

## **A review of basic soil constitutive models for geotechnical application**

### **ABSTRACT**

Solutions in soil constitutive modeling have been based upon Hooke's law of linear elasticity for describing soil behaviour under working loading condition and Coulomb's law of perfect plasticity for describing soil behaviour under collapse state because of its simplicity in applications. The combination and generalization of Hooke and Coulomb's law is formulated in a plasticity framework and is known as Mohr-Coulomb model. However, it is well known that soils are not linearly elastic and perfectly plastic for the entire range of loading. In fact, actual behaviour of soils is very complicated and it shows a great variety of behaviour when subjected to different conditions. Various constitutive models have been proposed by several researchers to describe various aspects of soil behaviour in details and also to apply such models in finite element modelling for geotechnical engineering applications. Recent published evolution of models used for soft soils and tunnels for the past 30 years was also presented. It must be emphasized here that no soil constitutive model available that can completely describe the complex behaviour of real soils under all conditions. This paper attempts to collaborate the efforts from various researchers and present the discussion on each models with advantages and limitations for the purpose of giving an overview comparison of various soil models for engineering applications.

**Keyword:** Soil constitutive models; Finite element; Elastic; Plastic