


Erfaringer med soil mixing fra Skandinavien og Finland

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Introduction

Soil stabilization could be divided in to

-  Wet or dry method
 - In wet method the binder/s is pre mixed with water before mixing with soil
 - In dry method the binder is dry when mixing with soil
- In-situ or ex-situ
 - In-situ treatment means no excavation or dredging needs to be performed
 - Ex-situ pre handling with excavation or dredging and then treatment

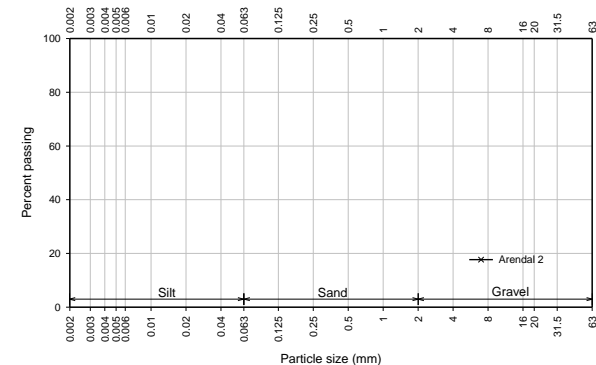
Some examples were stabilization/solidification of soil or sediment have been performed or considered

Arendal 2
Västerås
Köping
SCA
Kolkajen
Soil mix



How to start?

- Classifying soil and contaminants
- Identify possible remediation techniques
- If stabilisation/solidification is one solution
 - laboratory testing
 - Pilot testing
 - Evaluate
 - Full scale



Methodology

- Each project are unique regarding to soil and contaminants
- Different geology => different treatment techniques
- Different legalization in different country
- Different methodology/practice in each country
- No standard regarding laboratory or field methodology

We need a new standard for laboratory testing

- How should we mix?
- How should we cure?
- How should we test?
- What should we test?
- Etcetera

- to be solved in CEN 396, WG 7 and WG 8



Engineering weather

Pilot test Gävle



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Lesson learned from Gävle

- Low binder content leads to a high variability in results
- Using marginal material (bio fuel ash) need good planning and logistics
- Using bio fuel ash could imply lower strength due to low reactivity
- Monitoring is important both for quality aspects but also for better understanding of the mechanism that control the end result

