RijnlandRoute

Veilig,
Op Tijd,
In Goede
Samen-
werking

Informatiebijeenkomst Vlietweg
6 juni 2018

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Programma

19.30u	Opening	Govert van Hooff
19.35u	Werkzaamheden startzone	Hugo Jacobs
19.50u	Boorproces	Thomas Schubert
20.05u	Monitoring	Hans Mortier
20.30u	Definitief inrichtingsplan	Harm Post
20.45u	Vragenronde	
21.00u	Afsluiting/ drankje	
21.30u	Einde	

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Mijlpalen

2017 | 2018 | 2019 | 2020 | 2021 | 2022 | ’22-’37

Contract close
30-1-2017

Aanvraag
Aanvangscertificaat
1-6-2017

Start realisatie startzone
19-3-2018

Start realisatie ontvangstzone
1-6-2018

Start boren
1-6-2019

15 m. per dag

Voltooiingscertificaat
Eind 2022

Maintenance
2022-2037

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Hugo Jacobs
Werkzaamheden startzone N434

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Realisatie startschacht en toerit

<u>Gereed :</u>
Aanbrengen voorbelastingen diverse locaties
Diepwanden startschacht incl. sloop bovenzijde
Damwanden (m.u.v. deel bij HAK/gasleiding)
Asfalteren parkings bouwkeet en infocentrum

<u>Activiteiten bezig :</u>
Bouw/inrichten informatiecentrum (opening begin sept 2018)
Aanbrengen ankerpalen (reeds 25% aangebracht), vermoedelijk tot sept 2018
Aanbrengen koppelbalk op diepwanden (juni 2018)
Aanbrengen boorterp

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Realisatie startschacht en toerit

<u>Wat nog moet gebeuren :</u>

Damwanden bij HAK/gasleiding	Eind juni 2018
Ontgraven	Juli t/m november 2018
Bouw stafkeet + uitkijkpunt	Zomer 2018
Betonwerken (vloeren, wanden)	Oktober 2018 t/m maart 2019
Ingebruikname gescheiden bouwweg	November 2018
Vernieuwen damwandconstructie Schiekanaal	Vanaf november 2018

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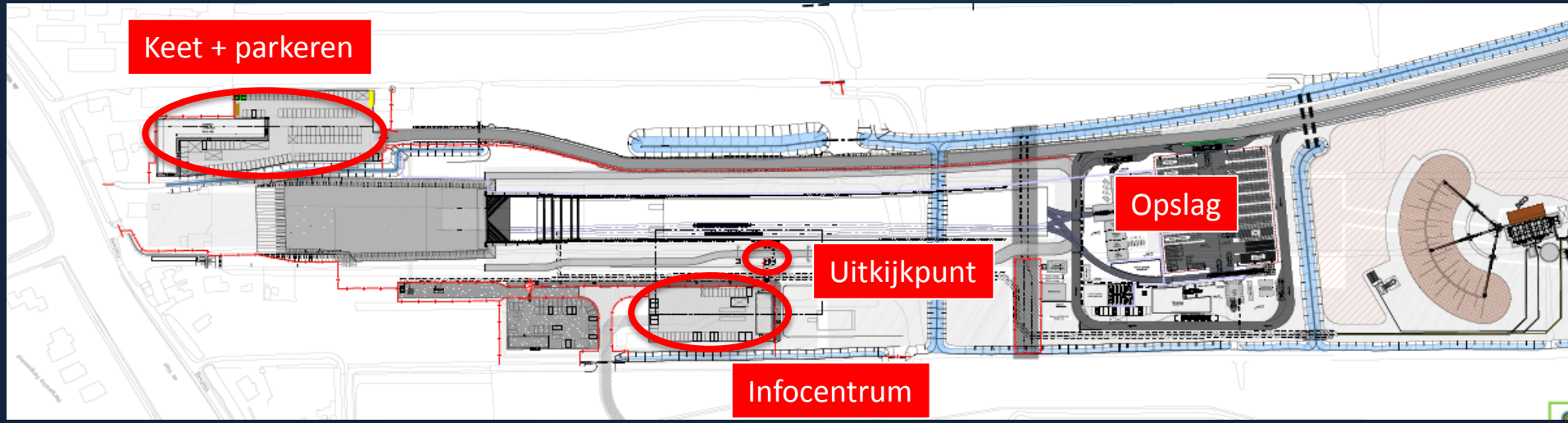
Terreininrichting



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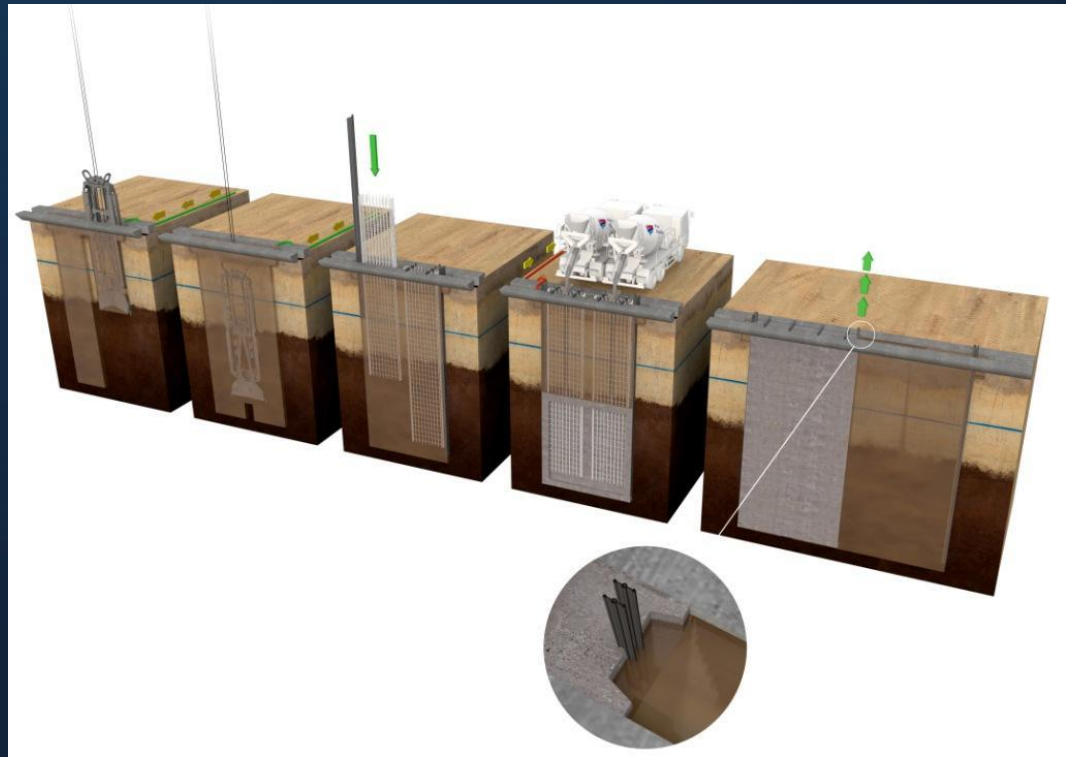
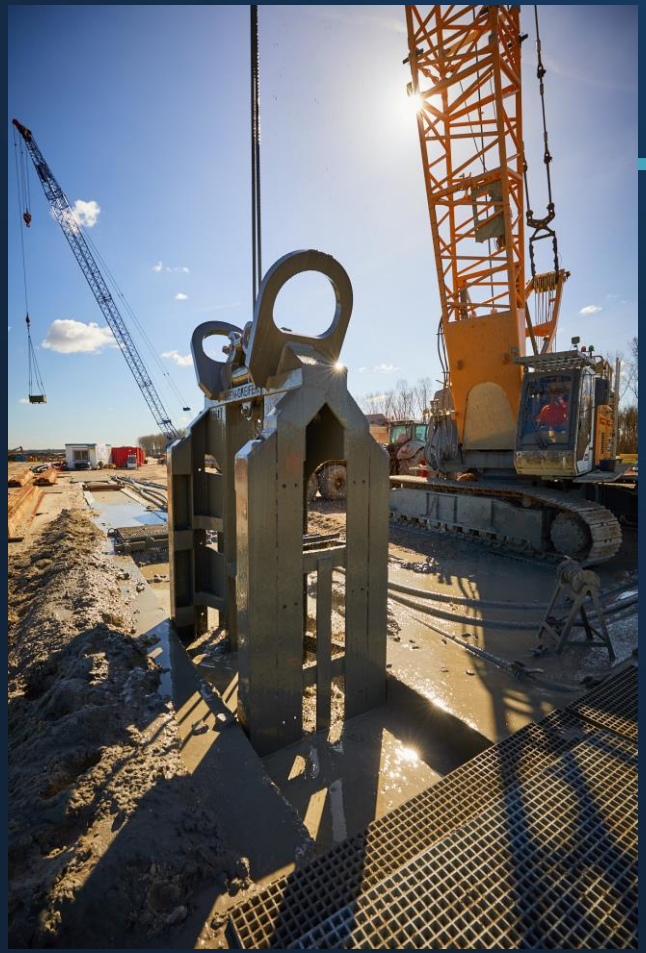
Diepwanden startschacht





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Diepwanden maart t/m eind april

Aanbrengen koppelbalk op diepwand

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Situatie
5 mei

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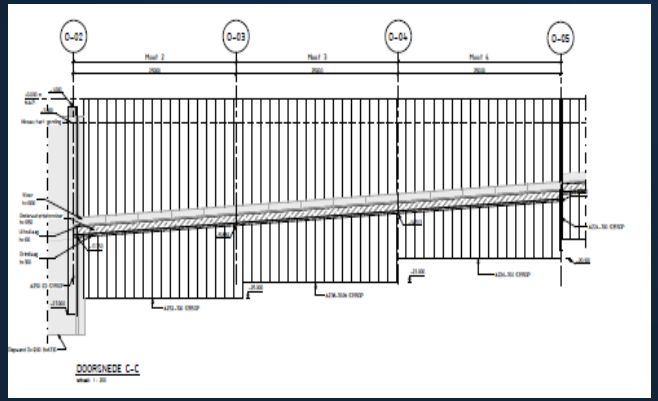
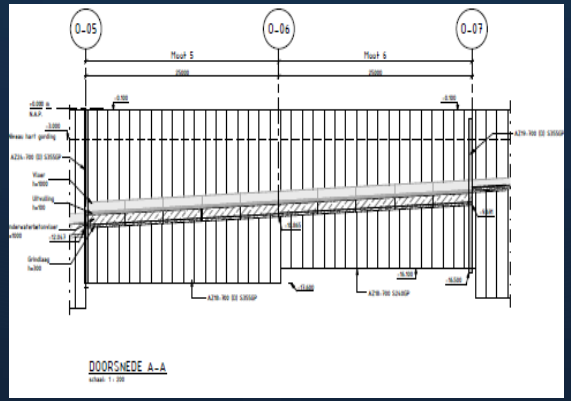
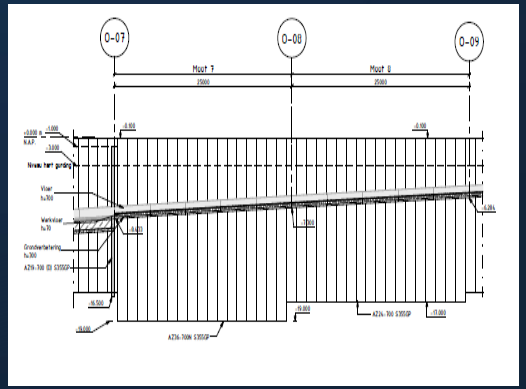
Damwanden toerit

Sinds eind maart 2018 :
Aanbrengen damwandkuipen : ongeveer 1.800 ton damplanken, waarvan al 1.400 ton achter de rug, over een paar weken restant.







