

Sustainable Pavement Construction Using Polyethylene Terephthalate (PET) Polymer Waste (Plastic Bottle) as Soil Stabilizer

Eduardo B. Leron*, N.T. Aldeguer, M.D.J. Aposacas, J.R.G. Cruz, A.O. Rosario

Department of Environmental sciences, University of the East Caloocan, Geneva, Philippines

Commentary Article

Received: 02/03/2021

Accepted: 16/03/2021

Published: 23/03/2021

*For Correspondence:

Eduardo B. Leron,
Department of Environmental
sciences, University of the East
Caloocan, Geneva, Philippines

E-mail: jayr.leron@gmail.com

Keywords: Climatic patterns;
Freshwater; Reproduction;
Endocrine; Phenology

ABSTRACT

Plastic products make the daily life of people convenient as it has become part of society's basic need. The Philippines, having a crisis on ocean pollution is now classified as one of the massive sources of plastic waste to international waters. However, disposing plastic wastes became a problem to people, the immense amount of plastic waste is constantly increasing. Thus, maximizing the efficiency of plastic through using it as an additive for soil stabilizer.

INTRODUCTION

The purpose of this study is to improve the soil properties by using the strips of Polyethylene Terephthalate (PET) Polymer Waste (Plastic Bottles) as soil stabilizer for sustainable pavement construction. An amount of 2%, 3%, and 5% of Polyethylene Terephthalate (PET) Polymer Waste (Plastic Bottles) with 3% of cement as per recommended by Bureau of Research and Standards (BRS) is used as soil stabilizer for sustainable pavement construction. Results of CBR and MDR with the inclusion of PET strips in soil with appropriate amount improves strength and deformation behavior of the soil. The stabilization using waste plastic strips is an economic method since the stabilizer used here is waste plastic materials, which are easily and cheaply available. In addition, it can be used to advantage in embankment/road construction.

Plastic wastes represent an excellent nuisance to the atmosphere in each developed and developing countries. This analysis showcased AN environmentally-friendly means of utilizing these wastes for construction in 2 alternative ways.

First, utilizing liquid plastic bottle wastes to coat the aggregates utilized in versatile construction and second, mistreatment liquid plastic wastes to exchange the asphalt cement. The results showed that the hydrocarbon mineral concrete created mistreatment the plastic-coated aggregates was able to utilize additional plastic wastes compared to the plastic-modified hydrocarbon.

However, the plastic-modified hydrocarbon knowledgeable additional stability, though they were shut. In summary, hydrocarbon created mistreatment the 2 strategies were found to exhibit higher properties compared to the traditional hydrocarbon.

It's counseled that government and construction firms ought to embrace exercise of plastic wastes in construction to induce obviate these wastes and improve the protection and repair lives of our roads. Sustainable, eco-friendly construction is increasingly progressively more and additional receiving more attention globally in each developed and developing countries and among numerous stakeholders like non-public and public sectors and governments. it's driven mostly partially by the rise in demand and opportunities to inexperienced our infrastructures and scale back environmental impacts of construction, adjustment take into account road infrastructures, and innovative practices that area unit unceasingly churned out across the world.

It's additionally spurred by the rise in demand for eco-cities and eco-developments that area unit additional environmentally friendly than before. Eco-friendly construction also can be viewed as a response of stakeholders to the necessitate property development that arose from growing awareness of the negative impact of construction on the environment. Eco-friendly construction is one that's helpful or non-harmful to the surroundings and is energy and resource economical. For any construction to be eco-friendly, it should imbibe sure basic components, namely: eco-design, eco-extraction, eco-manufacturing, eco-construction, eco-rehabilitation, eco-maintenance, eco-demolition, and socioeconomic authorization while not compromising all performance standards.

In terms of eco-design, it suggests that the development style should create provision for utilization of waste materials and should be designed to reduce negative impact on the surroundings. Eco-extraction suggests that there ought to be nominal extraction and nominal use of virgin materials. Furthermore, eco-manufacturing means the producing of the construction materials ought to be done at vasoconstrictor, ought to have reduced odor, smoke, fuel consumption, and emissions.

Eco-construction suggests that eco-friendly, recycled merchandise ought to be used, ought to minimize delay of traffic and inconvenience to traffic users whereas health and safety of the staff is given a high priority, nominal contamination of run-off, minimal impact on natural habitations like noise, pollution, and vibration, and optimum use of domestically accessible materials.

Eco-construction conjointly includes utilization of different and innovative technologies like geotextiles, geopolymers, low-carbon concretes, enzymes, and natural and artificial chemicals to enhance and stabilize the soil structure like the subgrade, sub-base, and base course and different hydrocarbon materials like vegecol, ecopave, greenpave technology, and coolpave.

A comprehensive analysis of the impact of climate change on the reproduction of freshwater fish is presented, primarily to deduce the expected changes and related results. This analysis was performed using knowledge from various scientific articles and literature published in various ways in peer-reviewed journals, Google Scholar, Semantic Scholar, Elsevier, Research Gate, Science Direct, Springer, magazines, reports, and news media.

CONCLUSION

Socioeconomic authorization entails cooperative, democratic approach via sharing best practices that results in socioeconomic authorization of native communities through their inclusion within the style and construction processes and their coaching and development that engender local street possession and experience additionally, adoption of phased construction, utilization of autochthonous information and native labor also as suburbanized project management through the employment of community-based organization contribute to the socioeconomic authorization of affected and engaged communities.