

CO15186 : MAJOR CIVIL ENGINEERING.

KEY WORK : BEHAVIOR/BRACED SHEET PILE WALL/DEEP EXCAVATION/BANGKOK
SOFT CLAY

PIPAT SRIWATTANAPONG : BEHAVIOR OF BRACED SHEET PILE WALL SYSTEM
FOR DEEP EXCAVATION IN BANGKOK SOFT CLAY. THESIS ADVISOR: DR.
WANCHAI TEPARAKSA Eng.D. 180 PP ISBN 974-581-571-3

Sheet pile bracing system is the most wellknown system for deep excavation in Bangkok soft clay. This research aims to study the behavior and correlation of lateral sheet pile wall movement with ground surface settlement, the influence of factors affected to the lateral wall movement, to suggest the appropriate method of construction, and compare the measured lateral wall movement with the simplified method proposed by Wong and Broms (1989).

Results of this study lead for the following conclusions: the mode of sheet pile wall deformation is the type of wall rotation about bottom (fixed end type). Delaying in installation of the first strut and traffic loading leads to an induce large wall movements. The measured ground surface settlements are within the settlement envelopes proposed by Peck (1969) and Manas Clough (1981). The correlations of the maximum surface settlement (δv_{max}) to the maximum lateral wall movement (δH_{max}) are in the order of 1.94 to 2.13 and 0.83 to 1.62 for traffic and non-traffic area, respectively. Half reduction of strut stiffness and delay in installation of the first strut may increase δH_{max} of three times. The preloading of strut can reduce δH_{max} for only shallow excavation or for the first and second bracing layers. The deflection ratio ($\delta H_{max}/H, \%$) decreases with increasing of excavation depth (H), while increases with increasing of clay thickness below the bottom of the excavation (T). Berm width can reduce δH_{max} for only the first three stages of excavation. For the study of factor of safety against basal heave (F.S), found that the deflection ratio tends to lower than those proposed by Mana & Clough (1981). The prediction of the maximum lateral wall movement by the simplified method proposed by Wong and Broms (1989), show reasonable agreement with the field measurement only at the final stage of excavation without consideration of surcharge load. The proposed appropriate methods of construction are : the ground surface settlement points should be installed around the site, struts should be immediately preloaded after reach the excavation depth, loading trucks or traffic load should be transported on platform to reduced large movement. During excavation berm should be provided around excavation area specially for the first stage of excavation.