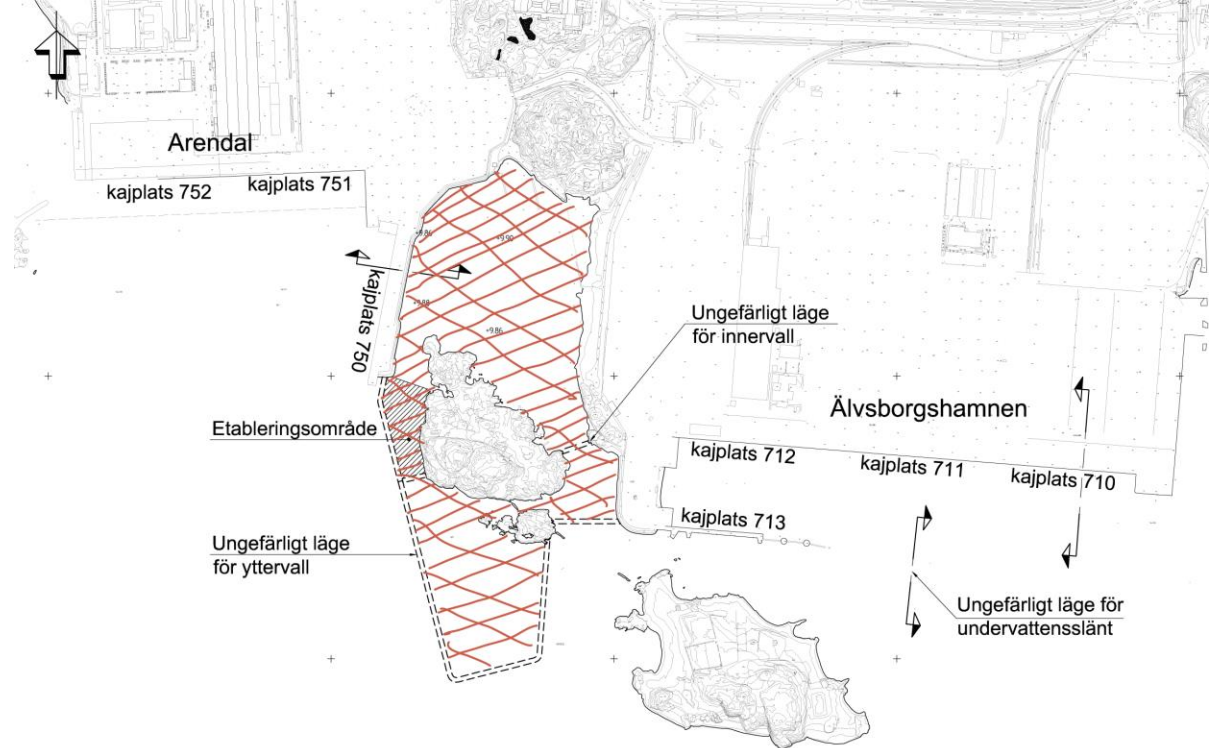
Arendal 2, Gothenburg harbor



Arendal 2, Gothenburg harbor



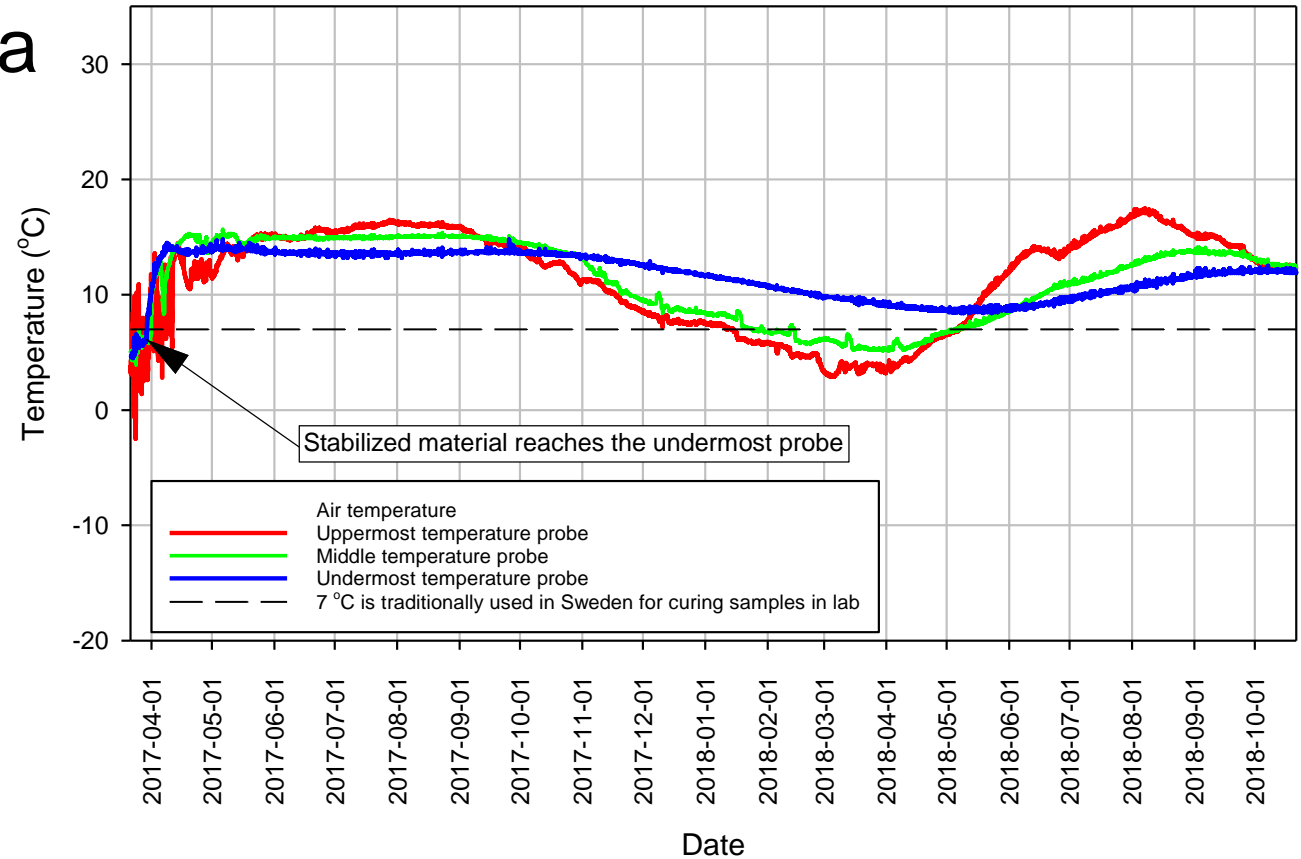
Arendal 2



Lesson learned from Arendal 2

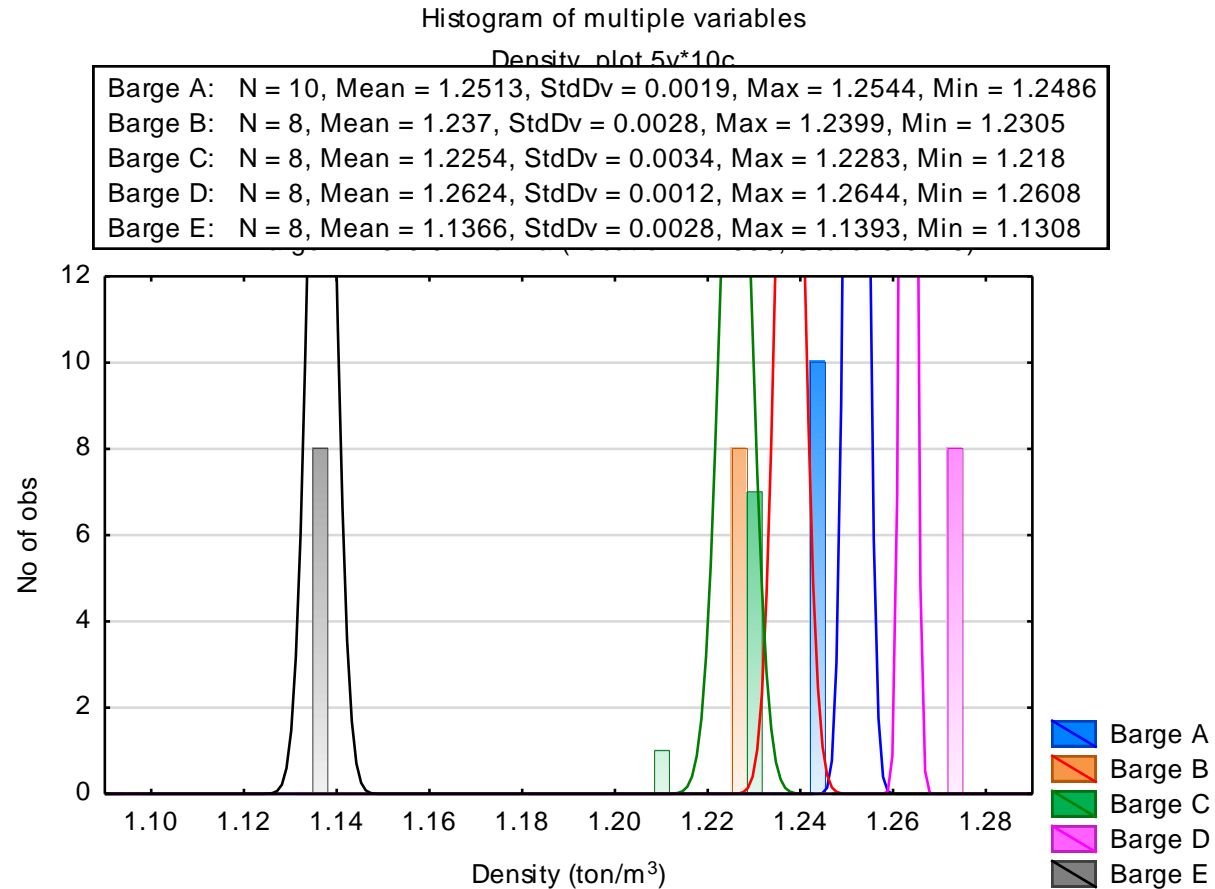
- Wet method in combination with pumping works very well
- High water content in the dredged material does lead to lower strength but not necessary below limit due to sedimentation
- Seismic testing works well with stabilised sediments
- Strength increase even after 90 days of curing
- Higher temperature in the stabilised material than expected

