Improvement of Waste Aggregates for Road Construction by Coating with Polythene

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The plastic waste and its disposal is a main threat to the environment. Since plastic shows bituminous properties, it has been used as a coating material of aggregates to improve the strength of the aggregates. Significant amount of manufactured aggregate is discarded as waste due to its poor quality. The coating the poor quality aggregate with polythene may enhance its properties. In this study, aggregate types, namely, hornblende biotite gneiss and charnockite, with poor quality than recommended by international standards, were coated with different polythene contents using dry method. Improvement of Los Angeles Abrasion Value (LAAV), Aggregate Impact Value (AIV), and Aggregate Crushing Value (AIV) were investigated. Interestingly, coated aggregates showed improved LAAV, AIV and ACV values. When the polythene content (w/w %) increased from 0 to 15% at 5% intervals, LAAV, AIV and ACV values increased linearly for both aggregate types. When, hornblende biotite gneiss was coated with 15% polythene content, the LAAV, AIV and ACV were improved by 74%, 73%, and 60%, respectively. In addition, charnockite which was coated with 15% polythene content showed improvement of the LAAV, AIV and ACV by 78%, 41%, and 32%, respectively. Therefore, results of this study revealed that the wasted aggregate due to non-meeting the recommended properties could be improved using polythene as a coating material. However, further studies are needed to be conducted to investigate the interaction of polythene coasted aggregate with other construction materials.

Key words: Unsuitable aggregate; polythene coating; property improving; road construction