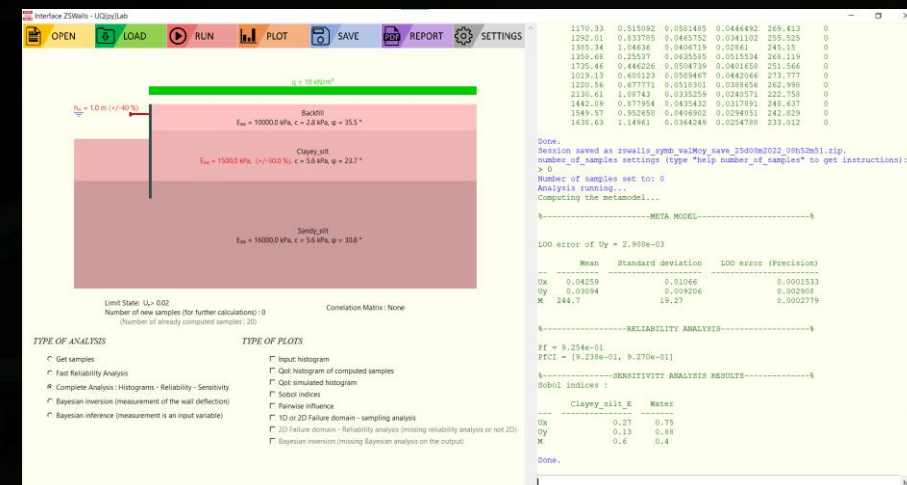
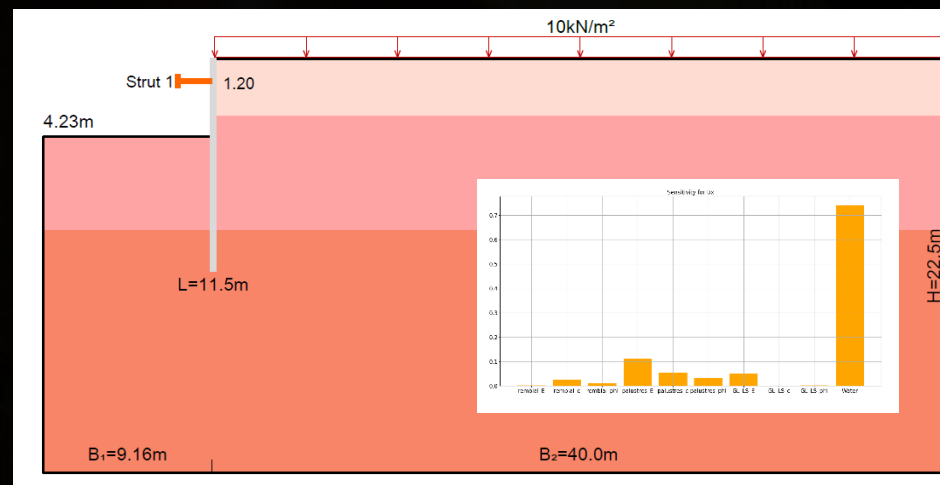


ZSWalls+R : Mastering uncertainties in deep excavations calculations

Marc Gros Lambert GeoMod SA

August 2022



Outline

- Zswalls + R : presentation
- Example of probabilistic analysis
 - presentation of the case
 - complete analysis
 - interpretation

