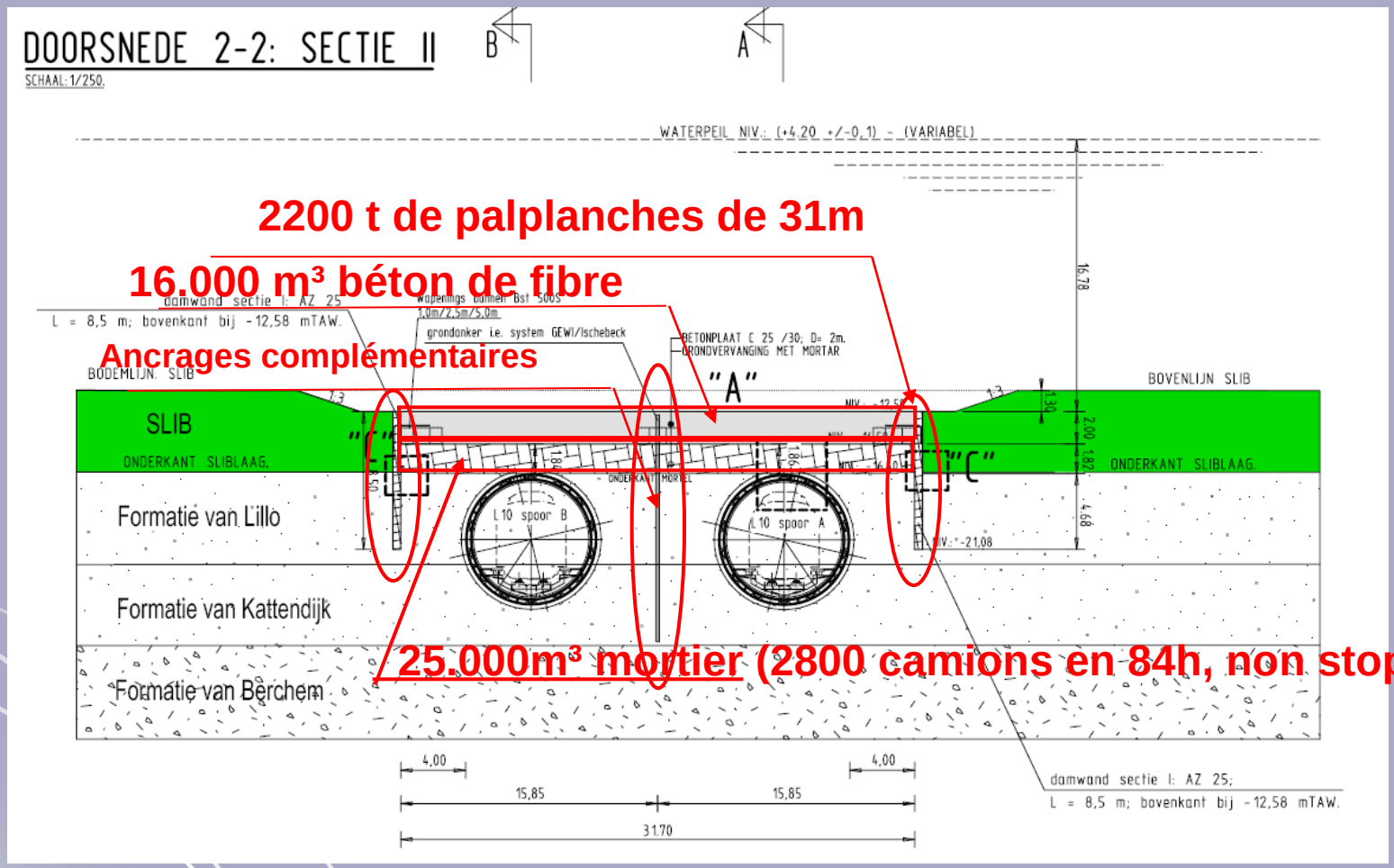
Niveau de flottaison



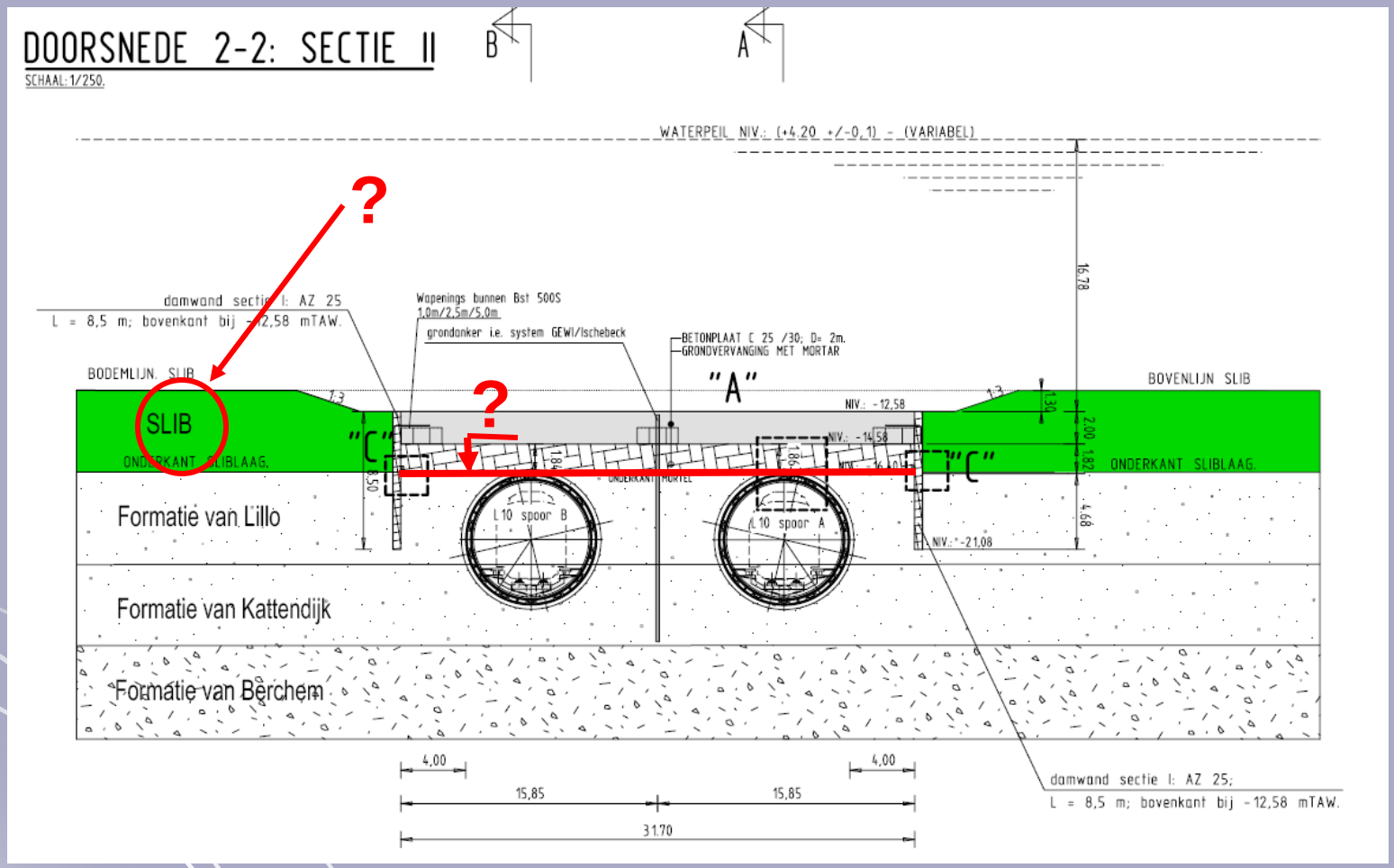


Design Department

La proposition de Locobouw



Le dimensionnement



Le dimensionnement

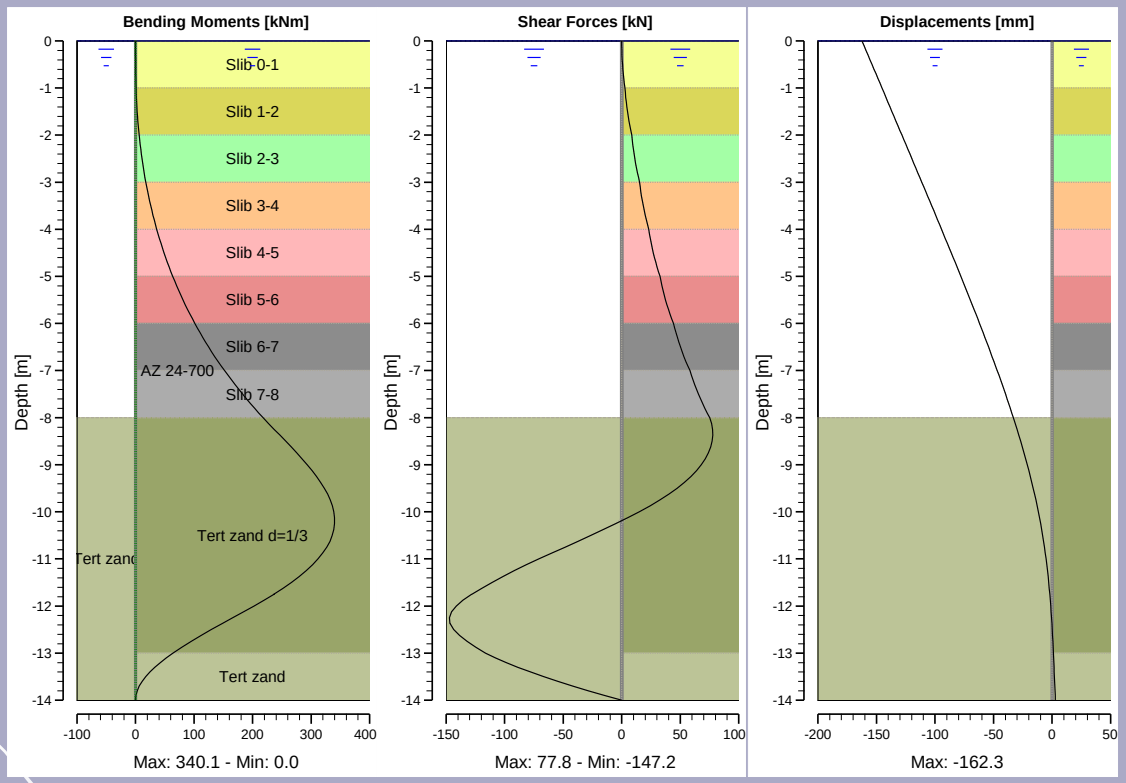
Design Department

Kanaaldok - vertserkingplaat - sect 2
Damplanken voor H=8m AZ24-700
Slib in undrained condition

