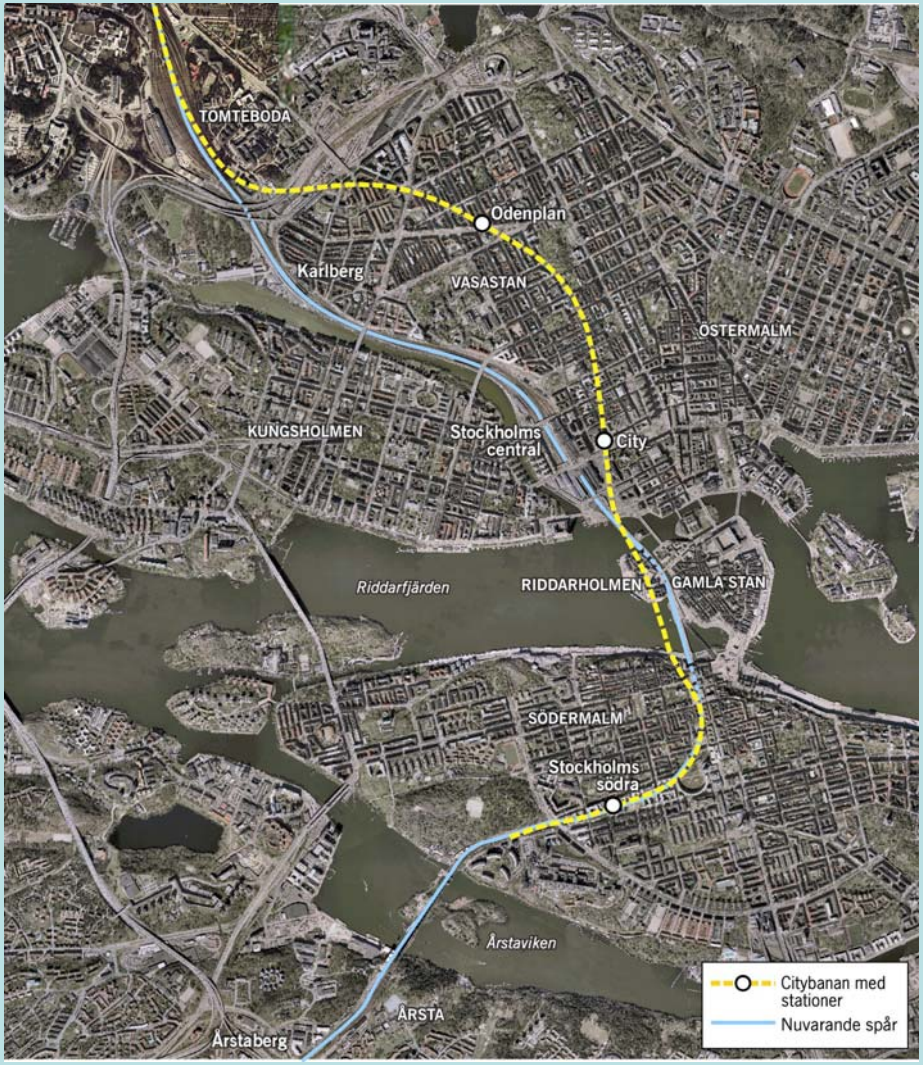
Söderströmstunneln – General Presentation of the Project

ZÜBLIN pihl

JV SÖDERSTRÖMSTUNNELN HB

Construction of an immersed tunnel in the heart of Stockholm

Overview



Citybanan

Underground commuter railway system through the center of Stockholm

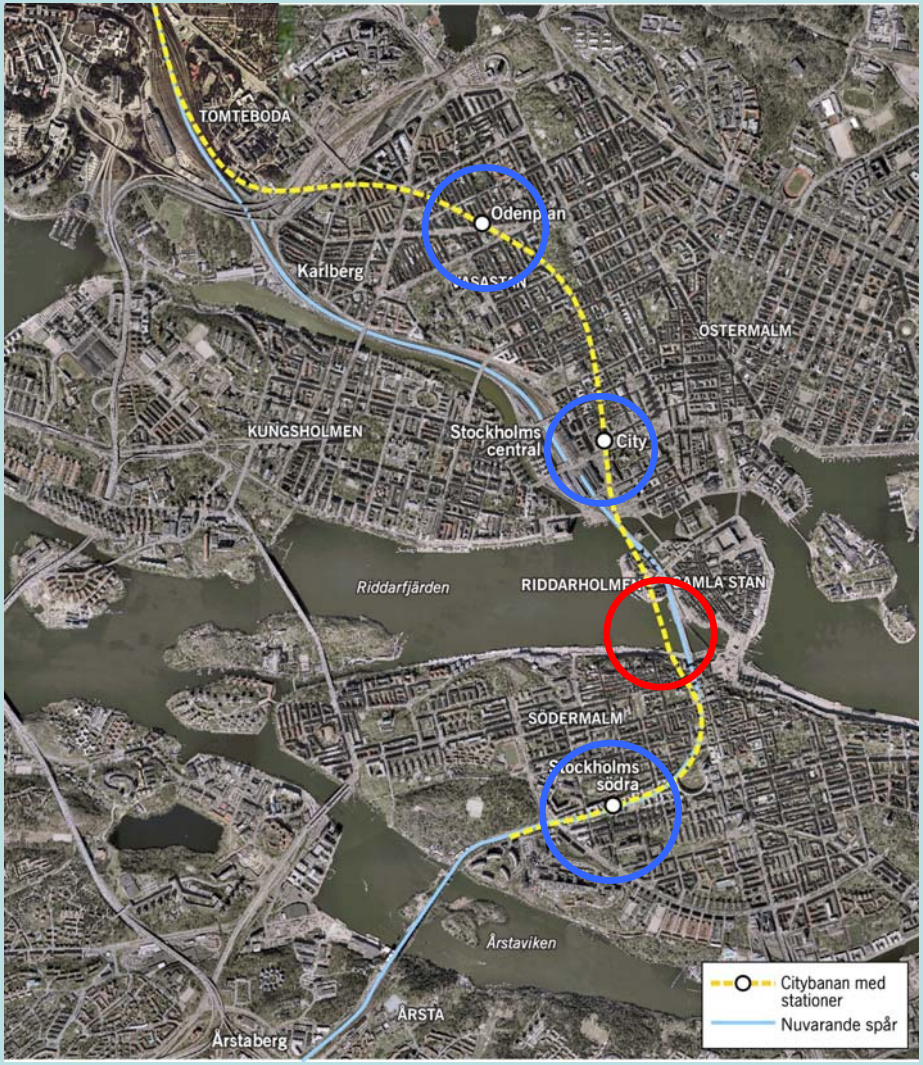
Trafikverket

Building authority and owner of the project

Construction period of the Citybanan

from 2008
until 2017

Overview



Stations

- Odenplan
- City
- Stockholm Södra

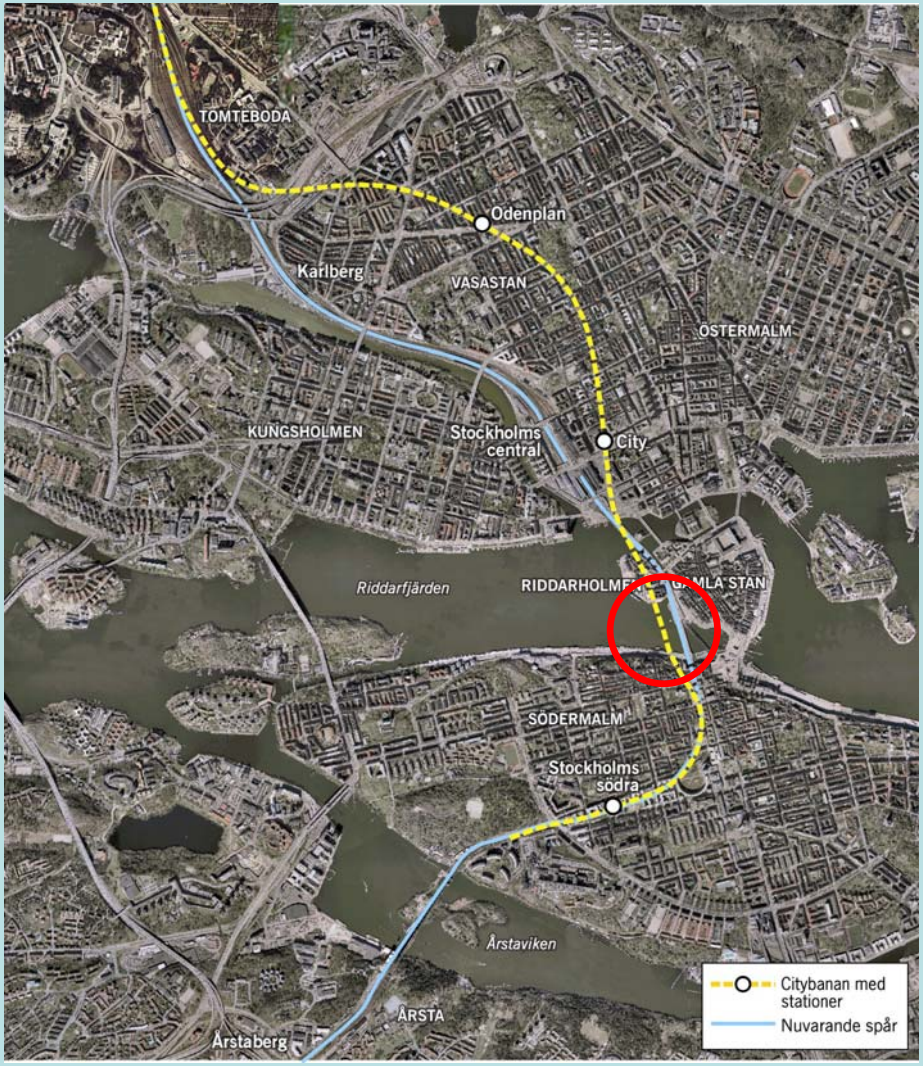
Immersed tunnel

- Söderströmstunneln

Construction organizations:

- Ed. Zublin A.G. and
- E. Pihl & Søn A.S.

