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EVOLVING CROSS-CORRUGATED COLD FORM SHEET BASED COMPOSITE SLAB PANEL FOR EFFICIENT PEB CONSTRUCTION

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ABSTRACT

Large number of industrial, commercial and low rise buildings is now being constructed using pre-engineered steel components. The prevailing practice of using cold-formed steel based decking slab for different type of floors required in the above mentioned buildings often disrupts normal workflow as these components are constructed using locally procured resources. Further, the deck slabs constructed in the above mentioned manner tend corrugated cold form sheet as the main flexural member and thin steel sheet attached as the liner at the bottom. The top surface is leveled using foam concrete and space between steel liner and corrugated sheet is filled using foam insulation. This paper provide performance assessment of the different type of cold form sheet designs using a finite element model developed from the experiments undertaken on deck panels currently being used. The results obtained from this research work would enable PEB manufacturers to design and use structurally efficient and cost effective cold form sheet based prefabricated slab panel system to be very heavy as an equivalent concrete slab, thus leading to the increase in the overall cost of the steel building. In order to overcome this problem, a prefabricated slab panel is introduced which consists of corrugated cold form sheet as the main flexural member and thin steel sheet attached as the liner at the bottom. The top surface is leveled using foam concrete and space between steel liner and corrugated sheet is filled using foam insulation. This paper provide performance assessment of the different type of cold form sheet designs using a finite element model developed from the experiments undertaken on deck panels currently being used. The results obtained from this research work would enable PEB manufacturers to design and use structurally efficient and cost effective cold form sheet based prefabricated slab panel system.