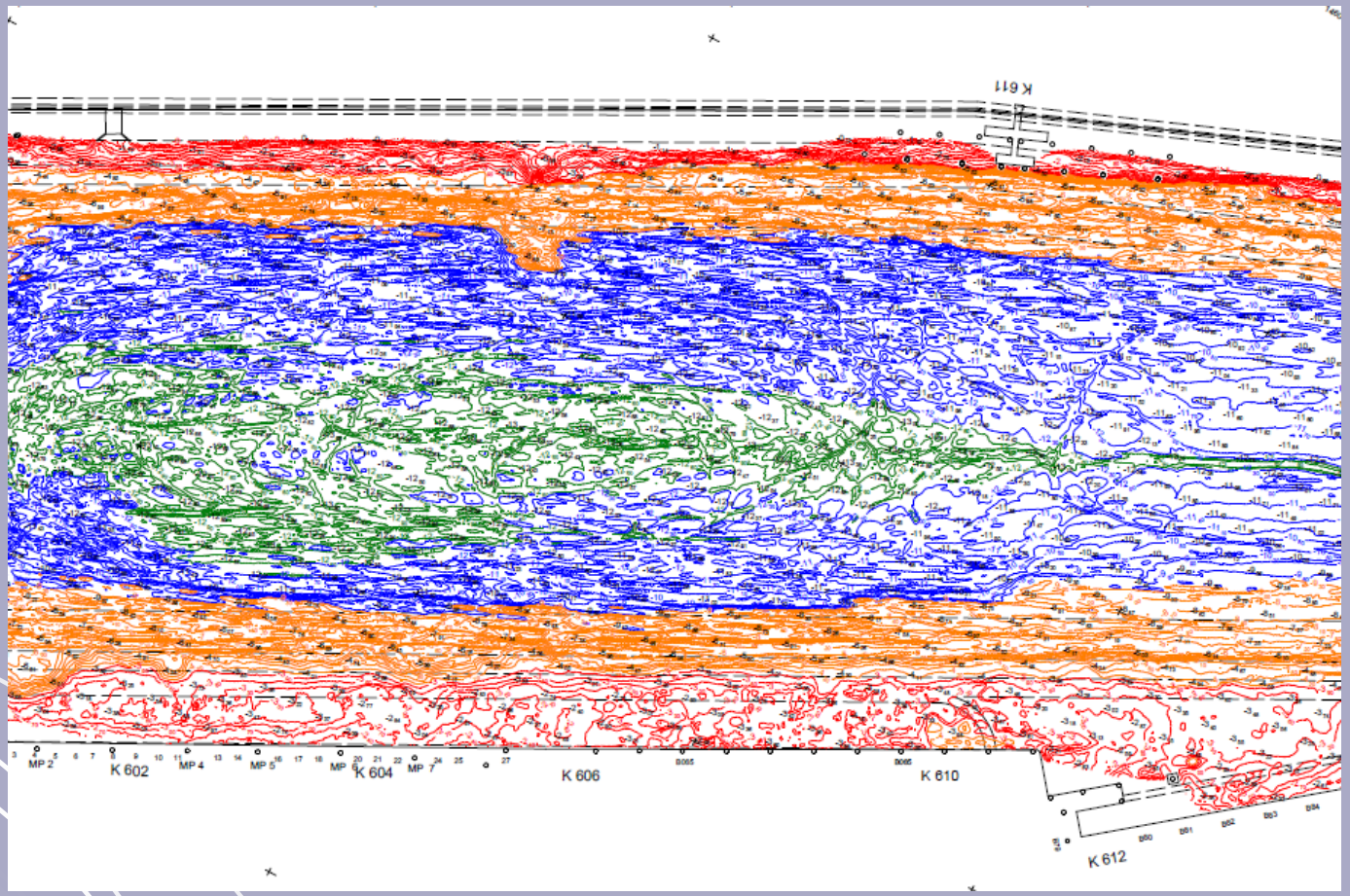
TELEPHONE
TELEFAX

22/09/2009
date

MSheet 7.7 - Kanaalplaat Appendix A of calculation note.shi

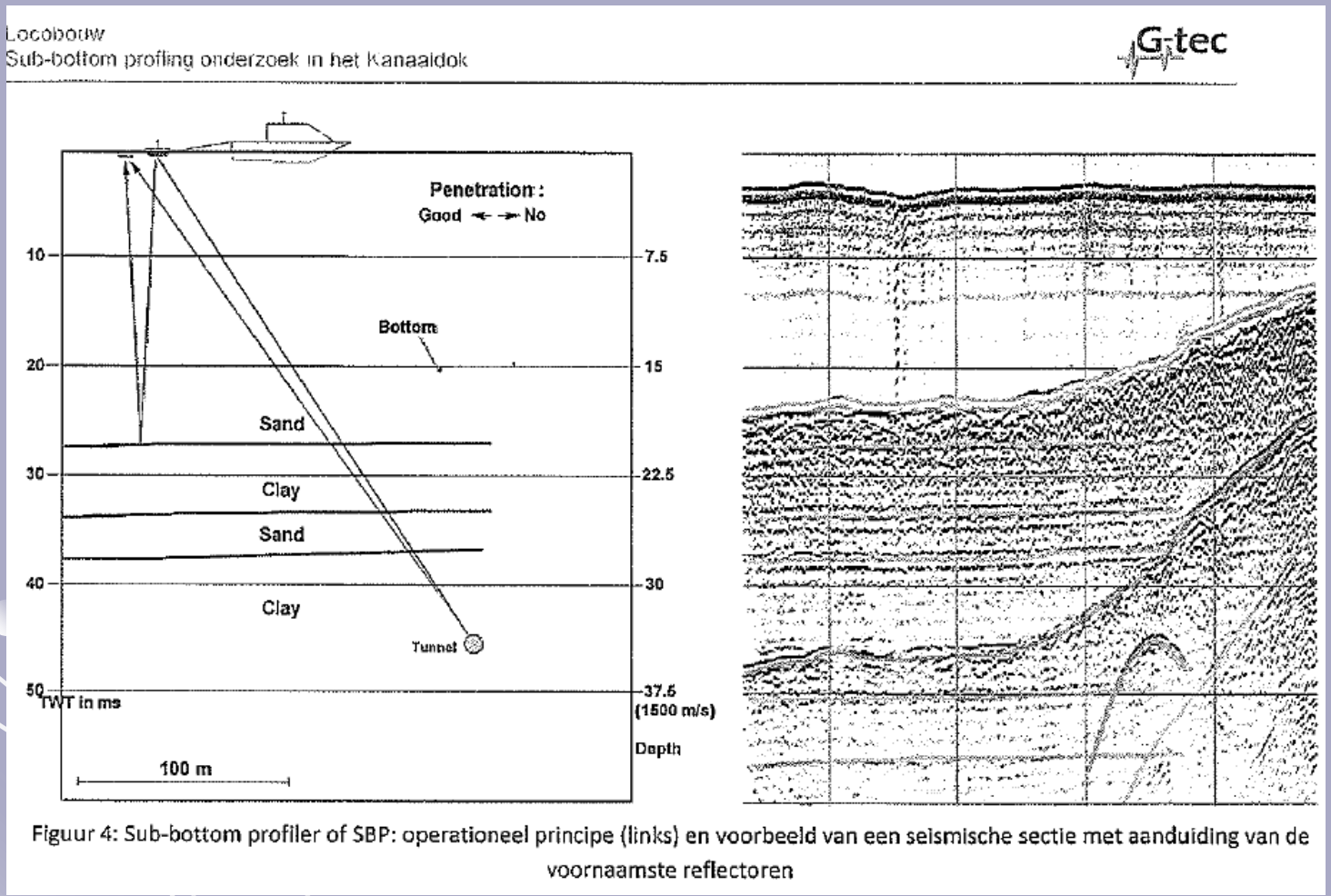


Bathimétrie



Design Department

Sub-bottom profiling

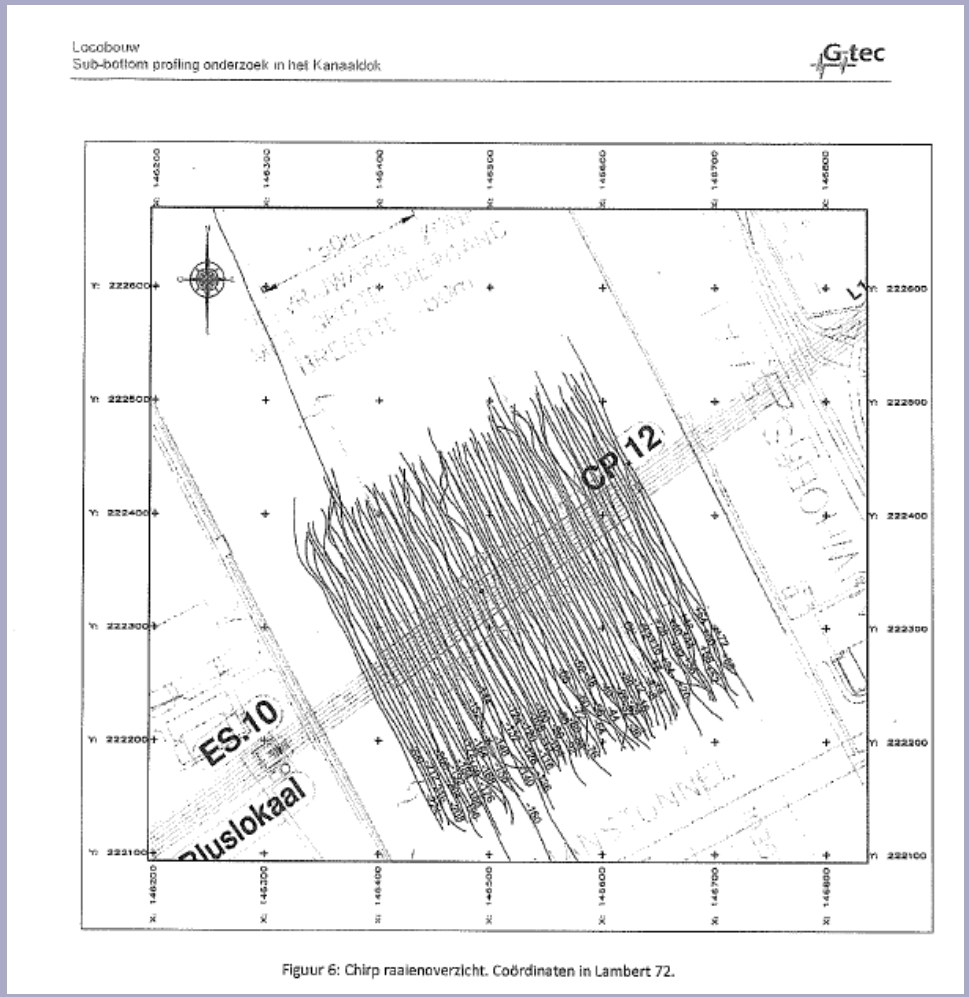


Figuur 4: Sub-bottom profiler of SBP: operationeel principe (links) en voorbeeld van een seismische sectie met aanduiding van de voornaamste reflectoren

Design Department

Sub-bottom profiling

