

CLAY MINERALS AND THEIR INFLUENCE ON MASS MOVEMENTS

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Mass movements are a threat to buildings and the people who live in them. Therefore it is important to know what contributes to the development of landslides, etc. An important factor is the presence of expandable clay minerals contained in sedimentary rocks which influence the mechanical behaviour of rocks very strongly due to their small grain size and other specific properties.

In Austria, flysch sediments reach from Vienna in the East to Vorarlberg in the West. They consist of very stable sandstones on the one hand and soft, unstable clay marls on the other hand. These marls have been known responsible for mass movements in this geological zone for a long time.

This project deals with the classification of mass movements and clay minerals. Their properties are explained and special attention is paid on how clay minerals contribute to the formation of gliding layers.

This knowledge has been applied on two locations in Upper and Lower Austria, Windischgarsten and Gresten, where slope instabilities caused damage on buildings. Since this is also an economic issue, counteractions must be taken.

From both sites, samples have been taken from drill cores, testing pits, and dynamic probes in order to determine the bulk and clay mineralogy. High amounts of mixed layer minerals and illite were found. There is a correlation between the occurrence of those minerals and the gliding tendency of observed slopes.

Keywords: Mass movements, Clay minerals, Mixed layer.