

EXPERIMENTAL STUDY OF PRECAST CONCRETE MINIPILES WITH SQUARE CROSS-SECTION WITH FIBERGLASS REINFORCEMENT

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Abstract

This study aimed to determine the method for manufacturing precast concrete mini piles with a rectangular cross-section using fiberglass fiber reinforcement as an alternative to wooden piles. This study also aimed to discover new materials for foundation piles made of fiberglass-reinforced concrete. The use of wood as foundation piles has drawbacks, such as environmental damage and low resistance to weathering. Fiberglass fiber was chosen because of its ability to increase the tensile and flexural strength of concrete. The cross-sectional area of the test specimens was 7.5 x 7.5 cm in diameter and 200 cm in length. Tests included compressive strength tests, flexural strength tests, and manual pile driving tests on two types of soil: clay and peat. These methods aimed to determine the fiber installation method, the precast concrete foundation pile manufacturing method, the casting method, and the results of the flexural strength and pile driving tests using fiberglass fiber reinforcement.

The results showed that fiberglass-reinforced mini piles increased flexural strength bending with the greatest load, namely 2,47 KN, with a deflection of 0.95 mm. and could be manually driven without significant damage. This research proves that fiberglass reinforcement can be an alternative reinforcement in precast mini piles and provides an environmentally friendly and economical solution in lightweight foundation applications. With a fiber diameter of 20 strands for one reinforcement, namely a diameter of 2,11. With the result that this fiberglass fiber reinforcement receives the largest load, namely 2,47 KN.

Keywords: *Fiberglass Reinforcement, Flexural Streght, Mini Pile, Precast Concrete, Pile Driving*