EU Strategy for the Adriatic and Ionian Region
EUSAIR

EUSALP
EU STRATEGY FOR THE ALPINE REGION
PRESIDENCY SLOVENIA 2024

EUSBSR
EU STRATEGY FOR THE BALTIC SEA REGION

DANUBE REGION strategy
Prosperity through Diversity

TEDEN SREDOZEMSKE OBALE IN MAKROREGIONALNIH STRATEGIJ
Izola, Slovenija
16. – 20. september 2024

MEDITERRANEAN COAST AND MACRO-REGIONAL STRATEGIES WEEK
Izola, Slovenia
16 – 20 September 2024

Consultation within TSG 3:
Construction Activities in the Sea and on the Seashore and Achieving good environmental status of the Sea

2021 2030 United Nations Decade of Ocean Science for Sustainable Development

CHALLENGES OF GEOTECHNICAL ENGINEERING OF COASTAL STRUCTURES

GEOTEHNIKA IN OBALNE KONSTRUKCIJE

Janko Logar
Univerza v Ljubljani, FGG

Lilian Battelino
OPI Inter

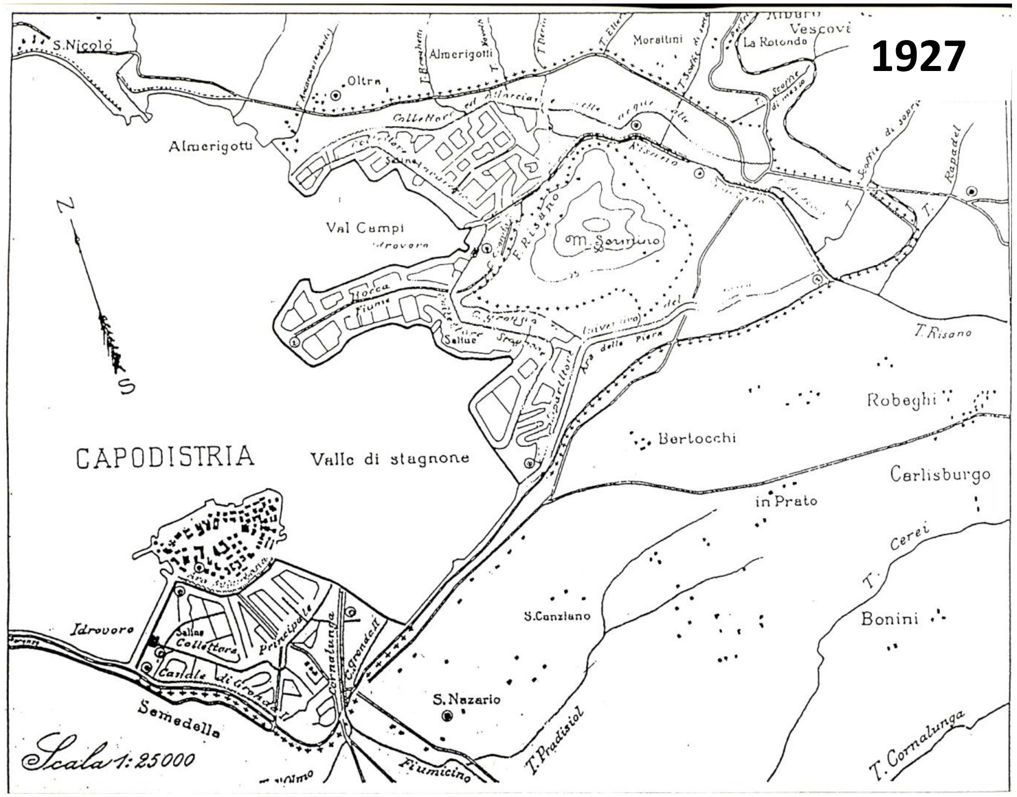
Izola, 19. 9. 2024


TVOJ
RADIO

Characteristics of the construction industry

- Construction is an industry of unique products in unrepeatable circumstances
  - Tradicionalist – slow and reluctant to adopt innovations
  - Priority: mechanical resistance and stability throughout the entire lifespan (> 50 years)
  - Construction is disruptive to the environment, but spatially and temporally limited
- Requirements of legislation, clients, stakeholders and consenting parties
  - Development of new materials (CO_2 footprint)
  - Development and transfer of new technologies
  - Loads, environmental requirements, climate change, etc.
- Short-term interests
  - Criterium of the lowest price, time constraints
  - Contractor´s profit