The power of Bayes with ZSWalls + R

=> to be able to create UQ analysis for real-life projects

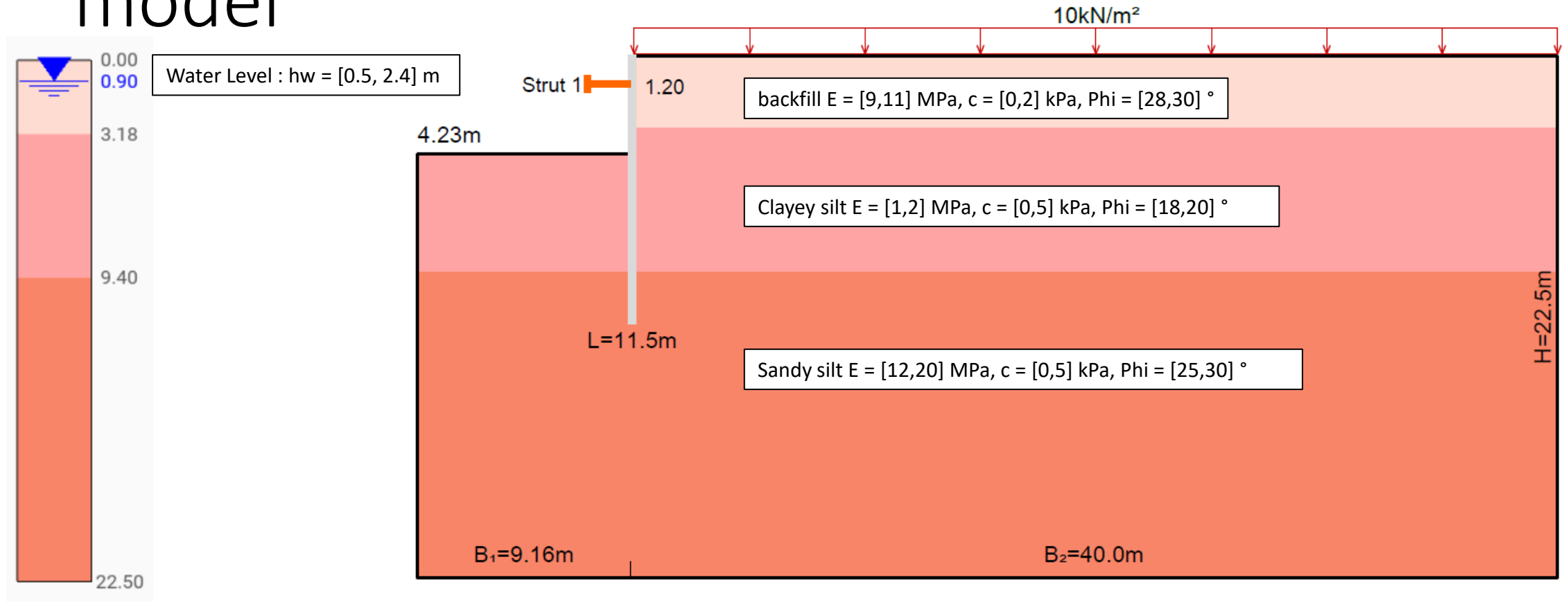
Workflow of the ZSWalls – UQLab interface :

- Import a ZSWalls file
- Assign probabilistic variables
- Get samples of the variable and compute the results with ZSWalls
- Build a PCE to surrogate ZSWalls calculations
- Do a UQ analysis : reliability, sensitivity, Bayes...

Quantities of Interest for excavations :

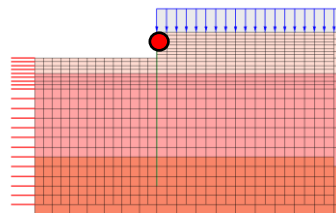
- U_x : maximal wall deflection
- U_y : maximal settlement behind the wall
- M : maximal bending moment

