



## **Comparison of Liquefaction Potential Index Values Obtained from Using SPT and CPT Data, A Case Study Tepebasi-Eskisehir**

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Turkey is inside an area which is very active regarding earthquakes, it is merely related to Turkey's geological and tectonic location on Earth. Therefore, it is very important for studies to be conducted to prevent and maximize the reduction of the risk of earthquake damage may occur. Especially, determination of the dynamic properties of the soil and the local soil conditions is the most crucial study can be done for residential areas. Water saturated sand is a soil condition, which is most negatively affected by earthquakes. This type of soil becomes liquefied during the earthquakes, loses its strength and causes significant damage. Therefore, liquefaction analysis must be done before the earthquake happens and areas at risk should be determined. Then, rehabilitation works should be applied to those areas and thus it can prevent the damage due to liquefaction.

The aim of this study is to determine and compare Eskişehir/Tepebaşı in regard of liquefaction potential of new alluvial units in the district by using Cone Penetration Test (CPT) and the SPT-N data. LPI values calculated by using 42 different CPT data and 53 different SPT-N data from boreholes. While liquefaction analysis is being processed, the SPT-N data was used in the method presented by Seed and Idriss (1971) and developed by Youd et al. (2001), the CPT data was used in the method developed by Wride Robertson (1998). Also, Eskişehir Fault Zone which may affect the study area have assumed that constitute the maximum horizontal ground acceleration of 0.3 g and this value was used on calculations. As earthquake magnitude in calculations, 02.20.1956 earthquake with 6.4 magnitude has been used.

In result of this study both methods have been used for given area and liquefaction analysis has been done. Results of the analysis have been used to generate liquefaction risk maps in GIS environment. In addition, since groundwater levels are directly related to liquefaction, groundwater level models have been prepared for study area. The study shown that there are areas around Porsuk River which are very highly and highly vulnerable to liquefaction. Also comparison between those two methods regarding to liquefaction values has been done. As the result it is realized both methods have given us approximately matching liquefaction risk values. Moreover, it is shown that the results of this study will clear up determination of risk areas where can be used in urban renewal projects of Tepebasi/Eskisehir.