Temperature data

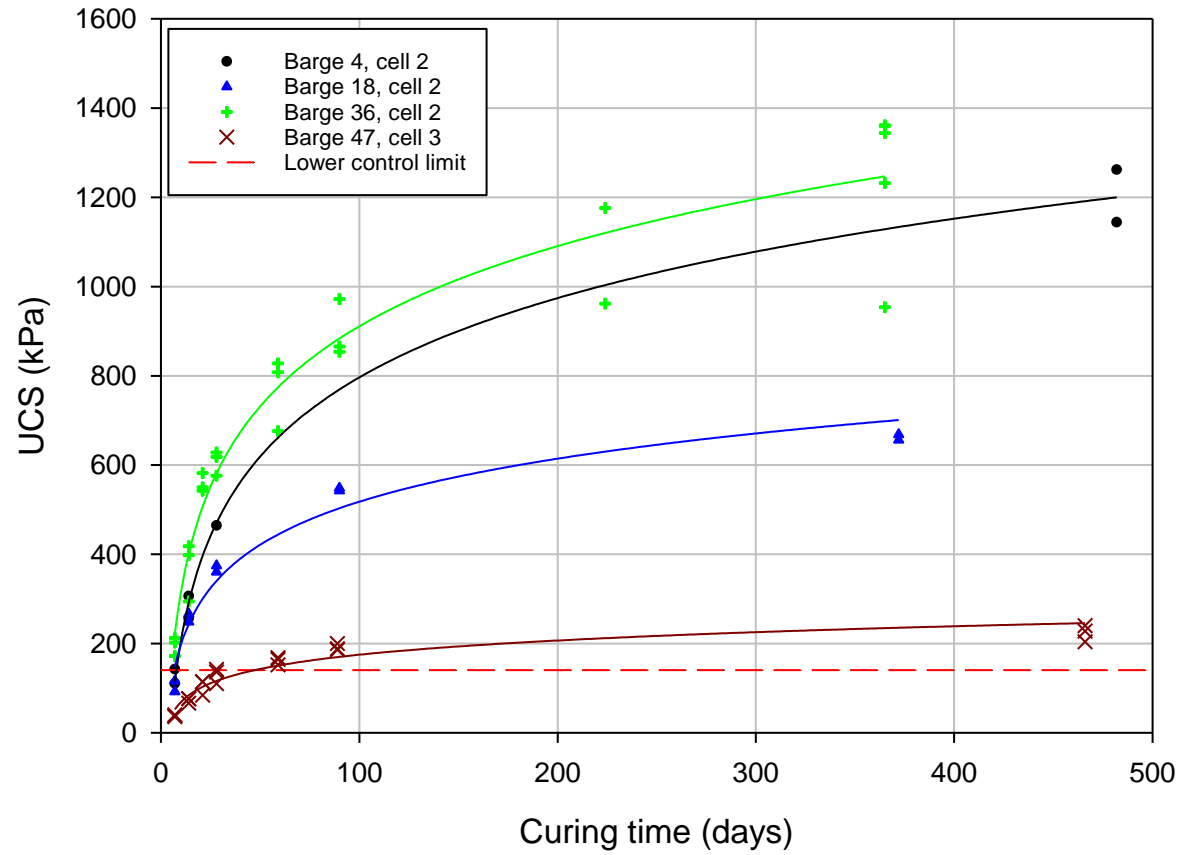


Density variation

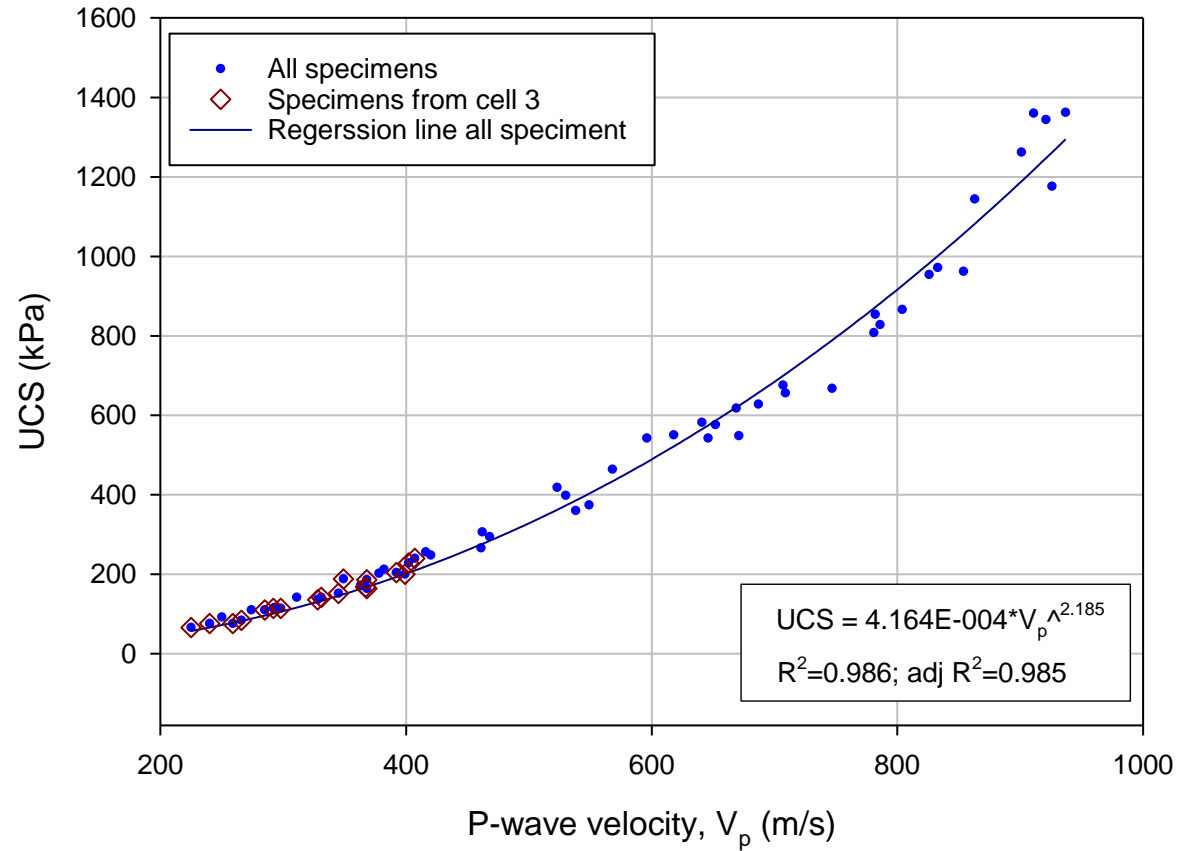
Possible explanation to



