

Study on factors influencing safety of the cross section of viaduct and seawall on soft foundation

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Abstract: With the rapid economic increase of coastal areas, the development of coastal buildings have reached an unprecedented height. Seawall and viaducts both are common coastal buildings. When they cross and construction time is close, they will inevitably affect each other. This paper based on soil consolidation theory, used the nonlinear finite element method to analysis mechanism of interaction between the on the cross section of viaduct and seawall on the soft foundation. And it proposed factors that may affect the safety of the cross section, provide effective recommendations for the construction of viaducts and embankment on soft foundation.

This paper summarizes the dynamic about the former embankment soft foundation Seawall and viaducts in all aspects, combined with the focus of this study, the analysis focuses on the following questions:

(1) Adopt 3D finite element method to study displacement and stress of seawalls, bridges and soil. Propose he main factors that influence the cross-section. By examples of numerical engineering, we assess the size of the various factors and identify the main factor.

(2) Sensitivity analysis of parameters of soil. By calculating the change of soil settlement, we compare sensitivity of every parameter. Find out the parameter that should be measured first, to provide a reference for future engineering survey.

(3) To ensure the safety of the cross section, we use composite pile to firm the soil and reduce the settlement of soil. Find out how the length of piles influences stress and displacement of the structure.

(4) Study the interaction mechanism, deformation and safety of seawall and piles in different construction procedures. Compare the results of FEM calculation to make fair construction interval. Improve efficiency as much as possible on the basement of ensuring the safety of the engineering.