

Annals of Civil and Environmental Engineering

Volume - 2, Issue - 1

Review Article **Published Date:- 2018-08-13**

[Effect of cement solidification on strength and leaching properties of Heavy Metals Contaminated Soil](#)

This study investigated the effect of Portland cement on stabilization of heavy metal contaminated clayey soils that may give range of geo environmental benefits. The absolute concentration of heavy metals: Lead (Pb), Zinc (Zn), Chromium (Cr), Cadmium (Cd) and Copper (Cu) were measured using an inductively coupled plasma atomic emission spectroscopy (ICP-AES). A series of laboratory scale experiments such as unconfined compression test (UCT), pH test and synthetic precipitation leaching procedure (SPLP) were performed to study the effects of curing time and cement content on the unconfined compressive strength (UCS) and leaching characteristics of heavy metals. According to results, excessive concentration of heavy metals are present in the topsoil of Shanghai Jiao Tong University (SJTU) among which Pb, Zn and Cd were most prominent. Other test results showed that the dry density of both C4 and C8 soil samples increases with curing time. Similarly the compressive strength (q_u) of C4 and C8 samples at 21 d of curing increases by 40% (113 kPa-288 kPa) and 15% (745kPa-864 kPa) respectively, as compared to the 7 d of curing. Besides, the test results showed a prominent decrease in the leached concentration of heavy metals with increasing curing time.

Review Article **Published Date:- 2018-06-22**

[Use of Geosynthetic materials in solid waste landfill design: A review of geosynthetic related stability issues](#)

Geosynthetics used in landfills provides a technical and economic advantages over traditional clay liners. It may create stability issue and even lead to landfill failure due to its low interface or internal shear strength if improperly designed and/or constructed. The most common failure mechanism in geosynthetic-lined landfills is transitional failure involving waste and bottom liner (deep-seated failure) or only final cover system (shallow failure). Shear strengths of geosynthetic-geosynthetic and geosynthetic-soil have a wide range of variations. Shear strengths of interface from literature may be used in preliminary design. For final design, site-specific interface shear strengths shall be used. Internal shear strengths of unreinforced geosynthetic clay liner (GCL) are less than those of reinforced GCLs. Unreinforced GCLs are not recommended for slopes steeper than 1:10 (1 Vertical and 10 Horizontal). Peak shear strength of interface and internal GCLs can be used in bottom liner; residual shear strength of interface and internal GCLs shall be used for geosynthetic placed along the slopes. Site-specific shear strengths of waste are recommended to be used in the design. Landfill failure could be triggered by static loadings including excessive leachate, pore pressure above the bottom liners, gas pressure, and excessive wetness of the geomembrane-GCL, and earthquake loading. The factor of safety of 1.5 is recommended for static loading and 1.0 for earthquake loading. A higher factor of safety is recommended if a failure could have a catastrophic effect on human health or the environment, and if large uncertainty exists in input parameters to calculate the factors of safety. The main objective of this review article is to provide a comprehensive knowledge of slope failure mechanisms, causes, and probable remedies in one place.

Research Article **Published Date:- 2018-05-04**

[Automatic control and protection of Coal Conveyor System using PIC](#)

The Coal conveyor system forms an integral part in Thermal Power plant owing to the fact that the overall efficiency of the plant is dependent on the rate at which the coal is carried to the crusher unit. But, as of now, only manual labors are employed to regularly monitor the operation of conveyor system which is highly risky. Hence, by means of a Microcontroller like PIC makes the controlling process much easier. The flaws that occur in the conveyor system are mostly due to the temperature at which the coal is carried and also due to the attrition in the belt. By means of a Temperature sensor and an IR sensor this could be regularly monitored and during any abnormal situation, this initiate Cooling fan in case of high temperature and signals an alarm whenever there is any fault in the system.