Söderströmstunneln



Construction period

from January 2008
until January 2013

Contract value

approx. 1 330 TSEK

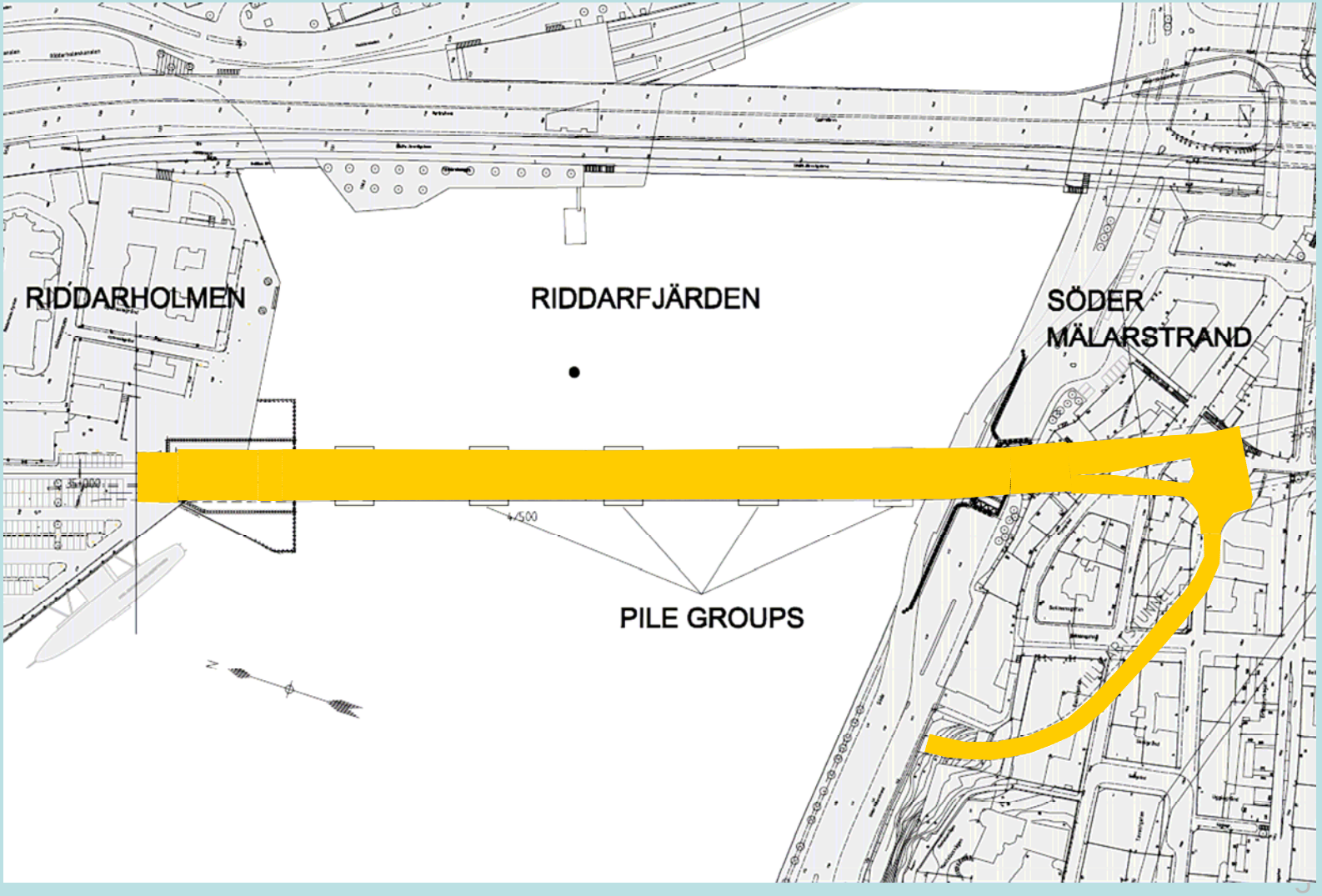
Conditions

Design and built
lifetime 120 years

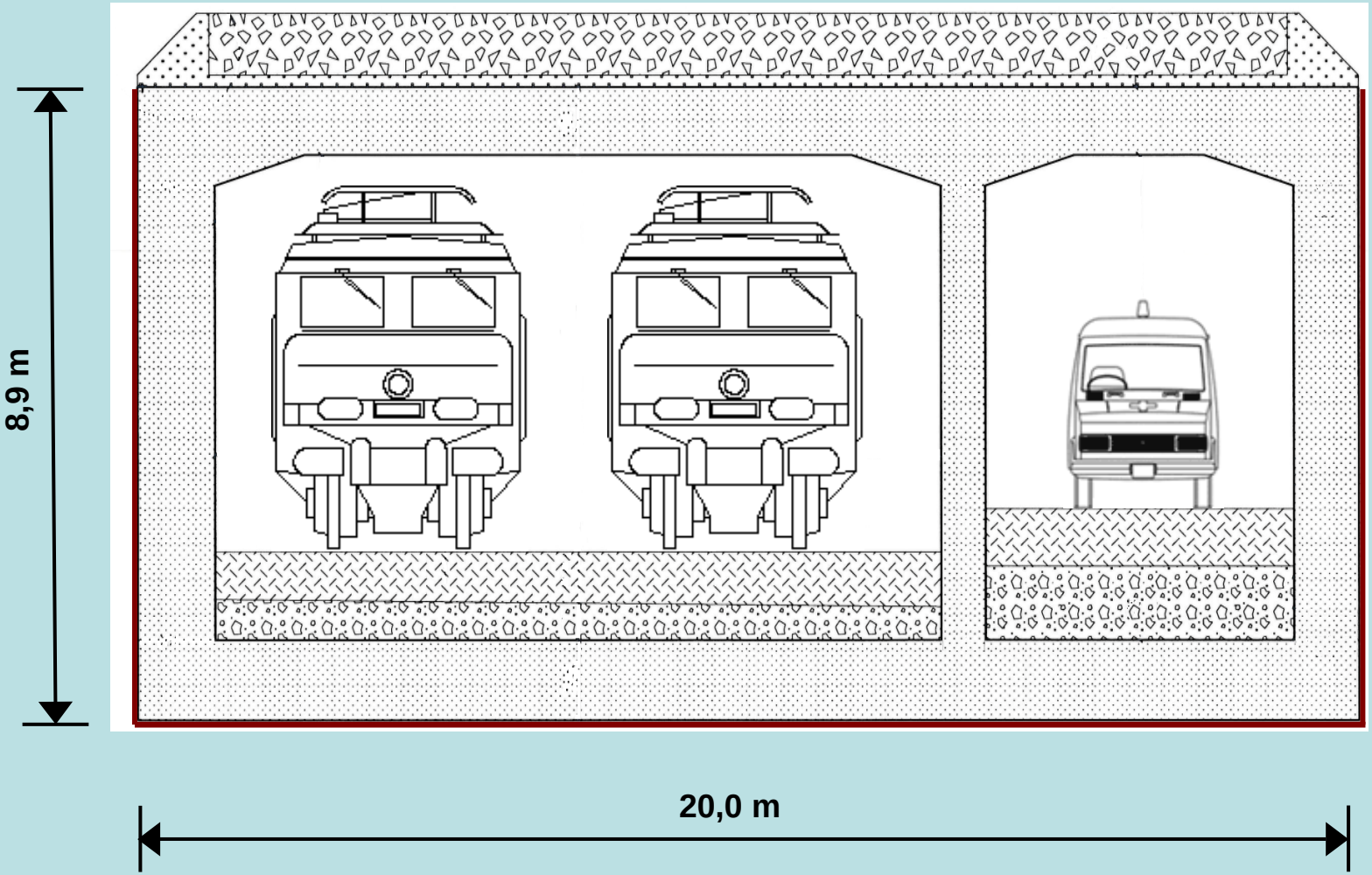
Environmental issues

load restrictions
noise limitation
drink water quality
limited sea access

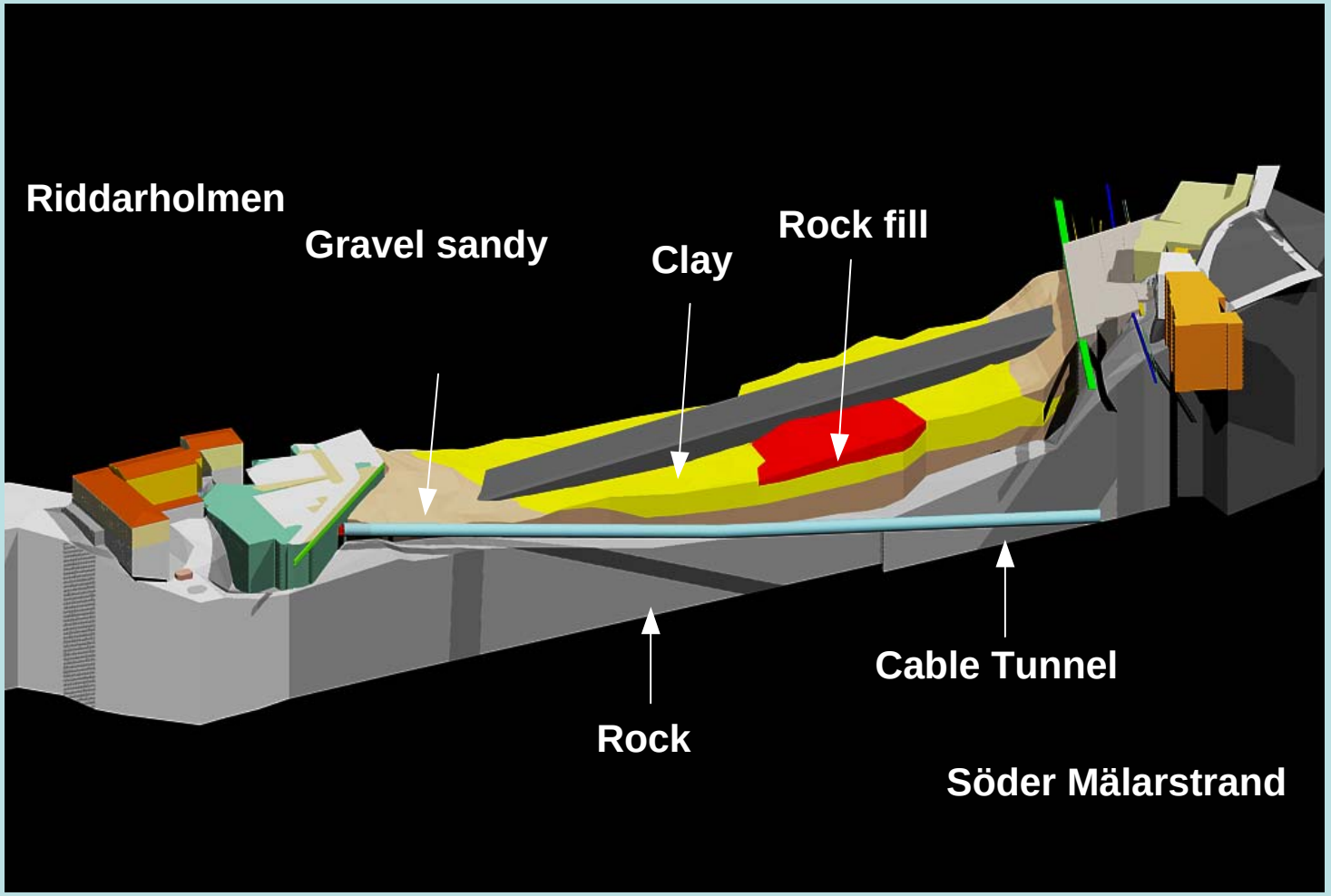
Overview


RIDDARHOLMEN
RIDDARFJÄRDEN
SÖDER
MÄLARSTRAND
PILE GROUPS

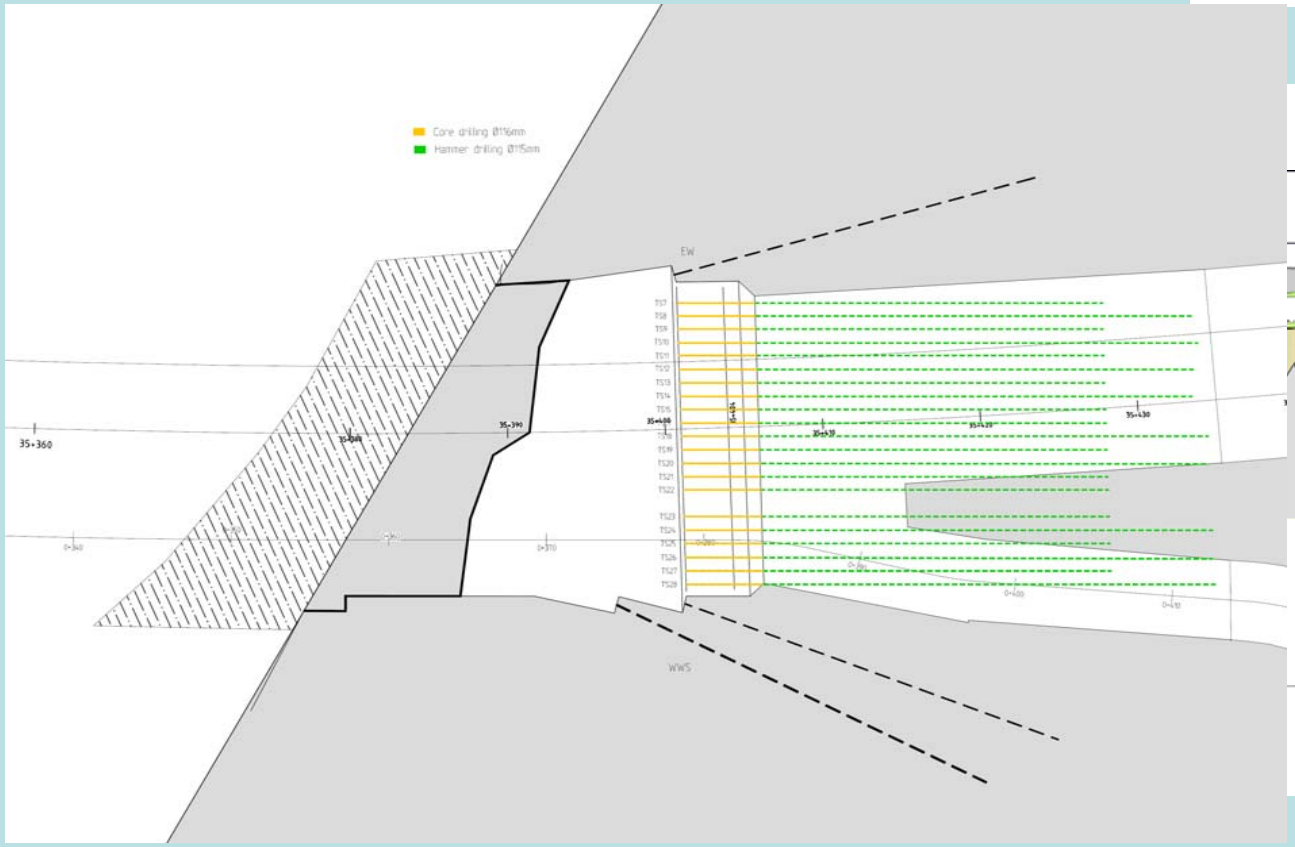
Cross section

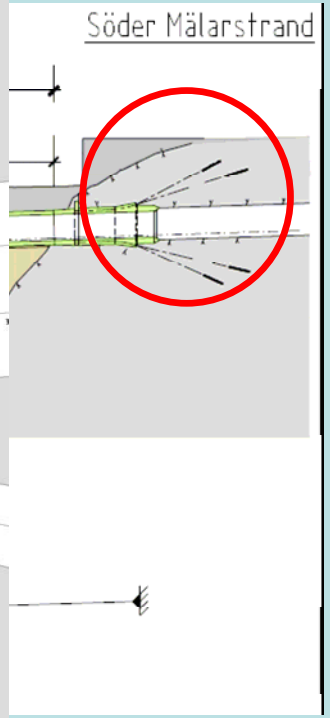


Boundary conditions



Longitudinal section





- Cristalline Rock up to 300 MPa
- Moraine, Clay, Filling

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Marine overview

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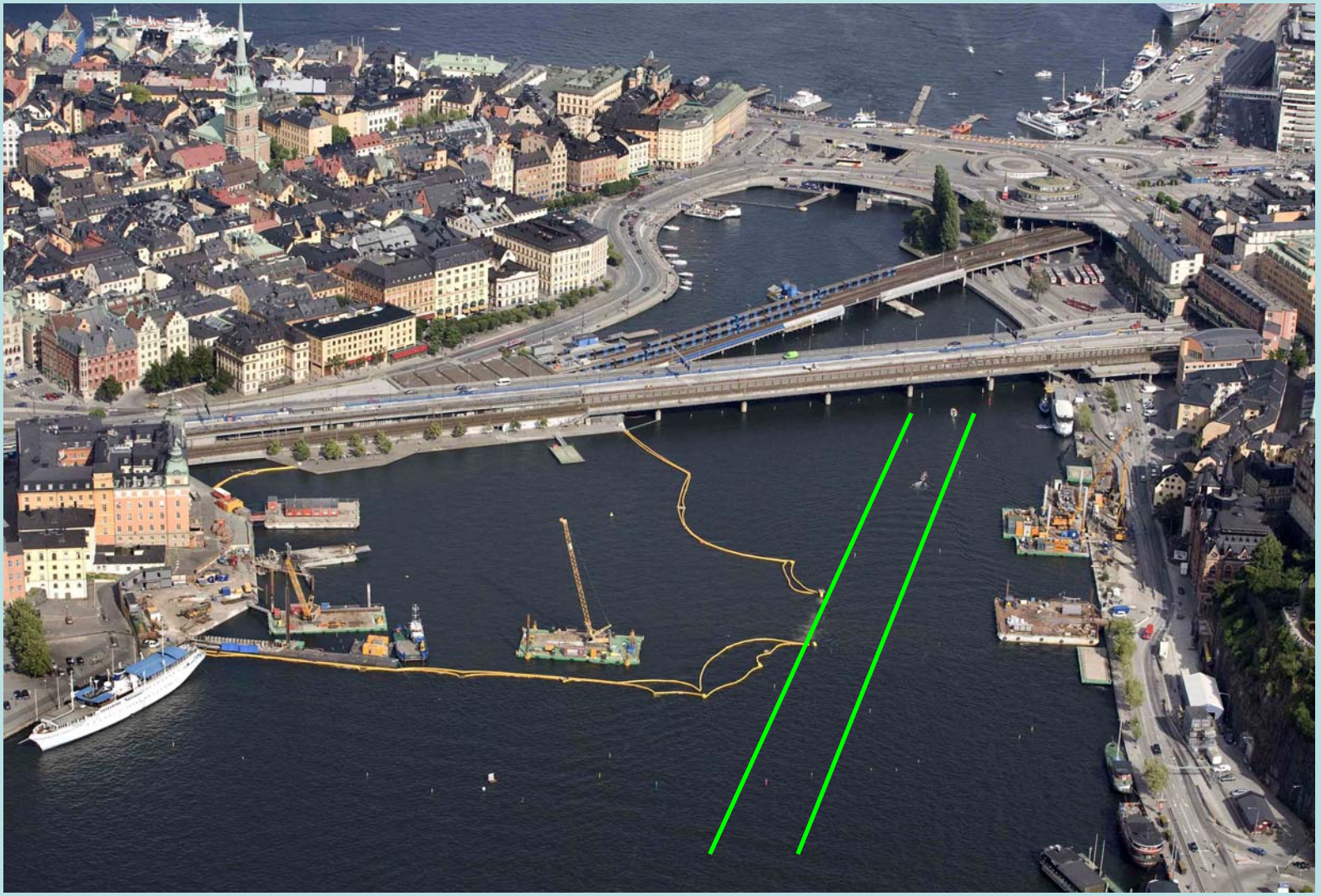