} **Influence on quality and environment?**

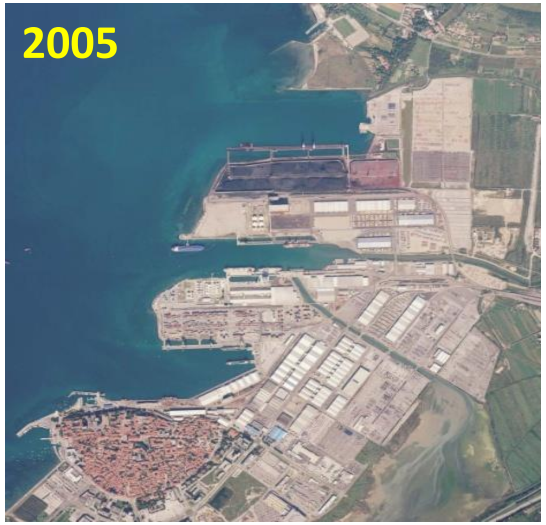

1927
S.Nicolò
Almerigotti
Oltra
Moratini
La Rotonda
Vescovi
Almerigottu
Val Campi
T. Risano
Robeghi
Bertocchi
CAPODISTRIA
Valle di stagnone
Carlisburgo
in Prato
S.Canziano
Bonini
Idrovoro
S. Nazario
Semedella
Scala 1:25000
T. Pradisiol
T. Cornalunga


2024
Pokopališče Školjk
Jadranska cesta
Spodnje Škofije
Luka Koper - Port truck parking P2 (Sermin)
Mestna plaža Koper
Luka Koper d.d.
Koper
Naravni rezervat Škocjanski zatok
Da Pontejev vodnjak
Avto Delux
Bertoki
Slovenska obala


