Report on

The Major Project II

COMPACTION AND SHEAR BEHAVIOUR OF SOIL BLENDED WITH SILICA FUME AND CEMENT

Submitted in Partial Fulfillment for the Award of the Degree of

MASTER OF TECHNOLOGY

IN

CIVIL ENGINEERING

With Specialization in

GEOTECHNICAL ENGINEERING

By

JAY SHANKER

(Roll No. 2K12/GTE/08)

Under the Supervision of

Prof. A.K.SAHU

Department of Civil Engineering

Delhi Technological University, Delhi

Department of Civil Engineering

Delhi Technological University, Delhi

(Formerly Delhi College of Engineering)

2012-2014

DELHI TECHNOLOGICAL UNIVERSITY,DELHI

CERTIFICATE

This is to certify that the Major Project II entitled "COMPACTION AND SHEAR BEHAVIOUR OF SOIL BLENDED WITH SILICA FUME AND CEMENT" is a bona fide record of work carried out by Mr.Jay Shanker (Roll No.2k12/GTE/08) under my guidance and supervision,during the session 2014 in partial fulfillment of the requirement for the degree of Master of Technology in Civil Engineering(Geotechnical Engineering) from Delhi Technological University,Delhi.

The work embodied in this major project II has not been submitted for the award of any other degree to the best of our knowledge.

(A.K.Sahu)

Professor

Department of Civil Engineering

Delhi Technological University

Delhi-110042

DELHI TECHNOLOGICAL UNIVERSITY,DELHI

ACKNOWLEDGEMENT

I would like to express my deepest sense of gratitude to **Prof.Pankaj Jalote**, Vice Chancellor, Delhi Technological University,Delhi for providing me facility for the completion of project.

I wish to convey my sincere gratitude to **Prof. A. Trivedi**, Head and all the faculties of Department of Civil Engineering, Delhi Technological University who have enlightened me during my project.

I would like to express my deepest sense of gratitude and indebtedness to my guide **Prof.A.K.Sahu**, Department of Civil Engineering,Delhi Technological University for his invaluable guidance and support in all the phases from conceptualization to experimental and final completion of the project.

I am deeply thankful towards all the lab assistants of my university who have helped me to conduct the experiments.

I would also like to thank my parents and friends for their encouragement and persistent support which have helped me to do better in all of my endeavours.

(Jay Shanker)

(ROLL NO.2K12/GTE/08)

DECLARATION

I,hereby declare that the work being presented in this project report entitled"**Compaction and Shear Behaviour of Soil Blended with Silica Fume and Cement**" is the bonafide work carried out by me as a part of major project in partial fulfilment of the requirement for the award of the degree of Master of Technology in Geotechnical Engineering.

The matter presented in this report has not been submitted by me for the award of any other degree.

(Jay Shanker)

Roll No.2K12/GTE/08

M.Tech(Geotechnical Engineering)

Department of Civil Engineering

Delhi Technological University

Delhi-110042

Contents Page no.

Chapter 4

RESULTS AND DISCUSSIONS

Chapter 5

Conclusions and Recommendations for Future Work

LIST OF TABLES

LIST OF FIGURES

LIST OF FIGURES

LIST OF FIGURES

List of Picture

List of Abbreviation & Notations

S.NO.	Abbreviation	Full form
1	O.M.C	Optimum moisture content
2	M.D.D	Maximum dry density
3	W_W	Weight of water
4	W_S	Weight of solids
5	W	Water content
6	M_W	Mass of water
7	M_S	Mass of solids
8	LL	Liquid limit
9	PL	Plastic limit
10	Y	Bulk unit weight
11	Y_d	Dry unit weight
12	P.I	Plasticity index
13	G	Specific gravity
14	UCS	Unconfined compressive strength

ABSTRACT

The main objective of this study is to observe the effect of silica fume and cement on the engineering properties of the silty soil. silty Soil with low plasticity was used in this study as a natural soil. A series of laboratory experiments have been carried out and varieties of samples were made by mixing soil with both silica fume and cement. Three different percentages of silica fume (3%, 5%, and 7%) and four different percentages of cement (0%, 3%,5% and 7%)were used as a stabilization materials . Test results show that addition of cement and cement with silica fume decrease the maximum dry density and increases the optimum moisture content. The unconfined compressive strength of the soil was found to increase significantly with increase in the cement and cement with silica fume content especially after a long curing period. However on addition of 5% cement with 7% silica fume, the unconfined compressive strength increases minutely. Further addition of cement decreases the unconfined compressive strength after a long curing.