

Comparative Settlement Analysis on the under of Embankment with Empirical Formulas and Settlement Plate Measurement for Reducing Building Crack around of Embankments

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Abstract : In road construction on the soft soil, we need a soil improvement method to improve the soil bearing capacity of the land base so that the soil can withstand the traffic loads. Most of the land in Indonesia has a soft soil, where soft soil is a type of clay that has the consistency of very soft to medium stiff, undrained shear strength, $C_u < 0.25 \text{ kg/cm}^2$, or the estimated value of NSPT < 5 blows/ft. This study focuses on the analysis of the effect on preloading load (embankment) to the amount of settlement ratio on the under of embankment that will impact on the building cracks around of embankment. The method used in this research is a superposition method for embankment distribution on 27 locations with undisturbed soil samples at some borehole point in Java and Kalimantan, Indonesia. Then correlating the results of settlement plate monitoring on the field with Asaoka method. The results of settlement plate monitoring taken from an embankment of Ahmad Yani airport in Semarang on 32 points. Where the value of C_c (index compressible) soil data based on some laboratory test results, while the value of C_c is not tested obtained from empirical formula Ardhana and Mochtar, 1999. From this research, the results of the field monitoring showed almost the same results with an empirical formulation with the standard deviation of 4% where the formulation of the empirical results of this analysis obtained by linear formula. Value empirical linear formula is to determine the effect of compression heap area as high as 4,25 m is $3,1209x + y = 0.0026$ for the slope of the embankment 1: 8 for the same analysis with an initial height of embankment on the field. Provided that at the edge of the embankment settlement worth is not equal to 0 but at a quarter of embankment has a settlement ratio average 0.951 and at the edge of embankment has a settlement ratio 0,049. The influence areas around of embankment are approximately 1 meter for slope 1:8 and 7 meters for slope 1:2. So, it can cause the building cracks, to build in sustainable development.

Keywords : building cracks, influence area, settlement plate, soft soil, empirical formula, embankment

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