



Geotechnical Challenges of Tehran Metro Line 7 (South Northern Route)

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Abstract

Tunneling in urban areas, has raised the level of difficulty and challenge in respecting the constraints deriving from human presence and, therefore, the necessity for the study of geological and geotechnical properties and parameter, classification of the soils according to their engineering behavior, choosing the right TBM, determine groundwater level and determining possible geological hazards. In this paper some geological and geotechnical study took place along the tunnel route. This investigation is done by the result of 73 machinery borehole and 32 manual borehole that took place in the process of studying the tunnel route and continued by the result of field tests and laboratory tests and according to the result, the geological zone classified in 6 zone in tunnel route; due to the result of Cerchar abrasivity test and since Alluvial soil is the main soil in most of the tunneling route, the excavation soil classified as highly abrasive. In some part of tunnelling there is a risk of clogging due to the high amount of clay. Based on the results of Lofran tests the permeability of most of the classified soils in route of the tunnel was obtained less than $10E-7$ m/s.

Keywords: Liquefaction Potential Index; Geographic Information System (GIS); Yangan City; Liquefaction Potential Map; SPT Data.

1. Introduction

The north-south section of Tehran Metro Line 7 begins on the mountain road (West Side) near the Yadgar Imam highway in northwestern Tehran, and continues east-westward to the Cave Field. Around the northern part of the Cuyor field, it moves along the path to the highway. The tunnel route in the Hemmat highway with torsion to the east along the Chamran highway and then Navab highway to the intersection of Qazvin Street continues and connects to the eastern-western part at 7N station. This section of the tunnel route has a length of about 14 kilometers and contains 12 stations, which are shown in Figure 1 of the north-south section of the route on the satellite image. Deep sections of drilling are located in lowlands and shallow parts of the plain. The sensitivity of studies in these projects is very high due to drilling inside the city. Therefore, accurate and comprehensive identification is necessary in order to understand the geotechnical position of the road along the route and to investigate the hazards caused by the existence of some natural and artificial factors.

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