Study case : Bayesian analysis with a ZSWalls model



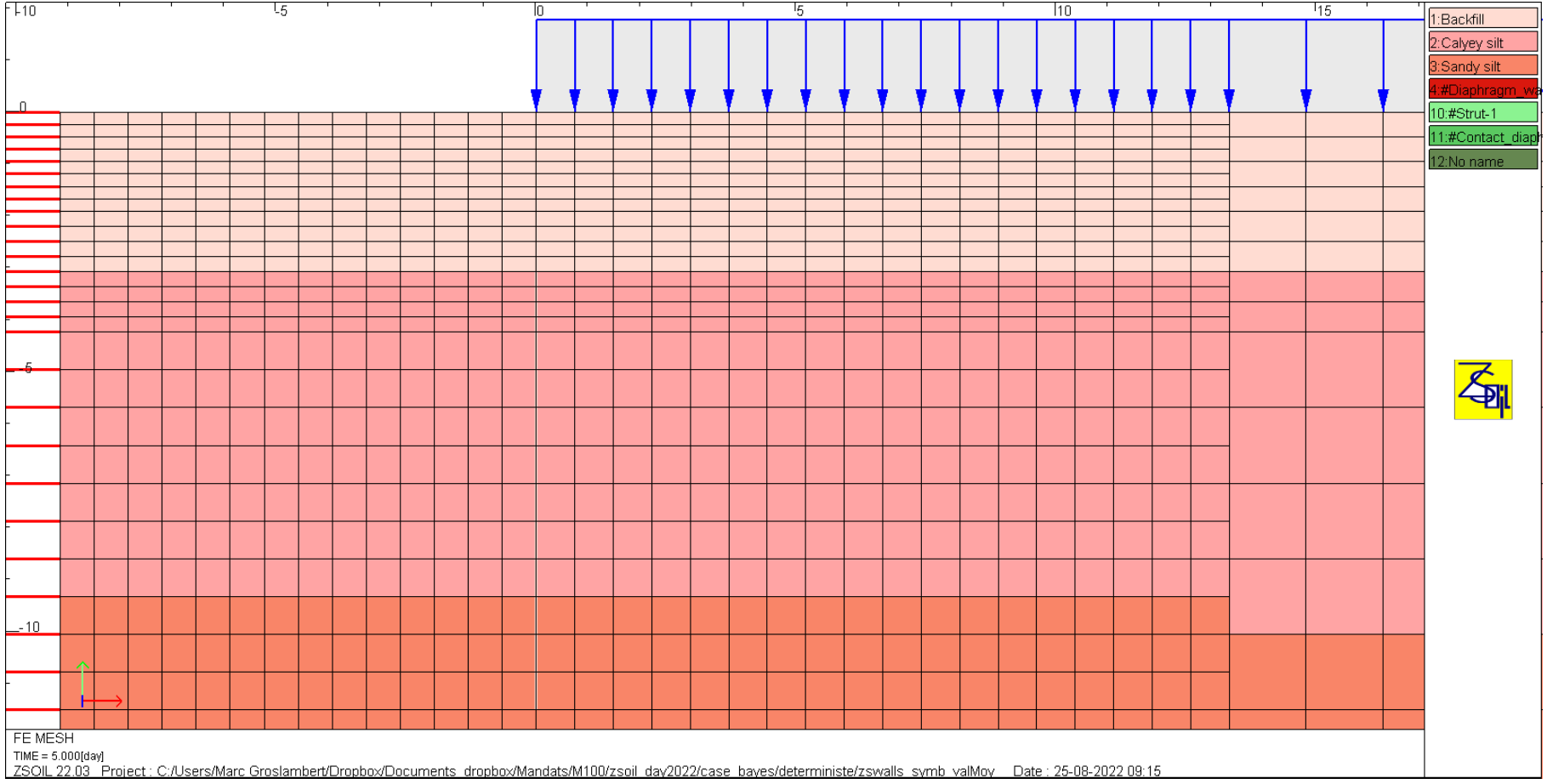
Field observation :

At a depth of 1m, after 1.9m excavated, before placing the strut, the horizontal displacement of the wall is 2.25cm

