

## LIQUEFACTION EVALUATION OF SAND-LIKE SOILS AT SEMANI SITE, IN ALBANIA

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### Abstract

This paper presents the liquefaction potential evaluation of sand-like soils at Semani site, in Albania using the Cone Penetration Test (CPT). A subsurface investigation that includes 12 CPT soundings up to 25m is performed in the site. The analysis of the factors that govern the liquefaction indicates that the soils in the site are susceptible to liquefaction. The method of Idriss and Boulanger 2008 is used to calculate the factor of safety against the triggering of liquefaction. The input data for the CPT-based method include: con tip resistance and sleeve friction, moment magnitude of the earthquake, maximum surface acceleration during earthquake, depth to ground water table, and the unit weights of the soils. The Cyclic Stress Ratio is estimated via the Seed-Idriss simplified procedure using the calculated stress reduction coefficient based on the relation proposed by Idriss, 1999 as a function of highest earthquake magnitude recorded to date  $M_s = 6.2$ . According to Shkodrani et al. 2010, the soil conditions at Semani site are classified as Category III according to Albanian Earthquake-Resistant Design Regulation KTP-N.2-89. The Peak Ground Acceleration for soil category III at Semani site according to maximum expected intensity is 0.26g. The Cyclic Resistance Ratio is calculated as a function of the equivalent clean-sand CPT penetration resistance that is used to account for the effects of nonplastic fines content on the liquefaction resistance. A cutoff line of  $I_c$  (the soil behaviour type index, as defined by Robertson and Wride 1998) equal to 2.6 is used to identify the liquefiable soils in the site. The results of the calculations and some of the conclusions are shown in the last section of the paper.

**Keywords:** *Liquefaction, cone penetration test, sand-like soil, Cyclic Stress Ratio, Cyclic Resistance Ratio*