Figuur 3: Surveyvlet De Zwaan.

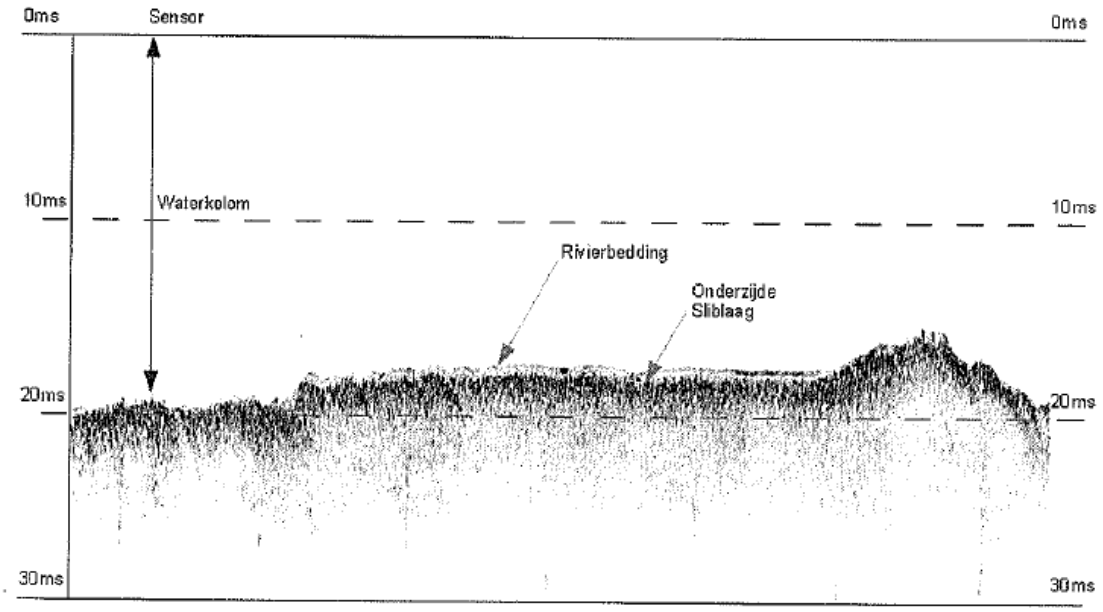


Figuur 6: Chirp raaienoverzicht. Coördinaten in Lambert 72.

Sub-bottom profiling

Het zachte slib heeft een dikte die varieert tussen de 0.3 en 0.5 meter. Onder deze laag bevindt zich een iets geconsolideerd sediment, rijk aan meer zand wat leidt tot een sterke attenuatie van het seismisch signaal.

Enkel de toplaag van dit ongeconsolideerd, herwerkt pakket kon met deze techniek worden vastgesteld.

