

Noppakao Bunruangkhaw 2010: Effect of Differential Settlement on Structural Behavior of Large-scale Reinforced Concrete Building. Master of Engineering (Civil Engineering), Major Field: Civil Engineering, Department of Civil Engineering. Thesis Advisor: Assistant Professor Kitjapat Phuvorawan, Ph.D. 154 pages.

This thesis presents the effect of differential settlement on structural behavior for large-scale reinforced concrete building. The differential settlement of foundation alters the structural behavior from the general analysis without settlement. The differential settlement can occur in general situation. Especially for large-scaled building that occupies large area, the settlements can take place at several spots. In order to investigate the effect of differential settlement, this research compares the behavior of structure under differential settlement condition to the behavior of structure under normal condition.

It is found that the positions of foundation settlement yields different effect on the change of moment and shear. Three cases of different locations of foundation settlement has been studied; namely, at the corner, at the edge, and at the middle point of building. The analysis indicates that the settlement at the corner yields the least effect of moment and shear change while the settlement at the edge gives the maximum effect.

Furthermore, when considering the effect of settlement to the structural behavior of members on different floors, the analysis shows that maximum effect of moment and shear change occurs at the lower level and the effect reduces as the floor is higher. When focusing on the magnitude of settlement, it is found that the effect varies linearly with the amount of settlement. In other words, when the magnitude of settlement is higher, the effect of moment and shear change gets elevated. For the case of large-scale building with several locations and amounts of settlement, the main effect of moment and shear change pronounces at the members near the location of large amount of differential settlement, but not the amount of settlement itself.

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