

OW_06

共振柱試驗於離岸風機基礎設計之應用 Application of the Resonant Column Tests on the Design of Offshore Wind Turbine Foundation

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摘要

離岸風機基礎設計所需之室內試驗種類及參數除考量一般陸上工程所需之外，為了評估風機基礎設置場址地震時土層的動態反應與土壤-風機基礎結構物互制之動態行為，尚需額外取得土壤動力性質之資料。其中，動態剪力模數及阻尼比為進行此行為研究分析不可或缺的參數，但傳統動三軸試驗無法求得土壤小應變範圍之最大剪力模數及最小阻尼比。因此，本研究利用Stokoe式固定-自由型共振柱試驗系統，針對離岸風機基礎設置預定場址土壤進行相關研究，成果可供未來國內離岸風機基礎設計應用之參考。

關鍵詞：共振柱試驗、土壤動態性質、剪力模數、組尼比。

Abstract

In order to evaluation the dynamic behavior of the soil and offshore wind turbine foundation under dynamic conditions such as machine vibration and earthquakes, the dynamic properties of soil like relationship between soil shear modulus(damping ratio) and shear strain are necessary. In this study, Stokoe type fixed-free resonant column device was used to perform the tests of the soil from designated offshore wind farm. The results can provide some information to foundation design of the offshore wind turbine of Taiwan in the future.

Keywords: Resonant Column Test, Dynamic property of Soil, Shear Modulus, Damping Ratio.