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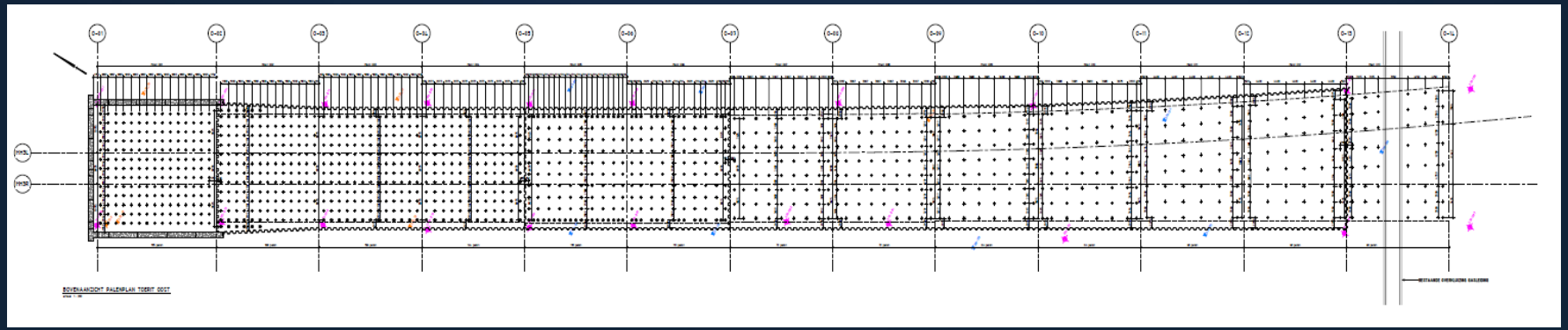
Ankerpalen toerit

Aanbrengen VAP-palen en schroefpalen vanaf 9 mei 2018

- uitdaging : lengte van langste palen (tot 54m) is dusdanig dat er slechts een zeer beperkt aantal stellingen in NL in staat is om bewuste palen te maken...
- veiligheid (zware) kranen garanderen door grondverbetering/voorbelasten
- zeer druk in de heiwereld, 3 à 4 stellingen tegelijkertijd nodig (2 oost)



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Ankerpalen toerit

Aanbrengen VAP-palen en schroefpalen vanaf 9 mei 2018

Kraanopstelling

Paalproeven

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Situatie
5 mei

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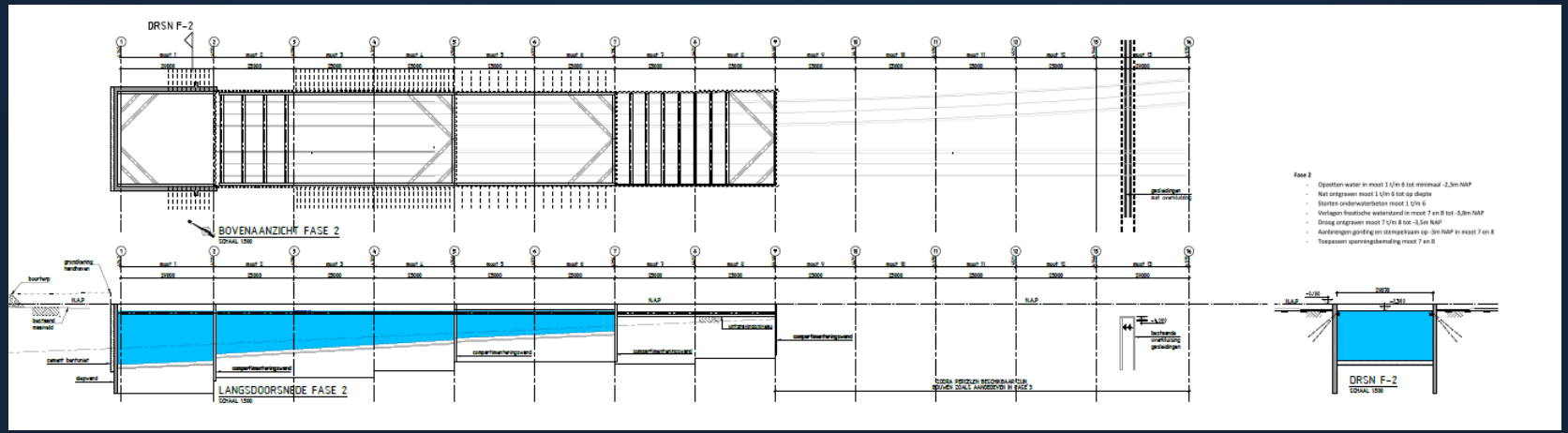
Ontgraven toerit

Vanaf juli 2018 ontgraven natte bouwkuipen (moten 1 t/m 6)



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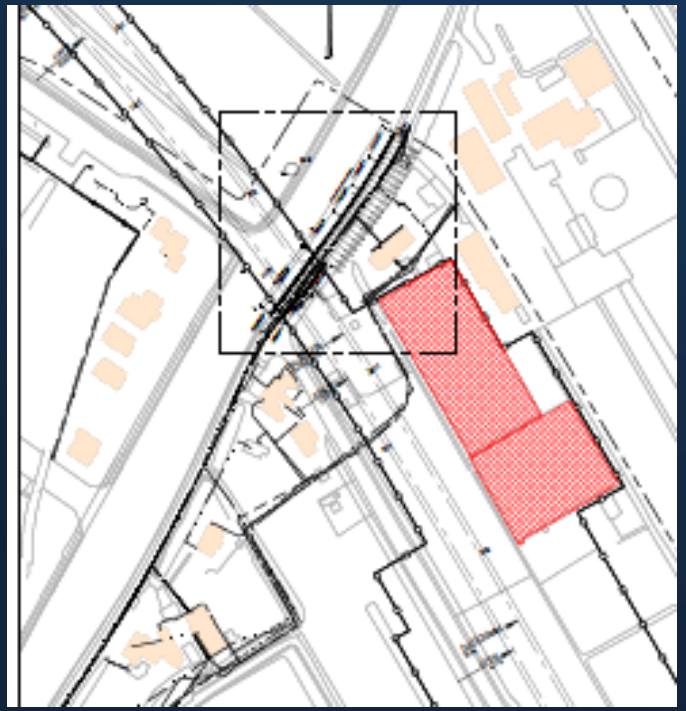
Aanpassen damwand Schiekanaal



Betrokken zone

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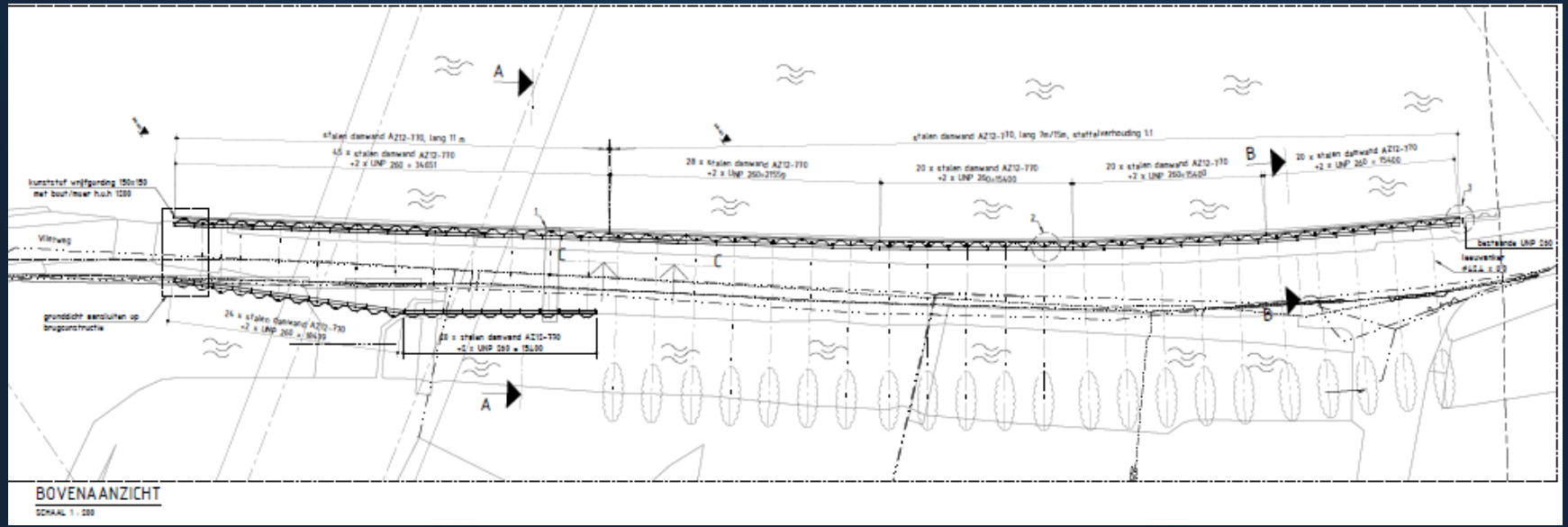
Aanpassen damwand Schiekanaal