1955

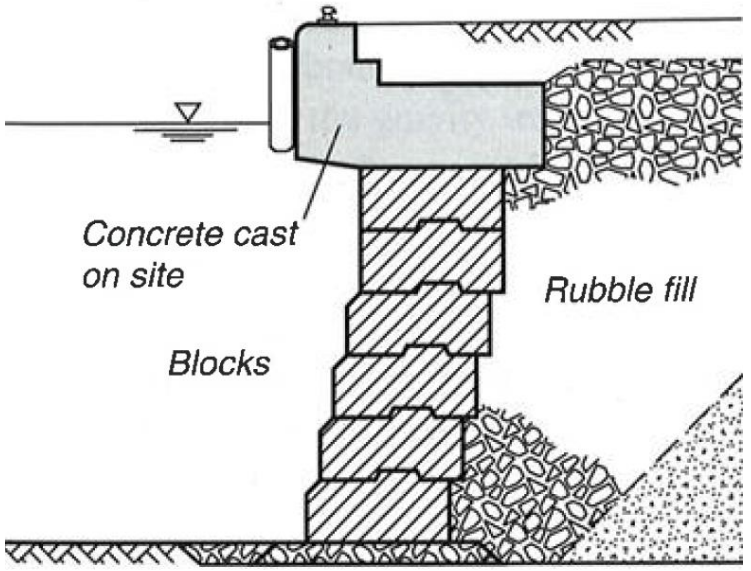

1974

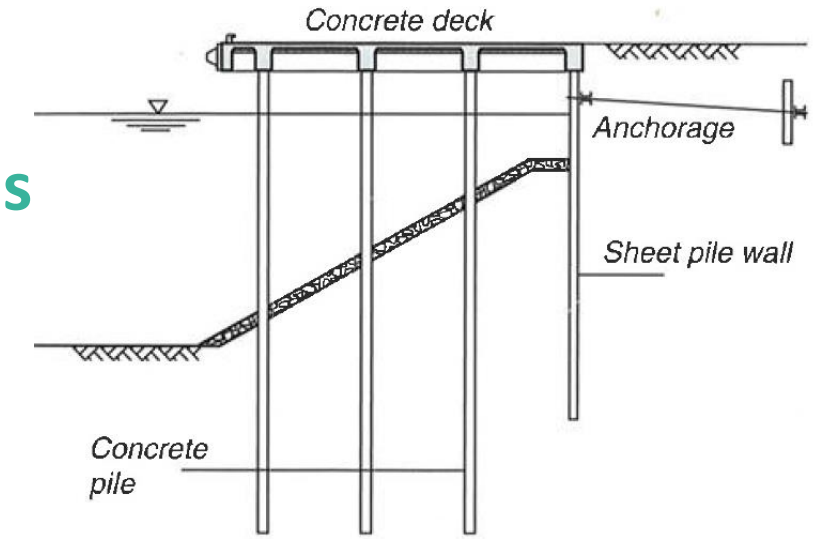

1995


2005

Geotechnical engineering

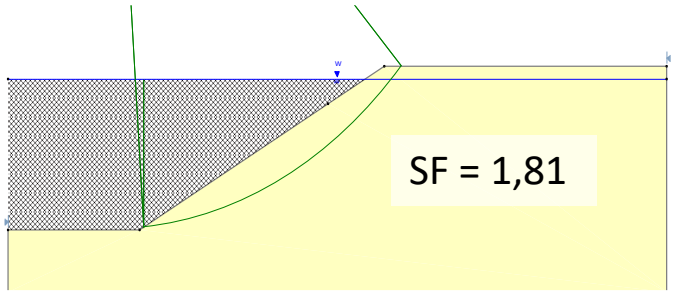
- Part of civil engineering, working with ground
  - Foundations
  - Earthworks (excavations, fills)
  - Ground improvement
  - Retaining/coastal structures
- Interaction between soil, water and structures
- **Ground properties are not known – investigations**
- **In ground engineering, TIME is important**

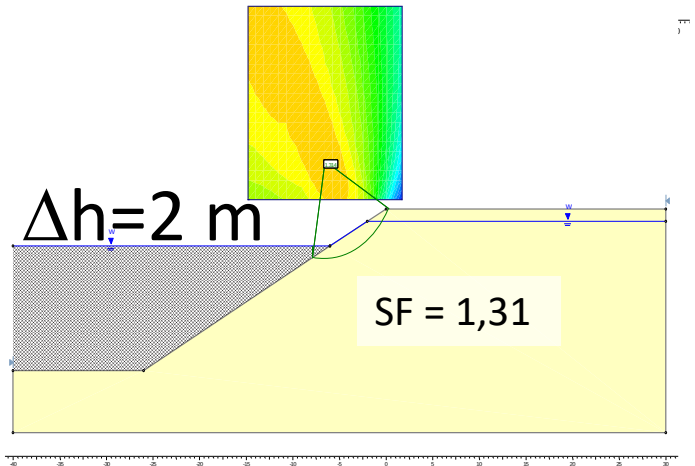




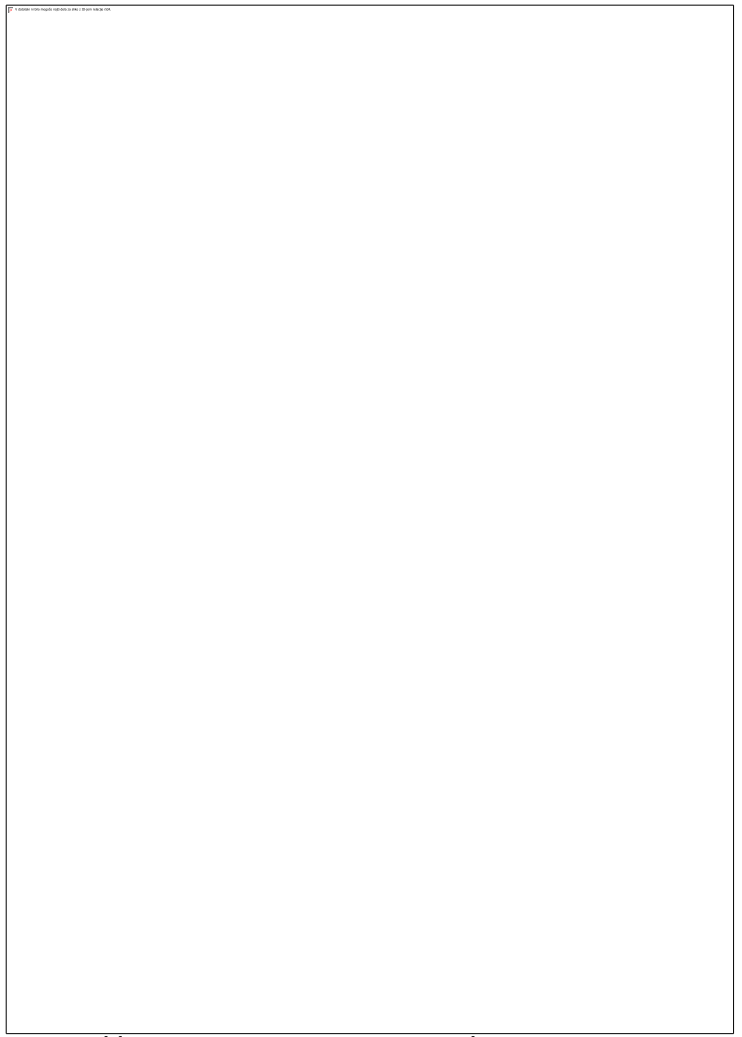
Some tasks of a geotechnical engineer

- Analysis of:
  - Bearing capacity of shallow and deep foundations
  - Ground settlements (magnitude and duration)
  - Ground stability (safety factor against sliding)
  - Earth pressures on retaining/coastal structures
  - Water flow through the ground
  - Influence of construction works on existing structures
- Design and selection of:
  - Construction technology
  - Details of execution of earthworks
  - Type of retaining/coastal structure
  - …



