

# STABILIZATION OF DUMP YARD SOIL USING FLY ASH

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## **Keywords:**

Stabilization, Flyash, Dumpyard, Soil (Untreated), Unconfined, Compressive Strength (Ucs).

## **Introduction:**

Soil is one of the world's most important and natural resources, together with air and water. Soil is the upper part of the earth's crust and supports our life supplies through chemical, biological and physical factors. Soil is a natural body that consist of layers composed primarily of minerals which differ from parent materials in their texture. Soil is a major concern in the battel against environment disaster. The sole purpose of the experimental study conducted was to study the properties of dump yard soil and to carry out the stabilization and neutralization process. Here the stabilization process is carried out by adding fly ash in different proportions. A landfill site, also known as a tip, dump, rubbish dump, garbage dump, or dumping ground, is a site for the disposal of waste materials. Some landfill sites are used for waste management purposes, such as temporary storage, consolidation and transfer, or for various stages of processing waste material, such as sorting, treatment, or recycling. Unless they are stabilized, landfills may undergo severe shaking or soil liquefaction of the ground during an earthquake. Once full, the area over a landfill site may be reclaimed for other uses. The soil which is collected from the garbage can also be treated and further used in the construction activities.

## **Objectives:**

- To study effect of fly ash on unconfined compressive strength of soil.
- To study the impact of fly ash on stabilization process of dumpyard soil.
- Study of geotechnical properties of soil is very important for designing the various structures.
- On growing population and use of things is increased the waste is also

increased and good solution to remove the dump waste.

### Materials:

Illegal dumping of municipal (dumped waste) This was brought in by the municipal and act lorries before the land fill was in operation. From this heap sufficient quantity of dumped waste is collected and kept in closed bags and carried out to the laboratory for testing. Fly ash is produced by the coal-fired electric and steam generating plants. Typically, coal is pulverized and blown with air into the boilers combustion chamber where it immediately ignites generating heat and producing a molten mineral residue to harden and form ash.

### Methodology:

The laboratory tests were carried out on dump yard soil blended with fly ash. Later stabilization process was carried out on dump yard soil with fly ash mixing it with the different percentages like 10%, 20%, 30%, 40%. And to determine the strength of dump yard soil when blended with fly ash according to the standard percentage of fly ash by conduction of unconfined compressive strength test. The test result of all mixtures are compared and the optimum mix is identified.



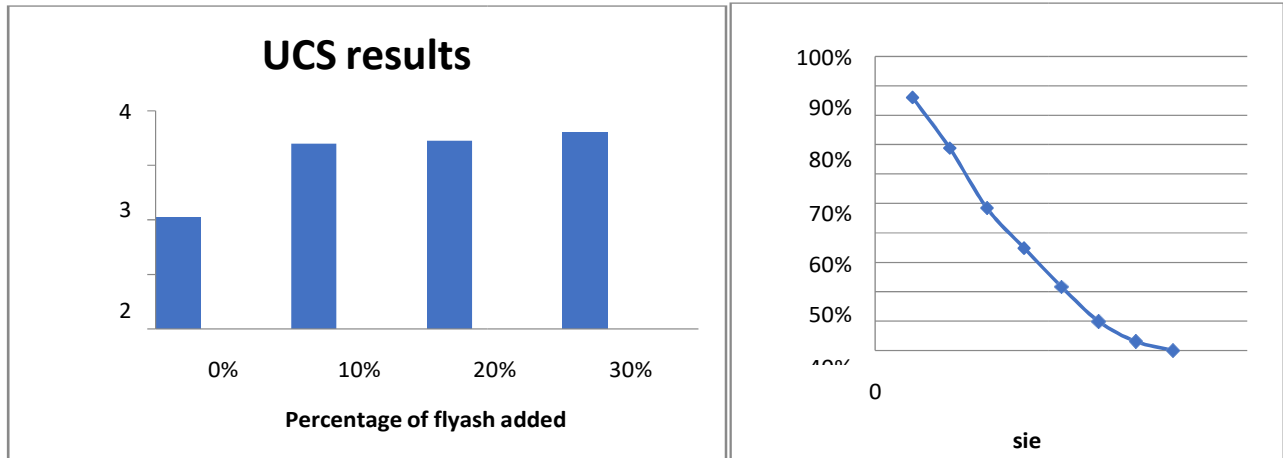
Figure 1: Unconfined compressive strength test specimen

### Results and Discussion: Table 1 Basic Test

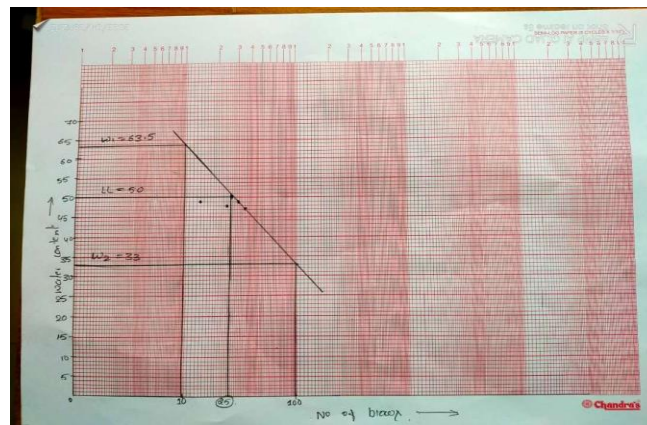
BASIC TESTS	RESULTS
Specific gravity of soil (untreated)	2.15
Specific gravity of fly ash	2.3
Grain size analysis (coefficient of uniformity)	11.07
(coefficient of curvature)	0.65
Plastic limit	50
Liquid limit	22.3%

**Table 2: UCS test results**

SI no	% of fly ash	Result
1	0%	2.041 kg/cm <sup>2</sup>
2	10%	3.401 kg/cm <sup>2</sup>
3	20%	3.45 kg/cm <sup>2</sup>
4	30%	3.6 kg/cm <sup>2</sup>



**Figure 2: Grain size analysis**



**Figure 3: Liquid limit**

**Conclusion:**

1. The main aim of this experiment is to determine the unconfined compressive strength of the dumpyard soil (untreated) using fly ash. Fly ash if fused with untreated dumpyard soil in four different percentages like 10%, 20%, 30% and 40%.
2. We found the results, shows that the unconfined compressive strength of the soil increases with the increase in fly ash content at some extent.

3. High strength was gained at fly ash content of 30% and moderate strength was gained at fly ash content at 10%. When 40% of fly ash added to the untreated soil, due to high content of fly ash the specimen for unconfined strength fails because of less cohesion in the soil.

**Scope of Future Work:**

- Flyash can be used in the stabilisation of dumpyard soil
- It can be a good way for the disposal of the flyash