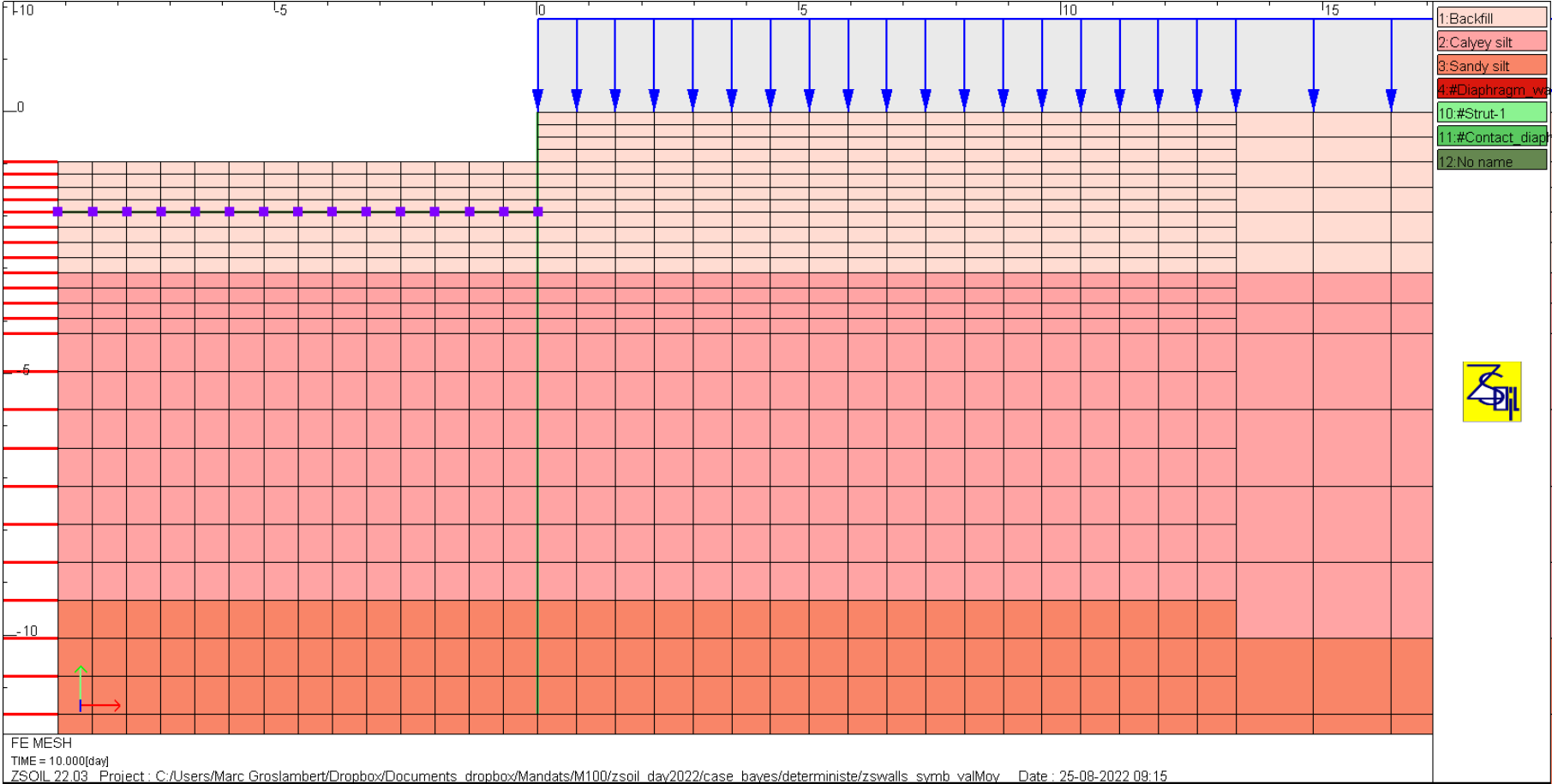


Time⁴ = 15

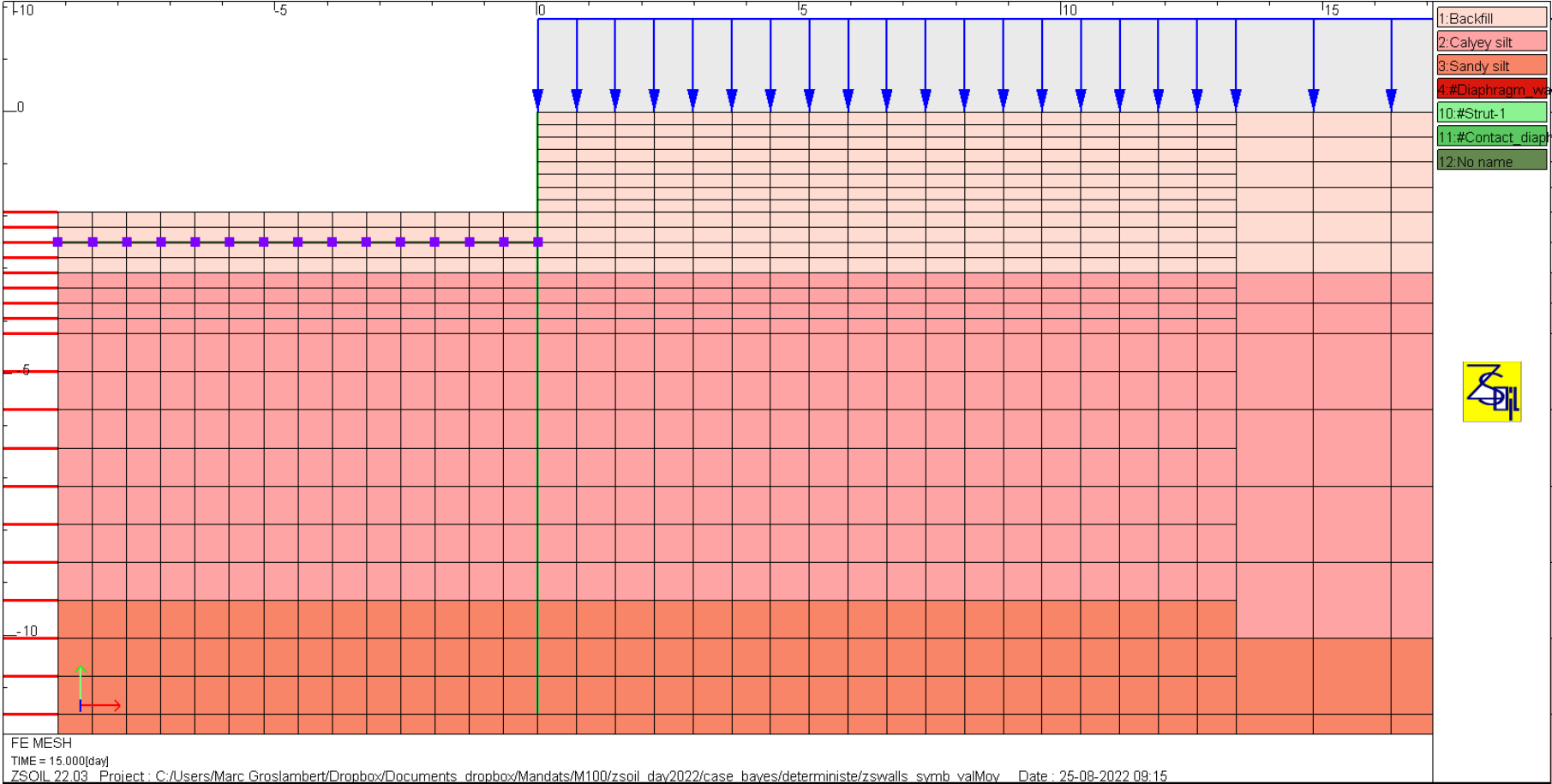
T=0



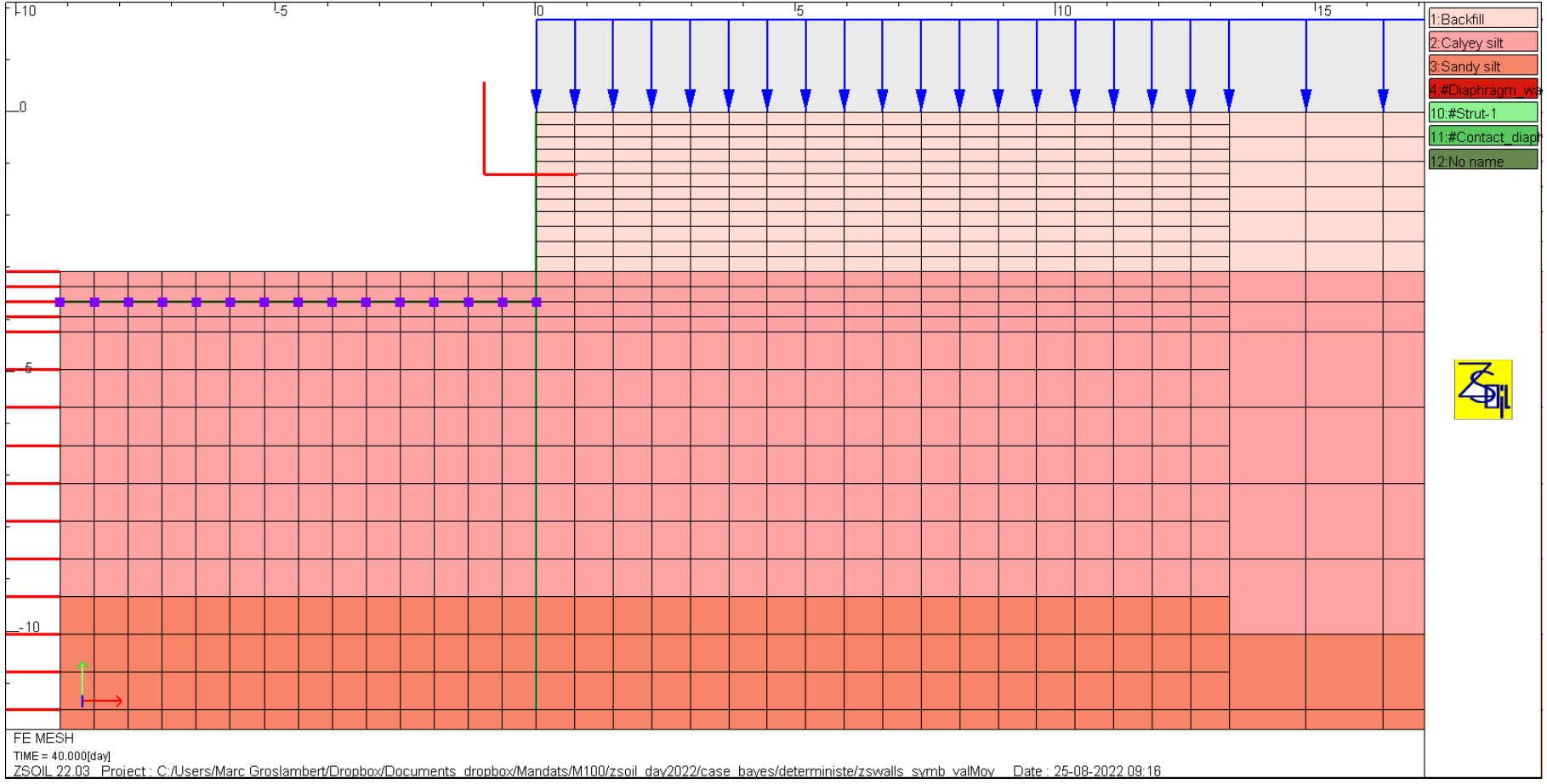
