

**FINAL YEAR PROJECT REPORT
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**EFFECT OF CONTAMINANT ON SHEAR STRENGTH
PROPERTIES OF SOIL OF A LANDFILL SITE**

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ABSTRACT

Landfill sites have been used for many years for the disposal of industrial and domestic wastes. It is anticipated that sanitary landfill would be the most cost effective means for disposing solid wastes. Landfill site located at Bt. 10, Jalan Bukit Kemuning, Kelang which cover 12 acres of the area was selected for this purpose of study because the site was expected to be completely closed in June, 1996.

An experimental-based project was conducted on samples of contaminated soils to investigate the effect of the leachate on the shear strength properties of the underlying soil of the landfill site. Soil samples were taken from site and were tested in soil laboratory. The types of test conducted were Particle size analysis, Oedometer Consolidation test, Triaxial Compression test, Atterberg Limit test.

From test results, most of the soil was predominantly sand with no fraction of clay. The soil strength parameters showed that the value of cohesion was 20 kPa on average and the frictional angle was 25 degrees for soil affected by leachate and 5 degrees for original soil. It seems that the soil shear strength was more affected by the angle of internal friction than the cohesion of the soil. Soil particles affected by leachate were generally more stable as these can contribute to the chemical bonding of the aggregates. The degree of soil erodibility of the area was medium and this is justified by the existence of rill erosion.

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CHAPTER 1

INTRODUCTION

1.1 GENERAL

One of the most pressing problems facing municipalities is the efficient and long-term disposal of urban solid waste. The disposal of solid wastes, once taken for granted, has become an issue of immense proportions. More and more these problems are in the news, with the political concerns overshadowing the technical and economic issues. Construction and operation of landfills, material recovery systems, and incineration systems have become costly. Because these systems are unpopular with the general public as a method for solid waste disposal, obtaining sites for new facilities has become very difficult. This resistance to the development of new facilities has imposed a capacity limitation on the existing facilities and caused a significant increase in the cost of refuse disposal in recent years. In the proposed project, a study would be made on a site near Kelang which is owned by Majlis Perbandaran Shah Alam (MPSA). The location plan is shown in Fig 1-1.

In Malaysia commonly, Landfill sites have been used for many years for the disposal of wastes be it industrial or domestic such as rubbish, chemical or biological. As a results of rainfall and chemical composition of the wastes themselves leachate (a by product of chemical reaction which takes place) seeps into the ground if the site is not lined. As a developing country, many sites have been reclaimed for housing, industrial and recreational purposes. The project will investigate the effect of this leachate on the shear strength properties of the underlying soil of the landfill site. A landfill area has been identified for the purpose of this study (Fig. 1-2).

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