DEVELOPMENT OF AN EXTRUDING MACHINE TO PRODUCE INTERLOCK BRICKS FROM SAND AND PLASTIC WASTE

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ABSTRACT

stic production comes from fossil fuels and they are non-biodegradable, thus resulting into stes that cause nuisance in the environment. Therefore, utilizing the plastic waste as rnative construction materials is a good waste management solution. This research work elopment of an extruding machine to produce interlock bricks from sand and plastic waste. extruder was designed and fabricated following standard design specifications parameters. machine was equipped with a temperature controller, a thermocouple, a band heater, a tactor, a switch, an electric motor and a voltage regulator. Five experimental stages were sidered, each stage having a study sample and a control sample. Stages 1, 2, 3, 4 and 5 had a entage mix ratios of 70:30, 60:40, 50:50, 40:60 and 30:70 sand to waste plastic, respectively, which the control samples were made using Portland cement as the binder and the study ples were made with melted waste plastic as binder. The samples were subjected to pressive strength, water absorption and absorption resistance tests for the samples and trols. The results revealed that compressive strengths for the study samples were: 10.29, 2, 20.25, 20.94 and 17.37 N/mm^2, while the values for the control samples were: 16.45, 1, 24.58, 30.33 and 32.27 N/mm^2 for the above mentioned mix ratios respectively. The lock bricks made from Portland cement had better compressive strength in all stages pared to the samples made with waste plastics, the maximum compressive strength obtained the controls was 32.27 N/mm^2 while that of waste plastic was 20.94 N/mm^2 which is far ter than the minimum standard (17 N/mm^2) recommended for concrete The maximum entage of water absorption for the control samples and study samples were 4.0 and 1.5%, ctively. However, the maximum water absorption resistance percentages for control les and study samples were 0.2% and 7.2%, respectively. The optimum percentage mix

o obtained from this research was 40:60 mix ratio of waste plastic to sand, with a mpressive strength value of 20.94 N/mm^2, for effective binding with the sand and the waste stic should not be less than 40% of the mixture. The study found that the developed extruding chine was able to produce melted plastic that binds sand for the production of interlock bricks.