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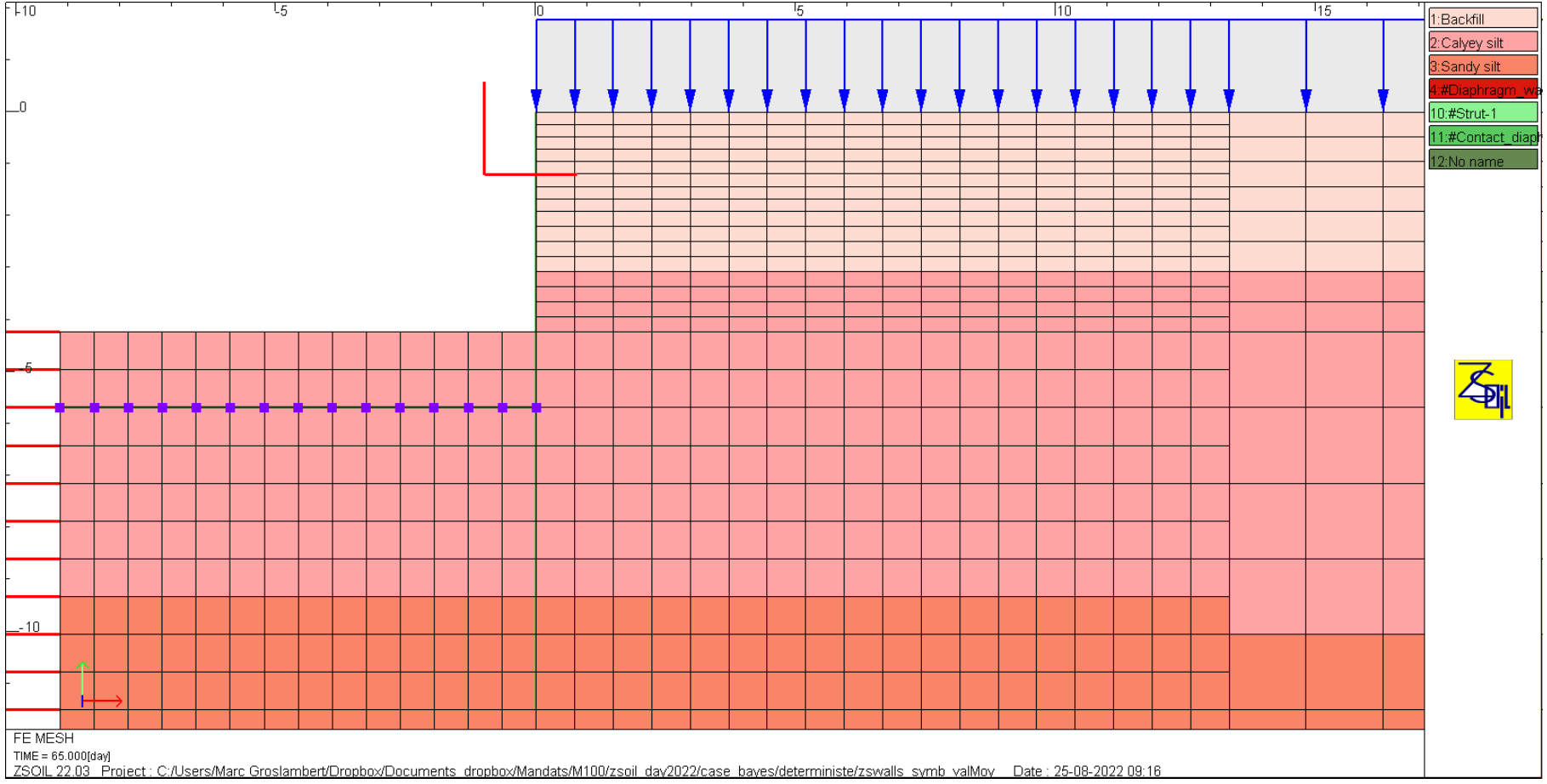