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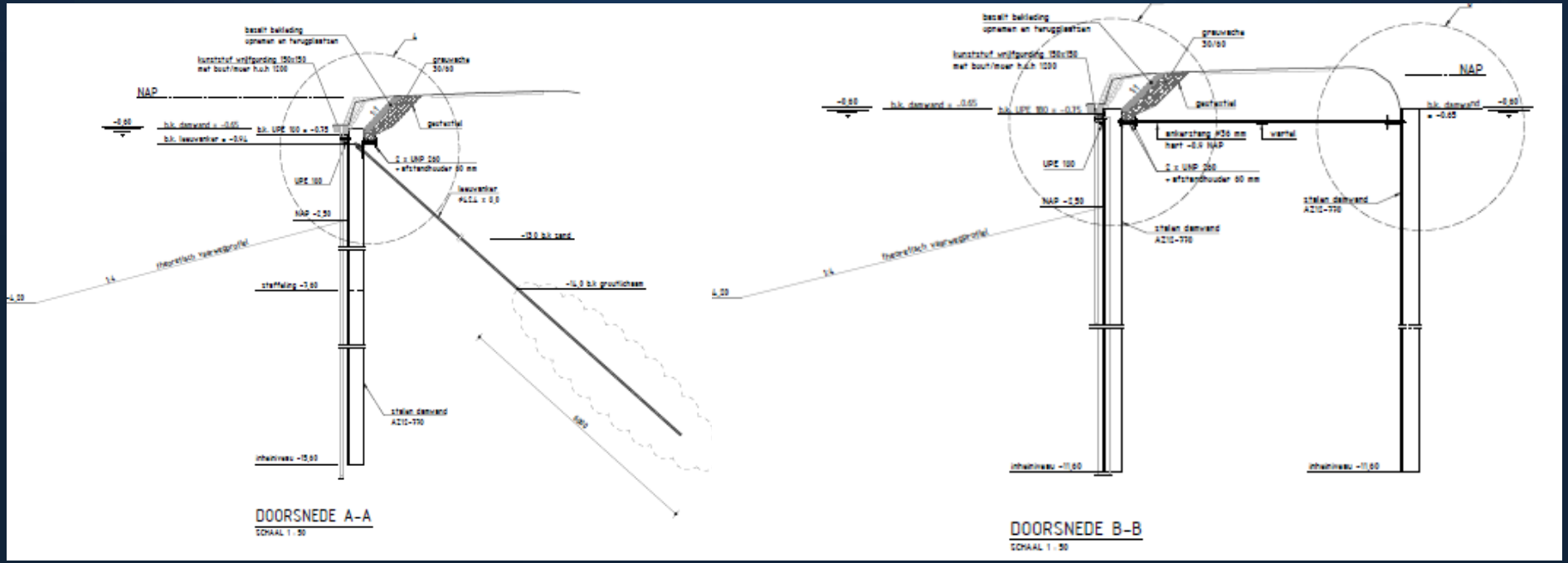
Aanpassen damwand Schiekanaal



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Thomas Schubert
Boortunnel N434

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Planning tunnelbouw

December 2018 - april 2019	Inrichten werkterrein boortunnel
Maart - mei 2019	Aanvoer en montage TBM startschacht
Mei 2019 - juni 2020	Transport tunnelsegmenten naar opslag
Juni 2019 - november 2019	Boren 1e tunnelbuis
November - december 2019	Ontmanteling boorkop en transport via A44 – A4 terug naar startschacht, volgwagens achteruit terug door tunnel naar startschacht
December 2019 - januari 2020	Montage TBM startschacht
Februari - juni 2020	Boren 2e tunnelbuis
Januari - oktober 2020	Bouwen dwarsverbindingen vriestechniek
Juni - augustus 2020	Demontage en afvoer tunnelboormachine

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Werkterrein

Werkterrein boortunnel

Activiteiten/geluidsbronnen startzone:

- Aanvoer betonelementen, ca. 20 vrachtwagens overdag
- Vrachtwagen diversen, 10 vrachtwagens overdag
- Laadschop (24 uur per etmaal)
- Heftruck (75% van de dag-, nacht- en avondperiode)
- Servicetruck rijdt tussen de startschacht en laad- en loszone (11 keer overdag, 4 keer ‘s avonds en 7 keer ‘s nachts)
- Personenauto’s nabij de stafkeet (150 overdag, 20 avond en 5 nacht)
- Personenauto’s nabij informatiecentrum
- Compressor bulkwagen (6 keer 45 minuten overdag)
- Luchtcompressor (continu)

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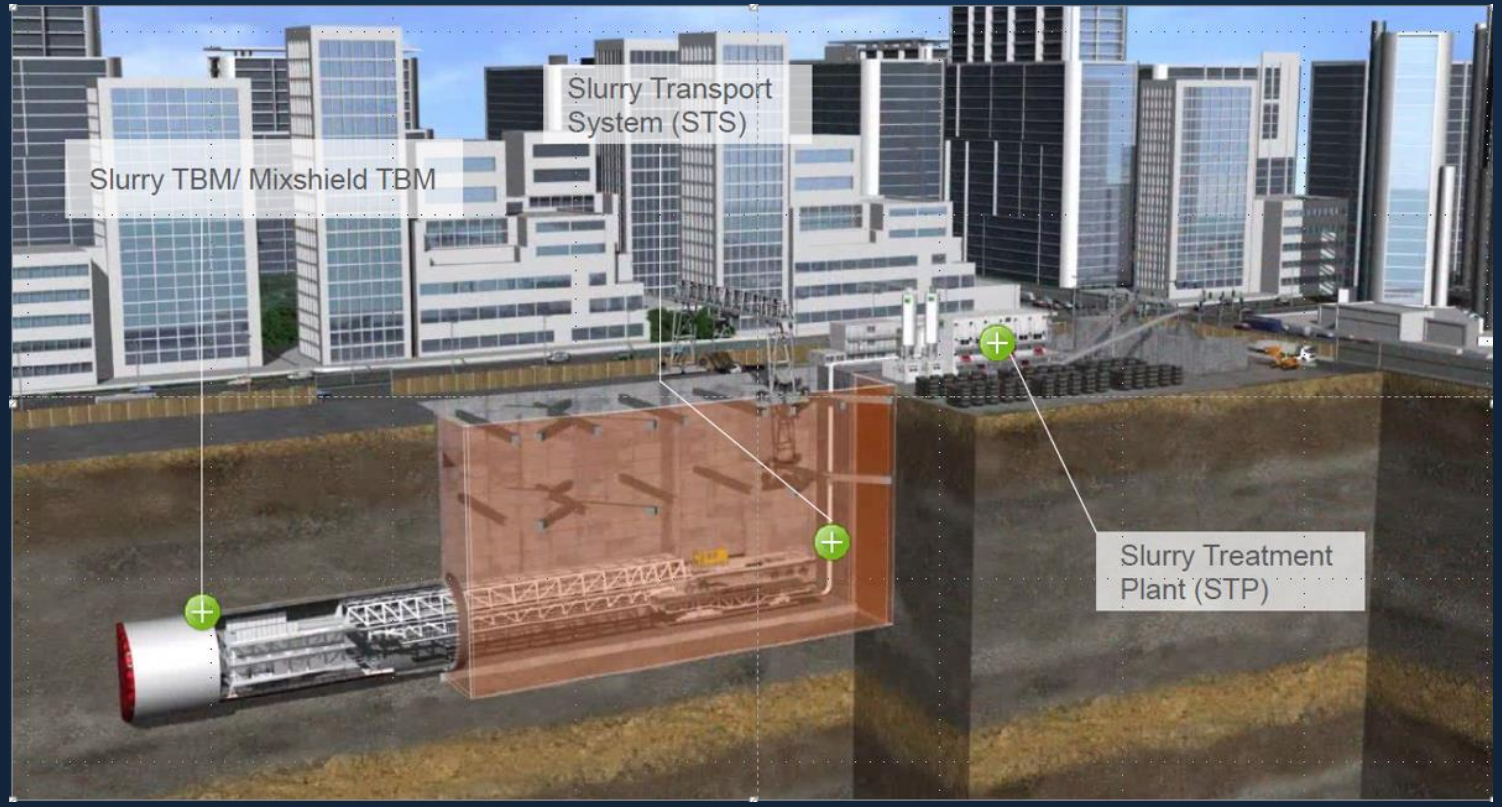
Principe werkterrein boortunnel



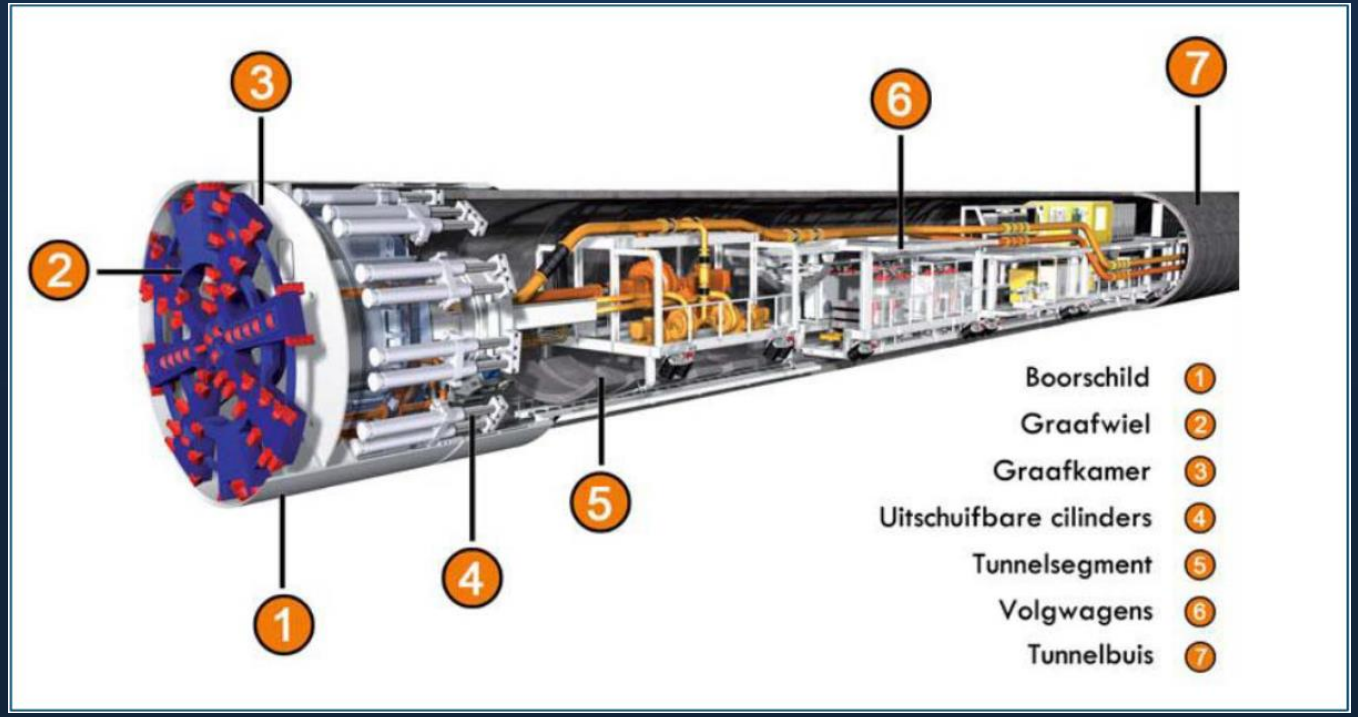
Boorploegrooster 24 uur per dag/ 7 dagen per week

Working hours:

E	Early Shift	07:00 - 15:00 = 8 hours
M	Midday Shift	15:00 - 23:00 = 8 hours
L	Late Shift	23:00 - 07:00 = 8 hours
D	Day Shift	07:00 - 19:00 = 12 hours
N	Night Shift	19:00 - 07:00 = 12 hours

| Month A | | |

Schematische weergave tunnelboormachine



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Gegevens tunnelboormachine (TBM)

TBM figures		
Ring internal diameter:	9790	mm
Ring external diameter	10590	mm
Ring thickness	400	mm
cutterhead diameter	10960	mm
cutter head length	775	mm
excavation section	94.3	m2
Front shield diameter	10930	mm
Front shield length from 0	3050	mm
Middle shield diameter	10915	mm
Middle shield length from 0	7545	mm
Tail skin diameter	10900	mm
Tail skin length from 0	11525	mm
Conicity	30	mm

