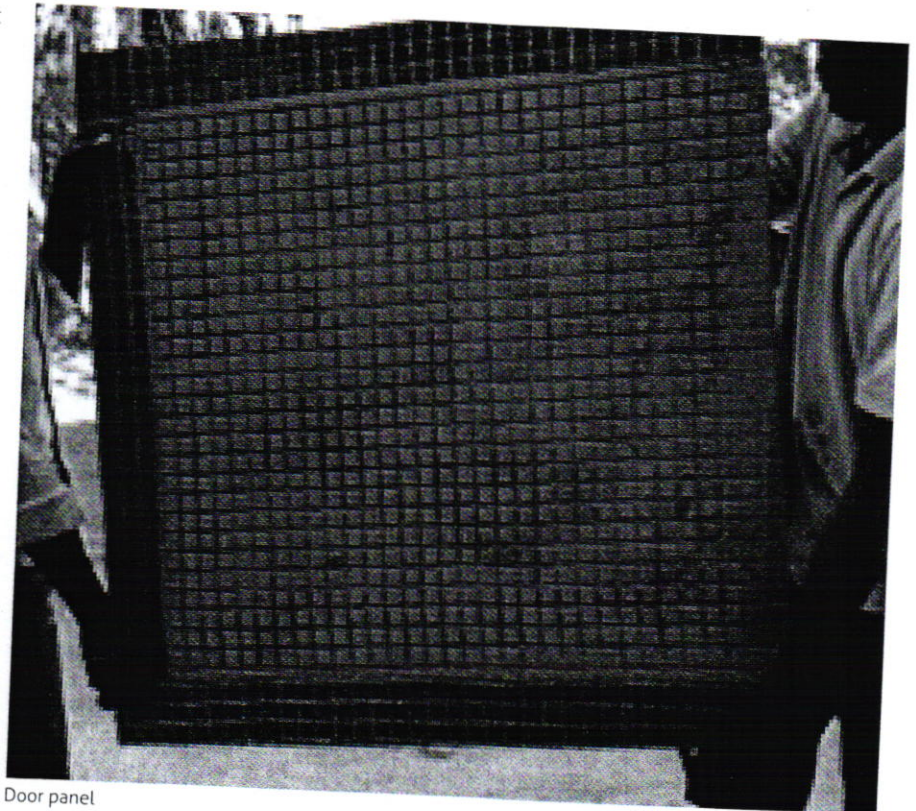


Innovative and Easy to Construct Textile Reinforced Concrete Toilet- An Indian Context

By: CSIR-Structural Engineering Research Centre, Chennai

Towards infrastructure improvement in urban and rural India, there is an urgent need for innovative and sustainable fast-track construction methods and products at affordable cost. At present, the majority of the construction in India is done as cast-in-situ. Although there has been a substantial rise in precast construction in the last decade, it forms only a small percentage of the total construction market. This is mainly because of the general reluctance of stakeholders to adapt to non-conventional construction material like textile reinforced concrete (TRC), which has already established its mark at the global level. In addition, considering the fast depletion of conventional construction materials in our country, there is an immediate need to find and use alternate construction materials.

Textile reinforced concrete (TRC) is the building material that consists of fine-grained cementitious binder and non-metallic textile as reinforcement. TRC and the associated new manufacturing technologies can lead up to 60% reduction in concrete consumption and thereby in embodied energy also giving way to



Door panel



Wall panels

sustainability and affordability besides enhancement in durability and a considerable reduction in end-of-life waste. TRC further offers the flexibility and freedom to design many new products. CSIR-SERC, Chennai, has developed Textile reinforced concrete prototyping technology (TRCPT) (Indian patent application 2751DEL2014), which can be used to produce various TRC products and has the potential to serve as an effective indigenous technological revolution in the precast construction industry. Using TRCPT, TRC sheets are prototyped to produce products of various shapes and forms. These products can be custom-made by appropriately choosing the cementitious matrix and textile combinations, leading to vast application potential.

TRCPT completely replaces the conventional method of concrete construction that requires moulds and can be used at sites as well as in precast plants. Unskilled manpower with proper supervision is enough for the production of TRC panels to meet the customised demand of the infrastructure requirements.

A TRC toilet was constructed with TRC panels manufactured using TRCPT. All the components except the supporting frame are made of TRC panels. These panels are lightweight, non-corrosive, durable and cost-effective. TRC panels are used as wall, roof, door and base of the toilet. The total weight of TRC panels in the toilet is around 500 kg and 2 persons can complete the entire installation in just 4 hours

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