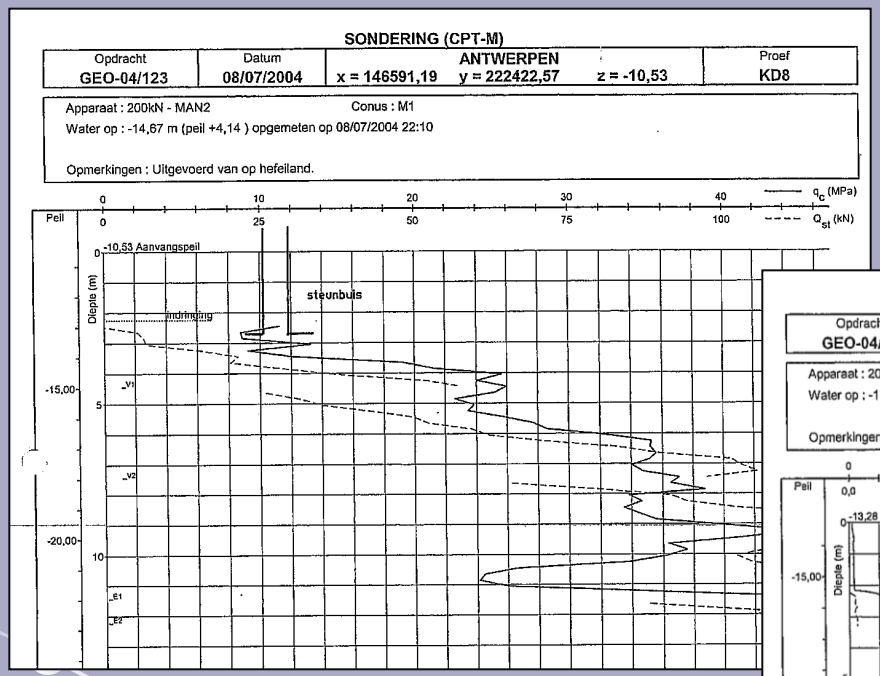


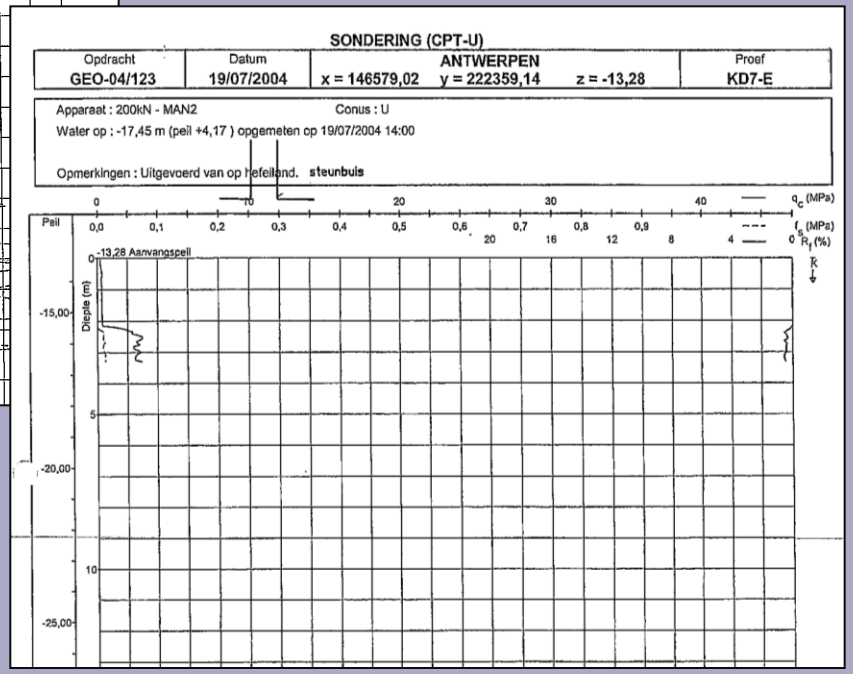
Figuur 7: Chirp hoge resolutie reflectie seismiek lijn -148

Jacked pontoon

Design Department

CPT





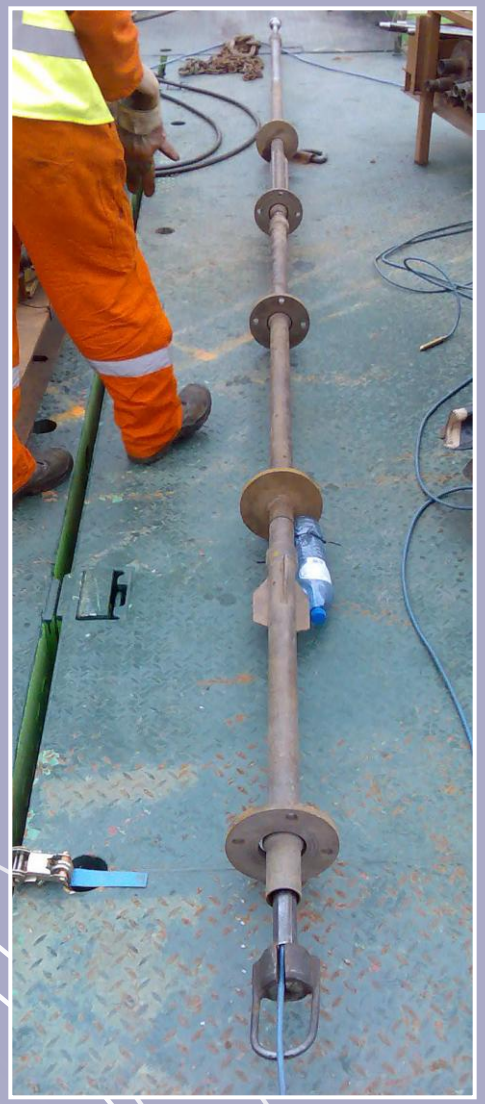
Design Department

Mini sondering

a.p. van den berg 25-40 kN - 2.5 à 10cm²

Design Department

Bol Sondering



Design Department

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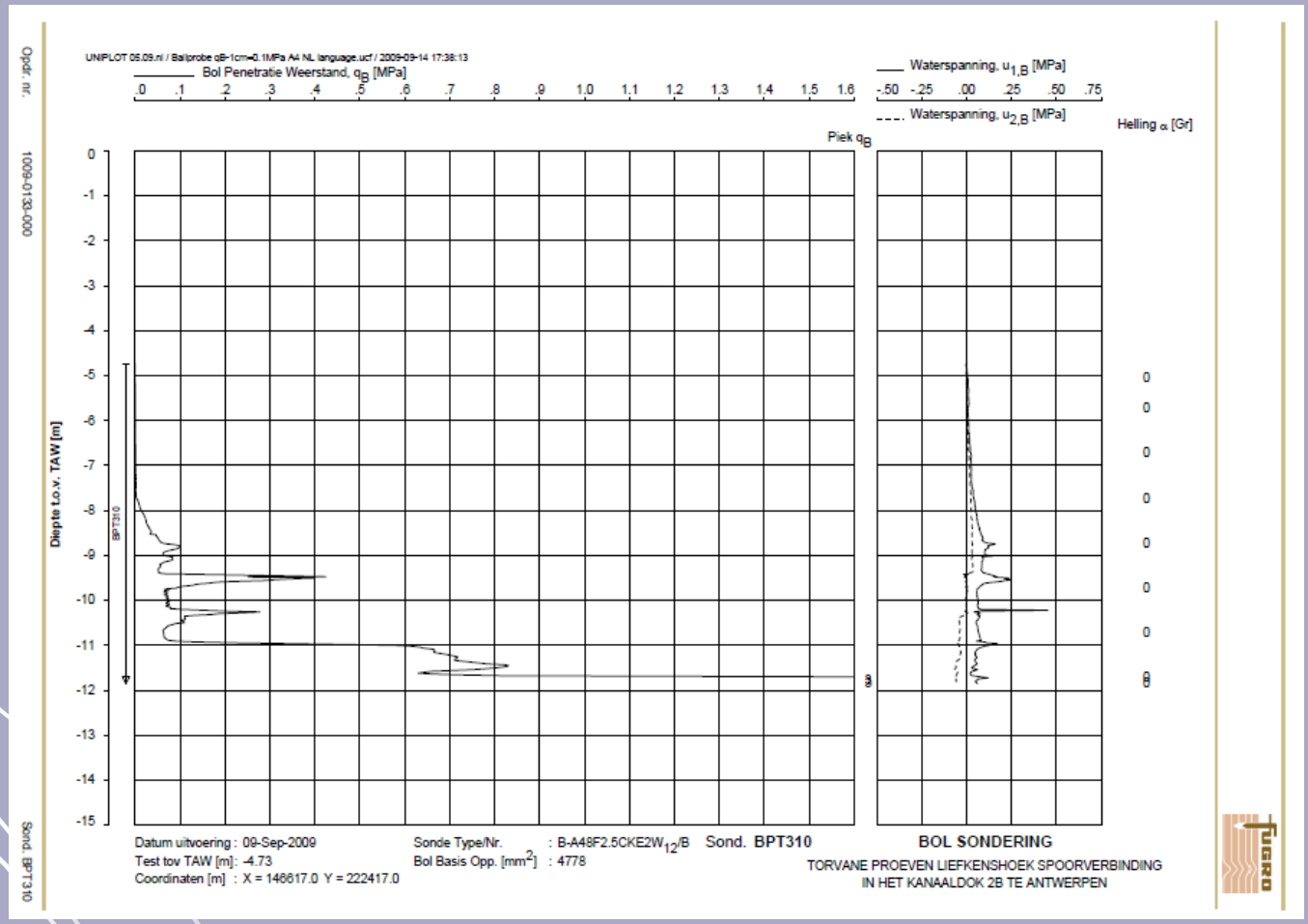
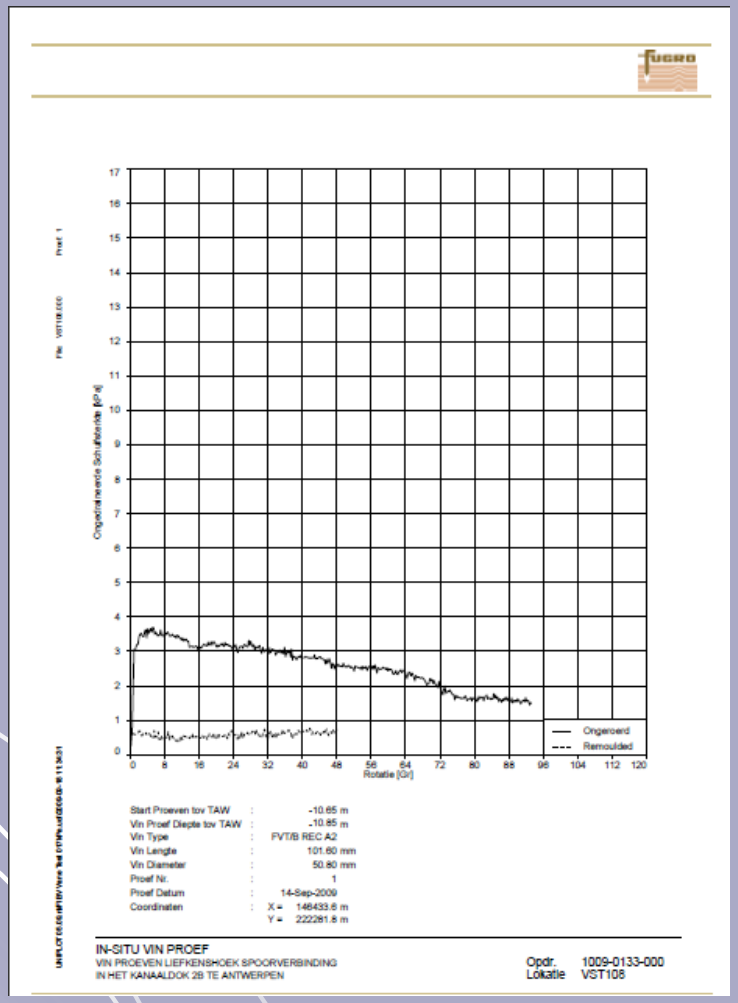
Bol Sondering