Strength variation



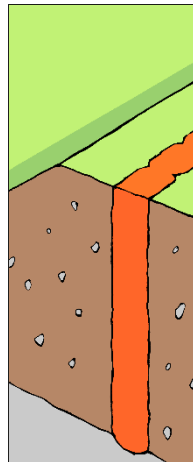
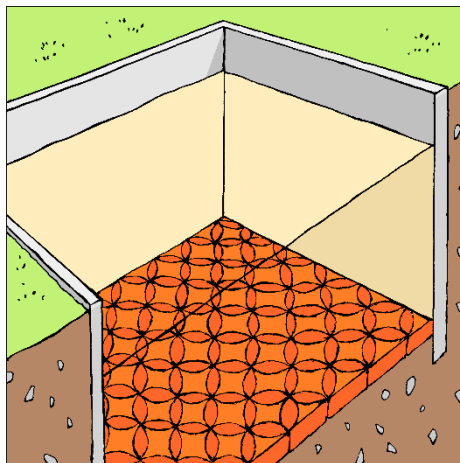
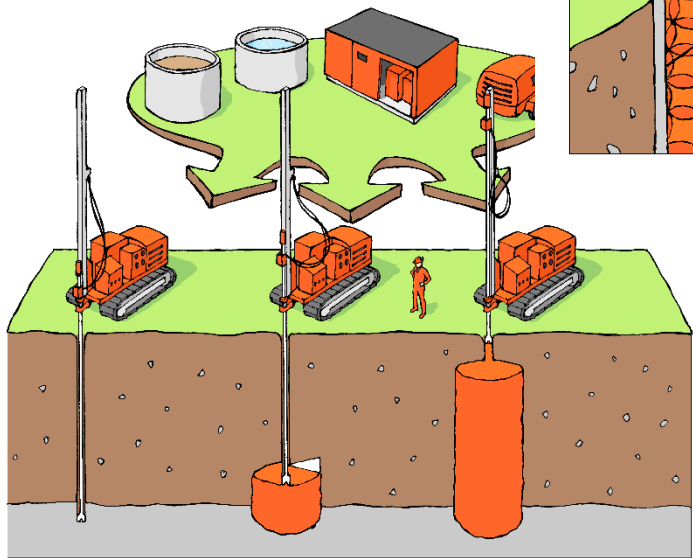
Seismic testing



