Geotechnical analysis for types of surficial fine-grained Soils at eastern side of Basra region, Southern Iraq.

1 Wisam R. Muttashar Marine Geology Dept./Marine Science Center, Basra University,
2 Fatima K. Al-Amari, Civil Engineering Dept., Enginnering College, Basrah University
3 Maitham A. Abd Al-Hussein Science College, Thi Qar University

Email : wrmgeo@mscbasra.com & wrmgeo@gmail.com

ABSTRACT:

This research focused on analysis of consolidations settlement factors and XRD analysis of types from surficial fine-grained soils at eastern side from Basra region in southern Iraq. Four sites have been taken for sampling of disturbed and undisturbed samples. These samples refer to tidal flat deposits of Khor Abdullah coast (site-1) ,south and north of Khor Al Zubair channel (site 2 and Site-3), and the fourth is a site of Qarmatt Ali city locating north of Basrah city. The ASTM specifications are based on to carry out the classification of soil and consolidation tests. The Odometer test is carried out in two statws (natural and wet) for two sites St-1 and St-4. The values of void ratio ranged (0.61- 1.16), where up to highest value (1.16) at St-2 sites and lowest values (0.61) at St-4.Swelling rate index (Cs) values were extended between (0.036 – 0.047) in wet state. The values of compression index (Cc) show slightly variation between (0.41-0.4) in wet state for all sites, while there is observed variation in natural state was (0.02 & 1.156) at (St-4 & St-1) sites respectively. The Coefficient of consolidation (Cv) values ranged between (0.0178 – 4.07). The high values of Cvs were being in St-2 & St-3 sites (gray clays of Hammar formation deposits).

For XRD-analysis, Clay minerals percentages are Kaolinite mineral (6.0-18) %, Illite mineral (6.0 -20) %, Montmorillonite mineral (17 -36) %. And also, the mixed layers of Montmorillonite and chloride appeared with the range (10 -36%).

The investigated soils are silty clay with high plasticity and clay content exceeds 58%, in exceptional flood plain deposits (St-4 site) has low plasticity that % clay reached to 50%. And mineralogically, clays minerals percentages are reflected low activity of fine-grained soils, where the activity range between (0.28 -0.4). Also, according to consolidation parameters, Basra soil is not classified as collapsible soil at St-1 and St-4, but St-2 & St-3 may be risky and slightly classified as collapsible soil.