Resistance of Building Materials from Recycled Rubble using Lime

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Abstract

Objectives: Recycling the waste materials and debris especially rubbles from demolished buildings. Methods: Environmental problems that have emerged by the non-normative and non-technical disposal of materials, has attracted researchers attention to the recycling of these materials. Available statistics on the composition of the rubbles from buildings in large cities show that bricks and mortar sand, cement, concrete, tile and soil are five main materials of construction rubbles. In this research the possibility of recycling these materials and using them after consolidation and improvement in the litter layer were examined, and to enhance the quality of the materials lime was used for stabilization. Results: Addition of lime increases CBR as well as the resistance of uniaxial compressive of these materials.

Keywords: Anomaly Detection, Data Mining, Healthcare Fraud, Outlier Detection, Unsupervised Method

1. Introduction

In developing countries, construction rubbles occupy the large proportion of municipal solid waste, in addition to high costs for the disposal, they have adverse consequences for the environment. The volume of construction rubble is to the extent that, in all developed countries has become a social and environmental problem1-4. Construction rubble recycling, not only helps to preserve natural resources and the environment, but also by applying scientific methods makes below economic senses:

- Due to urban development and expansion and increased distance of carrying rubbles from city centers to out of the city, this plan is highly economic due to increasing fuel prices and rising land prices and also the lack of vehicle depreciation and time-saving.
- Loading and transport of materials naturally creates problems for cleaning the town that can be prevented.
- Transportation for the means of carrying rubbles causes traffic, air pollution and also pavement damage that can be avoided by this project.
- Removal of rubbles from the site and replacing with high quality and standard materials, allocate high costs in road construction. It is also possible that near the project site there are no suitable materials.
- On the other hand excessive exploitation of natural resources to build roads, production of concrete, bricks and other building materials, causes shortage of natural materials, after which it can be prevented.
- Since chemicals are used in building materials, we can refer to injuries that can harm the environment and surface water caused by burying rubbles that can be prevented by this project5-6.
- Reduce health risks and issues.
- Prevent inappropriate landscape around the city.
- Stipulation and the benefit of restoration of damaged roads to execute passive defense.

In addition to the issues, due to the growing need to construction materials, harvesting of natural resources, which often exist in the along river, causes dangerous floods. It is clear that recycling rubble costs a lot which cannot be justified economically in the short term, but the increasing