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Utilization of Manila Clam Shells (Venerupis Philippinarum) and Raffia Palm Fiber (Raphia Farinifera) as an Additive in Producing Concrete Roof Tiles

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Abstract : Roof tiles, as integral components of buildings, play a crucial role in protecting structures from many things. The study focuses on the production of sustainable roof tiles that address the waste disposal challenges associated with Manila clam shells and mitigate the environmental impact of conventional roof tile materials. Various concentrations of roof tiles are developed, incorporating different proportions of powdered clam shell that contains calcium carbonate and shredded raffia palm fiber. Subsequently, the roof tiles are cast using standard methods and transported to the University of the Philippines Institute of Civil Engineering (UP-ICE) for flexural strength testing. In conclusion, the research aimed to assess the flexural durability of concrete roof tiles with varying concentrations of Raffia Palm Fiber and Manila Clam Shells additives. The findings indicate notable differences in maximum load capacities among the specimens, with C3.1 emerging as the concentration with the highest load-bearing capacity at 313.59729 N. This concentration, with a flexural strength of 2.15214, is identified as the most durable option, with a slightly heavier weight of 1.10 kg. On the other hand, C2.2, with a flexural strength of 0.366 and a weight of 0.80 kg, is highlighted for its impressive durability performance while maintaining a lighter composition. Therefore, for the production of concrete roof tile, C3.1 is recommended for optimal durability, while C2.2 is suggested as a preferable option considering both durability and lightweight characteristics.

Keywords : raffia palm fiber, flexural strength, lightweightness, Manila Clam Shells
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