

## DESIGN AND DEVELOPMENT OF PADDY STORAGE STRUCTURE FOR KONKAN REGION

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### ABSTRACT

Improved on farm structure of 1 tonne capacity from locally available laterite stone was designed. Engineering properties of the paddy (variety R-117) and the laterite stone were determined. The engineering properties of the laterite stone were recorded as compressive strength ( $210 \text{ N/cm}^2$ ) and water absorption (3.78%). Rankine's theory was used to design the height and diameter of the bin. Safe height of the bin was 1.6 m and the diameter was 1.2 m. Maximum lateral pressure exerted by the paddy grains on the wall of the bin of the designed dimensions was  $248.78 \text{ kg m}^{-2}$ . Design wall thickness, depth of foundation and total load supported by the foundation was 150 mm, 750 mm and  $7935.93 \text{ kg m}^{-2}$ , respectively. Roof of the bin was designed as a circular R. C. C. slab with its Design thickness of 100 mm and design diameter of the reinforcement was 6 mm with 140 mm c/c spacing. Total span of the roof is 2 m with 0.2 m overhangs. Laterite bin was constructed according to the dimensions determined by calculations. The total cost of the structure is ₹ 7525. Average paddy temperature remains nearly constant throughout the day. Axial temperature was greater than the peripheral because of heat added by the respiration of the paddy grains. Average moisture content of the paddy in the top layer was greater than that in the bottom layer. Moisture gradient due to difference in relative humidity has might have resulted in wetting upper paddy to become wet. Relative humidity inside the bin was greater than the outside because of vapour addition by the respiration of the stored paddy.

**KEYWORDS:** Design, Development, Paddy Storage Structure Low Cost, Moisture Content