ANALYSIS OF PILE GROUP BASED ON THE NON-LINEAR HORIZONTAL FOUNDATION COEFFICIENT

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The non-linear horizontal foundation reactive force coefficient calculation method of pile group is presented in this article based on NL method. The complicated pile group calculation could thus be simplified to the single pile calculation after a reduction of horizontal foundation coefficients, and be done directly by using the table of NL method. Suggested values of pile group horizontal foundation coefficients are given through comparison between observation data and theoretical calculation values. The conclusions are as follows:

1. The pile group under horizontal force could be calculated as the single pile by using the table of non-linear foundation reaction coefficient method-NL method according to formula $\xi_{KN} = \eta^{2.05}$. This paper presents the calculation formula of the reduction ratio. Table 1 is recommended in the view of engineering design.

2. This paper presents a concise and practical calculation formula which has results close to observed values. The formula is applicable to sand and earth.

3. This calculation method is only applicable to the pile group with vertical piles.

4. The pile group maybe totally break when the pile span is too less. When the pile span is relatively large, the stress relaxation of earth in front of the back-row piles has an obvious decrement, which is not reflected in the formulas. So formulas in this paper should be discreetly applied when $S < 3D$ and $S > 6D$.

Table 1. Suggested ζ_{Kn}

pile span \ reduction ratio	3D	4D	5D	6D	8D
ξ_{KN}	0.1	0.2	0.3	0.4	1.0

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