

**A STUDY ON THE EFFECT OF SLENDERNESS  
RATIO ON CONCRETE FILLED STEEL COLUMN  
COMPRESSIVE STRENGTH**

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**B.ENG (HONS) (CIVIL)  
MARA UNIVERSITY OF TECHNOLOGY  
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CONCRETE FILLED STEEL COLUMN COMPRESSIVE  
STRENGTH**

**BY**

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the requirement for the degree of  
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## **DECLARATION BY THE CANDIDATE**

I Oswald P Moloyos, 2003339652, confirm that the work is my own and that appropriate credit has been given where reference has been made to the work of others.

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## ABSTRACT

The use of circular steel column sections coupled with concrete infill has been used on various building projects with great advantage such as high axial load capacity and favorable ductility performance. From a point of view, the circular steel columns can serve as formwork for the concrete infill during construction, which makes concrete filled steel columns more economical than reinforced concrete columns.

Compressive strength is one of the important properties of concrete. The strength in compression has a definite relationship with all the other properties of concrete. It means to say that, the other properties are improved with the improvement in the compressive strength.

The purposes of this study are to check the slenderness ratio and the strength of the concrete filled steel column (CFSC). The concrete mix was prepared according to the British Standard 5328; 1981. For the steel hollow section the length was varied as 450mm, 600mm, 750mm and 900mm. The concrete characteristic strength that will be used is grade 50 ( $50\text{N/mm}^2$ ) with the elastic modulus 46.38GPa and the elastic modulus for the steel is 218GPa.

The behavior of column concrete-filled circular hollow sections (CHS) subjected to axial load was investigated experimentally. A total of 12 specimens were studied. The quantity  $L/r$  is called the slenderness ratio of the column. It is clear, that the minimum value of the radius of gyration,  $r$  should be used in computing the slenderness ratio. It will also provide a more realistic view of the relation between the slenderness ratio of a column and the load that causes it to fail.