

## **THE INFLUENCE OF SWELLING CLAY MINERALS ON THE BEARING CAPACITY OF SOIL**

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The municipality of Pulkau, a small town with only 1600 inhabitants, is situated in the north of Lower Austria, near the border to the Czech Republic. People tend to move to larger cities, mostly Vienna. An important contribution against migration to cities is the creation of jobs and the provision of land for building plots. Major problems to find appropriate building plots are the clay-rich subsoil in this area, as well as floods caused by the river Pulkau.

The investigation area, the so-called Pulkautal, is located in the north-eastern part of the molasse and is underlaid by the Crystalline of the Bohemian Massif. The molasse consists of clay schists and conglomerates, further marine sediments of the Pielacher Tegel, Melker Sands, clay schists, marly clay of the Zogelsdorf Formation and the Zellerndorfer Schlier. Zellerndorfer Schlier in particular is very problematical for building construction, because high amounts of the fine fraction of the Zellerndorfer Schlier consist of smectite. Since decades the Zellerndorfer Schlier is responsible for settlement, landslides and causes severe damages on buildings.

By means of bulk and clay mineral analysis with X-Ray Diffraction (XRD), Simultaneous Thermal Analysis (STA), Fourier Transform Infrared Spectroscopy (FTIR) and grain size analysis the clay minerals and the amount of swelling clay minerals in the soils were characterized. Further important parameters and analyses are the actual water content, Atterberg limits and shearing test.

The content of swelling clay minerals is an important matter in terms of construction stability. Plots with a high content of smectite are not suitable as building plots. Expensive construction measures are necessary to provide stability. Results of investigations provide information, which sites are suitable for building and which are not.