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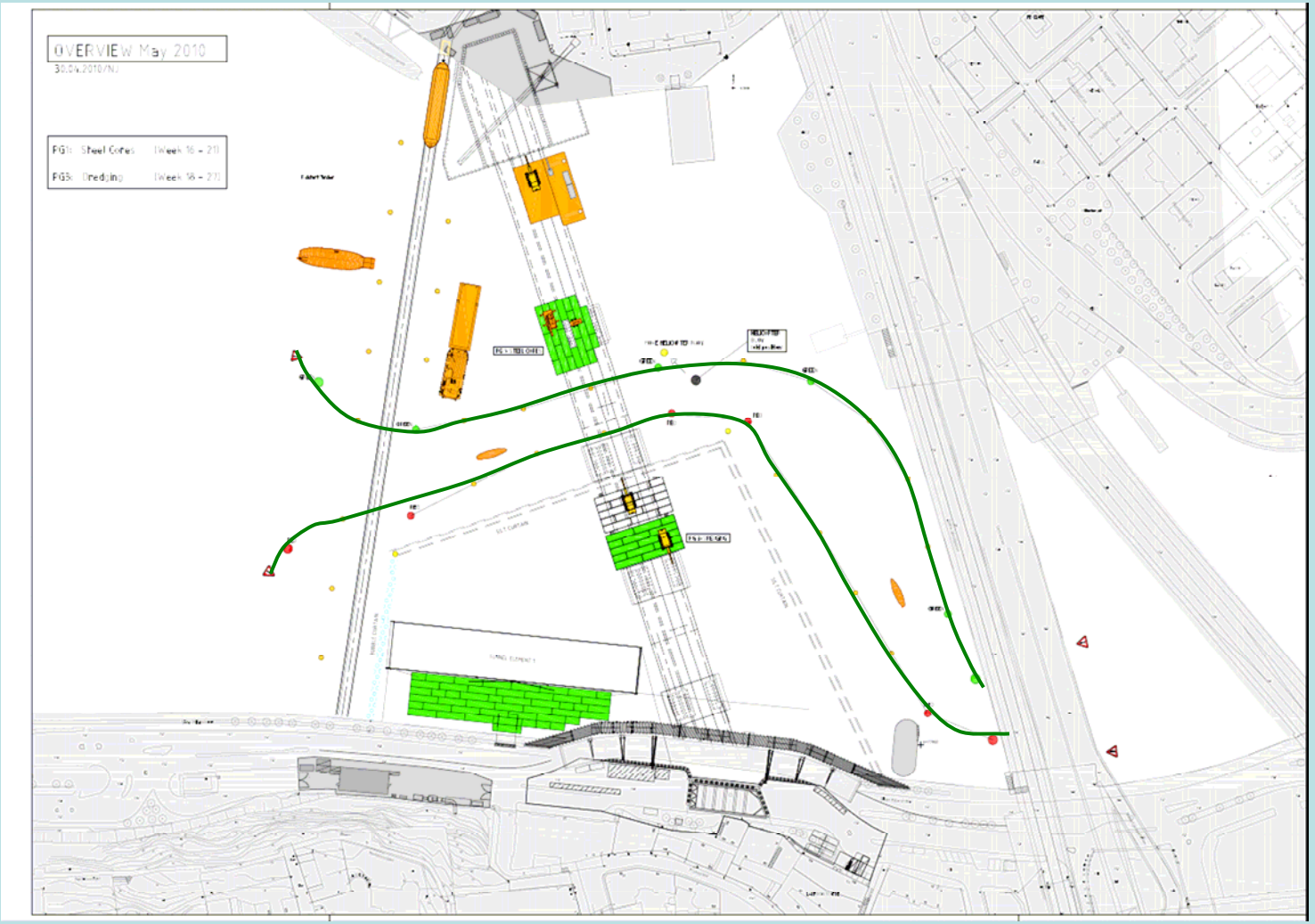
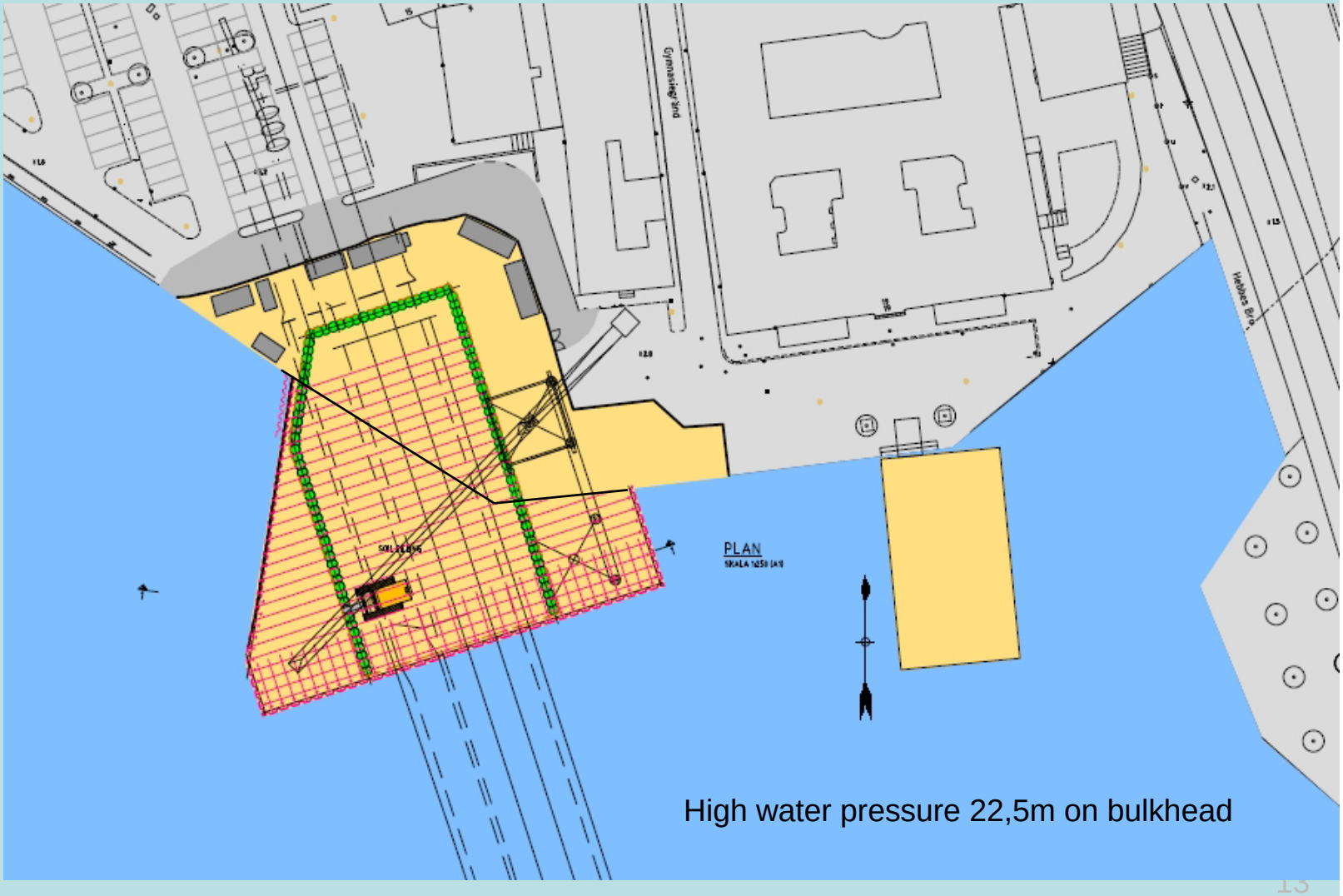
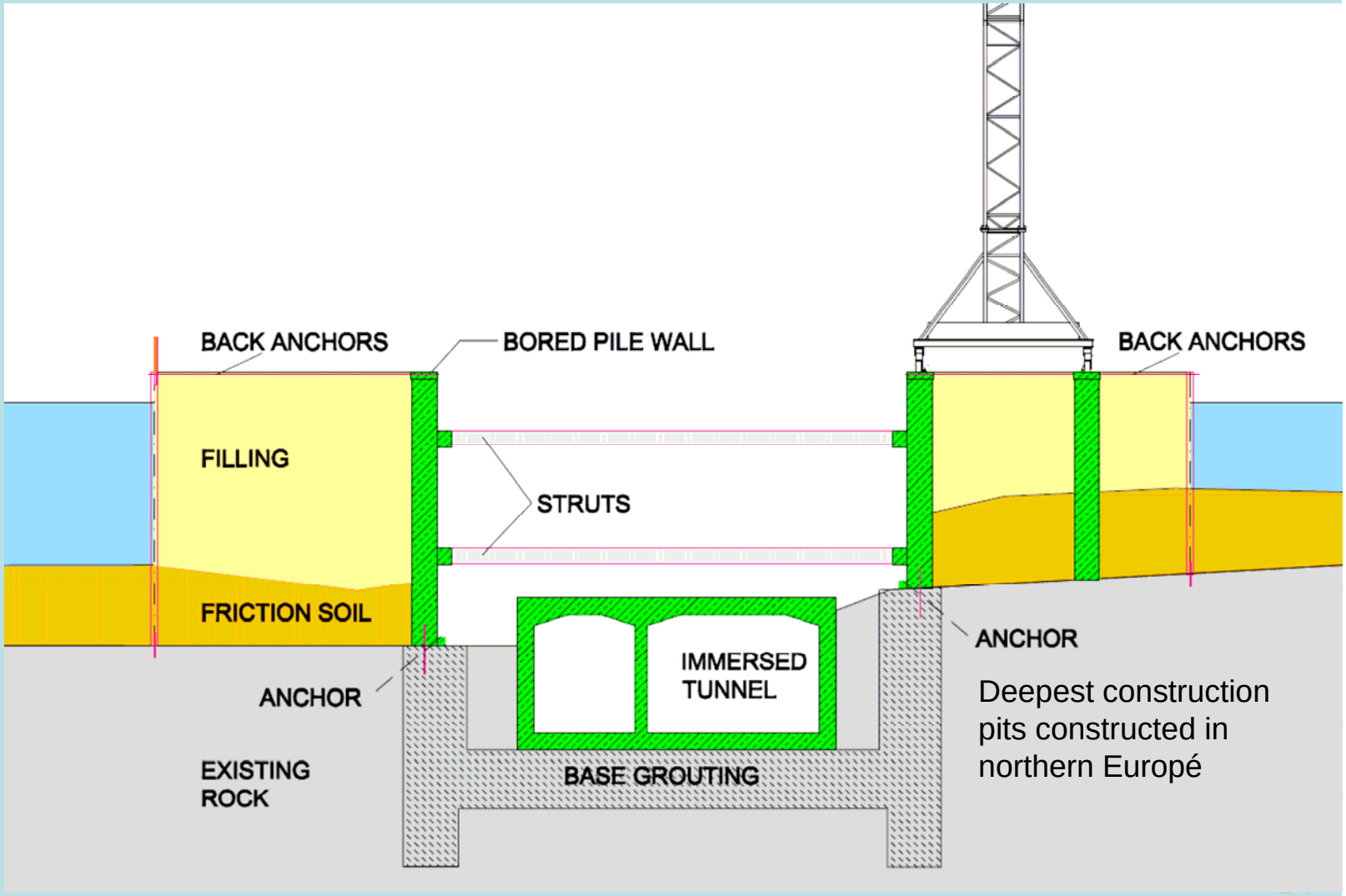


Riddarholmen



High water pressure 22,5m on bulkhead

Riddarholmen



Deepest construction pits constructed in northern Europé

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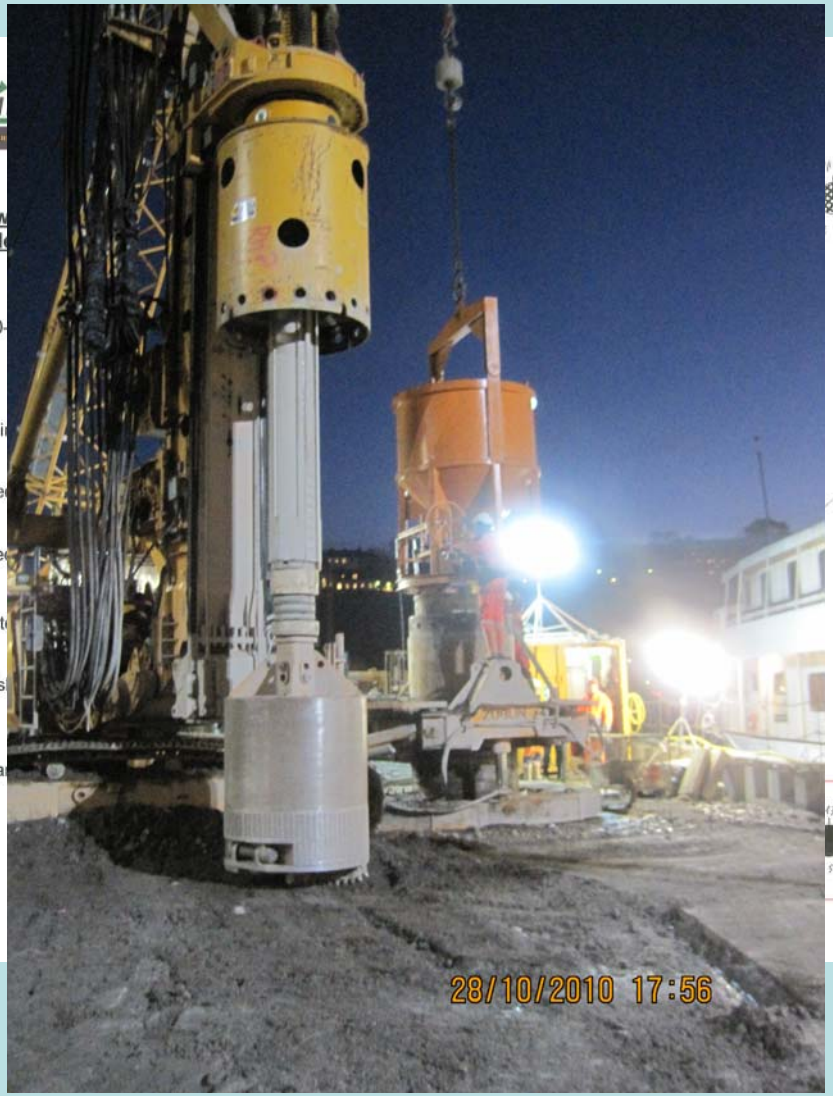

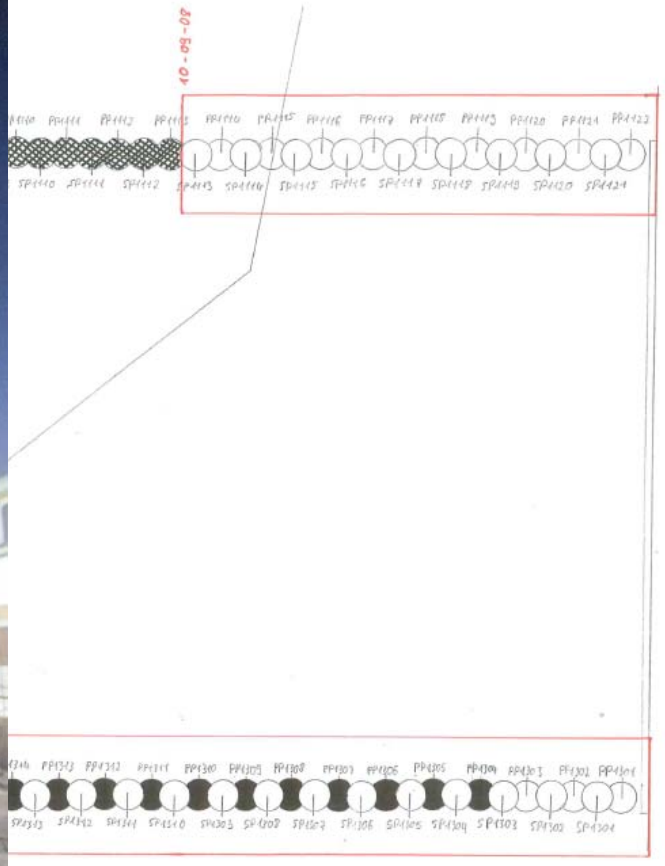

Riddarholmen

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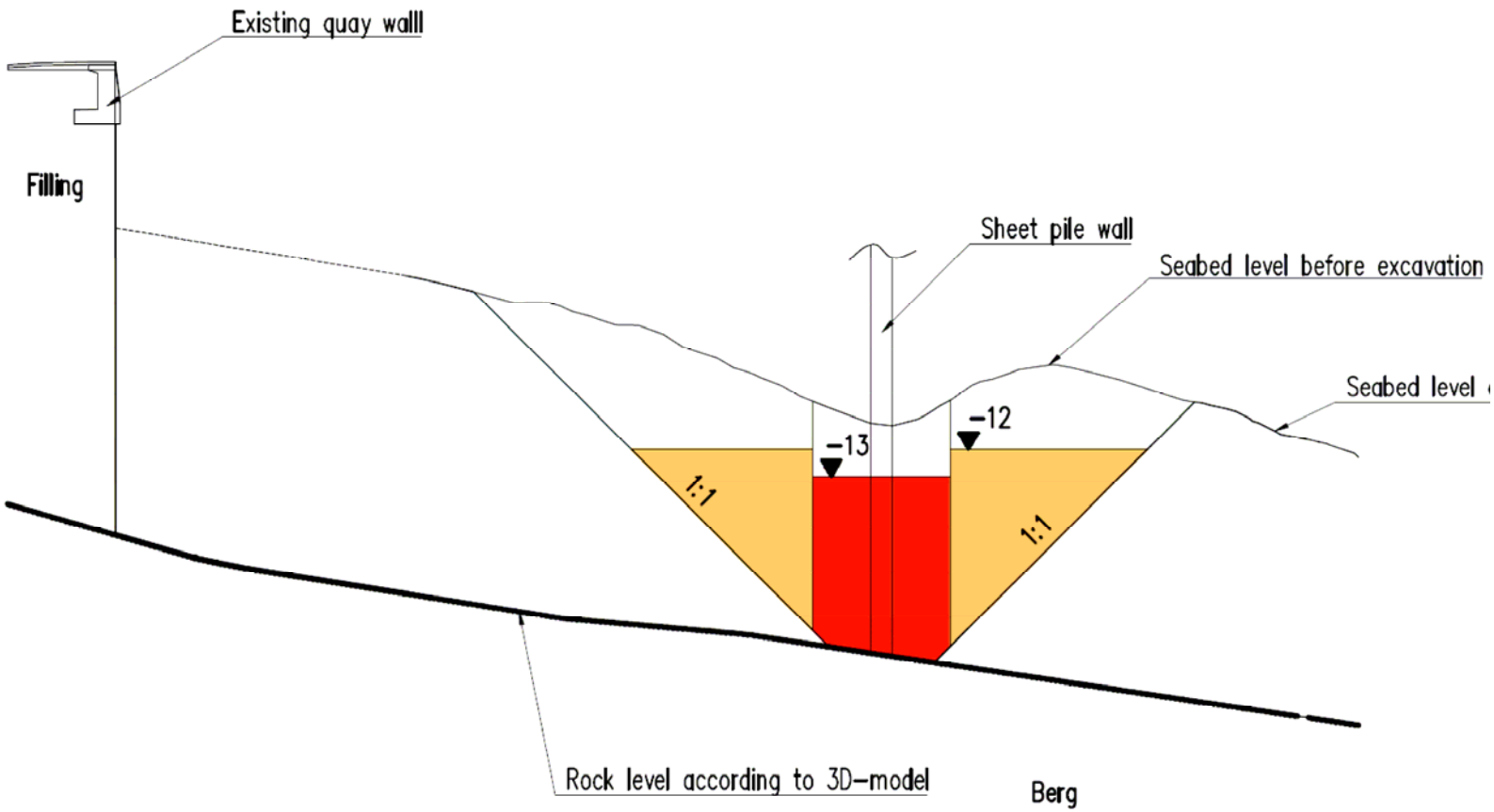


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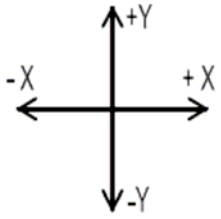
9.) After dewatering of construction pit.