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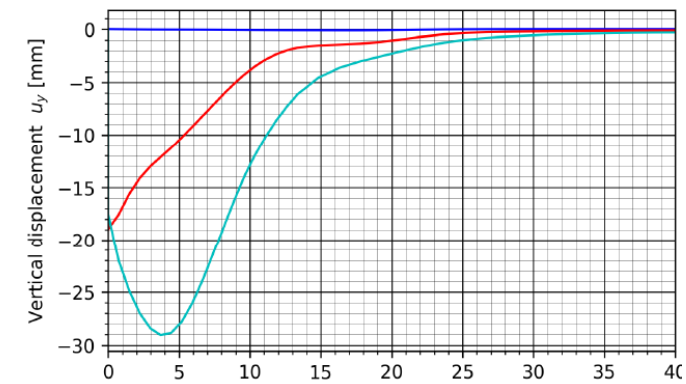
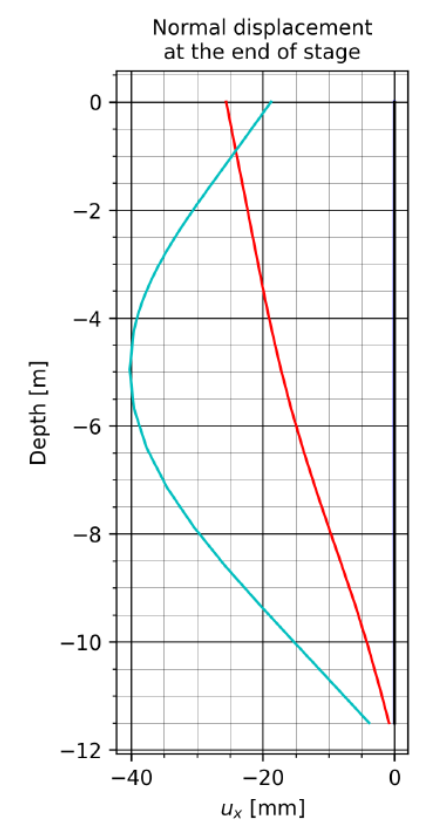