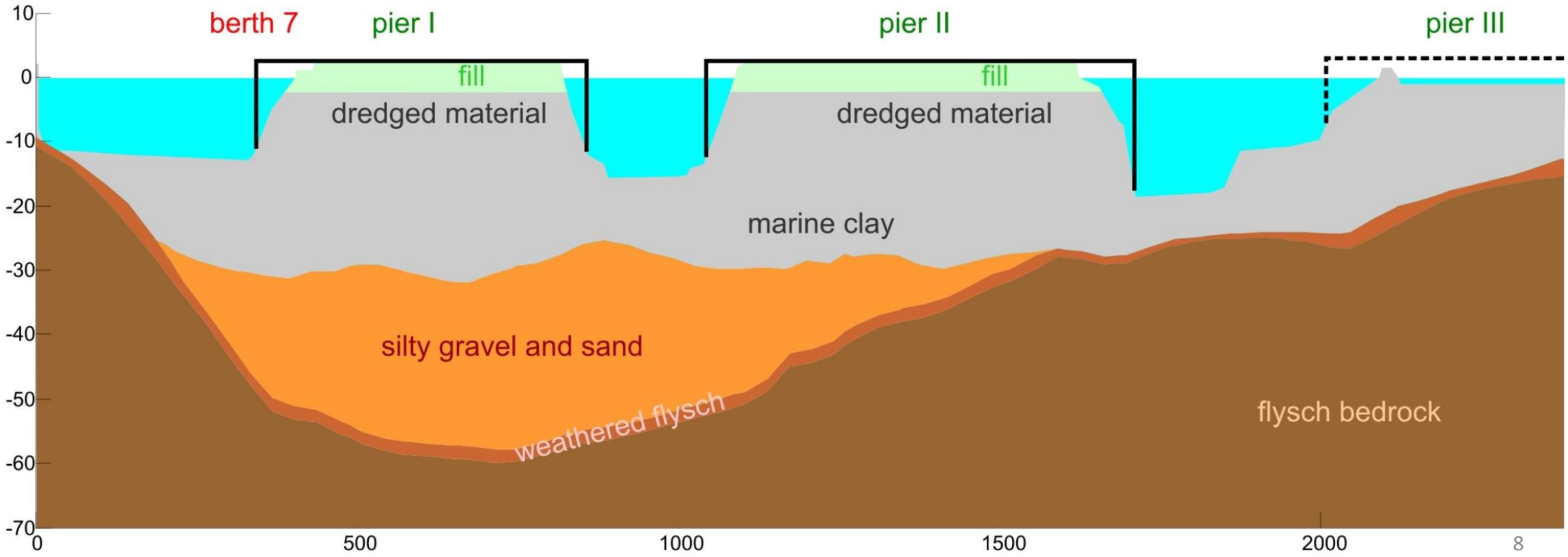


Nearshore ground investigations

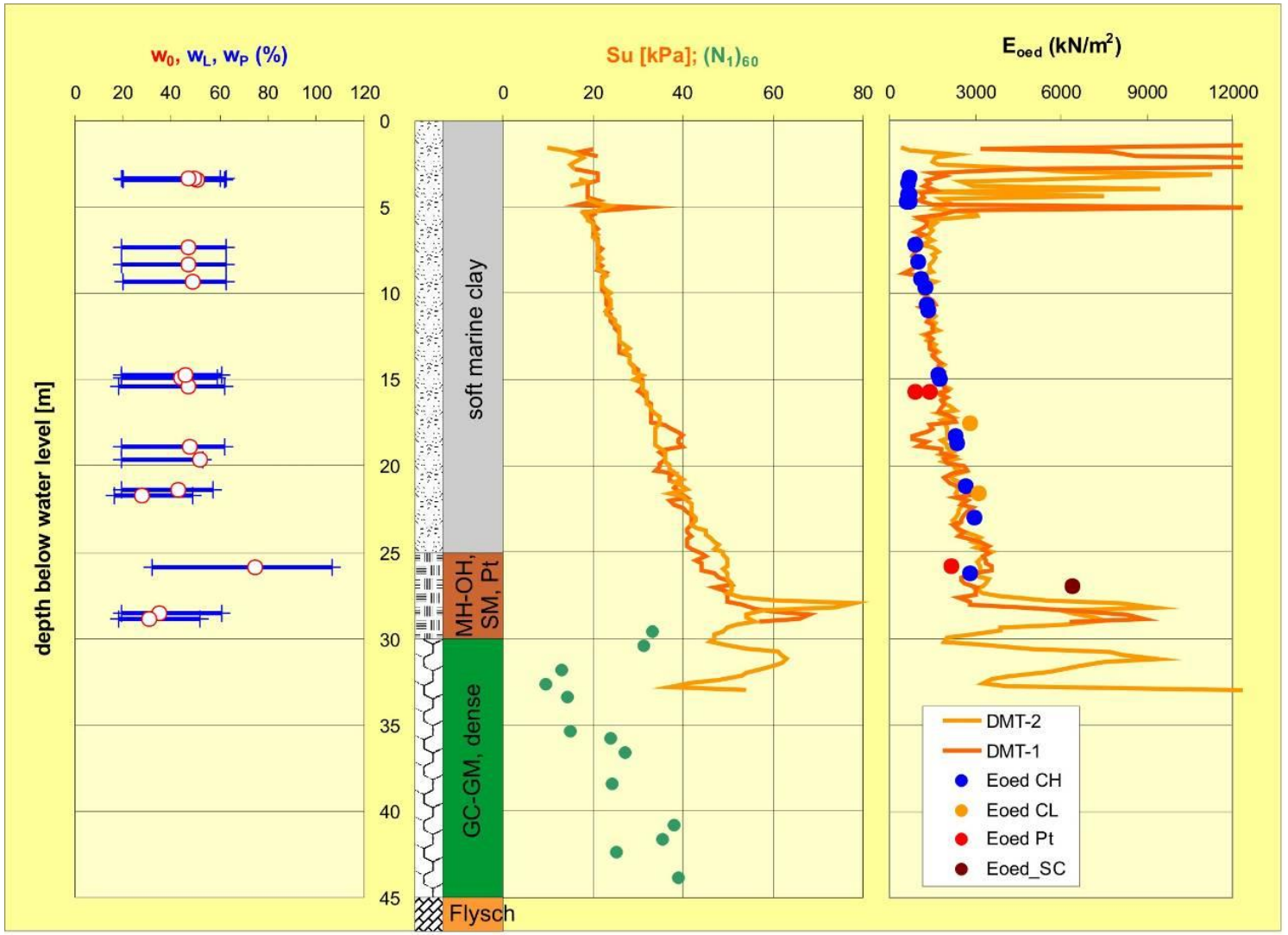


