

## **Franz Tschuchnigg**

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### **Abstract:**

In practical geotechnical engineering factors of safety for a geotechnical structure are still determined by means of simple limit equilibrium analysis in most cases. However, because finite element analyses are routinely applied for assessing displacements and stresses for working load conditions, a tendency can be observed towards application of finite element techniques for calculating ultimate limit states and consequently factors of safety. This is usually done by the so-called strength reduction technique and concerns about the validity of this approach have been raised, in particular when dealing with non-associated plasticity. Comparison with limit equilibrium analyses have been presented in the literature mostly for slope stability analysis and generally good agreement has been observed. The influence of dilatancy was considered to be minor in these cases. In the presentation comparisons of a strength reduction technique and rigorous finite element limit analysis are shown for associated plasticity and possibilities of overcoming numerical instabilities for non-associated flow are discussed.

### **About the Speaker:**

Franz studied civil engineering in Graz and works since 2006 in the Computational Geotechnics Group of Graz University of Technology. He is expert in 3D finite element modelling and his main research topic during his PhD was related to numerical analysis of deep foundations focusing on the improvement of the embedded pile formulation in Plaxis 3D Foundation and pile soil interactions. Since 2007 he is also involved in consulting and carried out numerical analysis for a couple of high rise buildings in Europe. After finishing his PhD he continued to work in the Computational Geotechnics Group and currently he is working on his habilitation.