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Analysis of In situ and laboratorial test results in Jaydar Pump Station in order to determine geotechnical properties

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Abstract

This article it was done to reach geotechnical properties at Jaydar Pump Station site. That is one of the water development projects for irrigation improvement in quality and quantities at Jaydar plain grounds with impure and pure area respectively 1935, 1755 Hectares. Geotechnical investigation done at site to purpose of reorganization the lithologhy, investigation the problematical soils potential, assessment to rock mass quality index (RQD), underground layers penetration, try for achievement the equation between RQD and Lugeon values by mathematical calculations in difference bore holes were drilled, correlation of Lugeon data and rock mass qualities, preparation the lithological sections, Lugeon numbers and ground behavior interpretation. This research shown the existence of gypsum and marl layers, expansive soils, very high penetration at upper layers that will be changed to low values in the deeper depths, poor to fair of average in RQD in the trend of exploration bore holes drilled.
Key words: Lithology, Gypsum, Marl, Expansive soils, Lugeon.

1. INTRODUCTION

Soils are unconsolidated materials that are result of weathering and erosion process of rocks. When water content of some soils change, it makes problems to civil activities. These problems include swelling, dispersing and collapse. The change of water content of expansive soils causes to changes their volume. The volume change can damage structures that have built on the soils. In dispersive soils, particles move through soils with water flow. It may be conduits form in the soils. Collapsible soils are settled when saturated under loading. The rapid collapse of soils damages the structures which have built on soil. Problematic soils are formed in especial geological conditions. For example, collapsible soils are often founded in semi-arid area. Field observation and laboratory test can be useful to identify problematic soils. Some properties of soils such as dry density and liquid limit are helpful to estimate collapsibility potential of soils.

These studies have done by drilling machine, in situ tests, and core sampling and laboratorial tests in order to recognize surface and underground engineering geology characterizations and also we will receive geotechnical properties of rocks and soils in Jaydar Pump Station site that had ability to pump water by Q =2.95m3/sec that done it with help of 7 electro motors. Project site was be located at 5 km after in west south of Poldokhtar (that is one of the cities in Lorestan province) between Poldokhtatr- Dareshar road and near the Two-kuke Rashnu village [1].

In order to engineering geology and geotechnical investigation we have drilled 2 bore hole drilling machine by depth 15 , 35 meters with geographical UTM coordination X:748071.74 Y: 3670219.73 and X:748047.59 , Y:3670179.99 for BH1 and BH2. After done drilling one of the results which we had received from holes drilled become to be geological logs that by correlation between them geotechnical map will be drown.

2. REGIONAL GEOLOGY

Case study borders located at regular big anticline folded in Zagros by wide 150 to 250 kilometer. Gachsaran formation in form of hill small at spume of the anticline between Maleh and Kabirkuh Mountain also Chenaran Mountain had sawn. Beddings of chalk – salt, sand lime and red to gray marl by periodical saw in Gachsaran formation. This formation perfectly stead under Poldokhtar landslide and spume Jaydar plain; because of fast erosion any mounts made in region. Site place located on the marls and gypsum rocks this shown a lot of probability related to Gachsarn formation (see fig1). [1]