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Aanvoer tunnelboormachine

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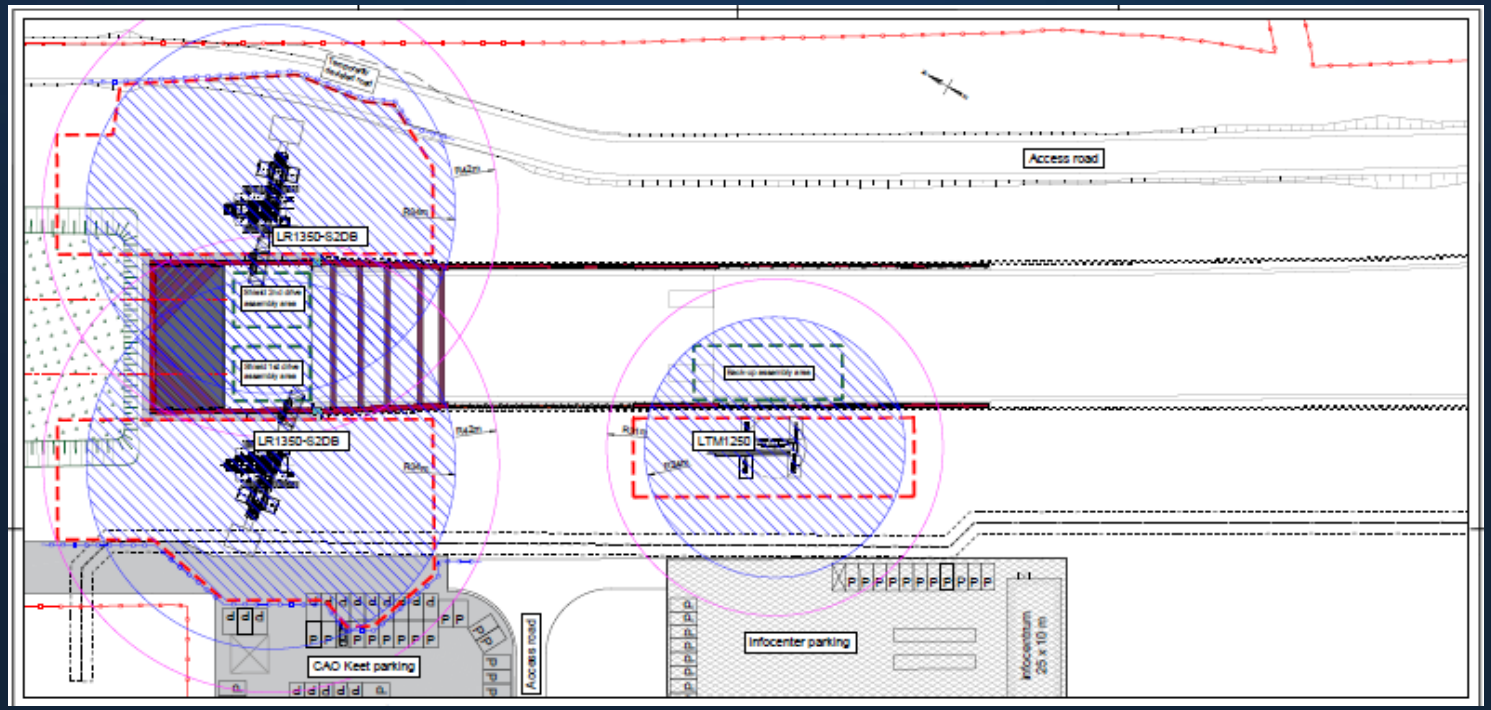
Werkvoorbereiding – montage TBM



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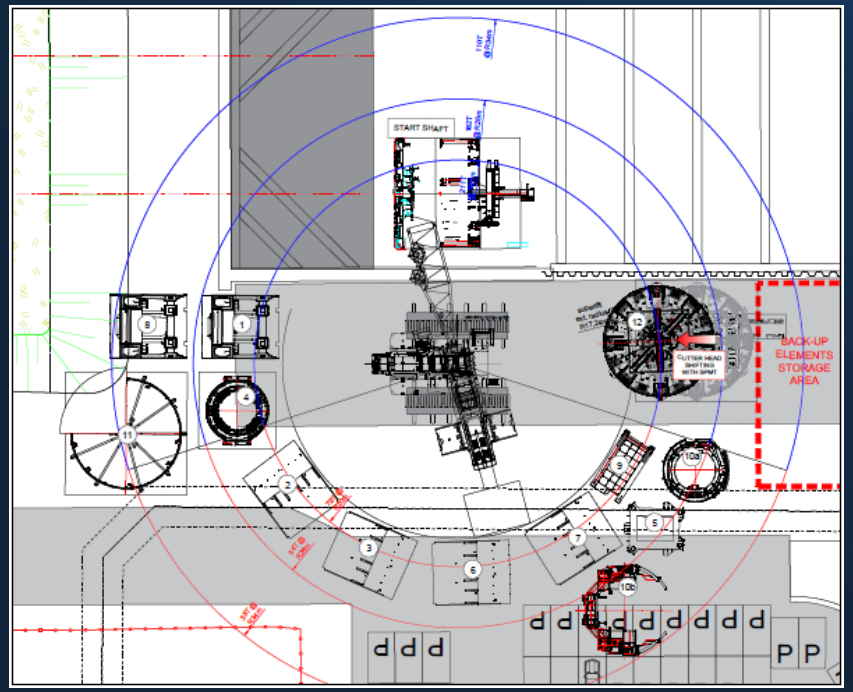
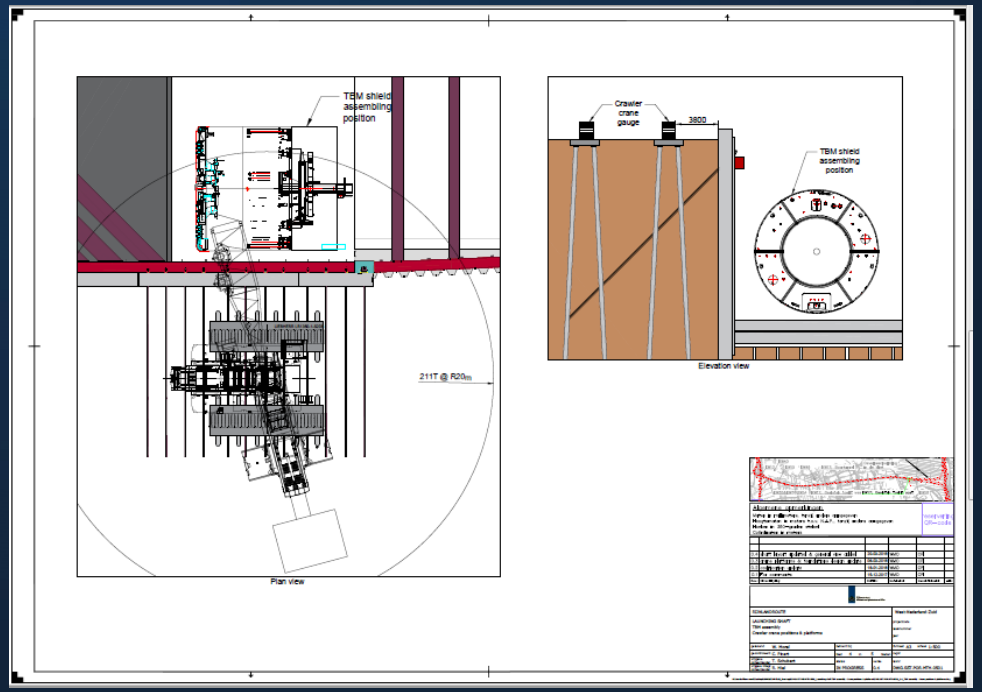
Werkvoorbereiding – montage TBM





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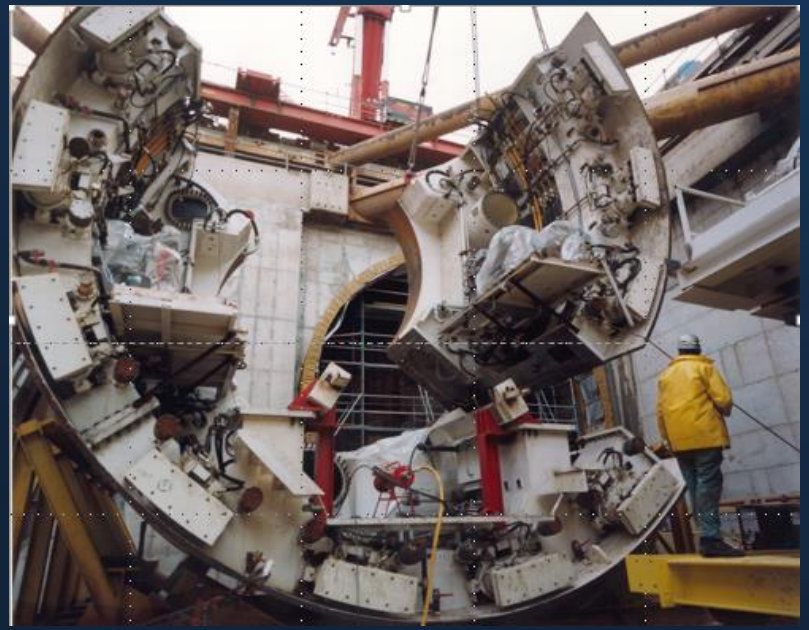
Montage TBM en volgwagens



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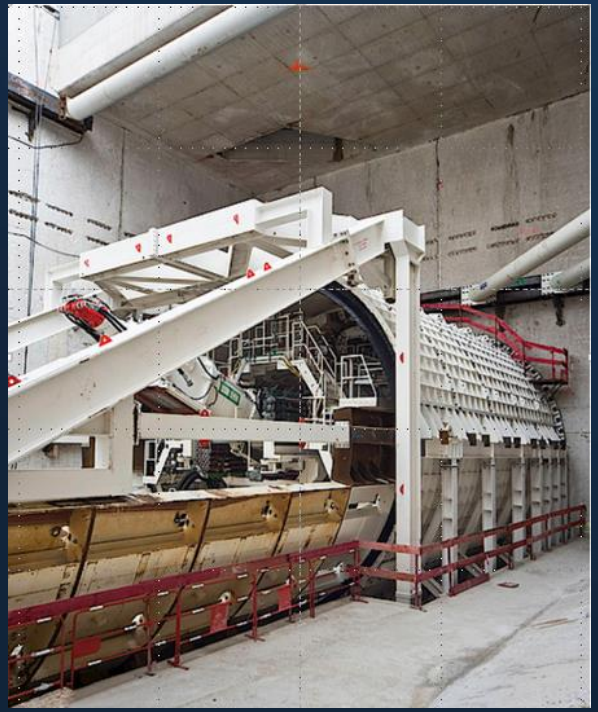
Tunnel boren – start en ontvangst



