Environmental Engineering and Management Journal xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
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SOIL IMPROVEMENT CHARACTERISTICS OF POLYETHYLENE TEREPHTHALATE WASTES

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Abstract

In this study, engineering properties of pure fine and coarse grained recycling waste of Polyethylene Terephthalate bottles as were investigated possibilities of their as lightweight fill material for different engineering applications (clay cores of earth fill dams, highway embankments, and backfills behind retaining structures). Various geotechnical tests were performed on the clayey soil, using recycling pure fine and coarse granulars of Polyethylene Terephthalate bottles) and soil-pet mixtures. The results indicated that the use of used recycling Polyethylene Terephthalate bottles mixed with clayey soils as a fill material is possible. The compaction test results indicate that the optimum dry densities of the pet mixtures are less than the optimum dry density of typical soils including the clayey soil used in this study (varying between 13.83 kN/m^3 and 12.55 kN/m^3). P-wave velocities values were correlated the pet mixtures. The results indicate that there are coefficient of determination between P-wave velocity values and pet mixtures percentage varies between R^2=0.93 to R^2=0.73. Finally, the results show a good potential for using the waste pet as lightweight fill material.

Key words: embankment, lightweight fill, Polyethylene Terephthalate bottles, recycling, soil improvement

Received: July, 2015; Revised final: January, 2016; Accepted: March, 2016

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