

SIMPLIFIED NUMERICAL MODELING AND ANALYSIS OF SANDWICH CONCRETE INSULATED PANEL USING SAP2000

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Sandwich Concrete Insulated Panel (SCIP) Technology has been in use since 1960. Its early applications include aerospace applications and refrigerators etc and nowadays they are widely used in building construction. But the main problem with this technology is that there are no analysis and design guides for this technology. This technology has lack of proper analysis and design strategy. Softwares like ANSYS and ABAQUS etc are not much user friendly for typical analysis and design. Researchers have used these software's but they have not interpreted the proper results. Therefore, this thesis has been aimed at developing analysis and design guides for SCIP technology, using commercial software, SAP2000. In the first stage of this research, a typical SCIP panel has been modeled in SAP2000 load applied according to "four points bending method" and then analyzed. The incremental loads have been applied starting from 2.5 KN and displacement corresponding to every incremental load has been recorded. A graph of force and displacement is then developed. Finally, the graph obtained from SAP2000 results is then compared with experimental results of Mr Nouman (MS work). The SAP results show that the graph of SAP is straight and displacement values are near to zero. To match the results, loads are amplified with a constant value for SAP. For amplified load, the SAP result get matched to experimental result up to elastic limit, beyond this limit, there is difference between both results. This is due to the non linear properties of the material which are not defined in SAP2000. It is the limitation of this application SAP2000 make it non preferable software application for the analysis and design of sandwich panels for load at which material get crushed. In the end, we conclude that the buildings having SCIP technology can be modelled and analyzed using SAP2000 up to their linearity limit.

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