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Ombouw

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Tunnel segmenten

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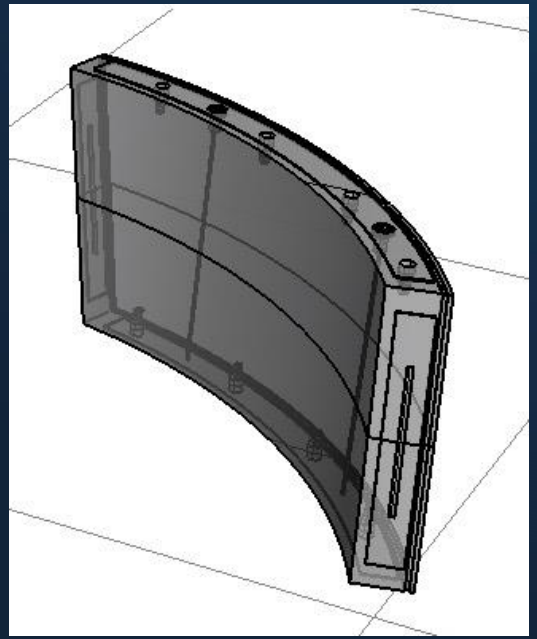
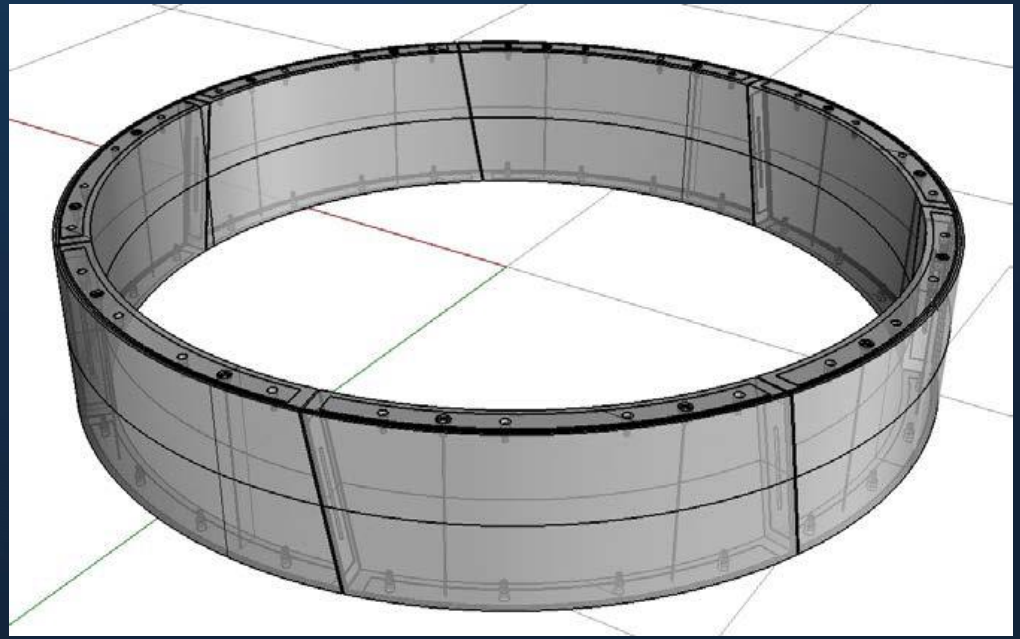
Tunnelringen





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Multi Service Voertuig

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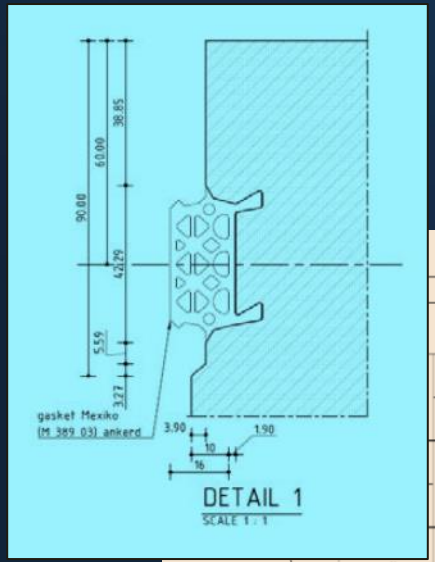
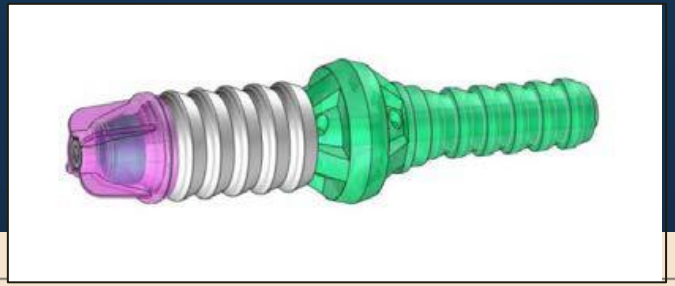
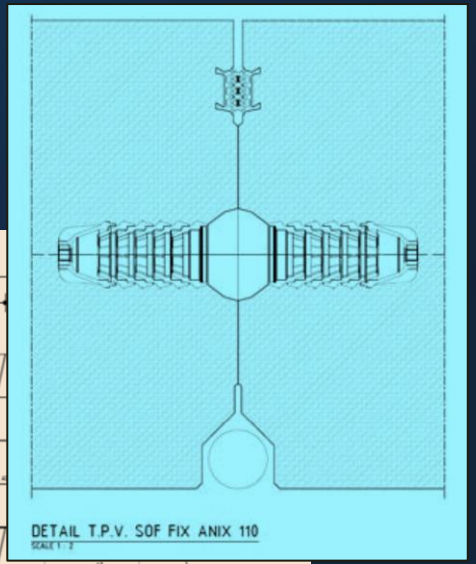
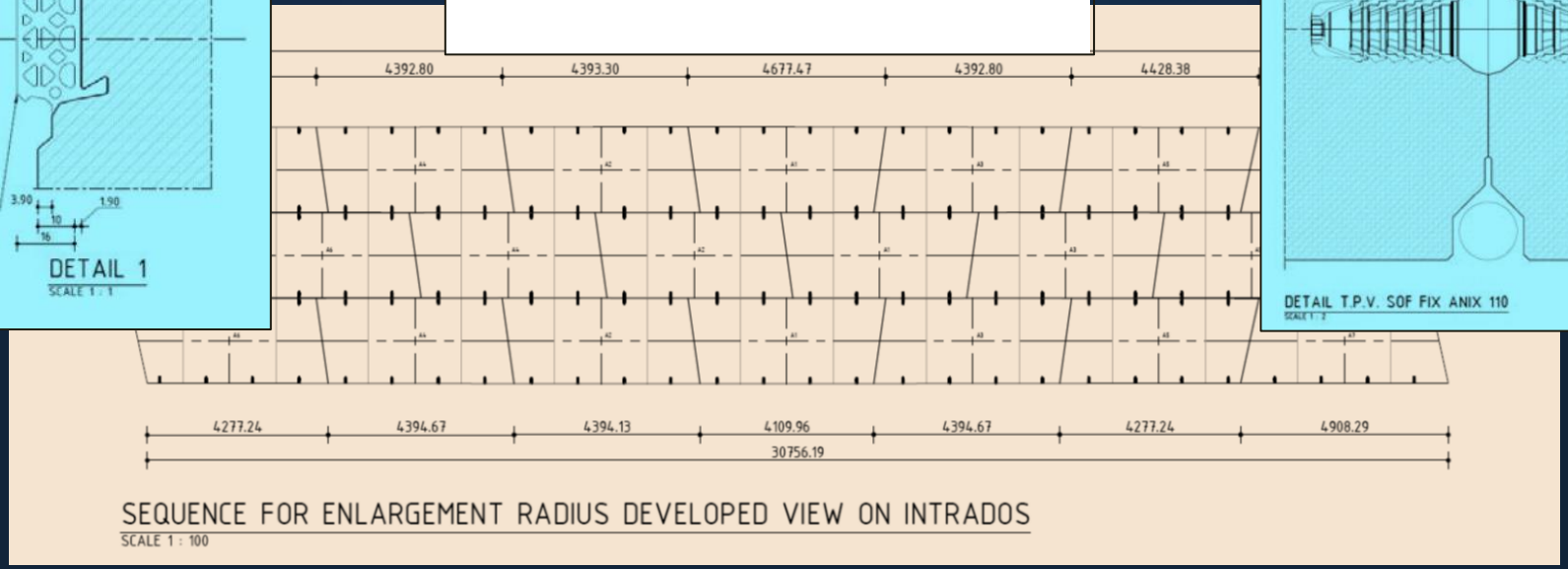
Boortunnel – Ring configuratie

