

CHAPTER I

INTRODUCTION

One of the factors that contributes its function to the behavior of the soil particle relative to the influence of the mass forces is the specific surface. The specific surface is defined as the magnitude of the surface area per mass or is sometime defined as surface area per volume. In general the specific surface becomes greater as the particle size becomes smaller. The specific surface ranges from less than $1 \text{ m}^2/\text{gm}$ for silty and sandy sized particles up to about $800 \text{ m}^2/\text{gm}$ for colloidal sized particle. Several methods have been used for surface area determination of particles, the three most commonly used methods are: the fluid flow method, gas adsorption method and sorption from the liquid phase method. The fluid flow method or permeability method is useful for measuring external surface area, whereas the others indicate the totality of external surface area and the surface area presented by internal capillary cracks along grain boundaries.

In order to determine the specific surface of soil and other packed material directly, the apparatus for this matter should be developed. The advantages of this type of apparatus are more simple in construction, portable, easy to operate and if carefully used, it yields result with the good accuracy. With the specific surface value obtained, the quality of several product from manufactures can be controlled, and this specific surface value applied to

contribute the stabilazation of soils with some binder materials. In other cases the specific surface value will be used to indicate the fineness of soils, the swell and shrinkage properties and the water absorption ability of fine grained soil.

Purpose and Scope of Work

The purpose of this study are to determine the specific surface of various size of soil particle by using three sizes of Blaine's air-permeability (0.40, 0.80 and 2.0 cm. inside diameter) and finding the suitable range of particle size used with each size of the apparatus. The effect of the glass tube diameter on the fineness of soils will be studied. The results from air-permeability method will be compared with the calculated results from sedimentation method. Also in this work the Blaine's air-permeability apparatus for measuring the specific surface of soils will be developed and calibrated with the standard cement fineness.