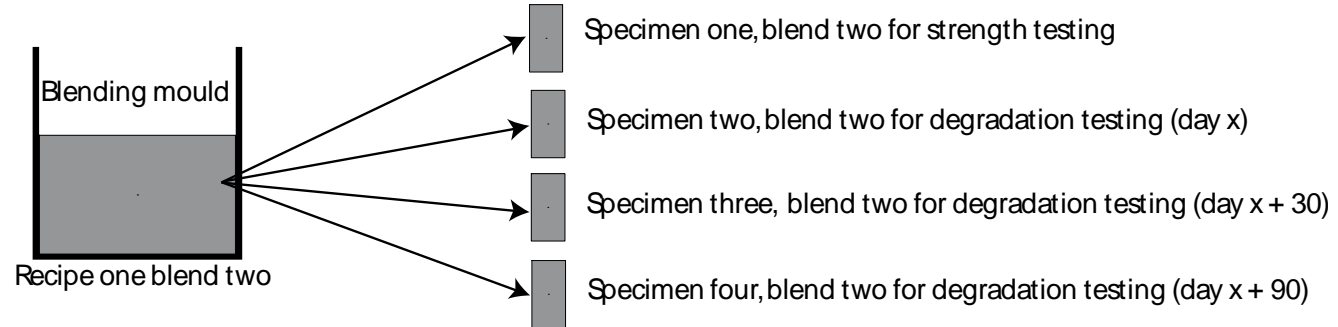
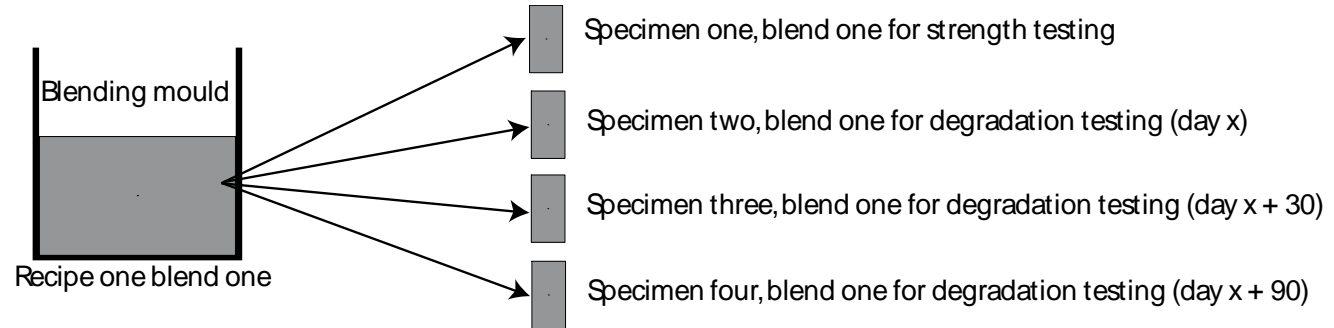
Different types of equipment for different purposes



