ACKNOWLEDGEMENT

The research work was carried out at Assam Engineering College, Guwahati, North Eastern Institute of Science and Technology, Jorhat and Soil Science Department, Assam Agricultural University, Jorhat. The advisor of the thesis is Dr. Diganta Goswami, Associate Professor, Department of Civil Engineering, Assam Engineering College, Guwahati.

I am greatly indebted and thankful to Prof (Dr.) Diganta Goswami for his able and stimulating guidance, constructive criticisms and constant encouragement during the course of this research work. His presence throughout and correct insight to the topic helped me immensely to take the appropriate path towards completion of the work. My sincere gratitude goes to Prof (Dr.) Diganta Goswami for his constant guidance from inception of this project work to the end. He is undoubtedly the person who saw me enough in every stage of my work. It has been a pleasant and fruitful experience for me and I consider myself fortunate to have him as my adviser.

I am grateful to Prof N.N Patwary, Dean, Faculty of Engineering, Gauhati University, former Principal Assam Engineering College, Guwahati for kind permission and help and encouragement by providing facilities to carry out the research work in the Civil Engineering Laboratory, Assam Engineering College.

I am equally thankful to Dr. P.G Rao, Director, North Eastern Institute of Science and Technology, Jorhat and Laboratory in-charge, Soil Science Department, Assam Agricultural University, Jorhat for kind permission and help and encouragement by providing facilities to carry out some part of laboratory testing of research work at their laboratories.
I am especially thankful to Dr. T.K Bhattacharjee, Principal, GIMT, Tezpur campus, former Principal, Jorhat Engineering College, Jorhat for his immense suggestions towards the fulfillment of the research work.

I am also thankful to Dr. K.N Sharma, Associate Professor, Department of Chemistry and Dr. Biswajit Sarma, Associate Professor, Department of Civil Engineering, Jorhat Engineering College, Jorhat for their help in different phases of work.

The help extended by Mr. Debjyoti Ghosh, a final year Civil Engineering student, Jorhat Engineering College, Jorhat is also gratefully acknowledged.

It is my pleasure to offer my deep sense of gratitude to all my family members especially to my wife Prof. Jona Dutta Choudhury, Associate Professor and Head, Department of Zoology, Devicharan Barua Girls’ College, Jorhat, my son Bharadwaj Choudhury, who has completed Master of Engineering at AIT, Bangkok in Information Management under Computer Science and Engineering Department and my daughter Ms. Bhaswati Choudhury, a student of P.O.W.E.I.T in Civil Engineering for their constant inspiration and moral support during the entire period of the study.

Last but not the least, I wish to express my gratitude to my mother (who has left for her heavenly abode few months ago at my residence) from whom I received blessings, encouragement and strength to complete the work in time.

Date: Bibekananda Choudhury

Place: Gauhati University
Guwahati-781014, Assam, India