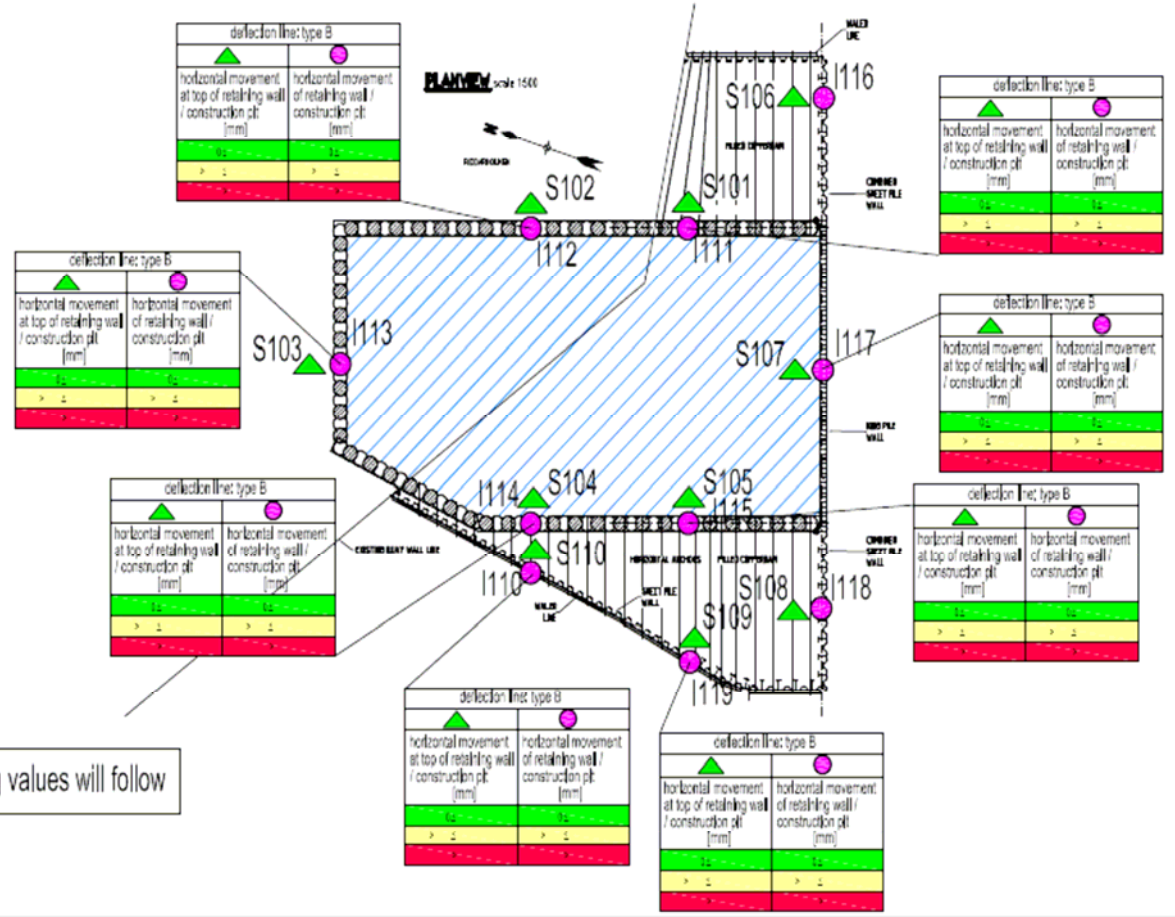
Measurement at existing buildings and quay wall		
type of measurement	frequency / interval of measurement	measurement points
S + I	1 x	all

(Measurement points shown as in 1.)

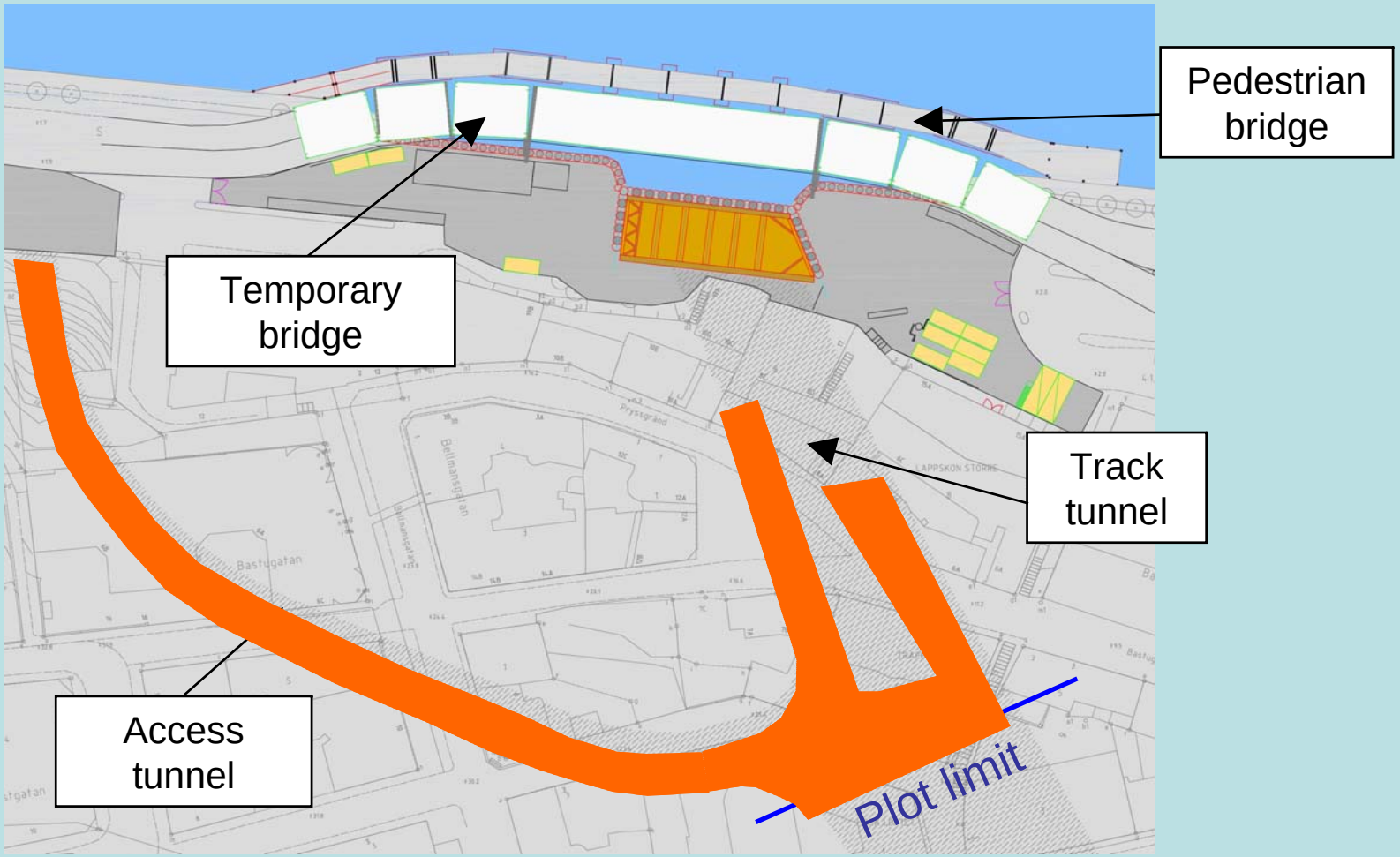
Measurement at retaining wall / construction pit		
type of measurement	frequency / interval of measurement	measurement points
S + I	1 x	as shown in this sketch



Limiting values will follow



Söder Mälarstrand



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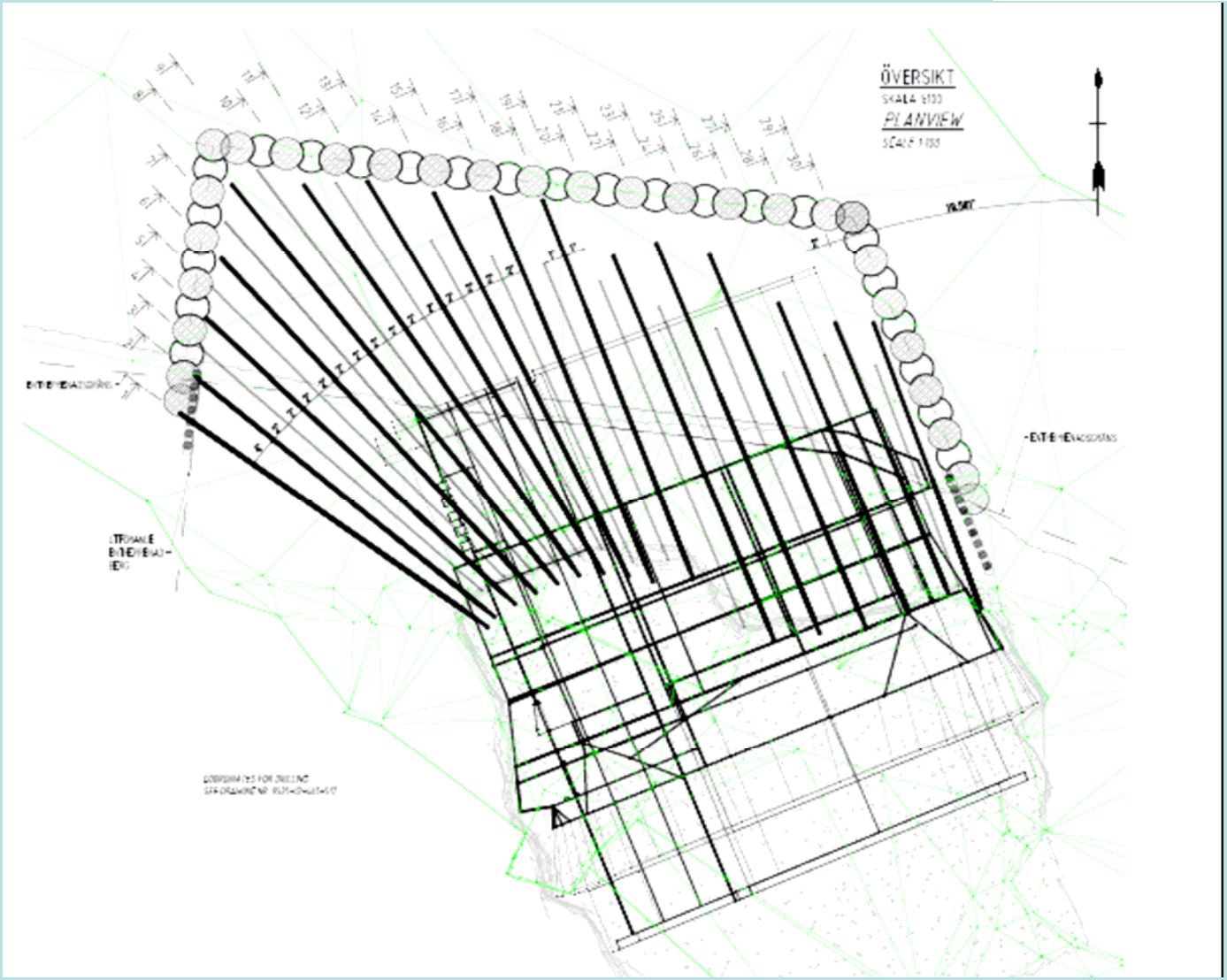

