

NANTACHAI NONTANANANT : STRENGTH OF PARTIALLY PRESTRESSED CONCRETE
BEAMS SUBJECT TO REPEATED LOADS : PROF. EKASIT LIMSUWAN , Ph.D.183 pp.

In this study the behaviors of partially prestressed concrete beams have been considered under static and alternative loading with two variables ; partial prestress ratios and applied load ratios. Eight rectangular beams with 10 x 18 cm.in cross section and 120 cm. span length were catagarized into 2 series with partial prestressed ratios of 0.27 and 0.59, respectively. One beam from each series was tested under static monotonically increasing loading up to failure as a reference beam. The rest of them from each series were tested under alternative loading with ranges 20 - 50 % , 40 - 70 % and 50 - 90 % of analytical ultimate loads. After the test of 2,000,000 cycles without any defects then static loading tests would be commenced to failure for examining the effect of pre-history loading.

Test results indicated that deflection and crack were increased with number of loading cycles. But there was no evidience that the beams were failed due to fatigue under repeated loading. Even repeated loading had induced permanent deflection of the beams but the ultimate strength was not much influenced by such loading after 2,000,000 cycles. The results have shown good agreement of the ultimate strength with the results from strain compatibility analysis. However, the ultimate strength was slightly stronger than their reference beams so it can be proved that the partially prestressed concrete beam under repeated loading is conservative in strength.