

**THE INFLUENCE OF DIAMETER TO
THICKNESS RATIO (D/T) TO THE
COMPRESSIVE STRENGTH OF AXIALLY
LOADED PVC-STEEL SKINNED HOLLOW
CONCRETE FILLED COLUMNS**

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**Bachelor of Engineering (Hons) Civil
(Infrastructure)
UNIVERSITI TEKNOLOGI MARA
JANUARY 2018**

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By

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This report is submitted as a
partial requirement for the degree of
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AUTHOR'S DECLARATION

I declare that the work in this thesis was carried out in accordance with the regulations of Universiti Teknologi MARA. It is original and is the results of my own work, unless otherwise indicated or acknowledged as referenced work. This thesis has not been submitted to any other academic institution or non-academic institution for any degree or qualification.

I, hereby, acknowledge that I have been supplied with the Academic Rules and Regulations for Under Graduate, Universiti Teknologi MARA, regulating the conduct of my study and research.

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ABSTRACT

Composite column system is currently being implemented in construction industry and concrete filled double skin steel tubular (CFDST) column has been recognized as one of composite column type. However, it is difficult to utilize CFDST column in the construction industry due to the use of steel wall tube with higher thickness which is not economical. Therefore, the utilization of thin-walled steel tube as the outer skin can be considered as the alternative to reduce the cost. Apart from that, the weight of the column also can be reduced by proposing hollow section in the column which also applicable for wiring purposes. This type of composite column better known as Double Skinned Hollow Concrete Filled Steel Tubular (DSHCFT) column. Hence, it is important to conduct a study on the structural behavior of DSHCFT column to evaluate the corresponding ultimate strength capacity. This study focusing on DSHCFT columns with PVC as the inner tube and mild steel as the outer tube which were subjected to axial load until failure of the specimen to investigate their load carrying capacity. This study was also undertaken to investigate the effects of diameter to thickness ratio (D/t) on the compressive strength behavior of DSHCFT columns. Total three specimens of DSHCFT columns of length 300mm with diameter of inner PVC tube of 60mm, 75mm and 85mm were prepared. M25 grade of concrete was as the in filled and the yield strength of steel used was 235N/mm^2 . The column specimens were loaded axially in the reaction frame of capacity 1000kN. Their load-axial shortening curves were recorded. The experimental results were verified with British Standard (BS5400). Theoretical and experimental results were compared and tabulated. The results indicate that decreasing the inner PVC tube diameter leads to an increase in the ultimate axial load of DSHCFT columns. Thus, it can be concluded that DSHCFT columns show a great potential to be utilized as a column system especially for moderate load condition or small load bearing capacity infrastructures.

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