

## Numerical study for the interaction between the submerged floating tunnel and shore connection under dynamic loading condition

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### ABSTRACT

Submerged floating tunnels must be connected to the shore to provide underwater routes between continents. The shore connection, which connects the subsea bored tunnel and submerged floating tunnel, has a risk of failure because it serves as a boundary between the two tunnels with different constraint conditions. Therefore, a proper shore design can be conducted after investigating the dynamic behavior of submerged floating tunnels at the shore connection, considering the stress concentration due to the difference in tunnel constraints. This study proposed a numerical coupling method for investigating the dynamic behavior of shore connections. In order to develop a numerical method to evaluate the dynamic behaviors precisely, the nonlinear characteristics of the ground at the shore connection and the hydrodynamic characteristics of submerged structures were considered simultaneously using two different numerical programs. The natural frequency of floating tunnels was utilized to couple the two programs based on the empirical relationship between the boundary stiffness and natural frequency. As a result, the numerical results derived by the coupled analysis showed a more realistic tendency than those from the previous studies.

### REFERENCES

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