DEVELOPMENT OF CELLULOSE FIBER REINFORCED SOIL-BASED COMPOSITE WALL PANELS USING SELECTED LIGNOCELLULOSIS MATERIALS

W.M.I.S. Jayaweera, M.M.H. Malshan, G.I.P. De Silva*, T.N. Fernando

Department of Materials Science and Engineering, University of Moratuwa, Sri Lanka

**Email: indikagip@uom.lk*

The present study focuses on preparation of composite wall panels, reinforcing with three different pre-treated lignocellulosic material fibers - bagasse (B), paddy straw (PS), and banana stem (BS). Soil-based composite wall panels were prepared by mixing cement, laterite soil, and lignocellulosic materials in the weight ratios of 1: 1: 0.025. Morphological characteristics, water absorption, flexural strength, and thermal conductivity were tested in prepared wall panels after keeping at curing period of 28 days. The characterization results of molded wall panels indicate the variation of flexural strength as 1.85 - 4.05 MPa, percentage of water absorption as 14.7-20.2% and thermal conductivity as 0.131 -0.252 W/mk. The characteristics of some molded wall panels prepared in the present study were at a satisfactory level compared to the market available wall panels.

Keywords: Wall panel, Composite cement mixer, Lignocellulosic materials, Cellulose fibers