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Monitoring of Deformation in Ground Before and After Tunnel Excavation

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As population increase in metropolitan city, we need transportation and transmission tunnel. In this context, the engineers and administors attach impotance to building and planning underground-tunnel. Moreover, we must at regular intervals monitoring to deformation in underground-tunnel for quality and safety. Firstly, a deformation monitoring network is designed as perpendicular to the tunnel main axis. Secondly, the prescribed number of deformation measurements must be made. Finally, the deformation analysis is evaluated and its results is interpreted.

This study investigates how deformation in monitoring network during and after tunnel excavate change.For this purpose, a deformation monitoring network of 18 object point and 4 reference point was established. Object points networks was designed steeply to the tunnel main axis as 3 cross section. Each cross section consisted of 3 point left, 2 point right and 1 point at the flowing line. Initial conditional measurement was made before tunnel excavation. Then the deformation measurement was made 5 period (1 period measured after tunnel excavate). All data sets were adjusted according to free adjustment method.

The results from the investigation considering the tunnel line, a symmetrical subsidence was observed. The following day of tunnel excavation, we were observed %68 per of the total deformation. At the end of the last period measurements, %99 per of the total deformation was detected.

Keywords: Tunnel, Deformation, Subsidence, Excavation