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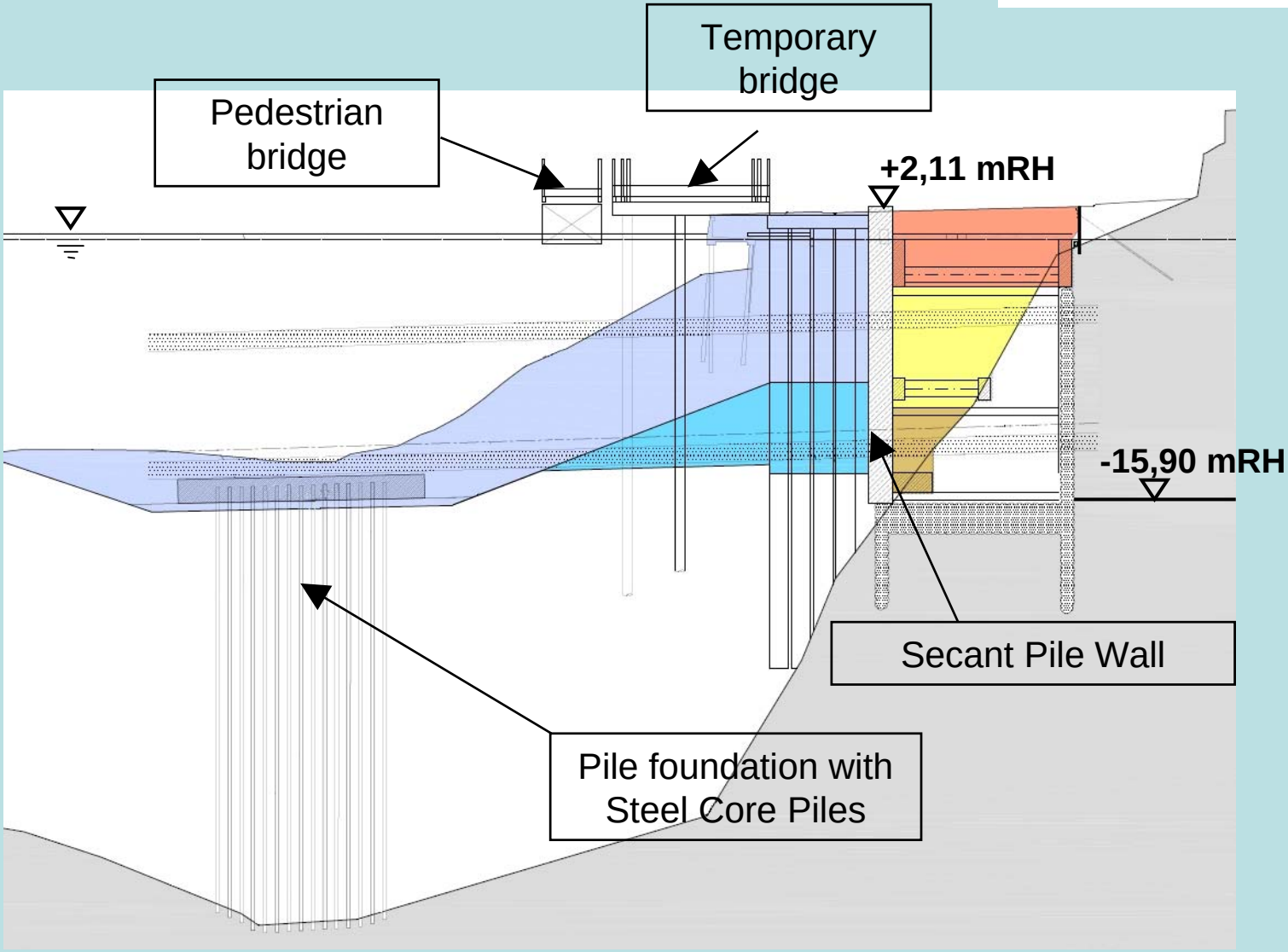
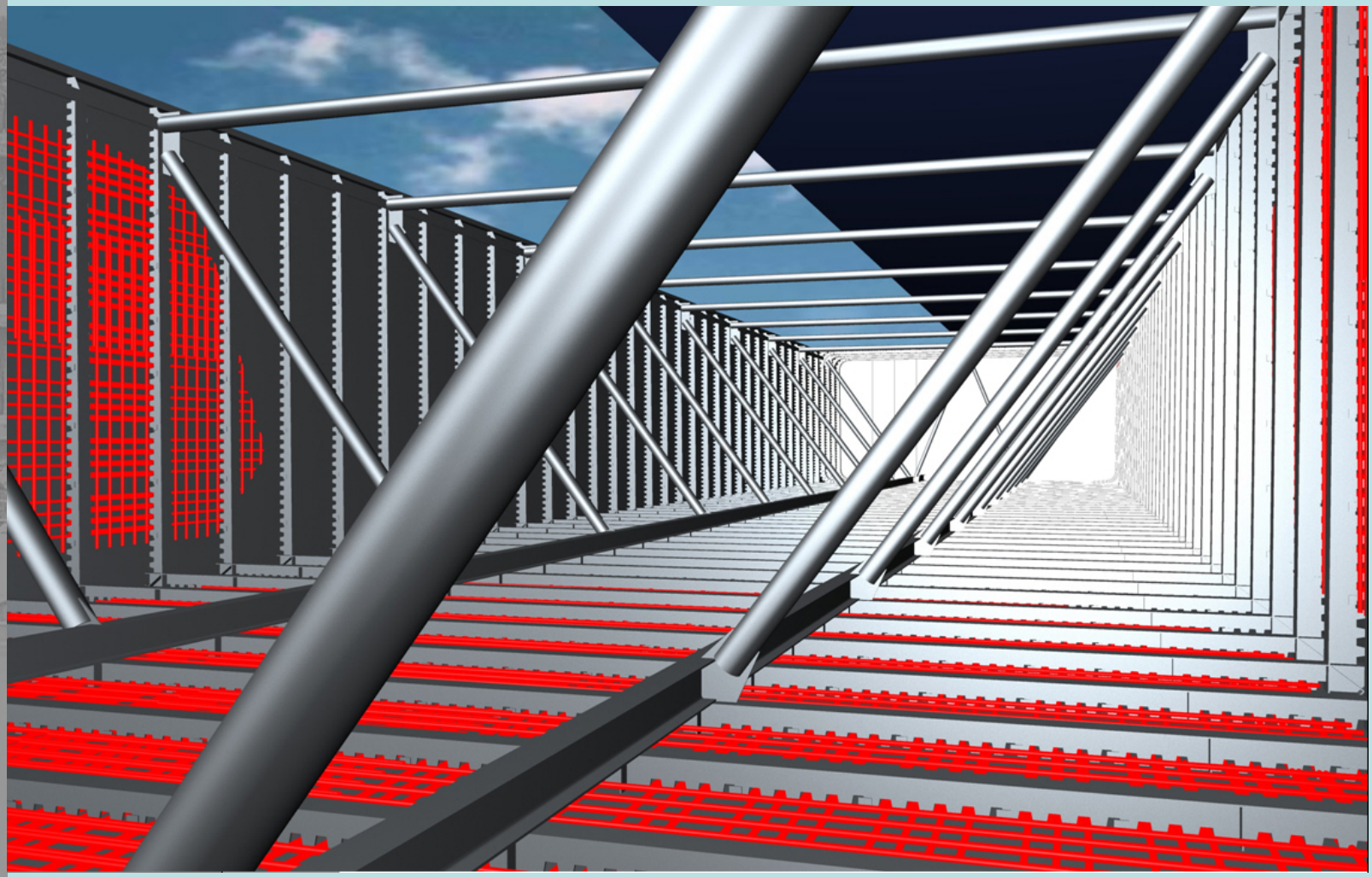
Söder Mälarstrand



Steel Core Piles

Tunnel Element



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Tunnel Element

Transport across the Baltic Sea …

Start: Dockyard of Tallinn

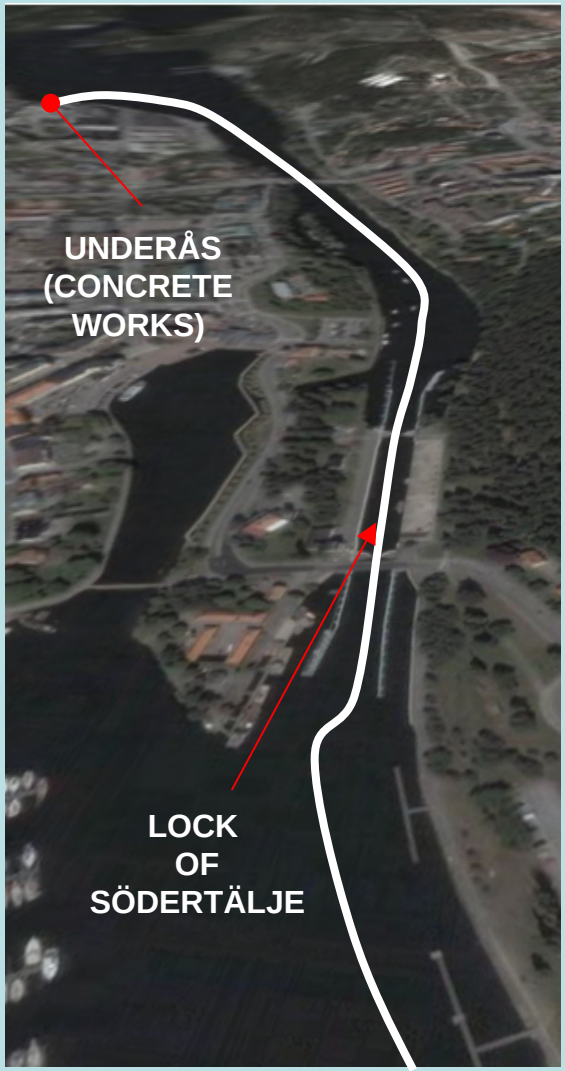
Destination: Lock of Södertälje

On open sea: 325 nm (600 km)

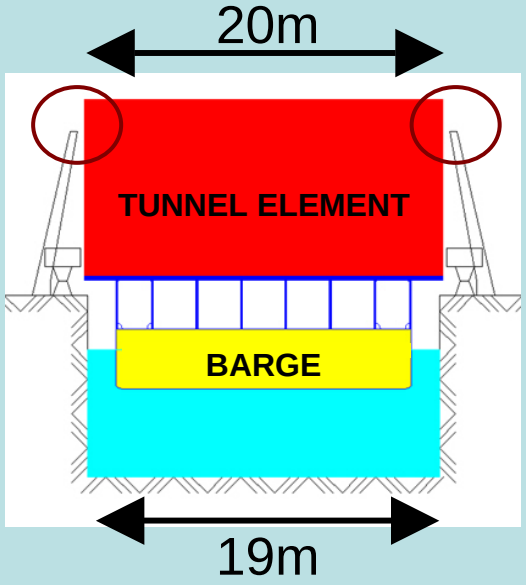
Total distance: 380 nm (700 km)

Duration: ca. 52 hours

Tunnel Element



…passage of the Lock of Södertälje…



Tunnel Element

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Tunnel Element

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Immersion of Barge

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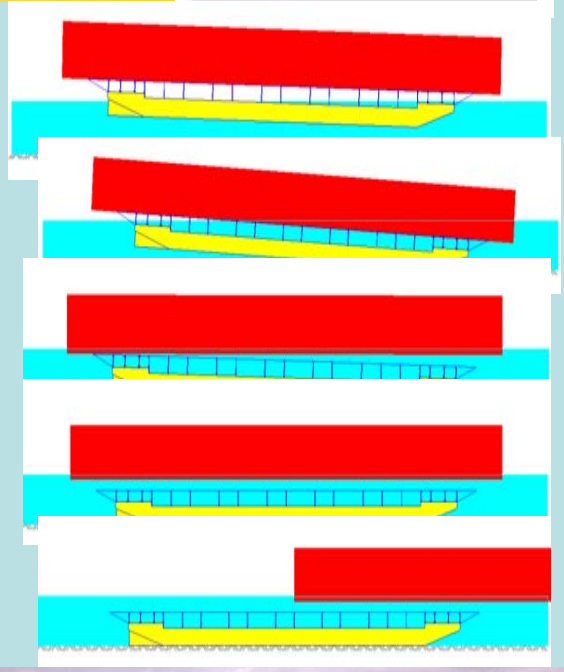

Tunnel Element

Tunnel Element

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…Transport Södertälje – Söder Mälarstrand

Tractive unit: Multicat

First destination: Underås

Final destination: Söder Mälarstrand

Distance: 30 nm (50 km)

Duration: ca. 8 hours


2010:04:27

Floating Element

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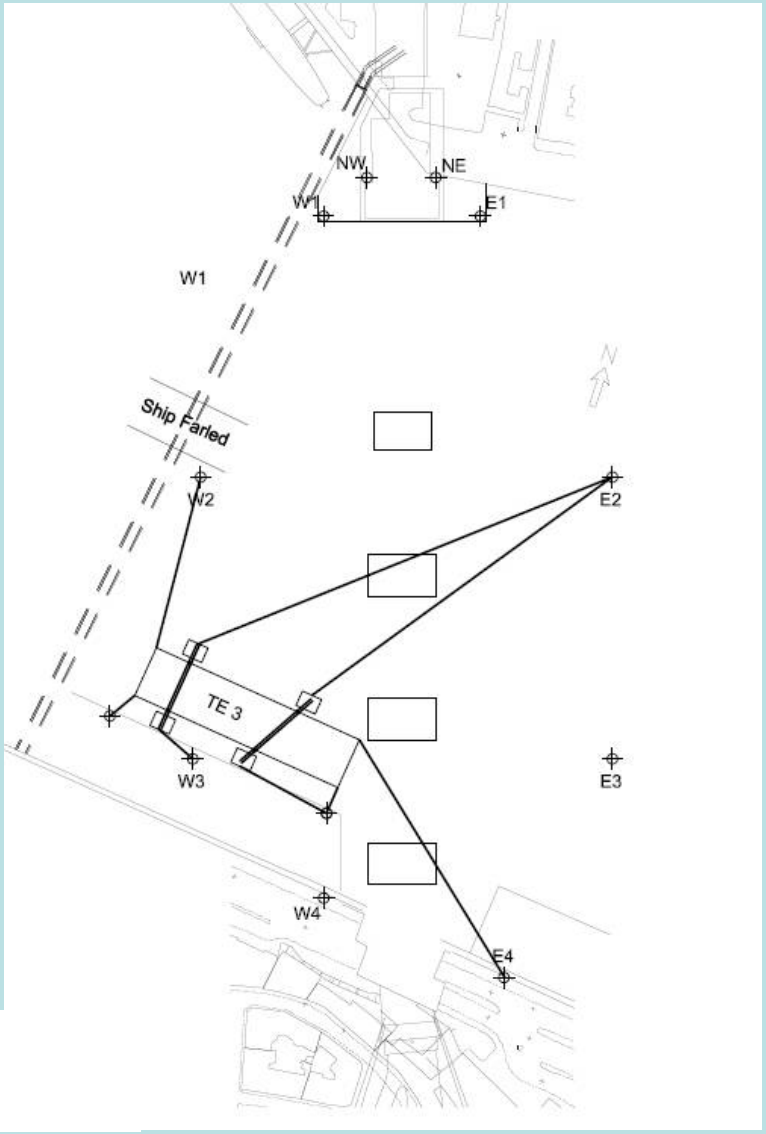
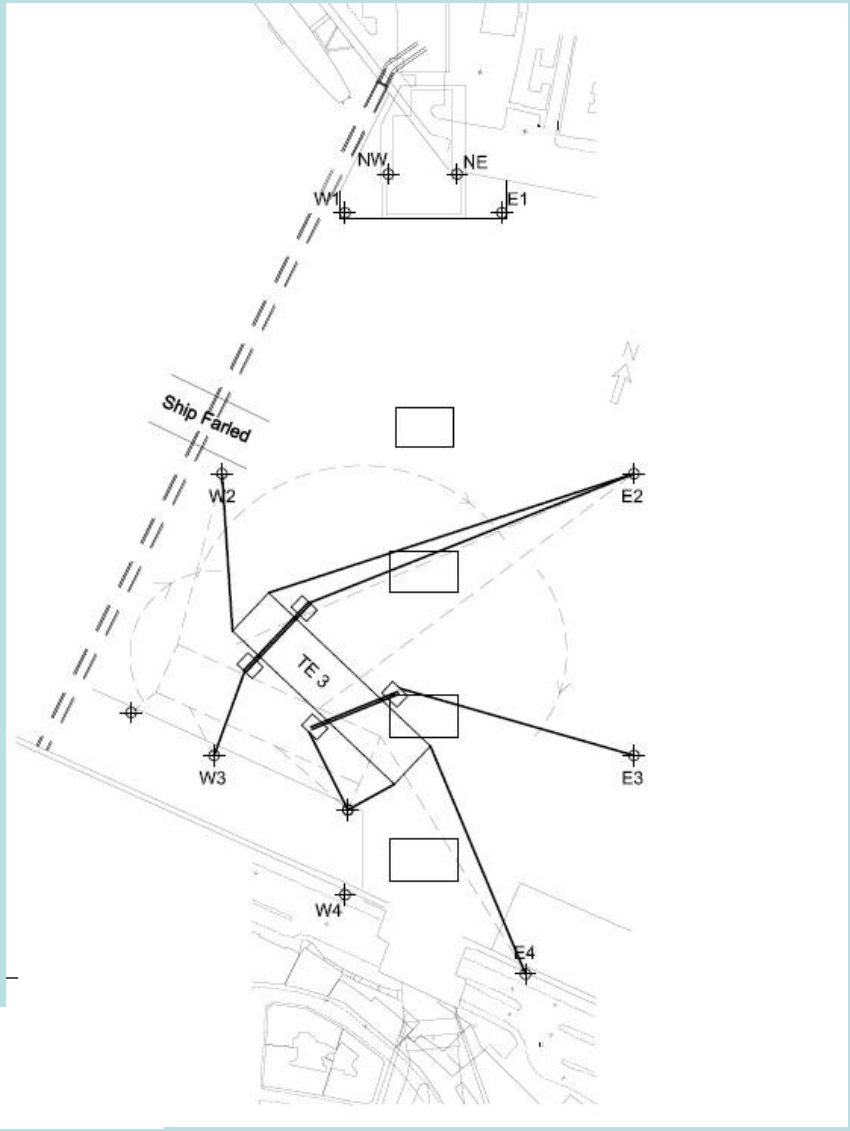
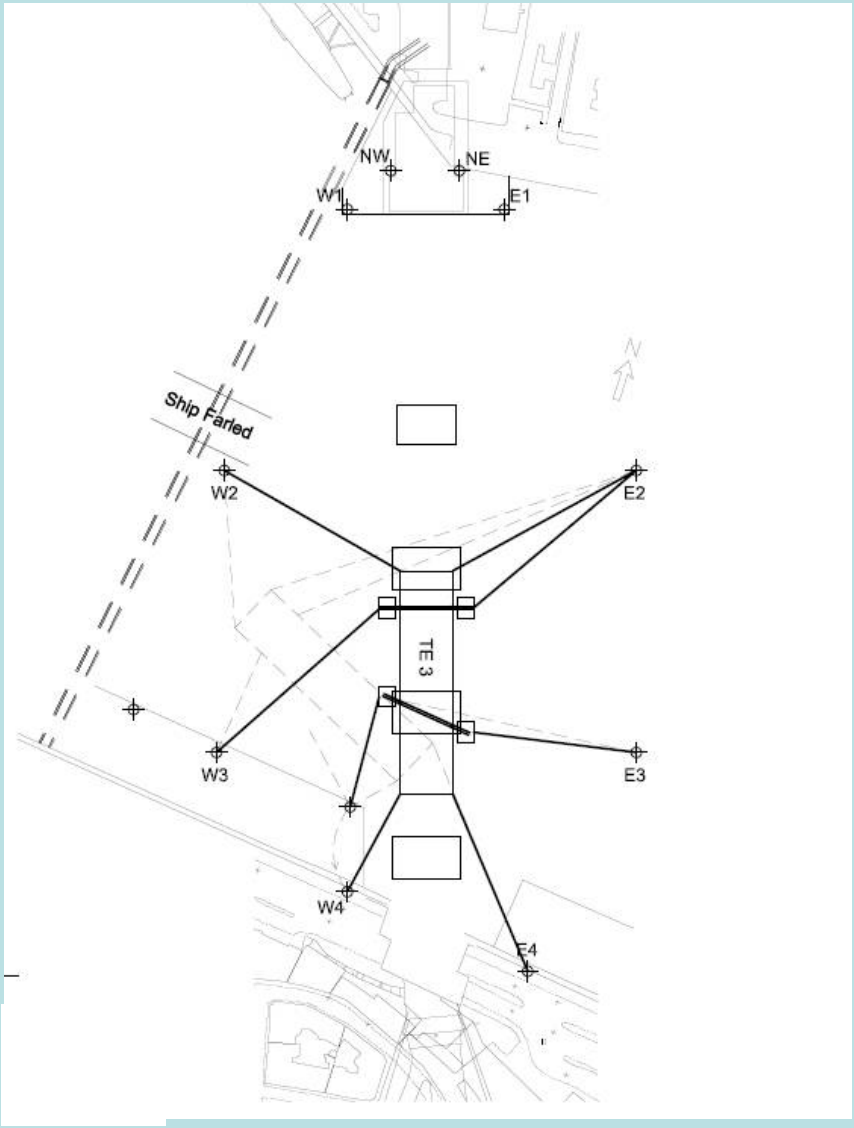
Warping of Elements