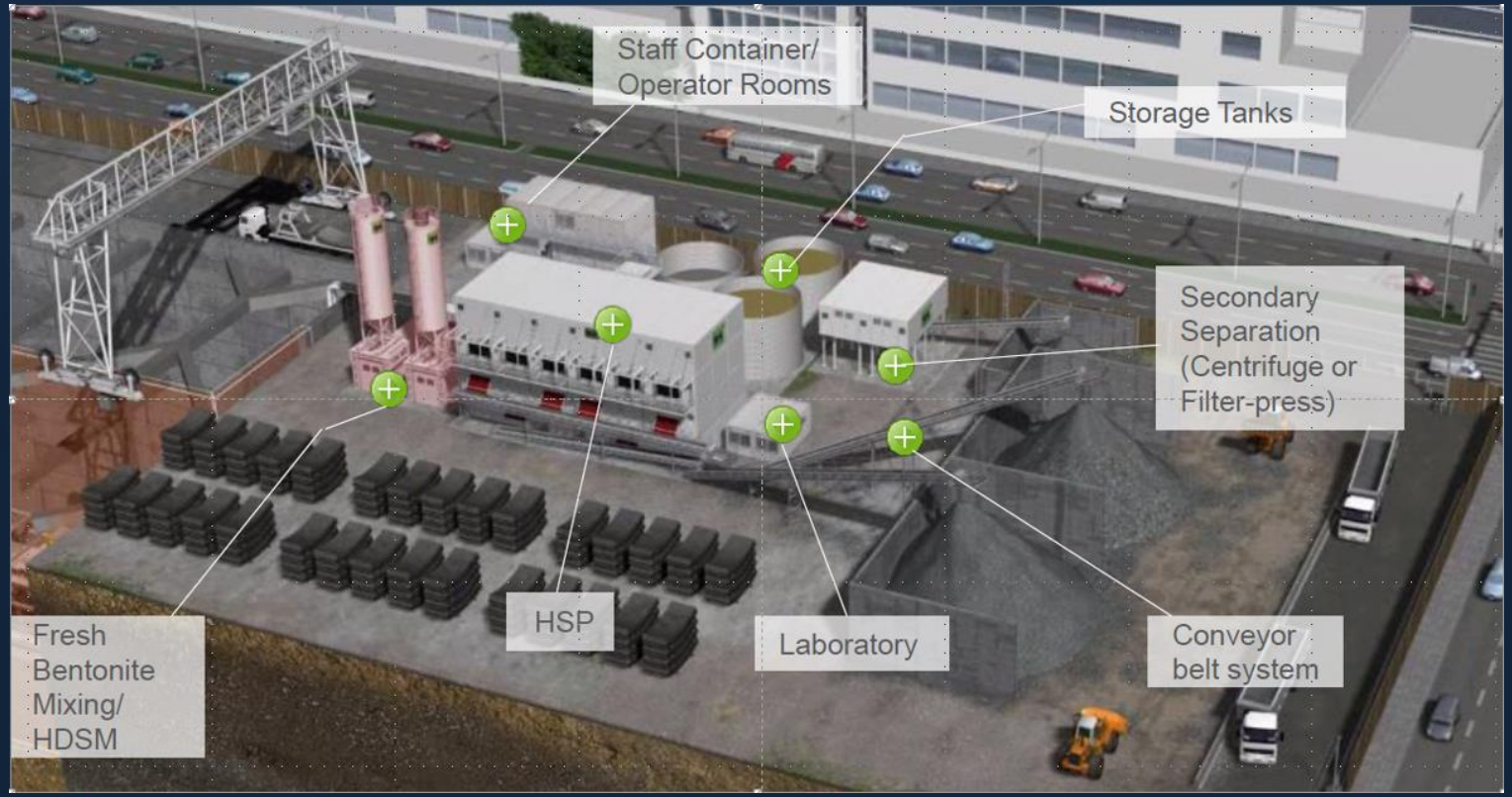




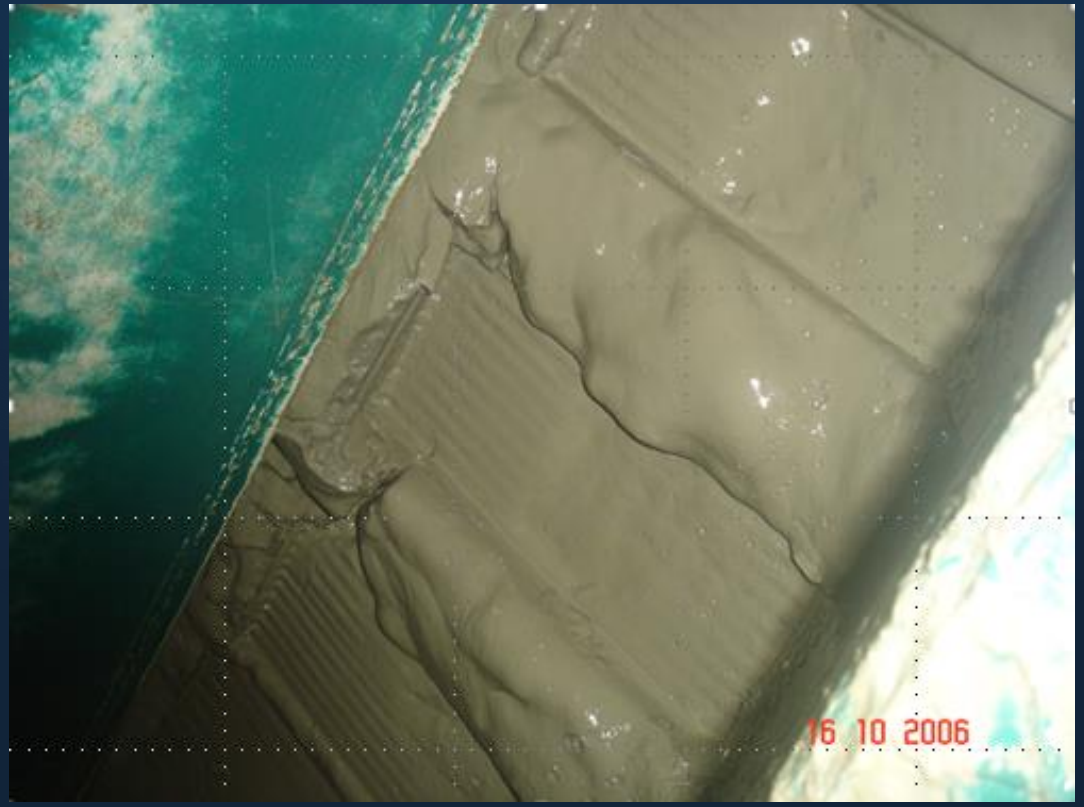




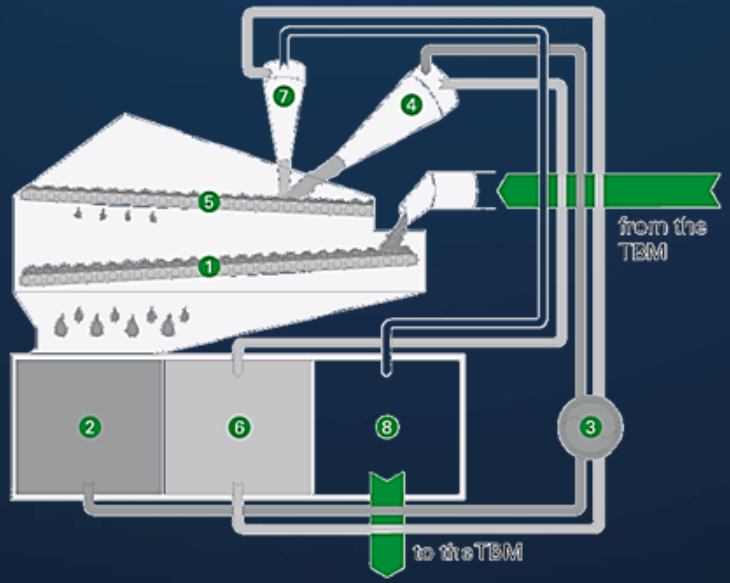
Principe-indeling scheidingsinstallatie



Bentoniet



Schematische weergave scheidingsinstallatie



1. coarse screen
2. process tank 1
3. centrifugal pump
4. coarse cyclones
5. dewatering screens
6. process tank 2
7. fine cyclones
8. process tank 3

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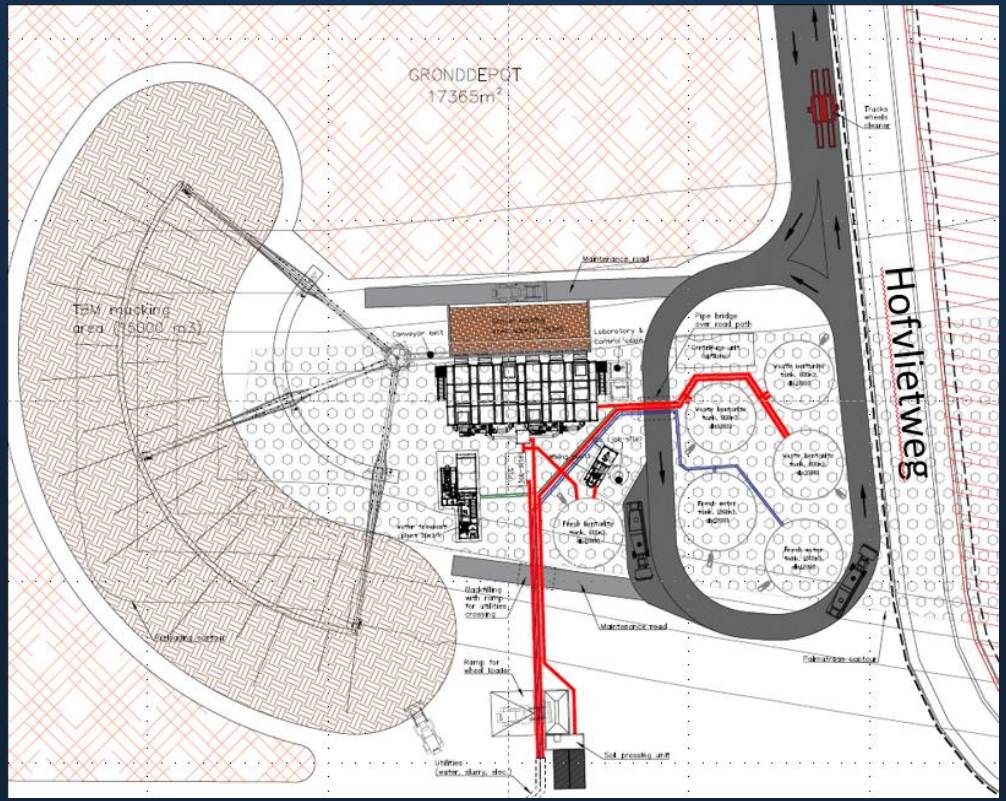
Plattegrond scheidingsinstallatie (in bewerking)



Planning tunnelbouw

Lengte x breedte x hoogte = 23 m x 10 m x 12 m

Hoogte silo’s = 15 m

April 2019 – juli 2020

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Aanvoer & kraanmontage

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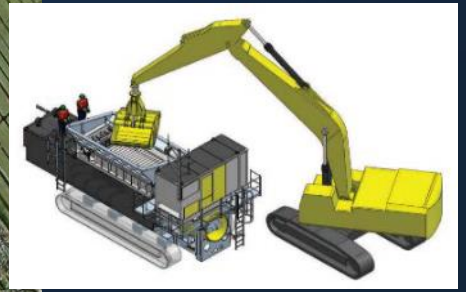
Grondafvoer naar Meeslouwerplas



Dwarsverbindingen – grond bevriezen

Dwarsverbindingen – spuitbetonschaal

Kabelkoker plaatsen & zand aanvullen

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Vragen?

Hans Mortier
Monitoring

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Monitoren

Monitoren van het effect van bouwwerkzaamheden is één van de (beste) beheersmaatregelen om schade te voorkomen.

- Hinder => geluid / trillingen
- Schade => deformaties => trillingen / gronddeformaties / grondwaterdalingen

Geluid en trillingen

Duidelijk (wettelijk) omschreven toelaatbare criteria

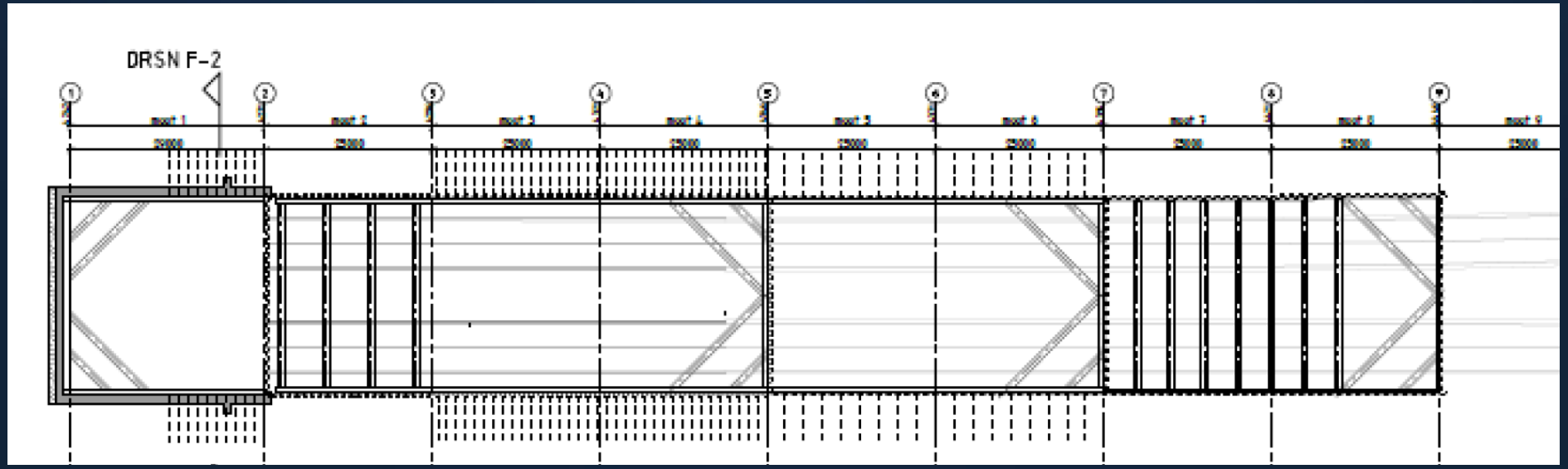
Geluid

Activiteit	L_{wr} dB(A)	Afstand tot activiteit [m]				
		60 dB(A)	65 dB(A)	70 dB(A)	75 dB(A)	80 dB(A)
Heien betonpalen	126	400	250	150	80	50
Heien stalen buispalen	140	1200	850	550	350	230
Heien damwanden	130	550	350	225	125	75
Intrillen buispalen	121	250	150	80	50	25
Intrillen damwanden	125	350	200	125	75	50
Geluidarm aggregaat	93	15	10	<10	<10	<10
Geluidarme pomp	90	10	<10	<10	<10	<10
Compressor	100	35	20	10	<10	<10
Pneumatisch beitelen/hameren	119	220	140	75	45	25
Ontgraven	107	60	30	20	10	<10
Zes vrachtwagen-bewegingen per uur	106	30	17	10	<10	<10

