

**FLEXURAL BEHAVIOUR  
OF  
PRESTRESSED CONCRETE PILE**

**by**

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*“May Allah Bless Them All”*

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## **ABSTRACT**

The objective of this study is to investigate the flexural behavior of pre-tensioned prestressed concrete pile. Bending strength test on the pile are done to determine the cracking bending moment ( $M_c$ ) and the ultimate bending strength ( $M_u$ ). Three square piles of prestressed of size 125mm x 125mm x 6m were design in accordance with BS 8004:Part 1 : 1974. The bending strength test on pile are made by the application of vertical load  $P$  to the centre of the span on the pile laid on two supports which have a span equal to  $3/5$  of its total length The pile were consider as beam. Cracking load, ultimate load, and deflection were observed and recorded during the testing .This experimental result were compared with the theoretical result where it was found out the experimental values are 5.98 kN for cracking load and 7.98 kN for ultimate load. From theoretical results, the value for cracking load is 4.54 kN and for ultimate load is 7.42 kN .

## **1.0 INTRODUCTION**

### **1.1 General**

Piles are columnar elements in a foundation which have the function of transferring load from the superstructure through weak compressible strata or through water onto stiffer or more compact and less compressible soils or onto rock. They may be required to carry uplift loads when used to support tall structure subjected to overturning forces from winds or waves. Combination of vertical and horizontal loads are carried where piles are used to support retaining wall, bridge piers and abutment, and machinery foundation.

It became apparent that there was a demand for long, high capacity piles of penetrating hard strata at relatively high levels. Most piling systems were seen to be unsuited to these duties due either to the very large plant required or the difficulty in placing concrete at great depth. A survey conducted by a specialist piling contractor indicated definite trends in demand towards piles capable of penetrating to depths in excess of 30m through hard intermediate strata and of carrying high individual loads or being placed in closely spaced groups.

The pile in this study originally developed in New Zealand (Boucher, 1991) where they have been in use for more than 30 years. The size of this pile is 125mm x 125mm x 6000mm. By using high concrete stresses, small cross sections only required. This gives small installation soil displacement reducing driving resistance and at the same time a unit capable of accepting relatively high driving stresses.