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SUSPENDED, SELF-SUPPORTED & RE-USABLE SHUTTER TECHNOLOGY FOR CASTING OF REINFORCED CONCRETE SLAB SUPPORTED ON STEEL FRAMING SYSTEMS

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Steel framing supporting cast-in-place reinforced concrete slab was historically being constructed using props-supported replaceable shutter system. Later, most commonly, the concrete slab is cast upon permanent cold formed steel deck which itself is supported on steel I-shaped sections. This system makes construction easy and saves time by eliminating props-supported replaceable shutter system. Permanent metal deck serves as shutter system and sometimes designers consider it as bottom reinforcement providing re-bar for top reinforcement only. But metal deck is vulnerable to fire which requires expensive fire protective measures whether it is considered as bottom reinforcement or not. Metal deck itself bear full construction load as shutter during casting of concrete slab on it. For this reason, I-beams are spaced closely to support metal deck and virtually cost of steel frame increases. So, research and study is required to develop alternate solution against props-supported replaceable shutter and permanent metal deck system. After long practice, study and research; a new design idea and construction technology has been developed by us to convert the metal deck as shutter. This new shutter is self-supported, suspended and continuously re-usable without any props. Weight of steel frame reduces by increasing spacing of I-beams. No fixed metal deck is required and fare face finishing of ceiling is achieved. No

prop is required under ceiling to support shutter. So, other construction works also progress simultaneously under ceiling which saves construction time. Additionally ceiling plaster, paint, costly fire proof spray and false ceiling may be avoided. So, significant cost and time saving is possible without any significant construction difficulties. Steel I-beam supported reinforced slab may be designed as composite beam using shear connectors to make floor I-beam further economic. Already, first time, this technology has been successfully used conforming all advantages mentioned above in a four storied steel framed building for garments factory in Bangladesh having 4500 square meter slab per floor. There is lot of options for further development of this construction technology. Initially production cost is two to three times more than metal deck cost, but it may be used minimum fifty times after production. So it is highly cost effective.

Biography

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