

EXPERIMENTAL STUDY OF PRECAST CONCRETE MINI PILES WITH CIRCULAR CROSS-SECTION WITH FIBERGLASS REINFORCEMENT

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ABSTRACT

This study aims to develop circular precast concrete mini piles reinforced with fiberglass as an alternative to wooden piles. Wooden piles have disadvantages such as damaging the environment and low resistance to weathering. Fiberglass reinforcement was chosen because it enhances the tensile and flexural strength of concrete. The research method used was experimental, involving six test specimens, consisting of two without reinforcement and four using fiberglass woven roving 200. The test specimens had a diameter of 7.62 cm and a length of 200 cm. The tests included compressive strength with a target f'_c of 25 Mpa, flexural strength, and manual pile driving tests on clay and peat soil. The 28-day compressive strength test results yielded an average of 16.62 N/mm², below the target, due to insufficient compaction and leakage in the immersion tank. The flexural strength test showed that the mini pile with fiberglass reinforcement had a maximum load of 3.06 kN and a deflection of 1.79 mm, while without reinforcement it had a load of 2.77 kN and a deflection of 1.01 mm. The manual driving test on the mini pile with fiberglass reinforcement did not cause any cracks or fractures. In conclusion, fiberglass reinforcement is suitable for use as environmentally friendly and economical reinforcement for precast mini piles in lightweight foundations.

Keywords: Driving, fiberglass, flexural strength, mini pile, Precast concrete