17th Symposium on Earthquake Engineering
November 14-17, 2022
IIT Roorkee, India
Paper No. 354

Numerical Analysis of a Rigid Wall Retaining Soil Reinforced With C&D Waste

A R Prajapati[1], Hasan Rangwala[1]

[1]Nirma University, Ahmedabad, Gujarat, India

Abstract

The enormous population growth brings some environmental concerns due to the need for exploitation of natural resources, and the implementation of recycling programmes is a fundamental element for achieving sustainable development. Natural well-graded readily draining granular materials such as sand are commonly employed as filling materials for various geotechnical structures. But, because of the shortage of perfect granular materials, the researchers were forced to look into other options. However, because granular material is in high demand, unlawful sand dredging from riverbeds is becoming more popular. The construction sector generates a huge amount of construction and demolition waste (CDW) in India and other areas of the world, which is created by operations such as demolition, excavation, site preparation, and other activities. The paper highlights the possibility of using CDW as a sustainable reinforced backfill material for retaining walls. The geotechnical properties of CDW, soil and mixture of both were determined and observed that it meets the requirements of backfill material for retaining walls. Further, the numerical studies were conducted to study the static and dynamic behaviour of retaining walls with an optimum dosage of CDW in soil for backfill, using a finite element (FE) analysis GEO5 software. The paper emphasises the potential application of CDW as a sustainable reinforced backfill material for retaining walls in dynamic condition.

Keywords: Construction & demolition waste, Numerical analysis, Retaining wall, GEO5 software