http://www.marchetti-dmt.it/

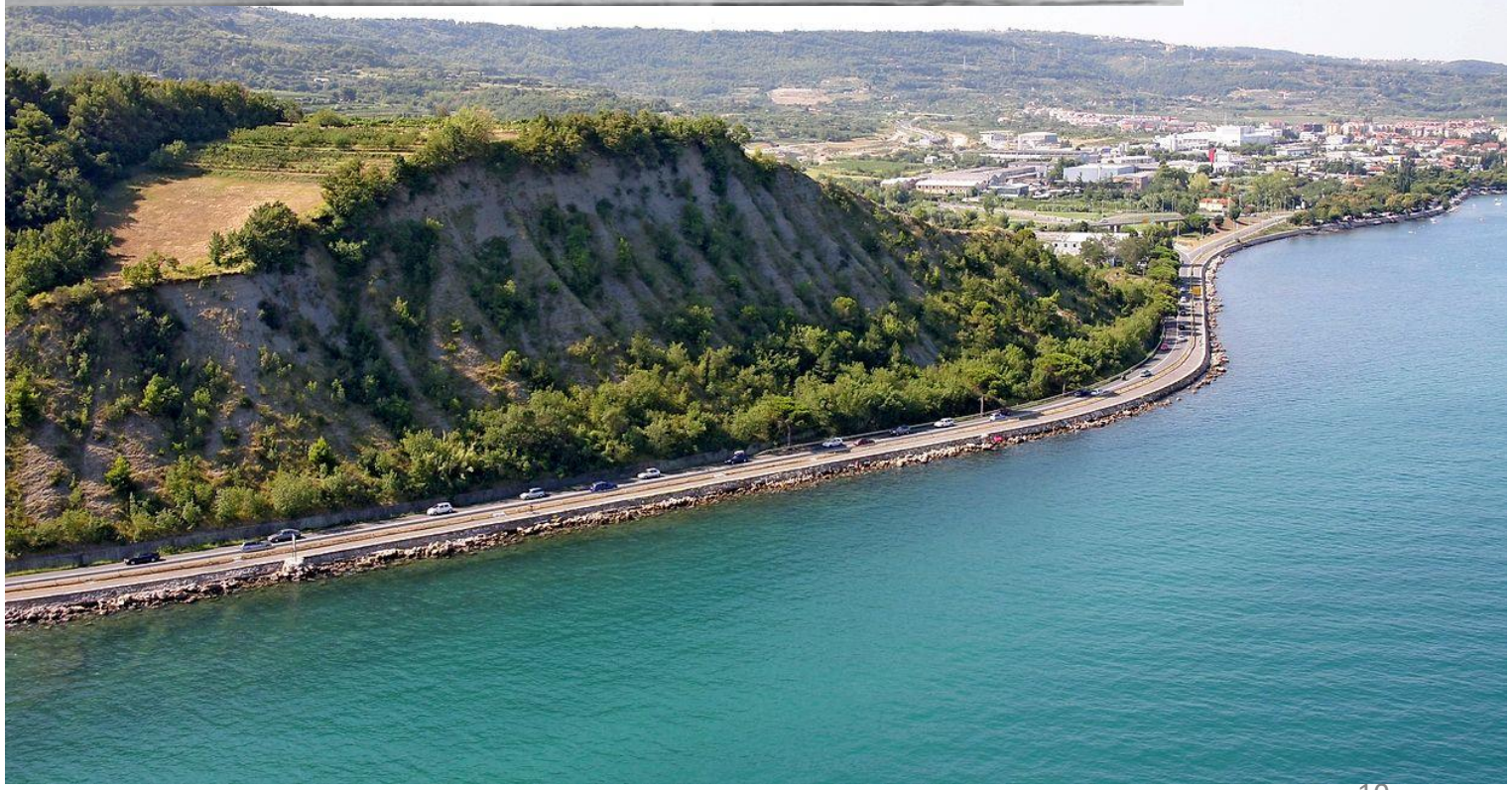
Ground profile of Koper bay



Soil properties



Challenges: land use