

## Soil Liquefaction Hazard Evaluation for Infrastructure in the New Bejaia Quai, Algeria

**Authors :** Mohamed Khatine, Amal Medjnoun, Ramdane Bahar

**Abstract :** The North Algeria is a highly seismic zone, as evidenced by the historical seismicity. During the past two decades, it has experienced several moderate to strong earthquakes. Therefore, the geotechnical engineering problems that involve dynamic loading of soils and soil-structure interaction system requires, in the presence of saturated loose sand formations, liquefaction studies. Bejaia city, located in North-East of Algiers, Algeria, is a part of the alluvial plain which covers an area of approximately 750 hectares. According to the Algerian seismic code, it is classified as moderate seismicity zone. This area had not experienced in the past urban development because of the different hazards identified by hydraulic and geotechnical studies conducted in the region. The low bearing capacity of the soil, its high compressibility and the risk of liquefaction and flooding are among these risks and are a constraint on urbanization. In this area, several cases of structures founded on shallow foundations have suffered damages. Hence, the soils need treatment to reduce the risk. Many field and laboratory investigations, core drilling, pressuremeter test, standard penetration test (SPT), cone penetrometer test (CPT) and geophysical down hole test, were performed in different locations of the area. The major part of the area consists of silty fine sand, sometimes heterogeneous, has not yet reached a sufficient degree of consolidation. The ground water depth changes between 1.5 and 4 m. These investigations show that the liquefaction phenomenon is one of the critical problems for geotechnical engineers and one of the obstacles found in design phase of projects. This paper presents an analysis to evaluate the liquefaction potential, using the empirical methods based on Standard Penetration Test (SPT), Cone Penetration Test (CPT) and shear wave velocity and numerical analysis. These liquefaction assessment procedures indicate that liquefaction can occur to considerable depths in silty sand of harbor zone of Bejaia.

**Keywords :** earthquake, modeling, liquefaction potential, laboratory investigations

**Conference Title :** ICSMGE 2016 : International Conference on Soil Mechanics and Geotechnical Engineering

**Conference Location :** Paris, France

**Conference Dates :** February 22-23, 2016