Warping of Elements



Warping of Elements



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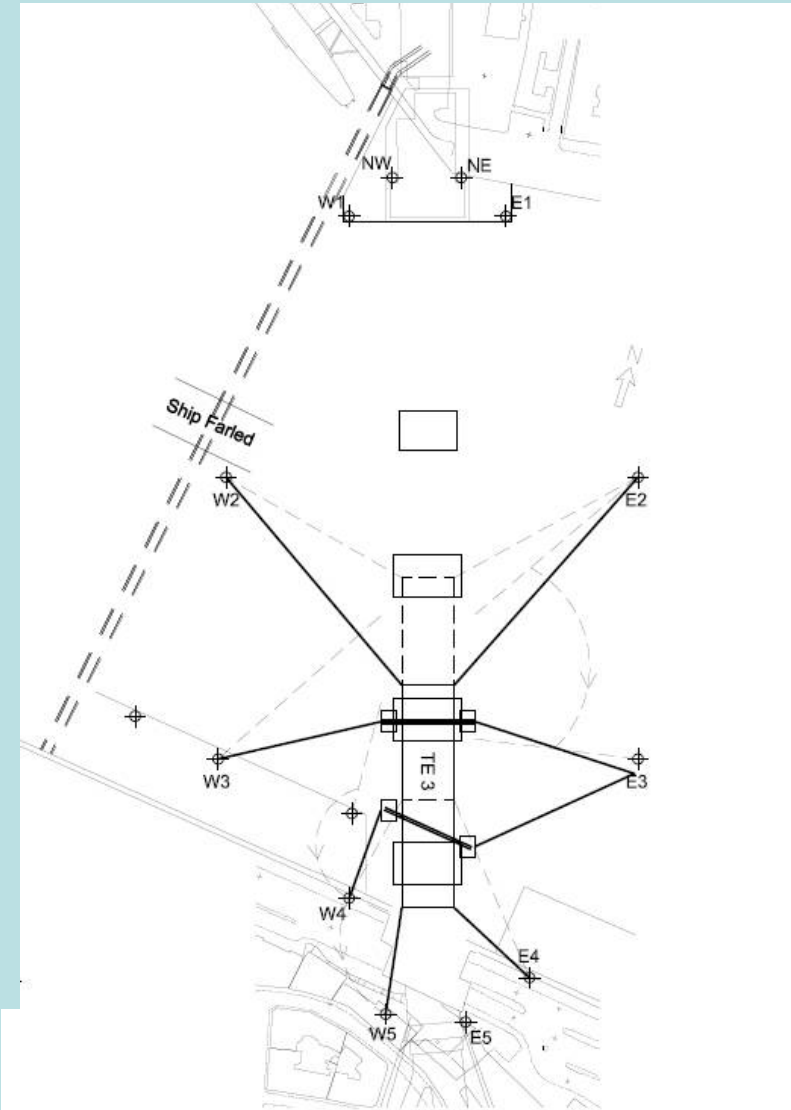

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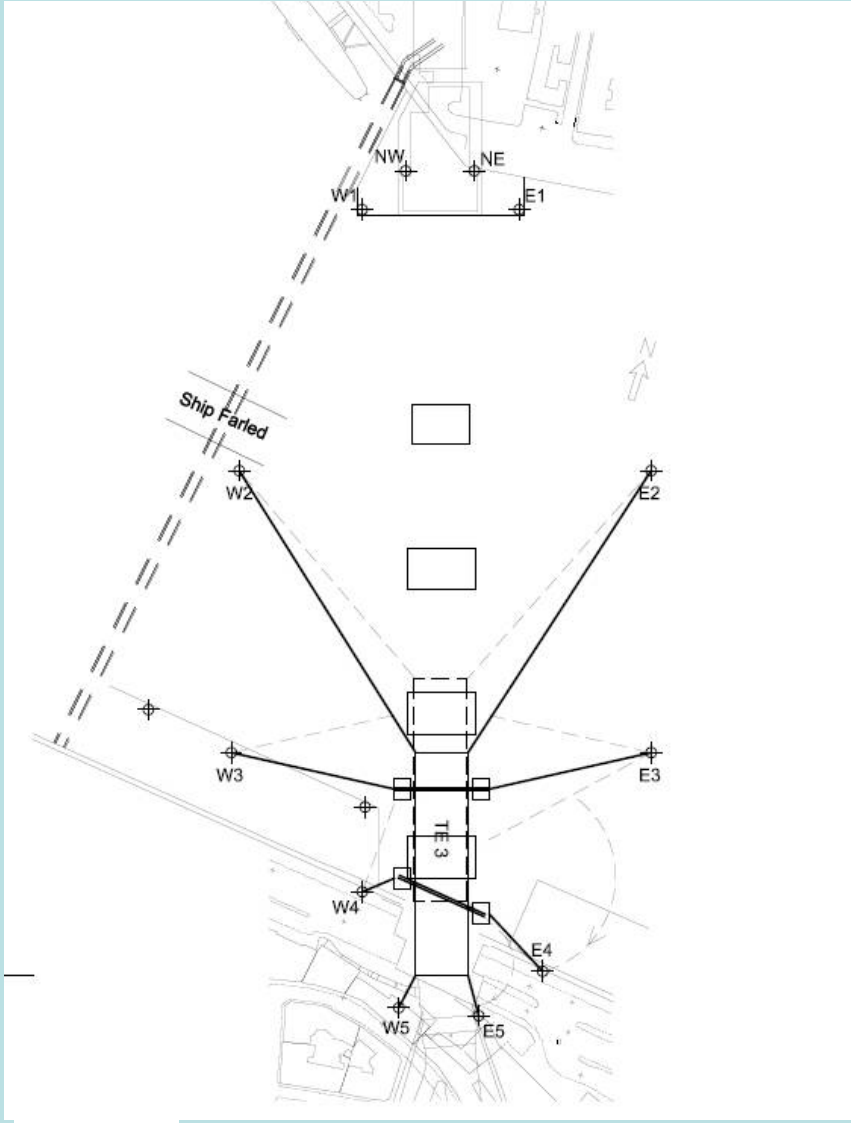
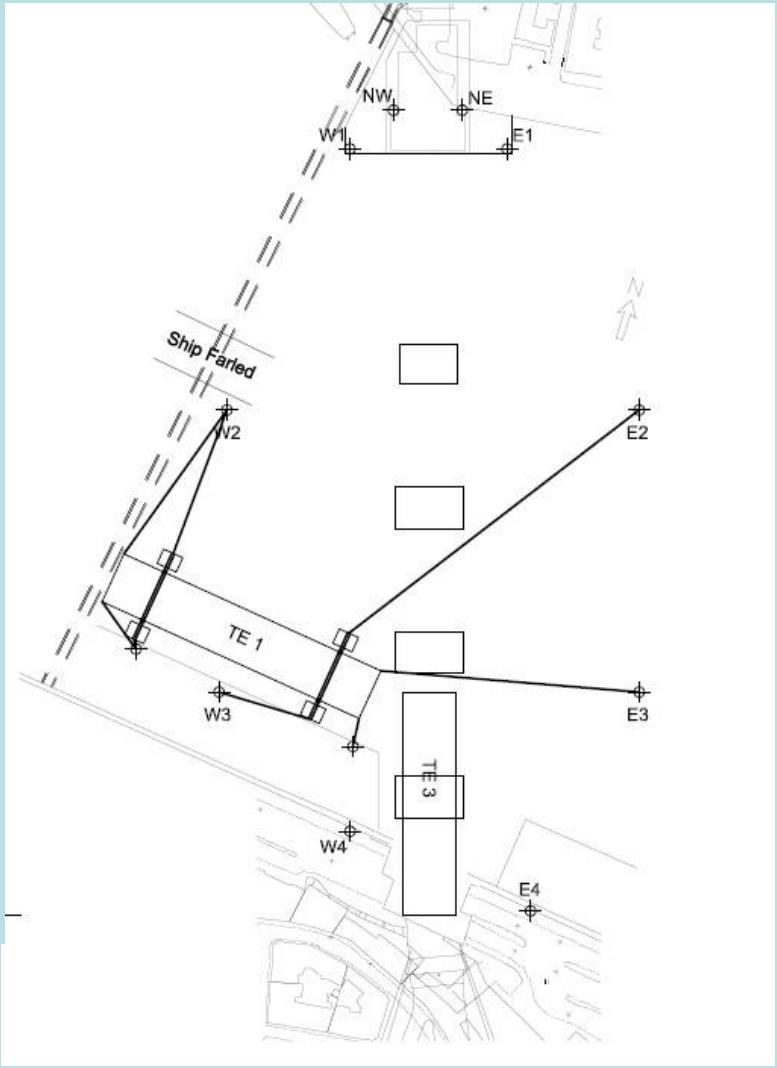


Warping of Elements



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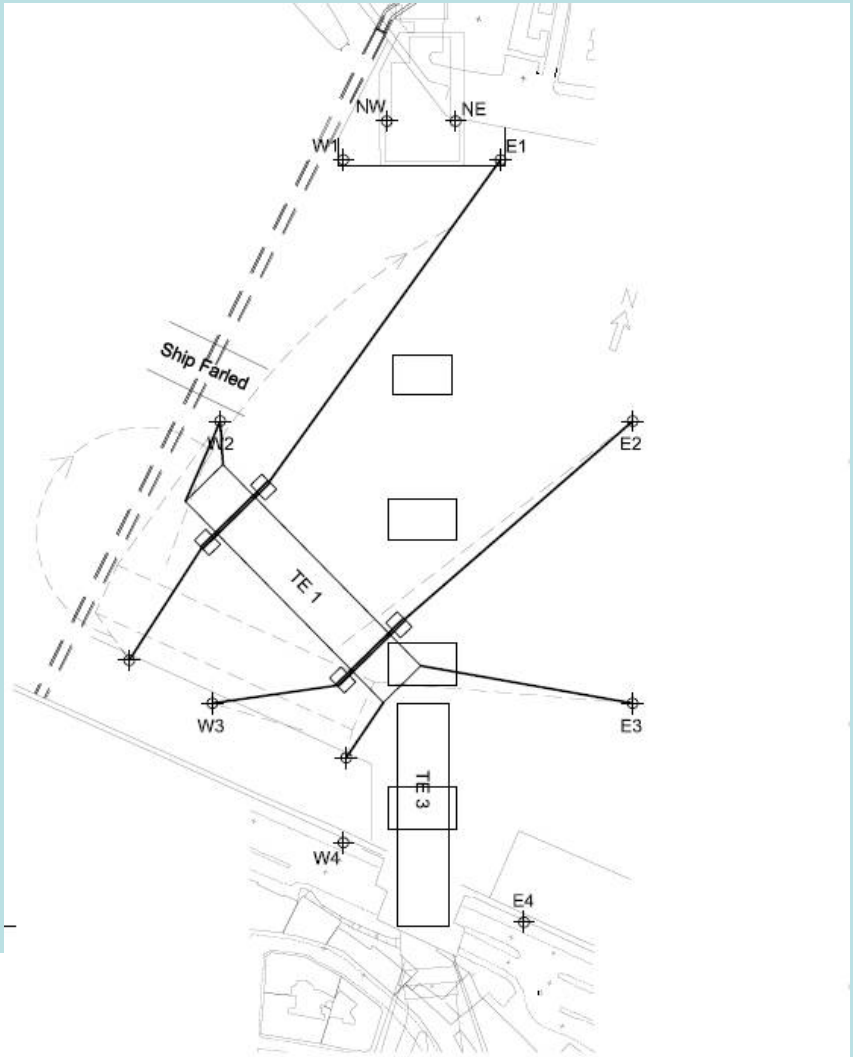

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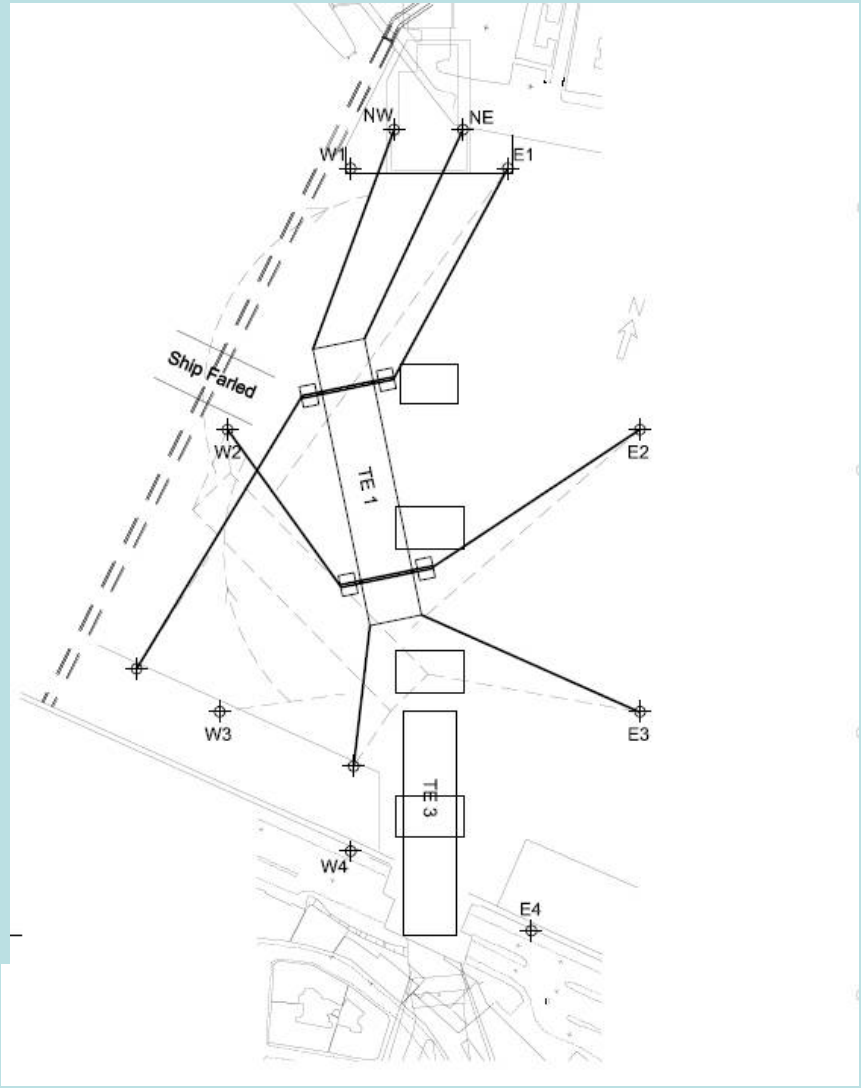