planning, nature conservation, engineering



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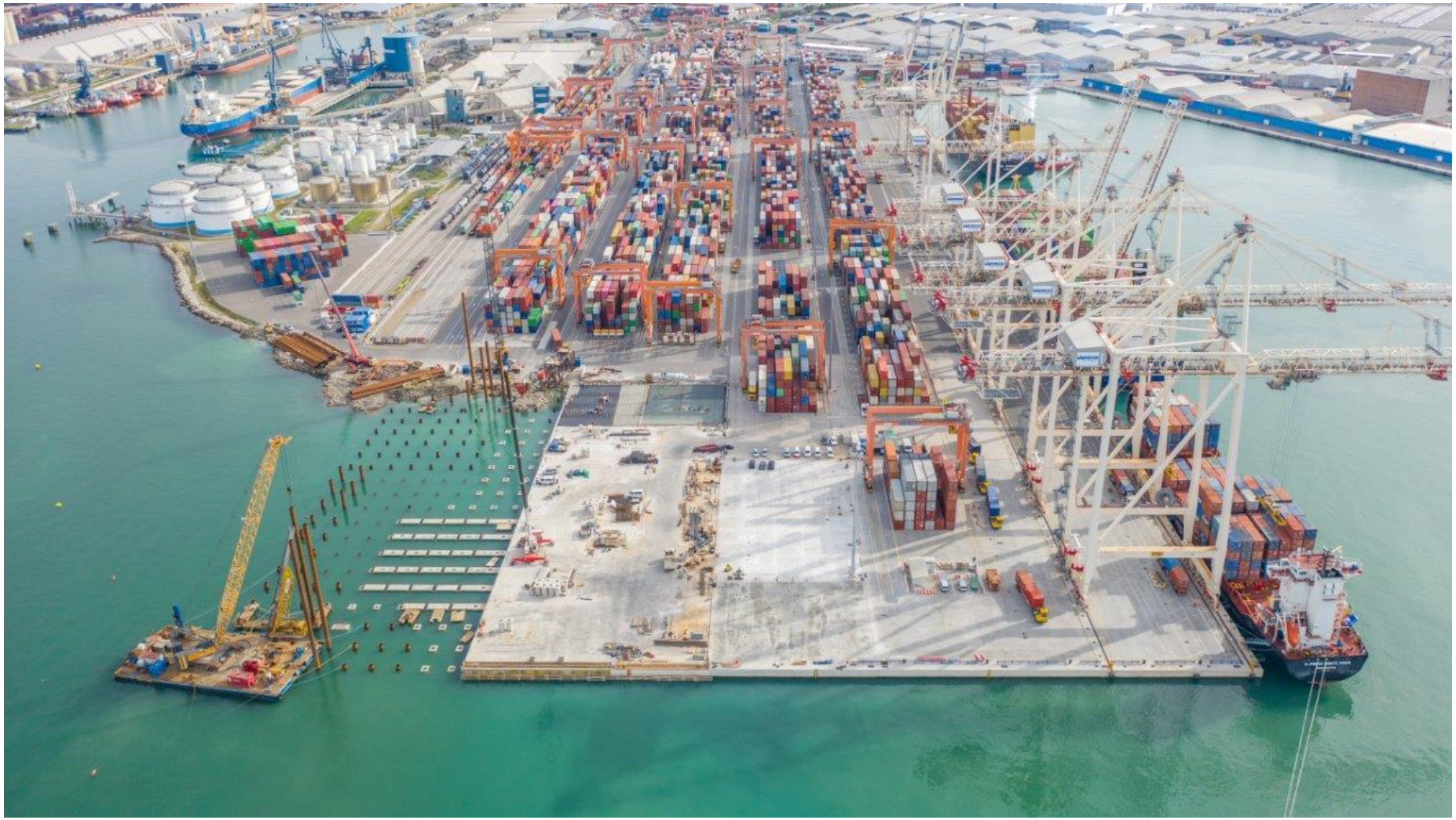