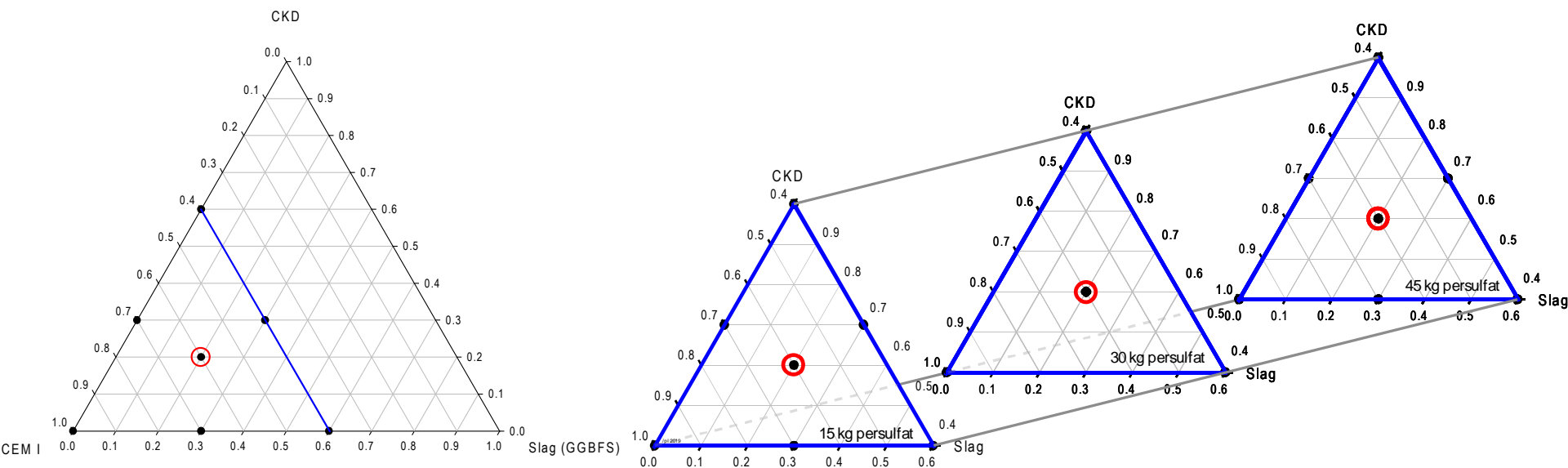
Jetgrouting



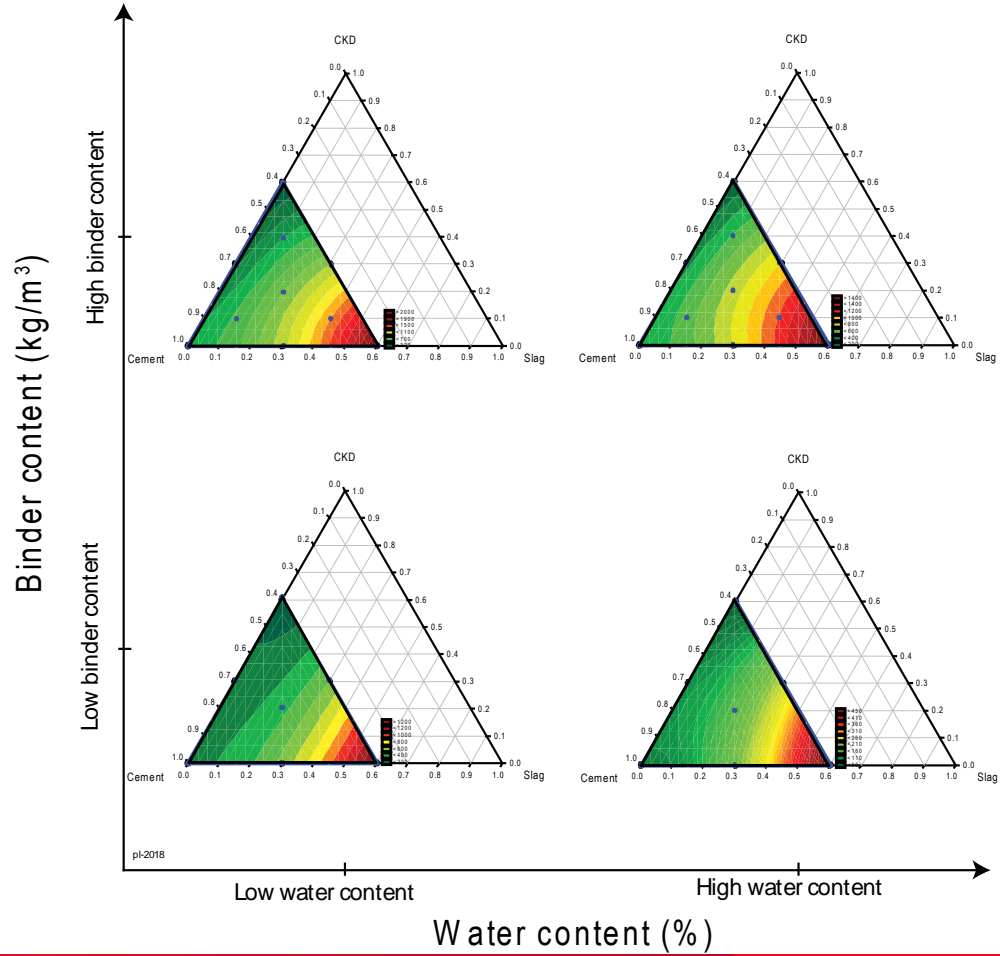
Proposal for coordinated laboratory methodology



Current work



Current work



Thank you for your attention

