

Analytical Study on Profiled Steel Sheet – Concrete Composite Sandwich Panel under Axial Load

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Abstract: *Steel-concrete composite panels have been proposed and developed for applications in various types of structures. A sandwich panel is a typical structural form with good structural performance and excellent material advantages, such as high-specific strength, stiffness, light weight, high thermal insulation, and better performance under shock absorption. The project investigated the response of profiled steel sheet – concrete composite sandwich panel subjected to axial loading. Steel-concrete-steel sandwich structures consisting of two steel face plates infilled with concrete composite material has been developed. Sandwich panel consists of profiled steel sheet as the outer skins(face) and concrete as the infill, connected by using through bolts and the concrete portion is called core. Further, numerical study has been conducted to assess the integrity of the connection between skin and core and to find the effectiveness of connection on overall strength of the panel. Three-dimensional finite element (FE) simulation model is created for the parametric study to investigate the effect of several parameters on overall strength of the panel. Parametric studies are performed and numerical analysis using ANSYS Workbench results are analysed including failure mode, load-deflection curves and strength capacity.*

Keywords: Steel-concrete composite panel, high-specific strength, axial loading

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