

## Developing Pre-Cast Partition Wall Panels Using Mud-Concrete (MC) Technology

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The growing emphasis on sustainable building materials has sparked interest in earth walling systems. The Mud-Concrete (MC) technology, combining concrete's strength and durability with traditional mud-based construction methods, offers an affordable, load-bearing wall system for indoor comfort. However, challenges arise when creating thin non-load-bearing walls due to shrinkage-related defects. This study explored the development of partition wall panels using Mud-Concrete technology, focusing on thickness reduction and robust construction systems. The methodology of the study involved experimental testing such as compressive strength test and flexural strength test of series of mix design adjustments on the purpose of reducing the thickness from 50% (from 150 mm to 75mm thickness) for the non-load bearing partition wall. The results concluded that the mix design can be improved as fine  $\leq 10\%$  ( $\leq$  sieve size 0.425mm), sand 55-60% (sieve size 0.425mm  $\leq$  sand  $\leq$  4.75 mm), gravel 30-35% (sieve size 4.75mm  $\leq$  gravel  $\leq$  20mm), cement 8% (minimum), bamboo fibre 2% (Particle size 10mm-25mm) and water 18% to 20% from the dry mix while arranging the 5-8mm thick, 10mm width bamboo strips creating a 150mm x 150mm mesh in the centre of 75mm thick precast Mud-Concrete non-load bearing wall panel. The study also proposes robust construction systems, joineries, and accessories for the installation process. Finally, the outcome offers methods to reduce the virgin material usability in manufacturing process such as the thin Mud-Concrete panels helping to utilize the interior spaces effectively in constructions.

**Keywords:** *Mud-Concrete (MC), Wall thickness, Partition wall panels, Earthen constructions, Bamboo reinforcement, Bamboo fibre, Non-load bearing walls*