Design Department

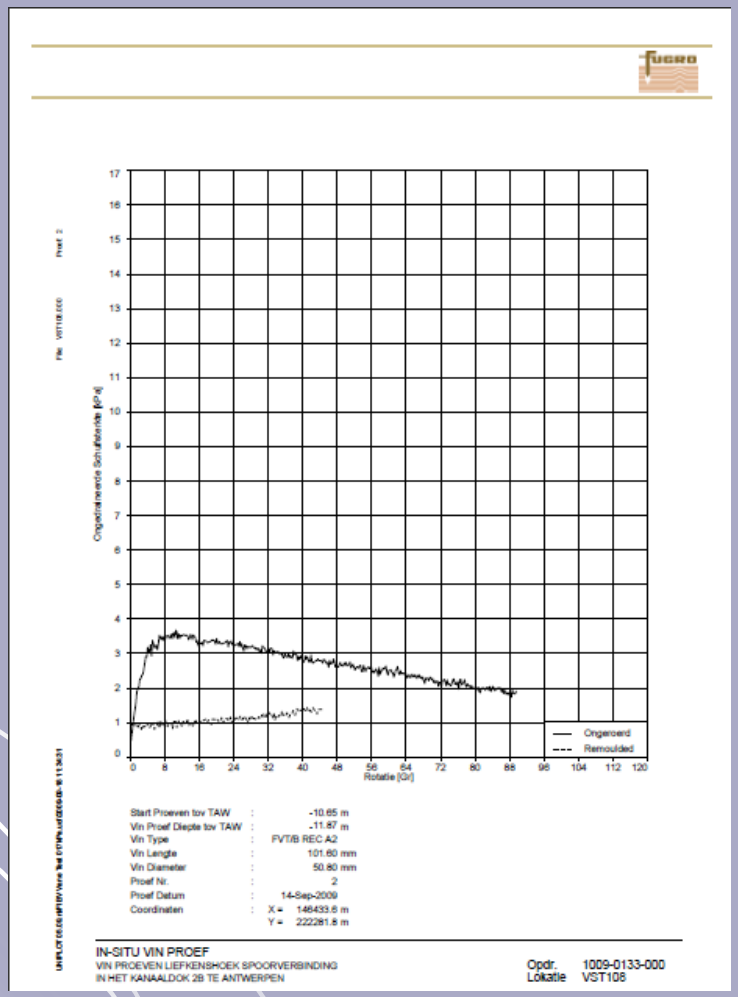
Vane test



Profondeur :

00.20m

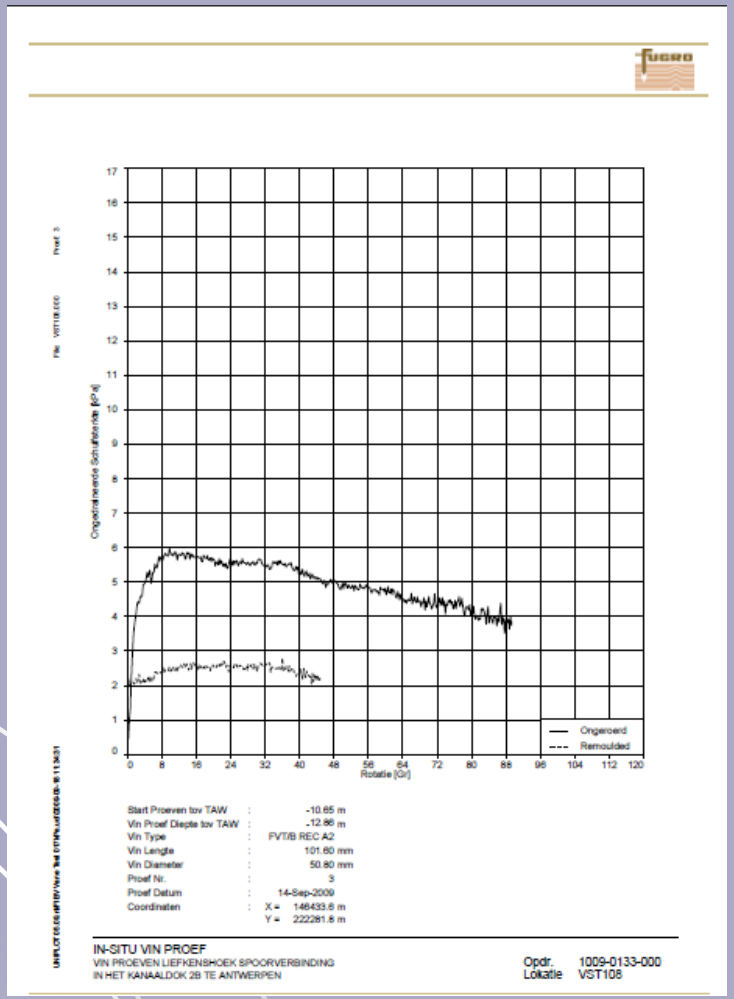
Vane test



Profondeur :

01.20m

Vane test



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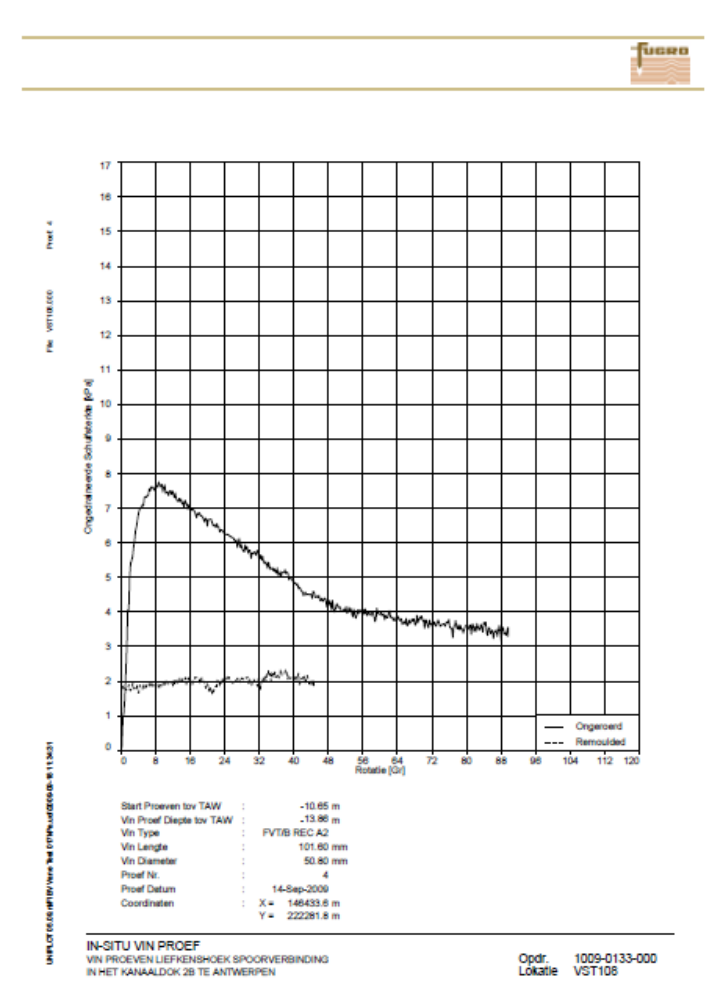

