Flexural Behavior of Eco-Friendly Prefabricated Low Cost Bamboo Reinforced Wall Panels

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Abstract: Precast concrete construction is the most commonly used technique for a rapid construction. This technique is very frequently used in the developed countries. Different guidelines required to utilize the potential of prefabricated construction are still not available in the developing countries. This causes over dependence on in-situ construction procedure which further affects the quality, scheduling, and duration of construction. Also with the ever increasing costs of building materials and their negative impact on the environment it has become imperative to look out for alternate construction materials which are cheap and sustainable. Bamboo and fly ash are alternate construction materials having great potential in the construction industry. Thus there is a great need to develop prefabricated components by utilizing the potential of these materials. Bamboo reinforced beams, bamboo reinforced columns and bamboo arches as researched previously have shown great prospects for prefabricated construction industry. But, many other prefabricated components still need to be studied and widely tested before their utilization in the prefabricated construction industry. In the present study, authors have showcased prefabricated bamboo reinforced wall panel for the prefabricated construction industry. It presents a detailed methodology for the development of such prefabricated panels. It also presents the flexural behavior of such panels as tested under flexural loads following ASTM guidelines. It was observed that these wall panels are much flexible and do not show brittle failure as observed in traditional brick walls. It was observed that prefabricated walls are about 42% cheaper as compared to conventional brick walls. It was also observed that prefabricated walls are considerably lighter in weight and are environment friendly. It was thus concluded that this type of wall panels are an excellent alternative for partition brick walls.

Keywords : bamboo, prefabricated walls, reinforced structure, sustainable infrastructure

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1