Trillingen

Frequentie [Hz]	Cat. 1 [mm/s]	Cat. 2 [mm/s]	Cat. 3 [mm/s]	Fundering [mm/s]
0	20,00	5,00	3,00	
5	20,00	5,00	3,00	31,83
10	20,00	5,00	3,00	15,92
15	22,50	6,25	3,63	10,61
20	25,00	7,50	4,25	7,96
25	27,50	8,75	4,88	6,37
30	30,00	10,00	5,50	5,31
35	32,50	11,25	6,13	4,55
40	35,00	12,50	6,75	3,98
45	37,50	13,75	7,38	3,54
50	40,00	15,00	8,00	3,18

Geluid en trillingen



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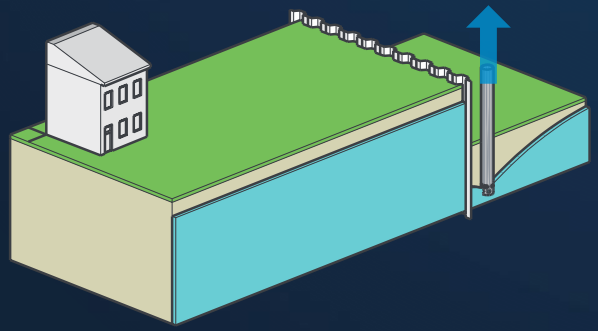
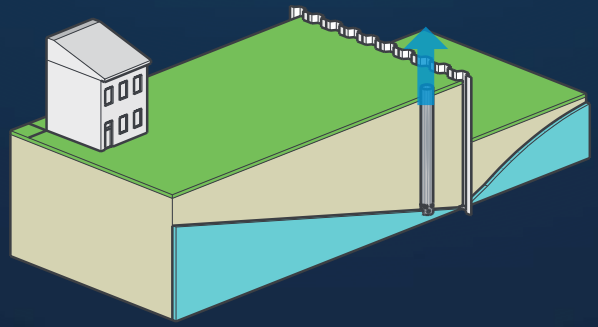
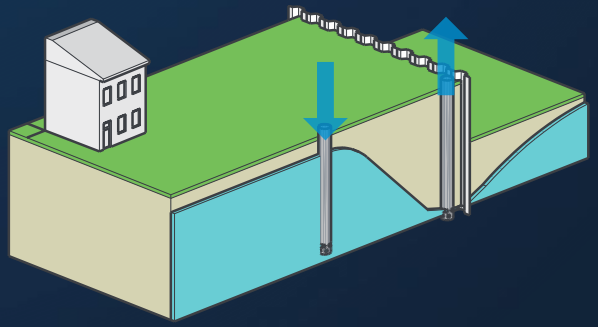
Grondwaterdaling door bemaling



Binnen bouwkuip



Buiten bouwkuip



Buiten bouwkuip met retourbemaling

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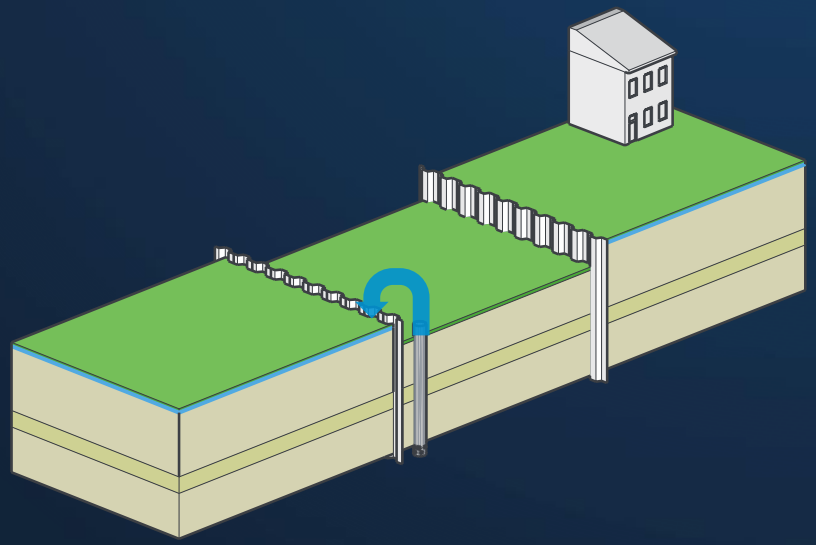
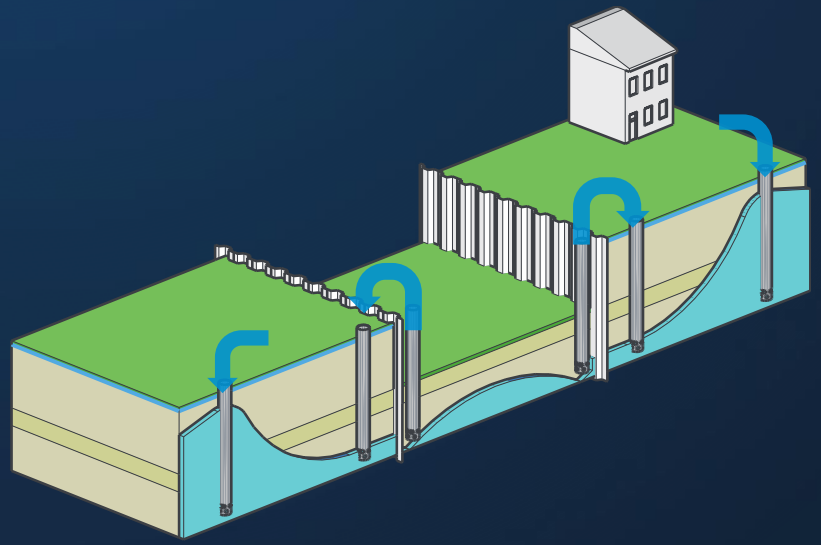
Grondwaterdaling door bemaling



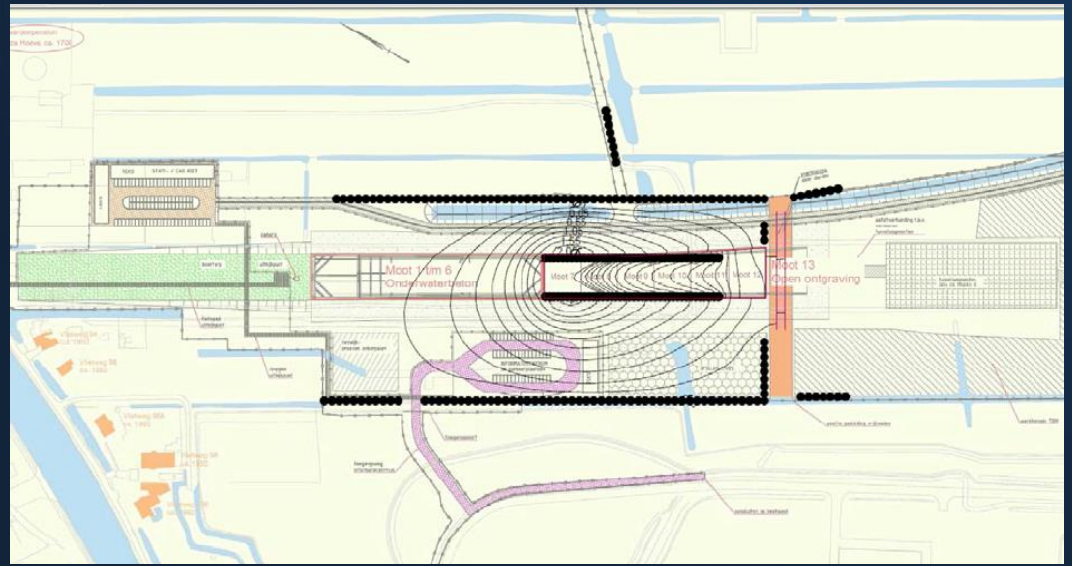
Bemaling binnen bouwkuip van freatisch water (leegpompen kuip)

