

Stability assessment of an abandoned underground chalk quarry

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Data collection Geomechanical properties Laboratory analyses Friction Poisson's Young's Tensile Cohesion Property Modulus Angle ratio Weight Strength MPa MN/m3 MPa deg. MPa footwall 0.39 0.065 35.37 Hardground 0.019 1 4 2 9 0.14 Phosphatic pillars geometry (2D map) 0.03 0.31 0.017 32.5 0.34 474

Building a preliminary numerical model





Conclusions and perspectives

- Multi-approach assessment for rock mass characterization and numerical modeling are instruments to understand the failure mechanism
- Parametric study allow better understanding the sensitivity of the rock mass properties and their influence on the rock mass behaviour
- Preliminary results are in agreement with the underground observations

Future work:

- Rock mass characterization/in situ and additional laboratory analysis
- Effect of water
- 3D numerical modeling: BEM
- Study the influence of old deep mining activities on underground cavities
- Understanding the failure mechanisms
- Develop risk management solutions

Avec le soutien du Fonds européen de développement régional