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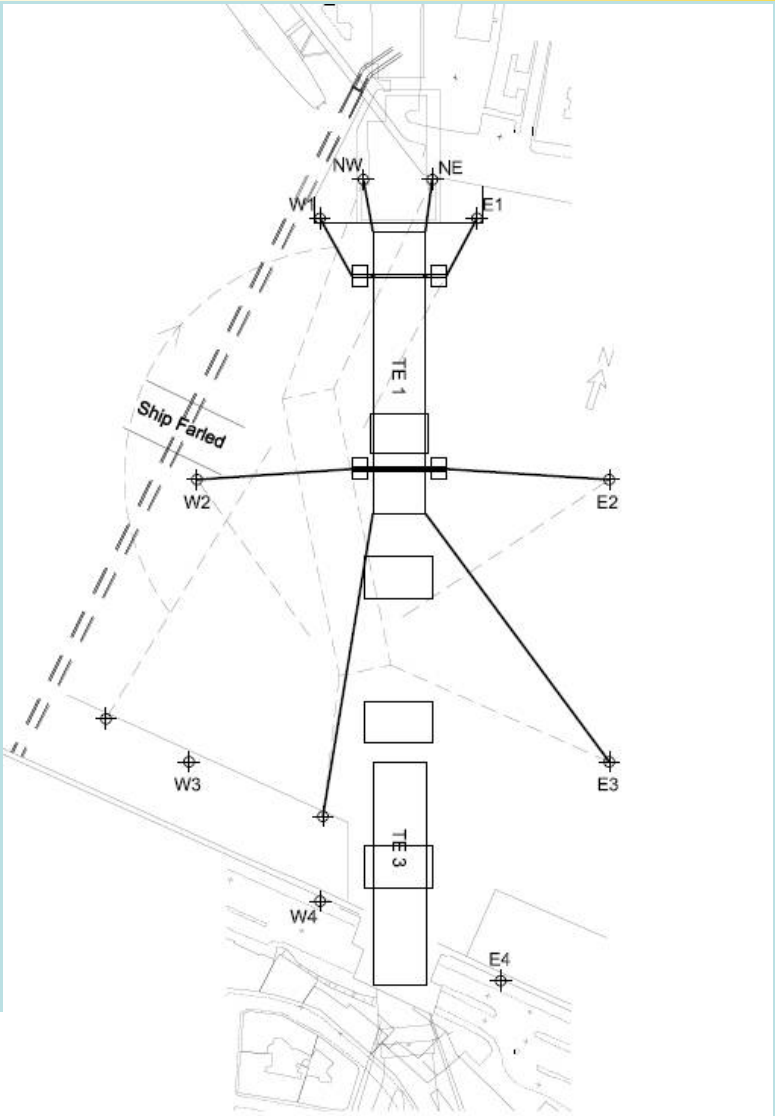

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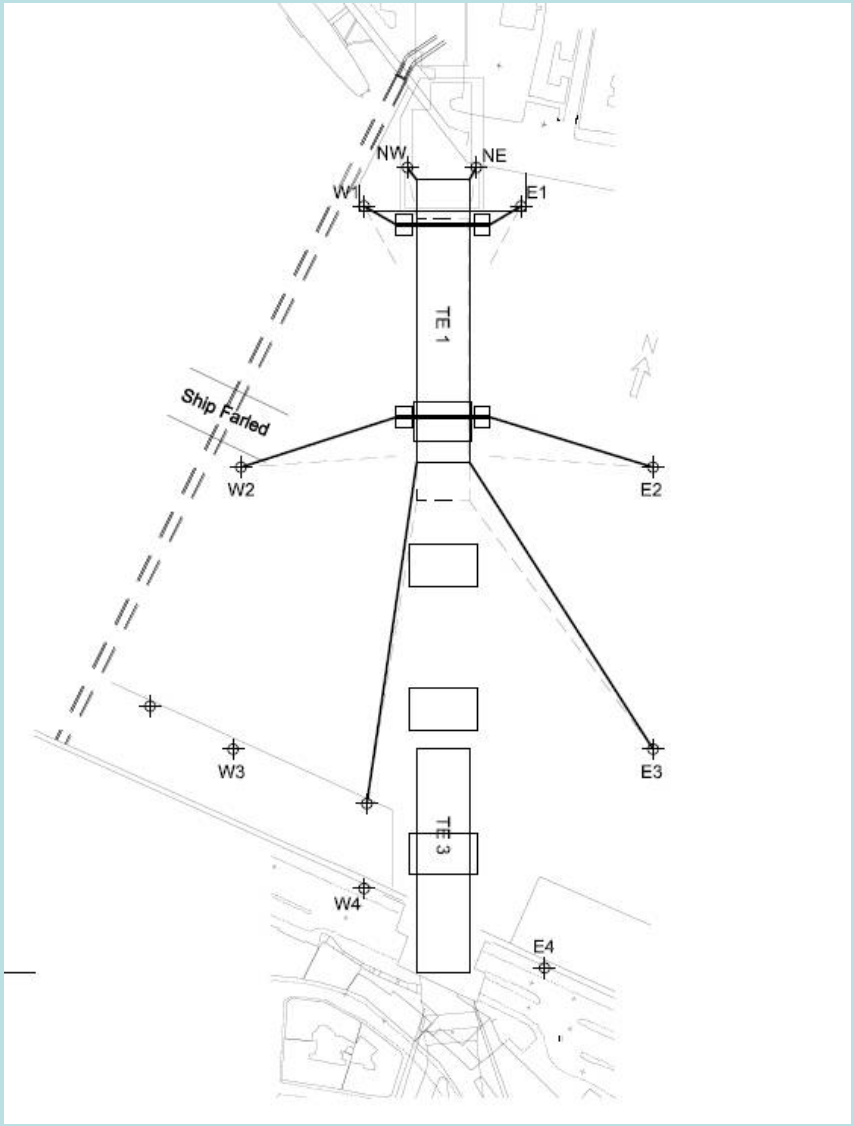

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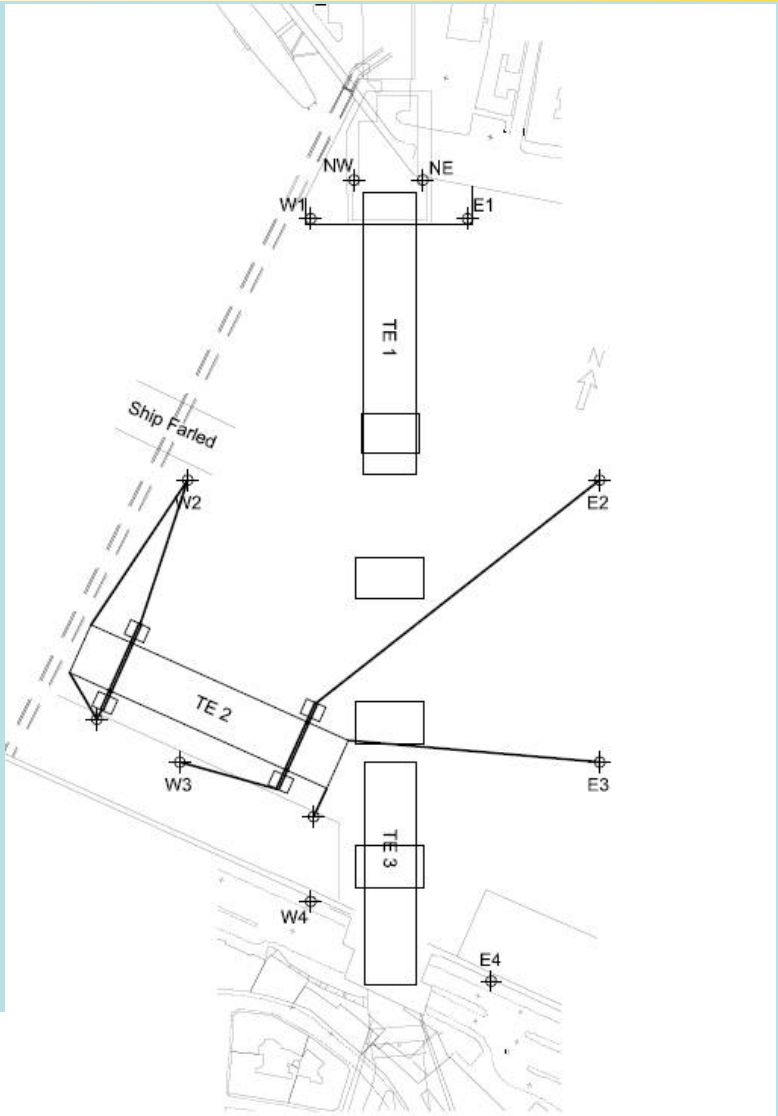

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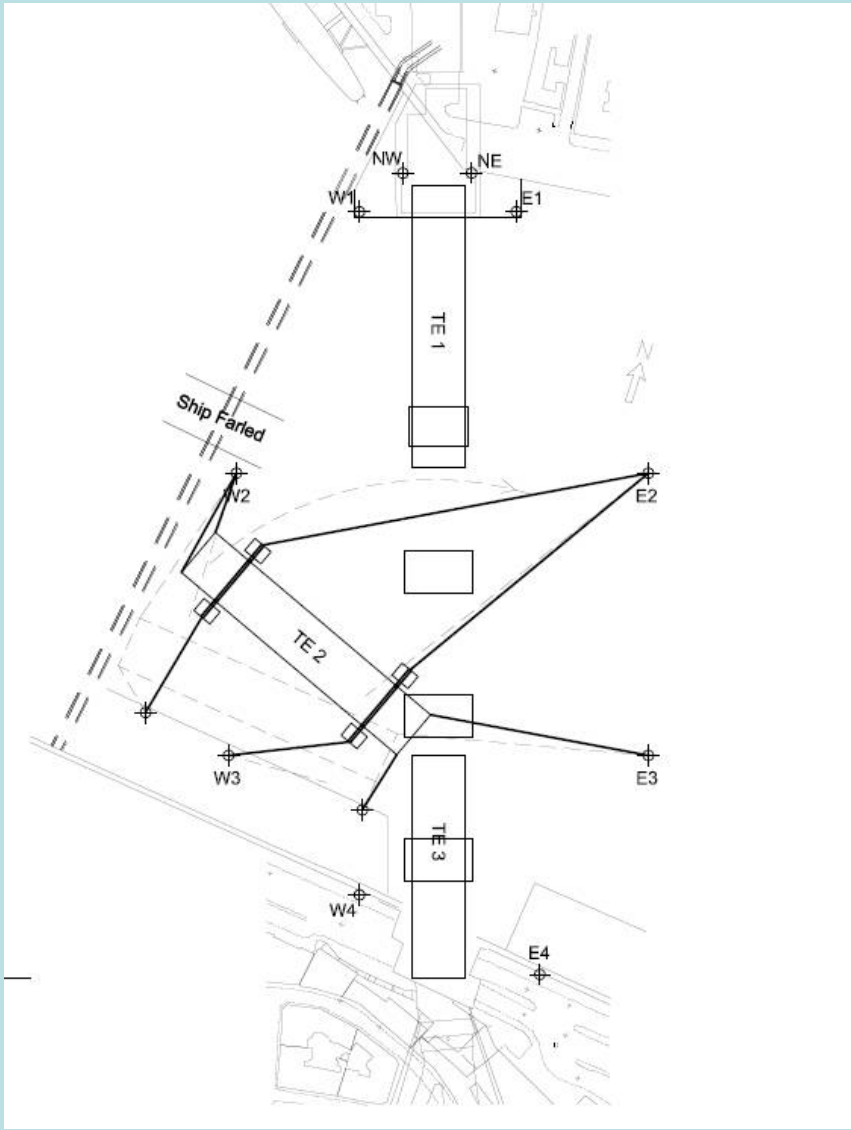

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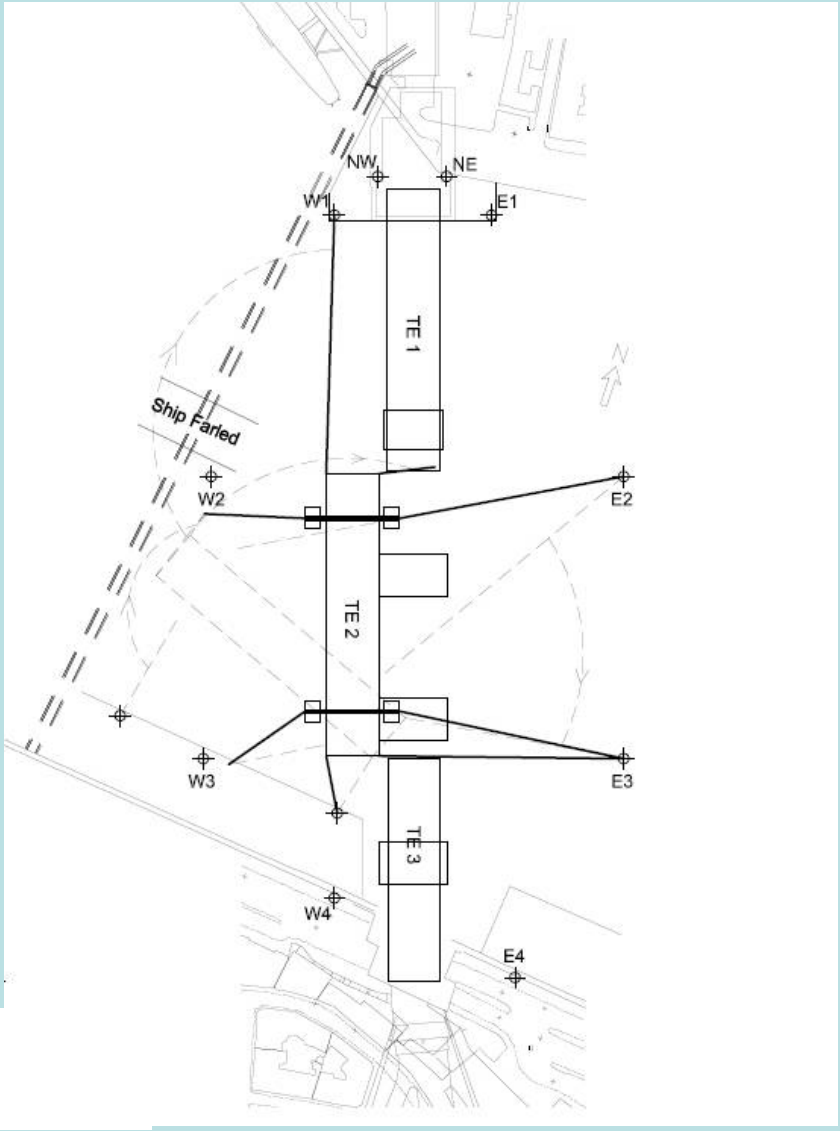