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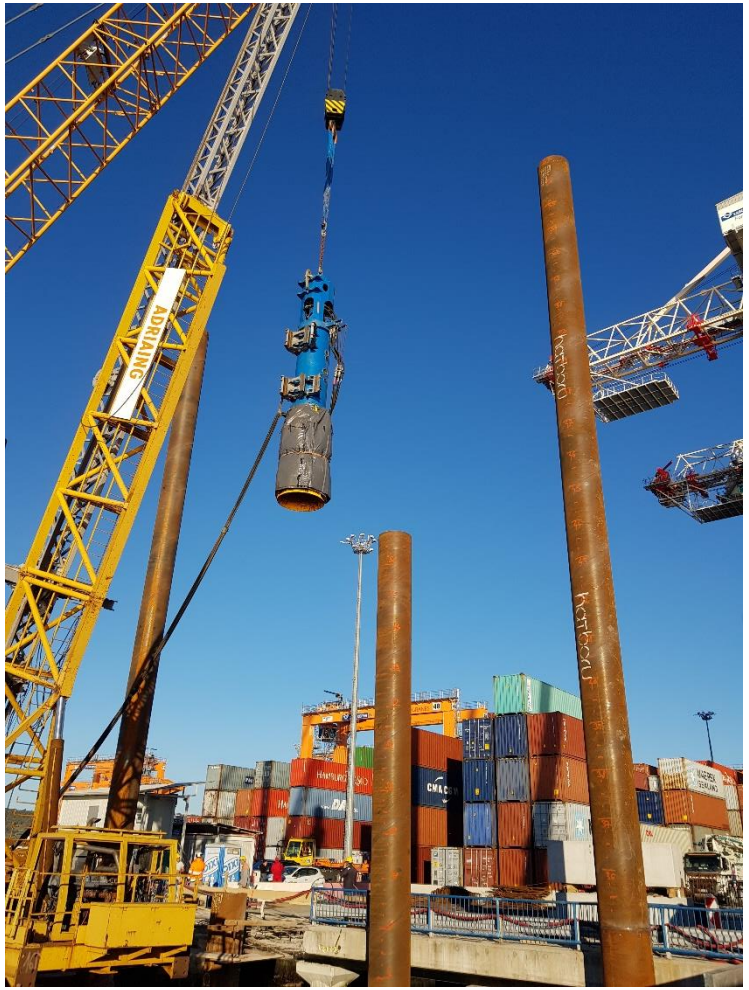
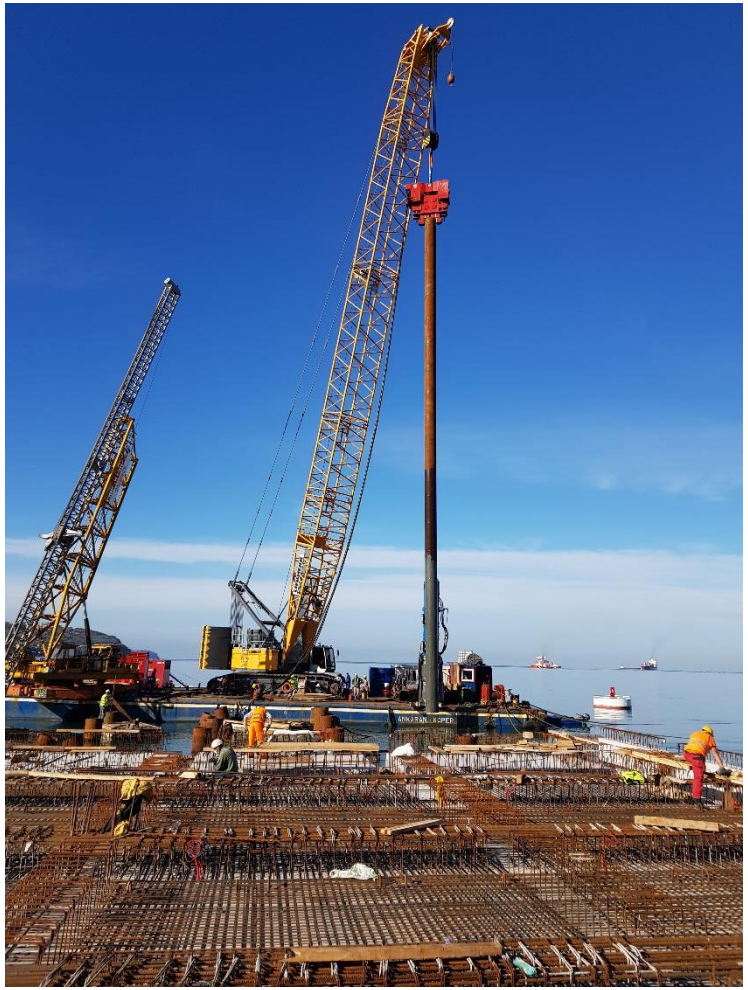




