CHANGES ON THE TEXTURE AND CONSISTENCY LIMITS IN STABILIZATION OF HIGH PLASTICITY CLAY: A SCANNING ELECTRON MICROSCOPE (SEM) STUDY

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Abstract - It is quite common to use natural and unnatural materials having pozzolanic properties as additives in improving the geotechnical properties of clays. In this method, which is also called as stabilization method, additive materials are added to the clay so that the consistency, strength and consolidation properties of the clay could be improved.However, used additive material should have the property of improving the geotechnical properties of the clay and easily obtained and economical. Therefore, not only the unnatural pozzolans such as slaked lime, fly ash, silica fume, cement but also, if possible, it is important to use natural pozzolans or both natural and unnatural pozzolans together for the stabilization of the clays. Studies on this subject showed that the mixture types consisting of different pozzolans cause favorable effects on clays. The main purpose of this study is to determine the changes in the consistency and texture of clays when using different pozzolans. For this purpose, laboratory studies were performed, and the effects of different kinds and proportions of additives on the consistency and texture of clay were investigated. Also, Scanning Electron Microscope (SEM) studies were performed to obtain changes in the texture of clay. The results of study showed that the Liquid Limit (LL) values decreased significantly in the samples with the use of slaked lime, fly ash and tuff additives. It was seen from the images which were obtained from the SEM studies that the agglomeration was well developed and the grain size and void ratio were increased in rate accordingly in the samples where the decreases in the LL values were higher.Also, it was seen from the SEM images of the samples where the decreases in the LL values were lower, the agglomeration was not developed enough, the grains were more plaque and the void ratio were less.

Index Terms - Agglomeration, clay, consistency limits, pozzolan, stabilization