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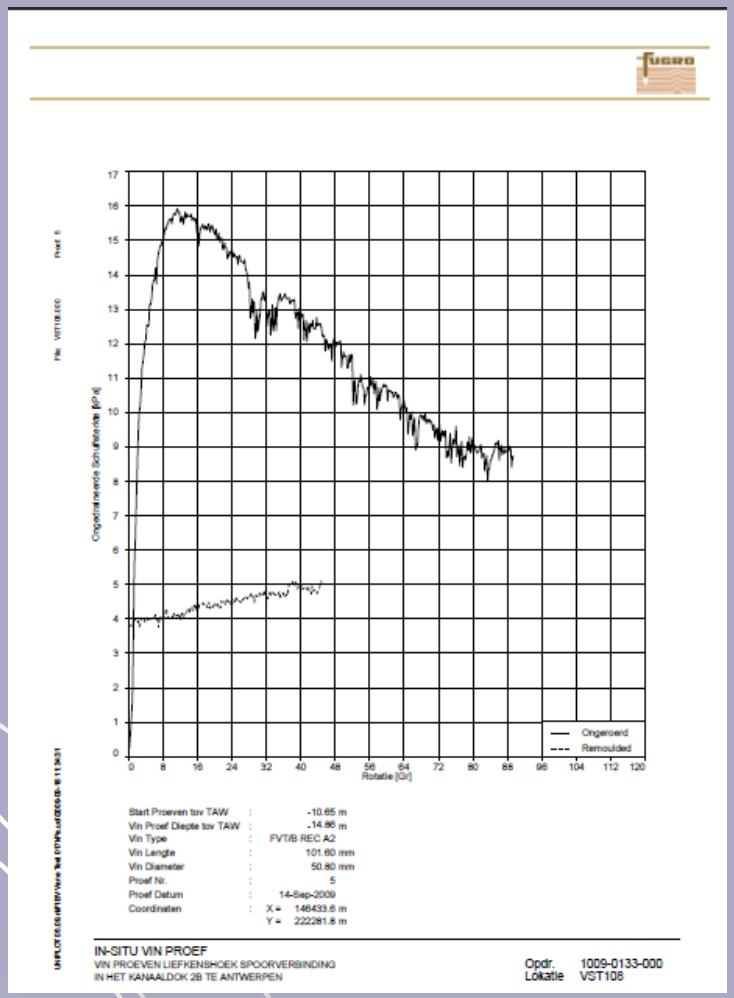

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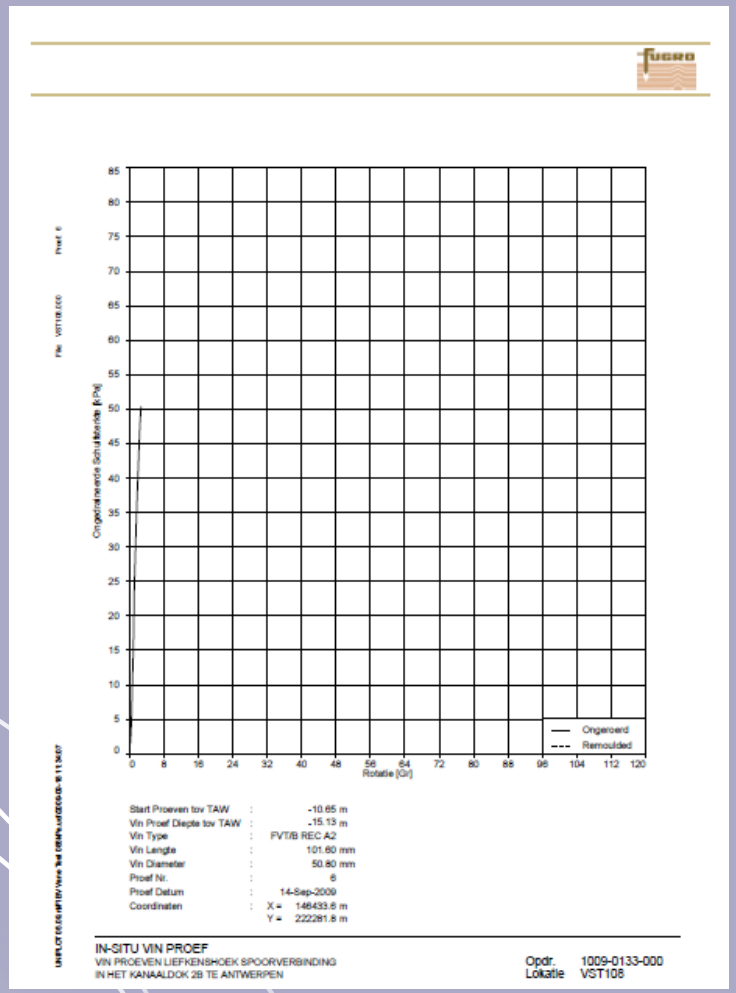
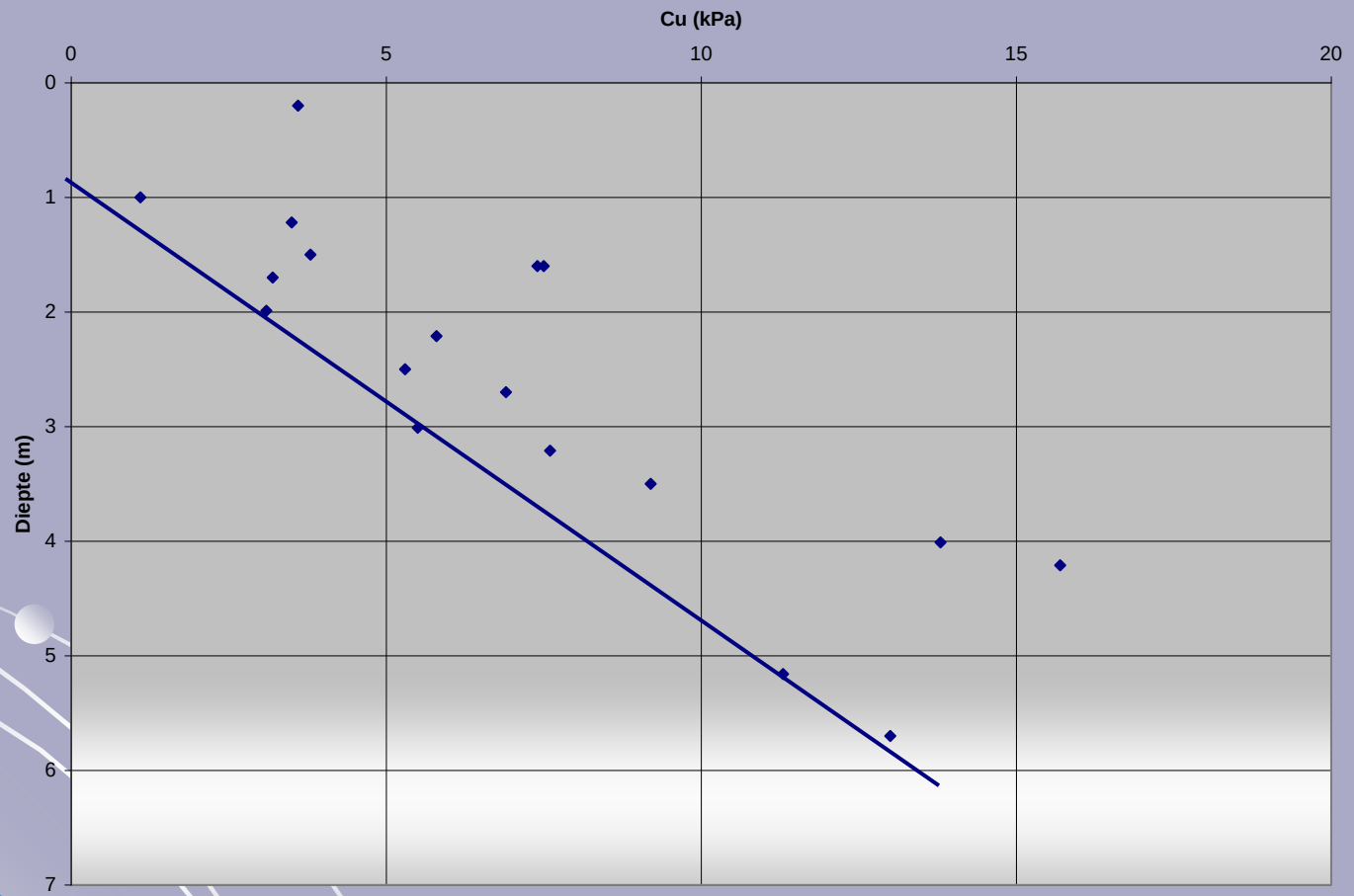
Vane test



Profondeur :

