**STRESS STRAIN BEHAVIOUR OF CONFINED NORMAL GRADE CONCRETE**

**ABSTRACT**

An experimental investigation into the behaviour of circular, confined, reinforced concrete columns was undertaken. Thirty 150 mm dia, 300 mm high units were cast with varying amounts of longitudinal and lateral steel.

These were subjected to concentric or eccentric axial loads to failure at slow or dynamic loading rates. Confinement requirements of reinforced concrete columns are discussed and the results and analyses of experimental work presented. Results include an assessment of the significance of loading rate, eccentricity, amount and distribution of longitudinal steel, and the amount of confining steel.

A general stress-strain curve for circular concrete sections loaded at seismic rates is proposed and compared with existing curves based on previous static loading tests.

Knowledge of the stress-strain curve for confined concrete is particularly important for columns with high axial load levels, when the moment curvature characteristics of the column are largely dependent on the concrete compressive strength and the stress strain relationship.

The testing was generally carried out in load controlled testing machines at slow loading rates. Behaviour under these conditions has been used to predict behaviour under seismic conditions, which are characterized by displacement control, rapid loading rates, repeated load application, and eccentricity of loading, recently more realistically sized units have been used but not under simulated seismic conditions.