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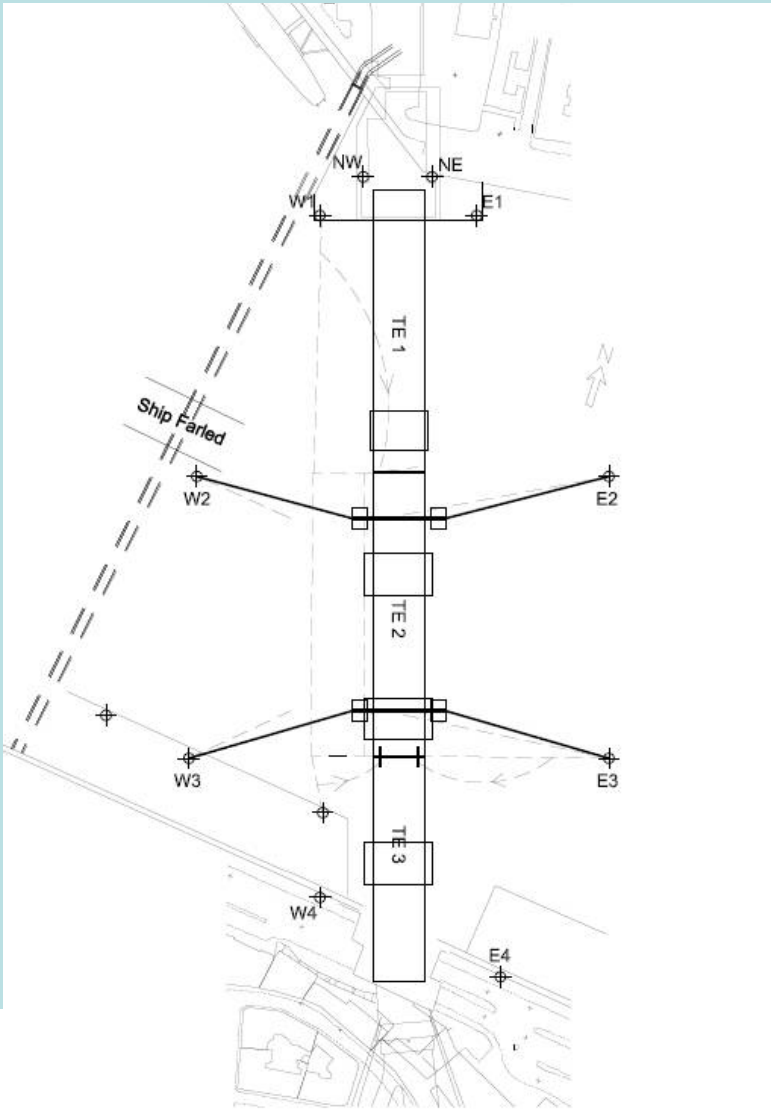

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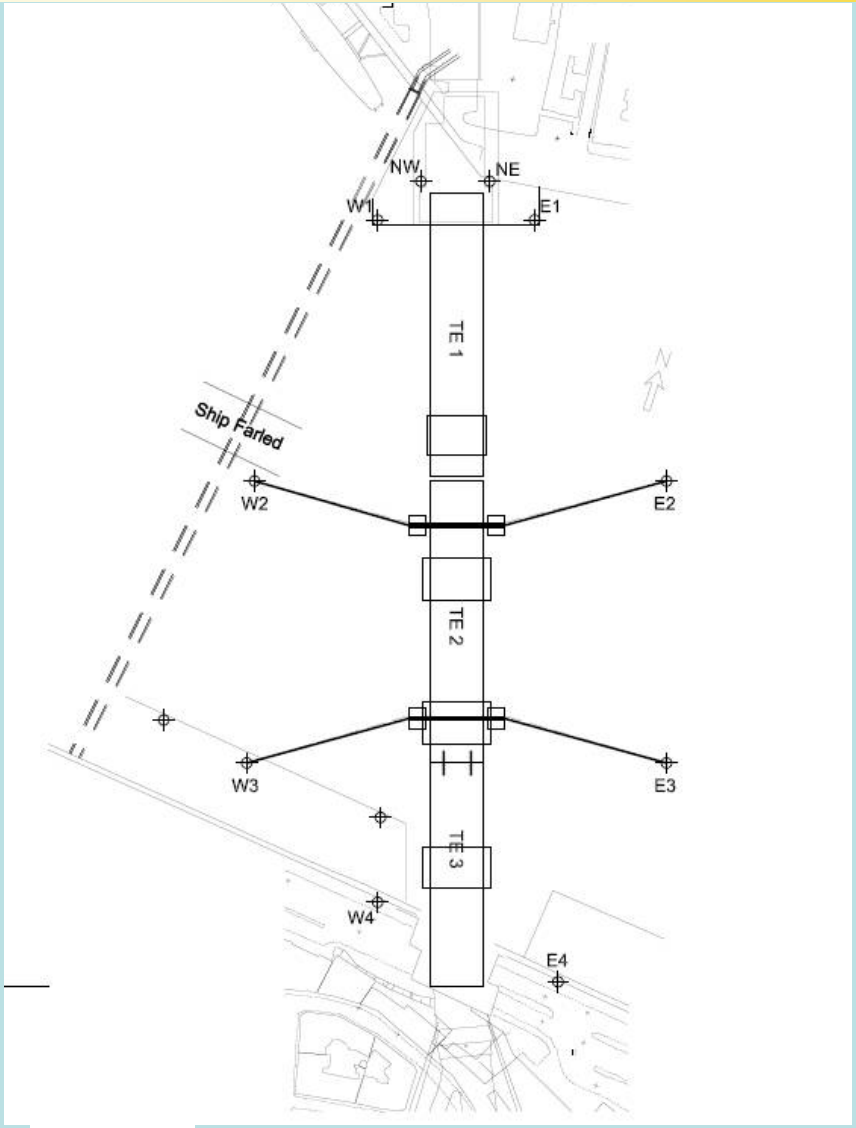

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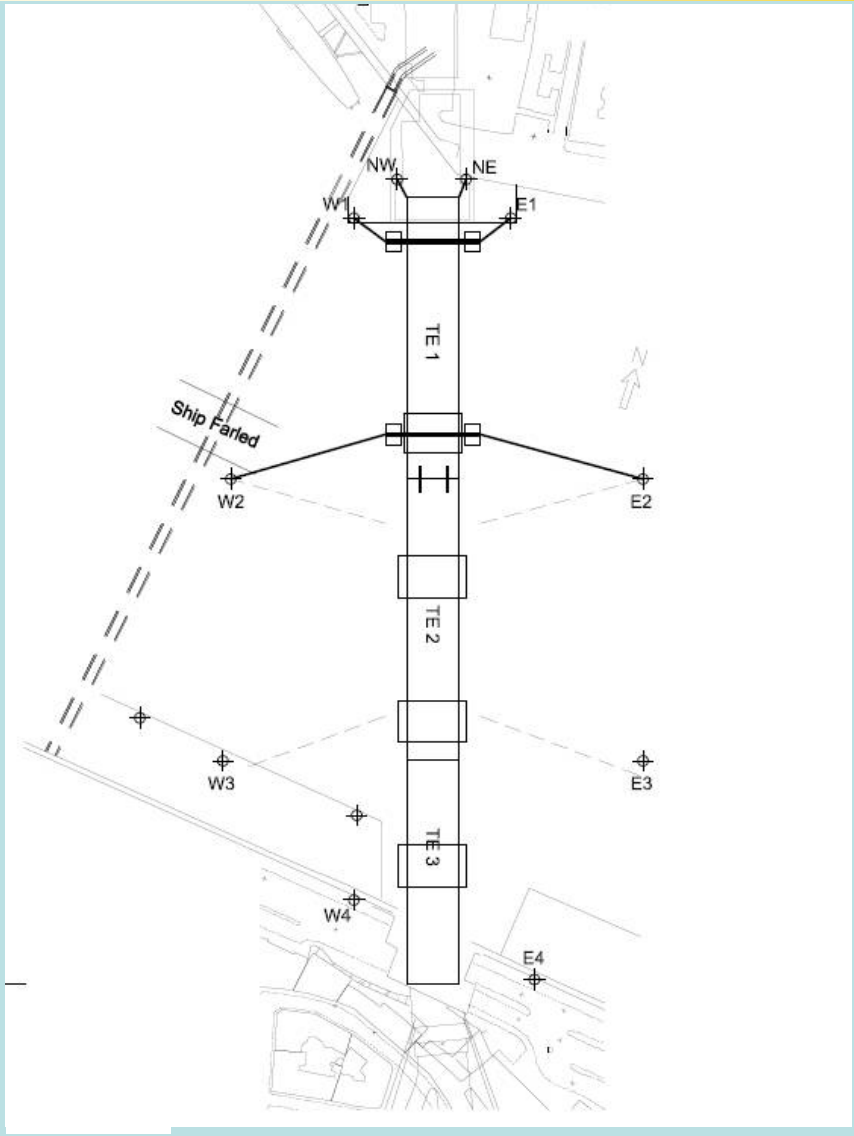
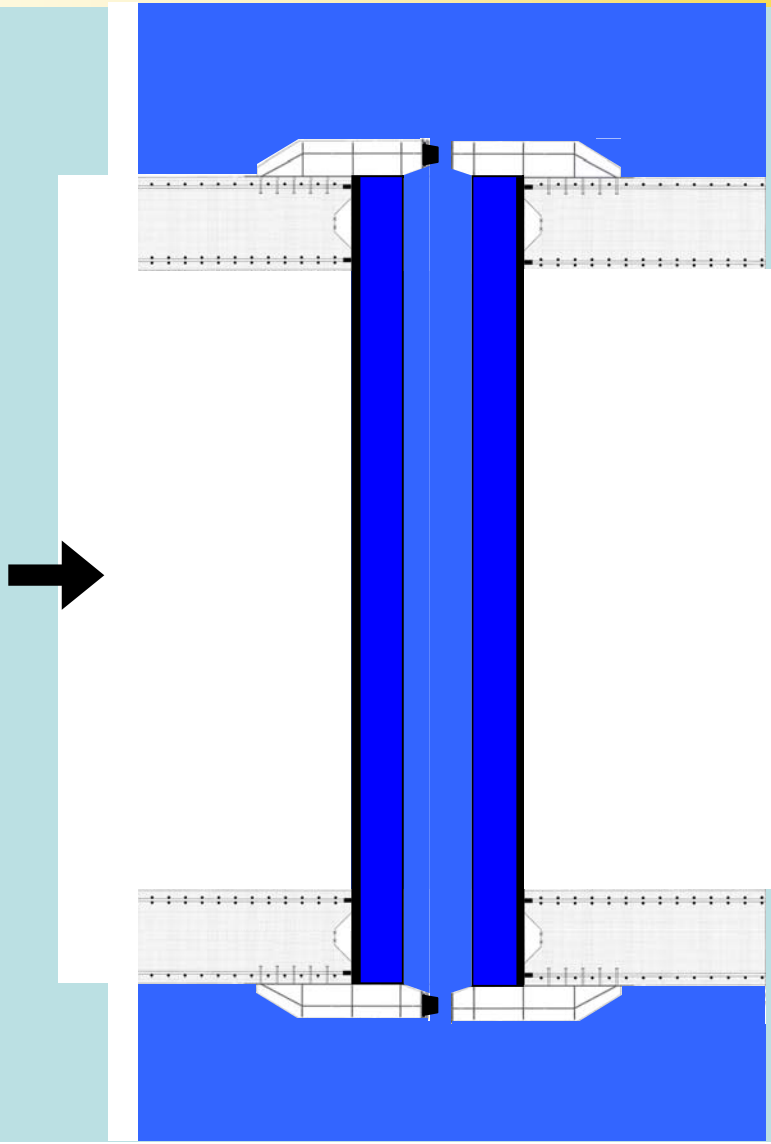
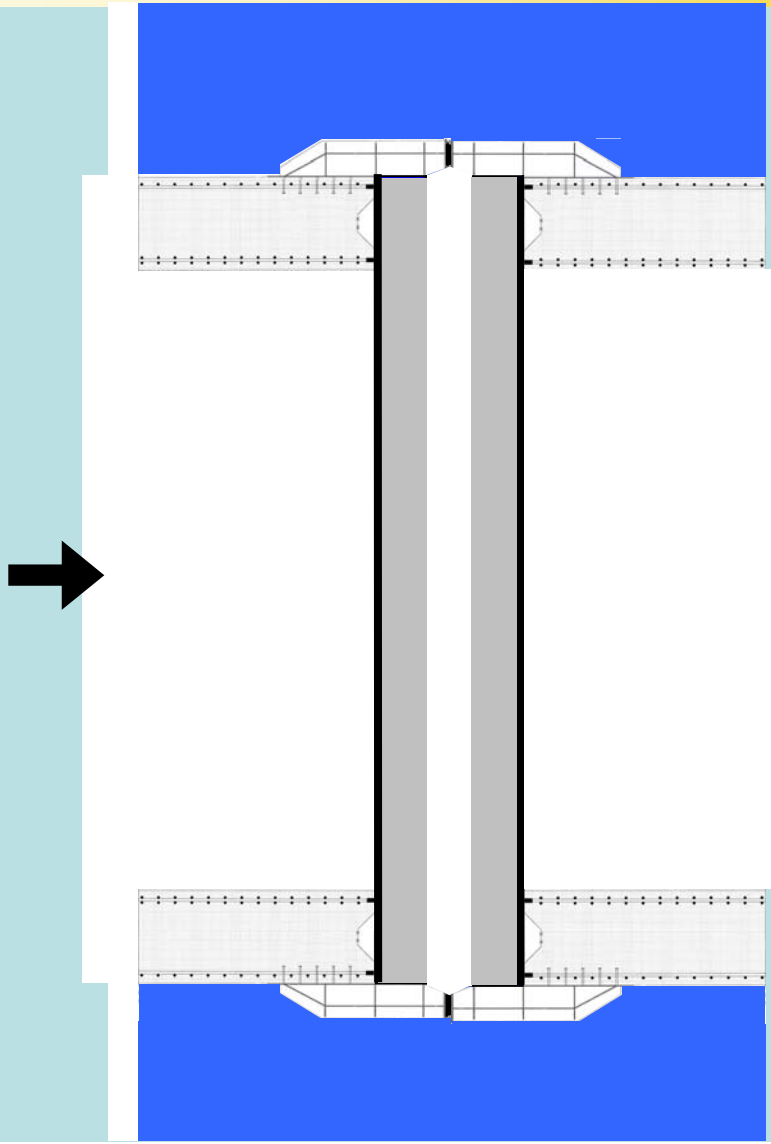


Joining of Elements



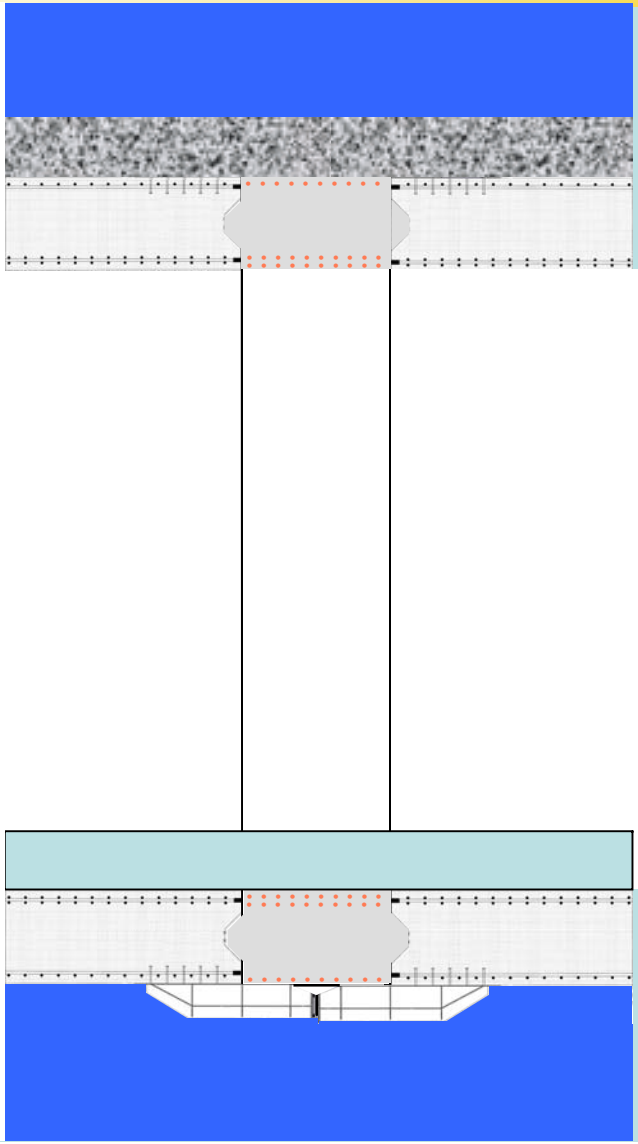
1. Element in place
2. TE pulled forward for initial sealing

Joining of Elements



1. Element in place
2. TE pulled forward for initial sealing
3. Void between Bulkheads emptied

Joining of Elements



1. Element in place
2. TE pulled forward for initial sealing
3. Void between Bulkheads emptied
4. Steel shell connected from inside
5. Bulkheads removed
6. Reinforcement installed
7. Concrete joint casted
8. Ballast Concrete casted
9. Stone protection placed