FINAL YEAR PROJECT REPORT

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FINITE ELEMENT ANALYSIS OF BUCKLING BEHAVIOUR OF PROFILED STEEL SHEET WALL PANEL WITH WINDOW AND DOOR OPENING

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I hereby declare that this report has not been submitted, either in the same or different form to this or any other university for a degree, as expected where reference is made to the work of others, it is believed to be original.

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ABSTRACT

The behaviour of profiled steel sheet in a wall tends to buckle when subjected to a compressive load. This work presents the buckling behaviour of profiled steel sheet of wall panel with window and door opening using finite element method and software called LUSAS was being used. The effect of the loading on the steel sheet was studied.

The finite element method is a general technique for constructing approximate solutions to boundary-value problems. The analysis of the whole structure is obtained by simultaneously analysing the individual finite elements. The LUSAS for finite element analysis have come to be constructed as a number of phases, executed in a manner that progresses from pre-processor phases, through the processor or solution phases and on to the final post-processor phases. The profiled steel sheet was tested as a wall specimen. The critical buckling load of folded plate with thickness t = 1mm, length L = 1000mm and width w = 600mm subject to in-plane compressive loading was determined from the experimental work that has been carried out by Noor Aziyah (April 2001).

Data such as displacement, stress and strain of profiled steel sheet due to compressive load can be obtained using LUSAS and were compared with experimental work. The displacement of profiled steel sheet gave a percentage difference of 15.6% and while for strain was 39%. However, the value for stress gave a highest percentage difference. Based on the previous experimental work done by Noor Aziyah (April 2001), the existence of window and door opening has reduced the ultimate load capacity.