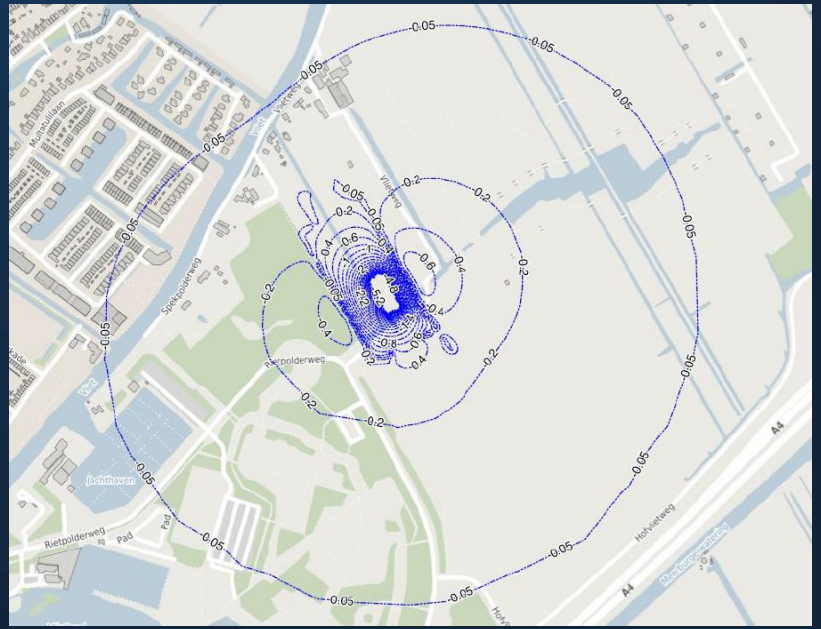


Spanningsbemaling binnen kuip in combinatie met retourbemaling

COMOL5

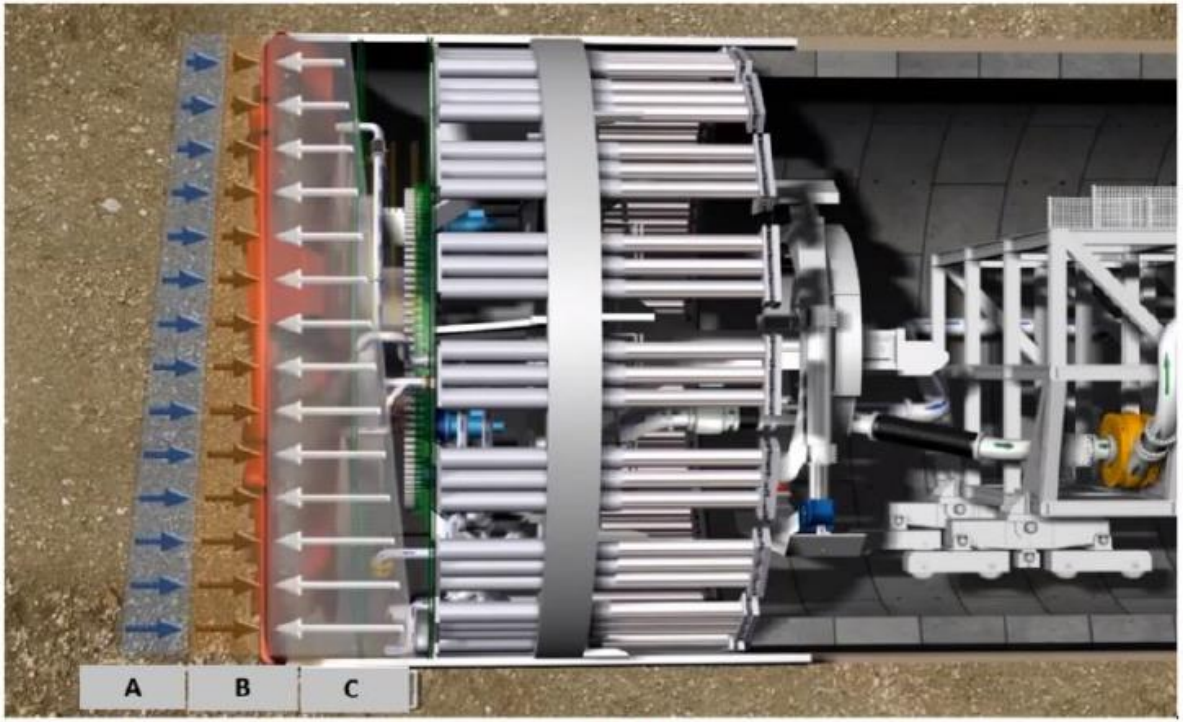
Grondwaterdaling door bemaling





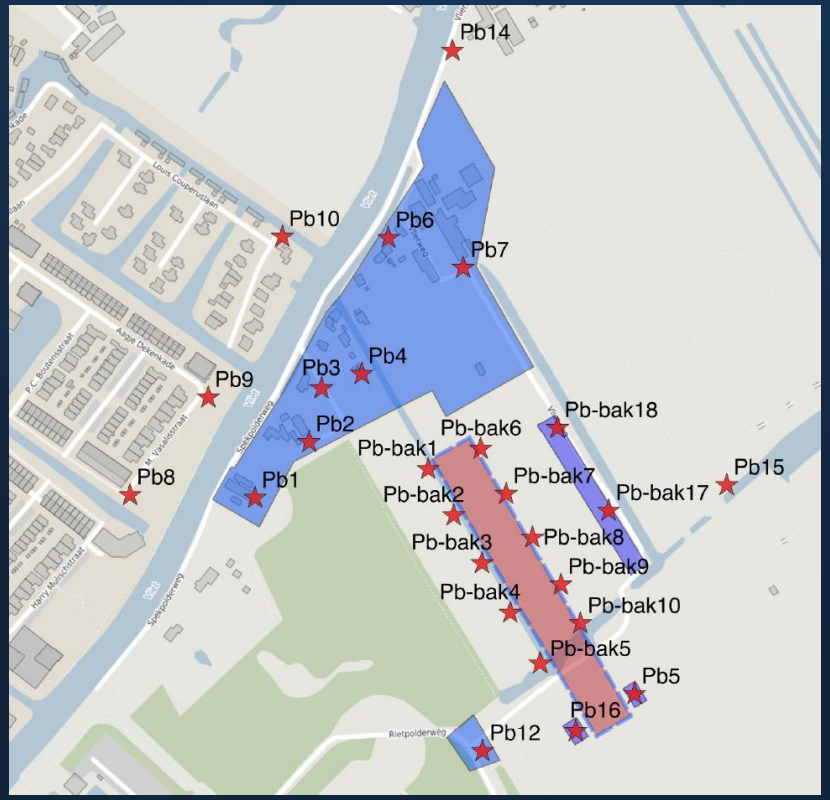
COMOL5

Boorfrontstabiliteit



A: Pore water pressure B: Horizontal effective stress C: Support pressure

Peilbuizen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Pb6
Pb7
Pb4
Pb3
Pb9
Pb2
Pb1
Pb8
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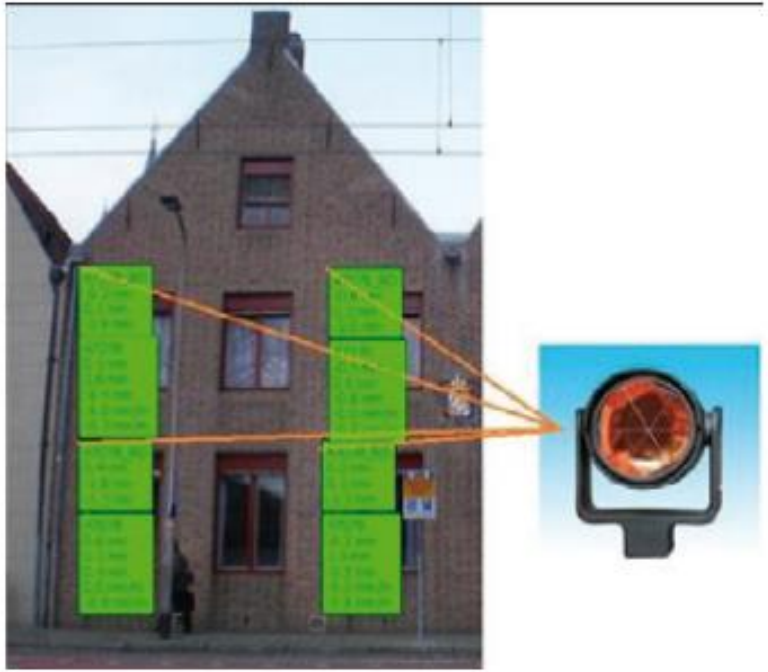
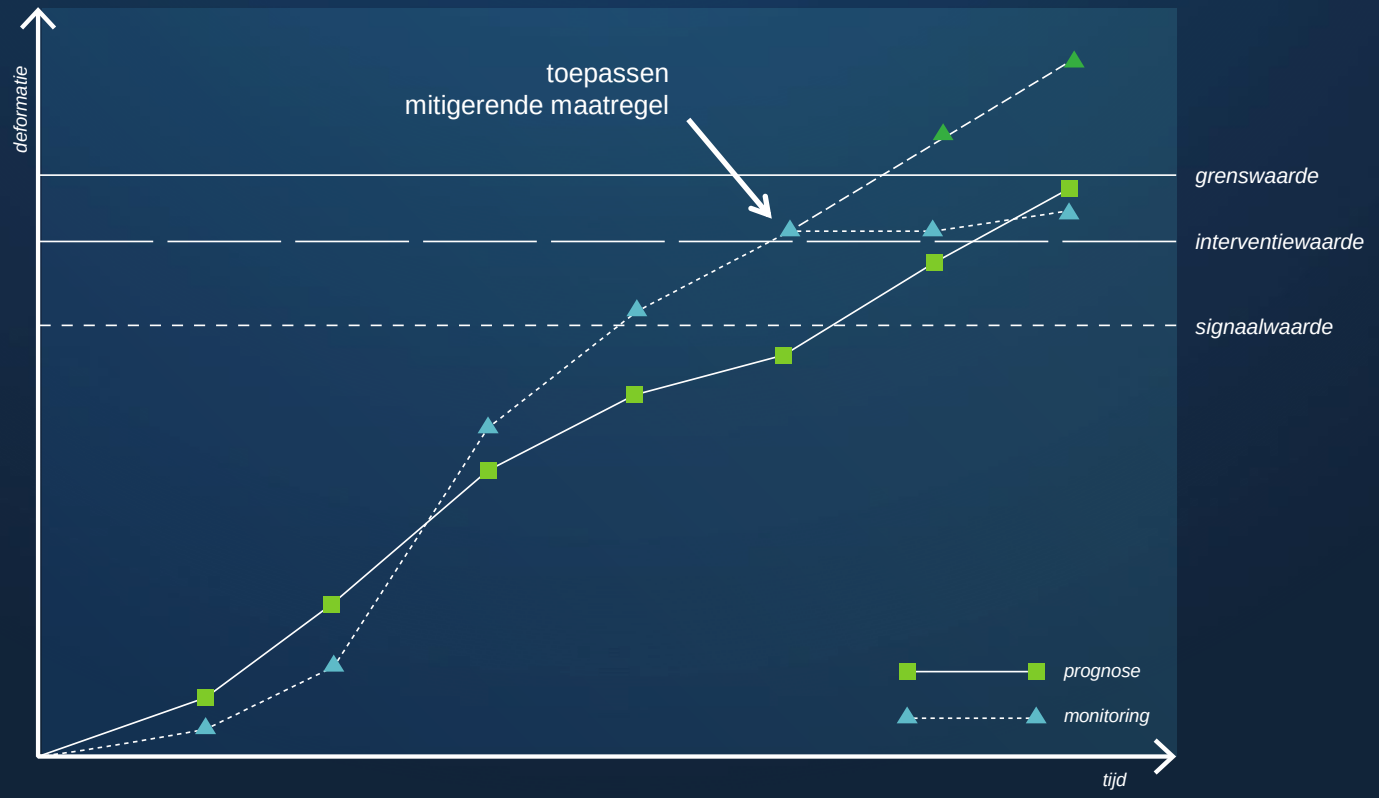
Pb-bak2
Pb-bak17
Pb15
Pb-bak8
Pb-bak3
Pb-bak9
Pb-bak4
Pb-bak10
Pb-bak5
Pb5
Pb16
Pb12
Rietpolderweg
Spatpolderweg
Harry Mulischstraat
M. Vasalisstraat
P.C. Boudenstraat
Aagje Dekenlaan
Louis Couperusdaan

Monitoren van deformaties



Monitoren van deformaties



COMOL5