04.50m

Synthèse des Cu



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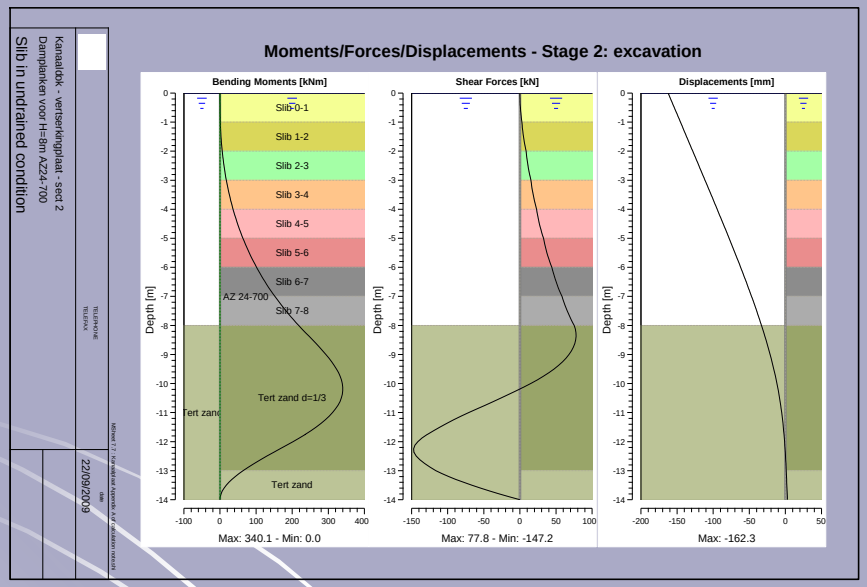
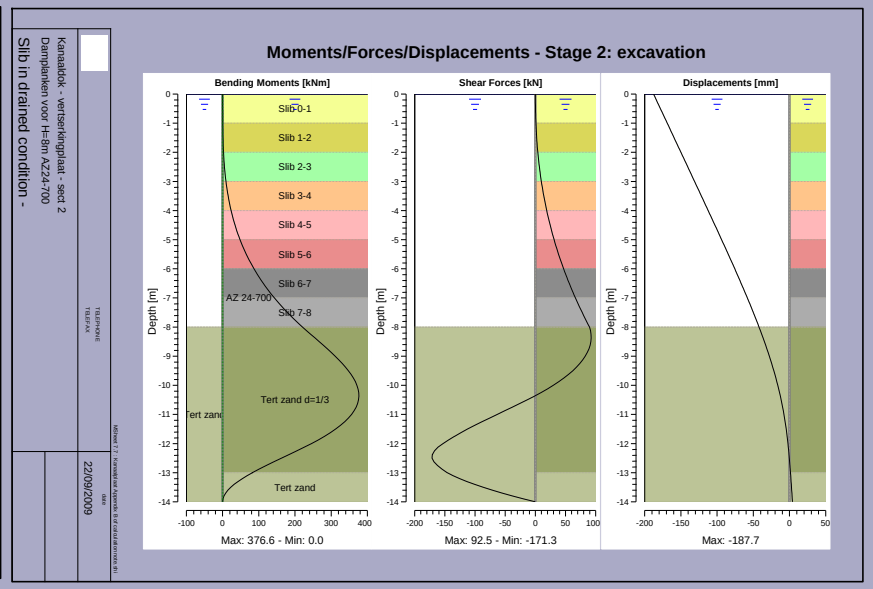
Drained – undrained conditions





Design Department

Positionnement plateforme

A	B	C	D	E	F	G	H	I	J
		GEGEVEN							
			ool						
				Heading Tijl II	Heading in RAD	Heading tov moonpool	Afstand tot moonpool	Bodempeil (TAW)	indringingsdie
			22262,9	139,3	2,431243648	0,814425125	15,55	-9,75	
			22262,9	139,3	2,431243648	1,970927841	12,28	-9,75	
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			22291,1	111,5	1,946042116	0,814425125	15,55	-10,59	
			22291,1	111,5	1,946042116	1,970927841	12,28	-10,59	
			22291,1	111,5	1,946042116	3,616951635	5,55	-10,59	
			22291,1	111,5	1,946042116	6,048215182	10,91	-10,59	
			22307,1	162,1	2,829178717	0,814425125	15,55	-11,68	
			22307,1	162,1	2,829178717	1,970927841	12,28	-11,68	
			22307,1	162,1	2,829178717	3,616951635	5,55	-11,68	
			22307,1	162,1	2,829178717	6,048215182	10,91	-11,68	
			22325,7	141,4	2,467895562	0,814425125	15,55	-12,5	
			22325,7	141,4	2,467895562	1,970927841	12,28	-12,5	
			22325,7	141,4	2,467895562	3,616951635	5,55	-12,5	
			22325,7	141,4	2,467895562	6,048215182	10,91	-12,5	
			222343	127,5	2,225294796	0,814425125	15,55	-12,58	
			222343	127,5	2,225294796	1,970927841	12,28	-12,58	
			222343	127,5	2,225294796	3,616951635	5,55	-12,58	
123	4	146519,8	222343	127,5	2,225294796	6,048215182	10,91	-12,58	
127	1	146544,3	222361,1	314,9	5,496041815	0,814425125	15,55	-12,34	
127	2	146544,3	222361,1	314,9	5,496041815	1,970927841	12,28	-12,34	
127	3	146544,3	222361,1	314,9	5,496041815	3,616951635	5,55	-12,34	
127	4	146544,3	222361,1	314,9	5,496041815	6,048215182	10,91	-12,34	
131	1	146568,8	222378,8	288,1	5,028293575	0,814425125	15,55	-12,03	
131	2	146568,8	222378,8	288,1	5,028293575	1,970927841	12,28	-12,03	
131	3	146568,8	222378,8	288,1	5,028293575	3,616951635	5,55	-12,03	
131	4	146568,8	222378,8	288,1	5,028293575	6,048215182	10,91	-12,03	
137	1	146592,9	222396,7	143,5	2,504547477	0,814425125	15,55	-11,27	
137	2	146592,9	222396,7	143,5	2,504547477	1,970927841	12,28	-11,27	
137	3	146592,9	222396,7	143,5	2,504547477	3,616951635	5,55	-11,27	
137	4	146592,9	222396,7	143,5	2,504547477	6,048215182	10,91	-11,27	
201 S	1	146414,7	222282,6	171,9	3,000220984	0,814425125	15,55	-10,51	
201 S	2	146414,7	222282,6	171,9	3,000220984	1,970927841	12,28	-10,51	
201 S	3	146414,7	222282,6	171,9	3,000220984	3,616951635	5,55	-10,51	
201 S	4	146414,7	222282,6	171,9	3,000220984	6,048215182	10,91	-10,51	
201	1	146413,7	222285	1,9	0,033161256	0,814425125	15,55	-11,76	
201	2	146413,7	222285	1,9	0,033161256	1,970927841	12,28	-11,76	

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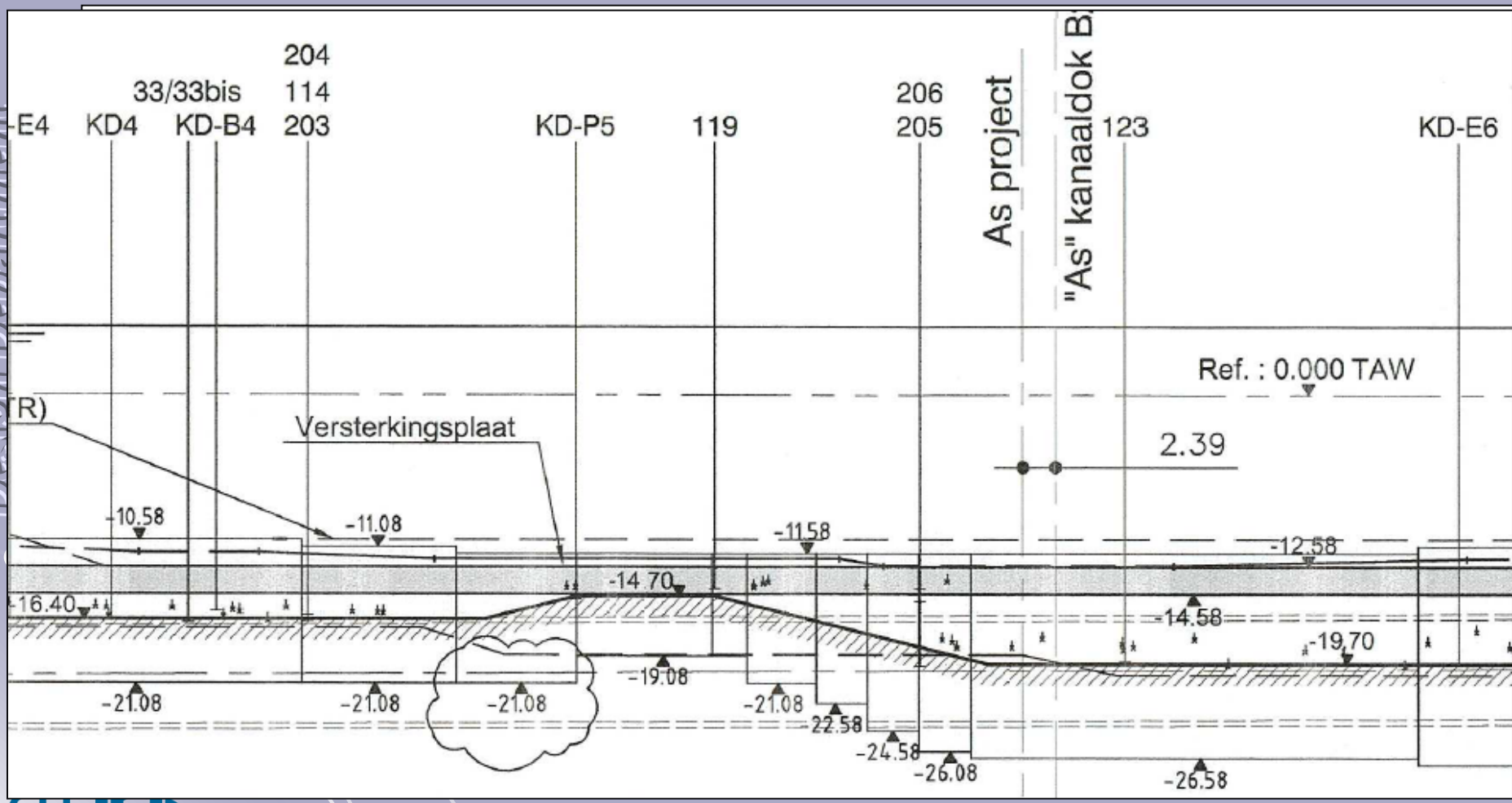
Niveau assise des sputs



