COMPRESSIBILITY OF SANDY SOILS

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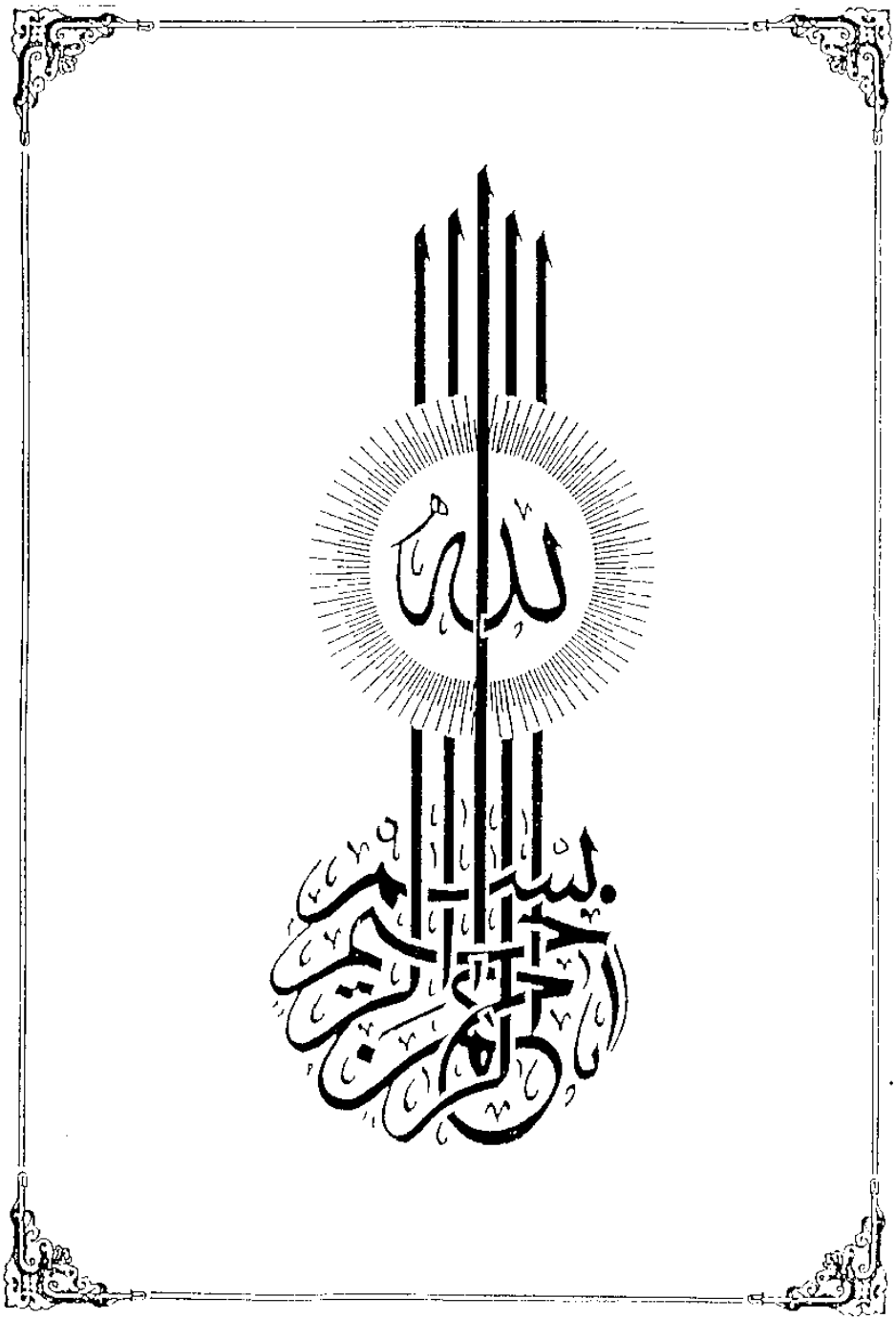

CONTENTS

LIST OF FIGURES

LIST OF TABLES

LIST OF PICTURES

NOTATIONS

a	parameter in equation (30), page 19
c	parameter in equation (30), page 19
D_r (%)	relative density
d_{10} (mm)	effective grain size = grain size at which 10 percent of the material is smaller
d_{30} (mm)	is the size of which 30 percent of the material is smaller
d_{60} (mm)	is the size of which 60 percent of the material is smaller
E (kg/cm^2)	modulus of linear deformation
e	void ratio
e_i	initial void ratio
e_{max}	maximum void ratio
e_{min}	minimum void ratio
F (%)	percentage of fine materials contained in sand
G_s	specific gravity
k	parameter in equation (30), page 19
L.L.(%)	liquid limit
n_1 (%)	parameter in equation (49), page 67
n_{10} (%)	parameter in equation (50), page 67
n_1	parameter in equation (49), page 67
n_{10}	parameter in equation (50), page 67
r_1	correlation number for the relationship between strain and initial void ratio at stress = 1 kg/cm^2

r_{10}	correlation number for the relationship between strain and initial void ratio at stress = 10 kg/cm^2
$r_{min_{(allowable)}}$	minimum allowable correlation number
P L (%)	plastic limit
P. I. (%)	plasticity index : L.L.- P.L.
U_1	uniformity coefficient by "Allen Hazen" d_{60}/d_{10} (Terzaghi and Peck, 1948, P. 20)
U_2	uniformity coefficient by Wagner (1957) : $(d_{30})^2 / d_{60}\, d_{10}$ (Bureau of Reclamation)
γ_{dry} (t/m^3)	dry density
ε	strain
$\Delta\varepsilon$ (%)	percentage increase in strain
ε'	strain of the auxiliary line at stress (equation (43), page 55)
ε'_1	strain of the auxiliary line at stress = 1 kg/cm^2
ε'_{10}	strain of the auxiliary line at stress = 10 kg/cm^2
σ (kg/cm^2)	stress

INTRODUCTION

In nature, sand may be found mixed with fines such as silt and clay. Previous studies on sand indicate that proper attention was given mainly to the mechanical properties of clean sand. On the other hand, the mechanical properties of sandy soils which contain some fine materials are not well known.

The purpose of the present work is to study the compressibility of dry sand containing some fines. Accordingly, compression tests have been carried out in Oedometer on samples of dry clean sand mixed with variable percentages of silt. The stress-strain relationship for the tested soil is discussed and the analysis of the test results are represented in the form of semi-emperical relationships.

Other series of compression tests have been carried out to study the compressibility of the tested soil when subjected to water.

The present work consists of two main parts, the first deals with a review to previous work, and the second deals with the experimental phase, presentation and discussion of test results and conclusion