



Equipment Design

Consulting

Software

Rental

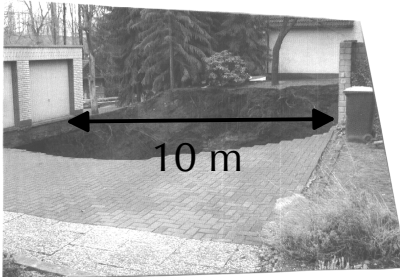
## Old Mine Safety

Abandoned mine sites are potential risk sites for subsurface subsidence phenomena. Especially, old mining shafts filled with any material available decades ago may lead to major destruction on buildings as areas are being recultivated within last years and settlement took place.

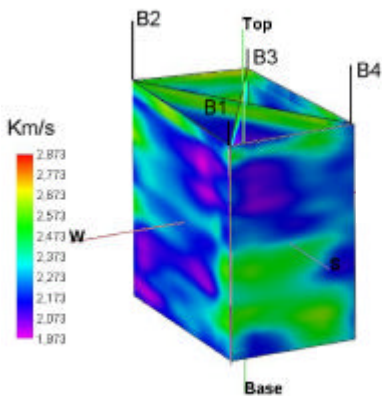
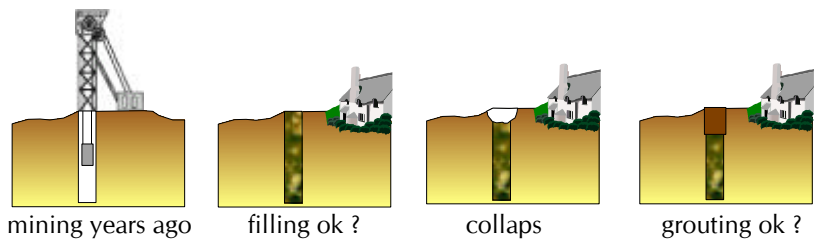


Abandoned Mine Site

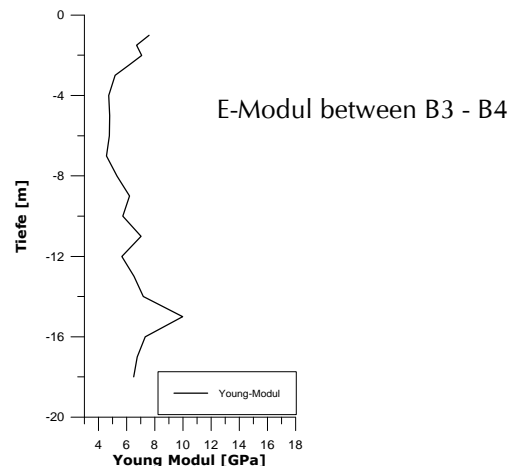
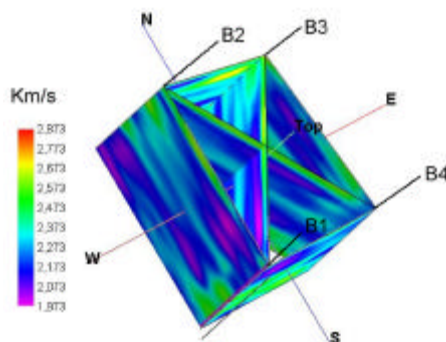
Collapsed Site in Germany



Although grouting and pumping concrete into collapsed sites or potentially risk sites are reasonable carried out nowadays quality control of grouting is needed to ensure maximum long term safety.



High resolution P-wave tomography together with standard crosshole testing for vertical S-wave profiles can meet safety demands for quality control. Using tomography detailed images after grouting activities can be obtained showing the cementation success. Based on standard crosshole testing shear stiffness parameters can be calculated.



Seismic tomography on top of a grouted shaft (green - successful, purple - less successful grouting)