Challenges due to climatic changes, advances in technology and societal awarness

- Global trends in (extreme) sea water levels
- Precipitation regime
- Winds, sea waves

- Ship size, crane size, larger loads, powerful engines

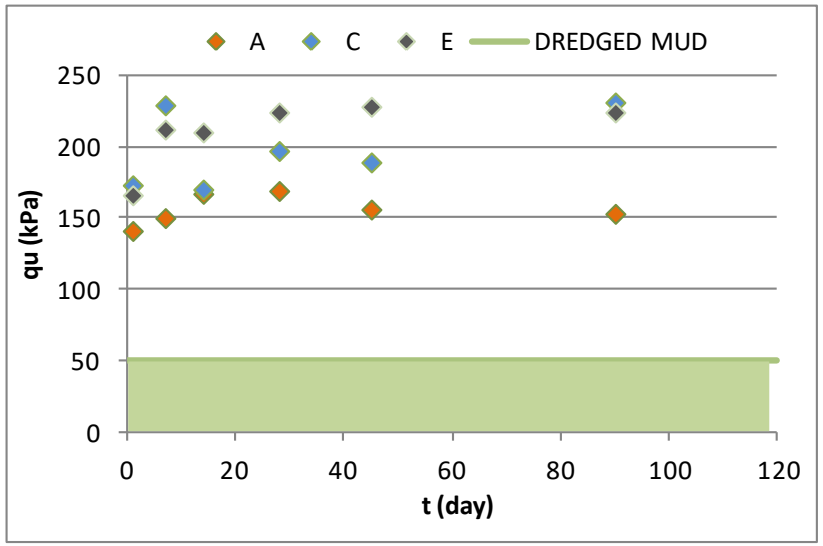
- Sustainable use of raw materials and energy
- Reduction of harmfull emissions (greenhouse gases, noise …)
- New design standards for engineering structures

Challenges concerning sustainable use of raw materials

Can we use dredged mud in geotechnical structures?

MIXTURES (A, C, E):

- dredged mud – w = 39 %
- additive: 3% lime & 5% to 7% of fly ash



LEACHING TEST

- mixture A after 55 days
- Exceeded quantities of: Selenium, Sulphates and Chlorides

Conclusions

- **(Geotechnical) engineers have knowledge, skills, technology … needed to meet societal expectations**
- **(Spatial, temporal, evironmental …) conditions must be well defined**
- **Communication between disciplines at early stages is always important**