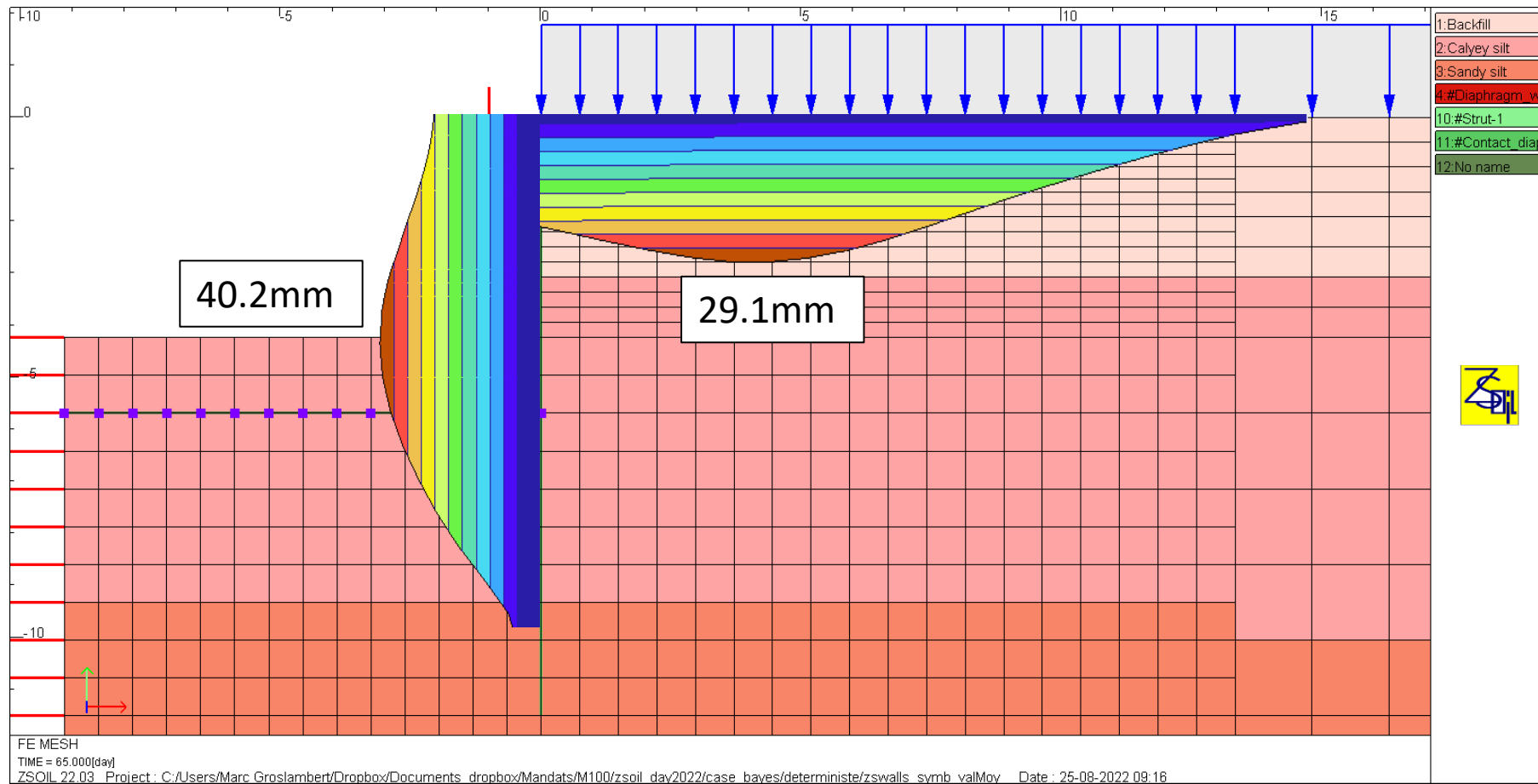
T=40



T=65



Focus on U_x , U_y



- **THANK YOU FOR YOUR ATTENTION...**

- **QUESTIONS?**

Acknowledgements

- Prof. Th. Zimmermann, Zace Ltd.
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- My colleagues @GeoMod