Developing curve of displacement factor for determination of additional modulus of subgrade reaction on nailed-slab pavement system

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Abstrak

The pavement of the nailed-slab system has been proposed as an alternative solution for addressing the rigid pavement problem in soft soils. This system is used for developing a rigid pavement. The simple method of using an equivalent modulus of subgrade reaction (k') in nailed-slab system analysis was proposed by a previous researcher. This modulus consists of the modulus of subgrade reaction from a plate load test (k) and an additional modulus of subgrade reaction due to pile installing (k). The additional modulus of subgrade reaction has been proposed by some authors. The displacement factor was used in determining the additional modulus of subgrade reaction. This factor is difficult to define. In this research, the prototype test of a nailed slab with single-pile installation was conducted to learn the validation of the theory of the additional modulus of subgrade reaction on a full-scale dimension. The prototype was constructed on soft clay, and the connection between the pile and slab was perfect monolithically. This system was loaded by centric load. A new curve of the displacement factor is proposed. Calculated deflections based on this curve were compared to the observed deflection and resulted in good agreement with the observation. Hence, it can be used in preliminary design.