



ABSTRACT

One of the salient features of the demands of human beings to survive are the need to satisfy convenience in terms of food and infrastructure associated with plastic waste management and concrete hollow block consumption, respectively. While studies proposing solutions to both demands thrive, there is a dearth in the utilization of plastic pellets using polyvinyl chloride (PVC) and polystyrene (PS) in concrete hollow blocks. Thus, to fill in this research gap, the study aimed (1) to characterize PVC and PS pellets; and (2) to evaluate and to compare their potentials when incorporated as fine aggregates in terms of workability and compressive strength. The PVC and PS plastics were pelletized through a grinding machine, characterized in the laboratory, and used as substitute to sand to obtain two experimental groups with five batches of each specimen having 0%, 10%, 20%, and 30% of each type of pellet by volume which were molded and cured for 28 days. Workability and compressive strength were identified using slump cone and universal testing machine, respectively, and compared. Results revealed that PVC absorbs more and sinks in water while PS absorbs less and floats in water as aggregate substitutes. Generally, workability of both experimental groups increases linearly as the percentage substitution of plastic pellets increase with values suitable for road construction. The compressive strengths of PVC experimental group drop linearly with increasing pellet substitution and less than the minimum acceptable value. Meanwhile, batch with 30% PS pellets obtained the highest compressive strength among the experimental group and greater than the minimum acceptable value. This implies that incorporation of PS pellets can be a promising solution to plastic waste management and stronger concrete hollow blocks.

Key terms: Plastic utensil, wire cable insulation, slump value, compressive load