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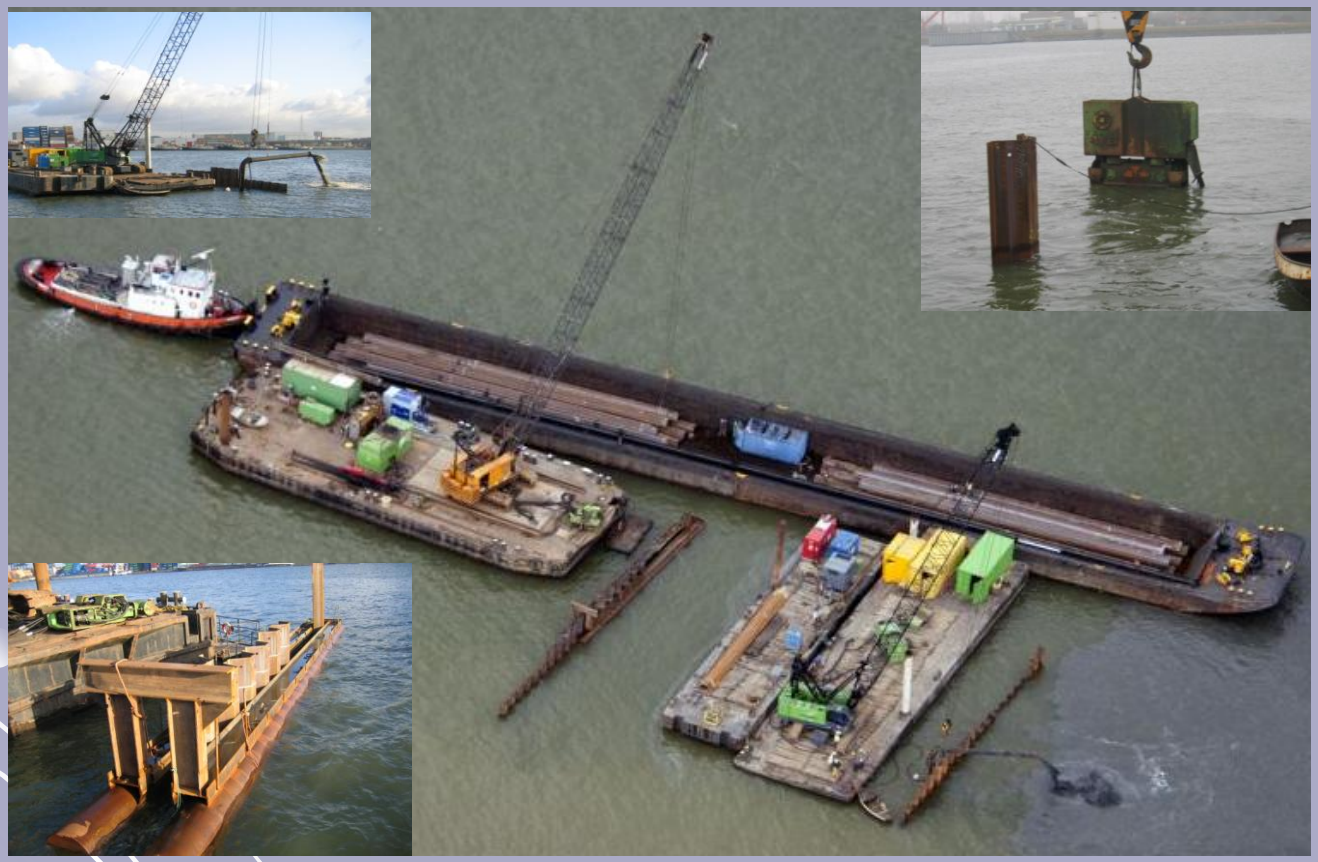
La mise en place des palplanches

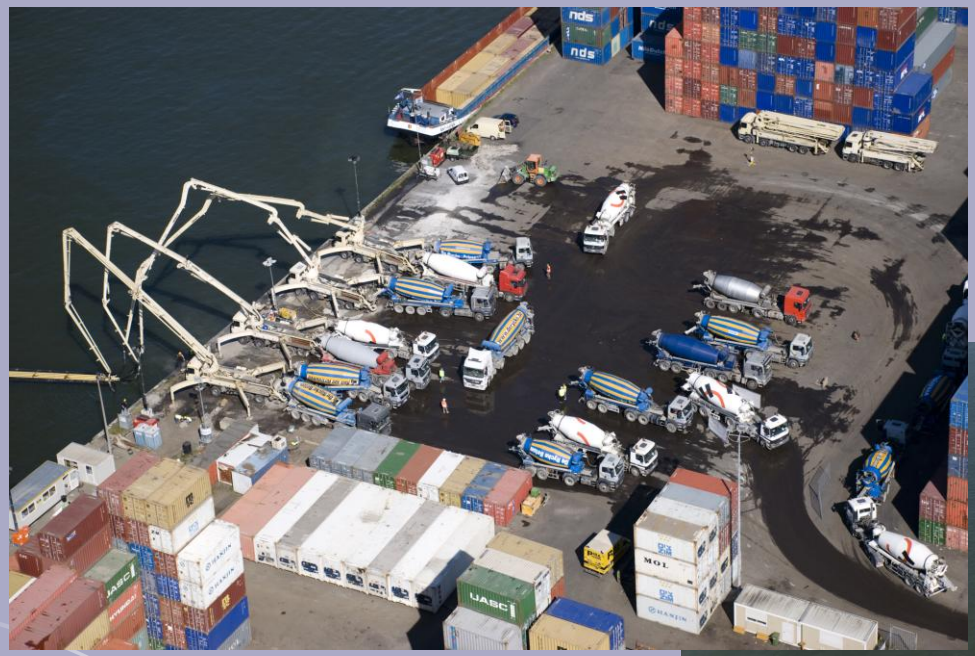


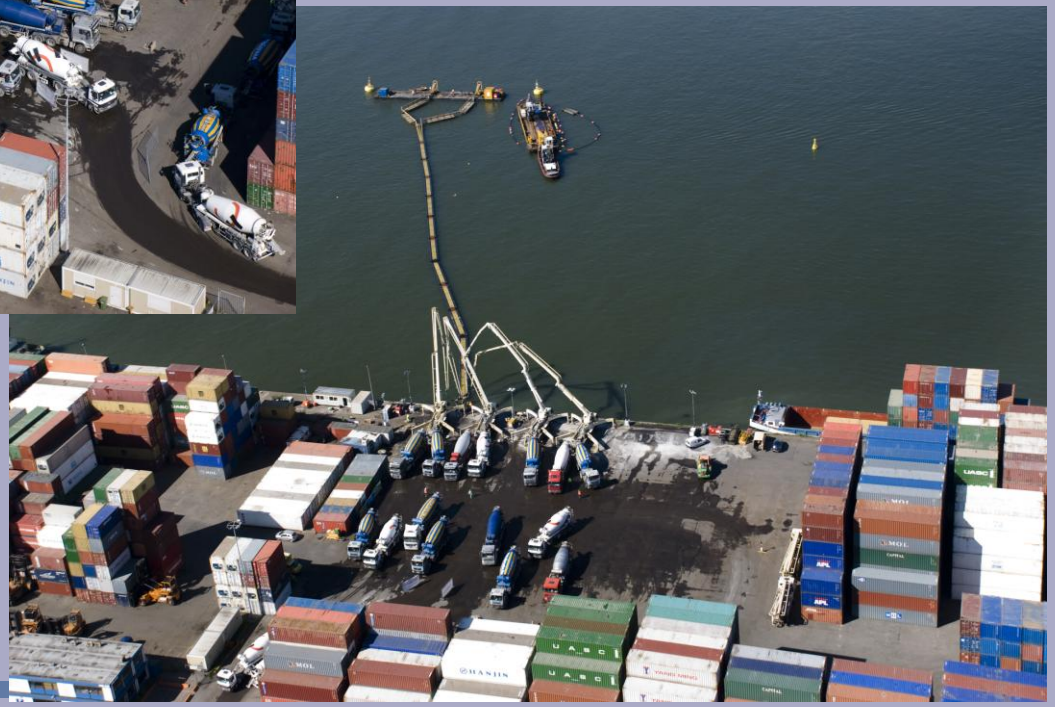
2200 t de palplanches

Mise en place mortier basse résistance

Design Department

Mise en place mortier basse résistance





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Arrivée du premier bouclier le 16 mai 2011

Photo Philippe van Gelooven

Merci pour votre attention

Questions ?