ACKNOWLEDGEMENT

I am highly grateful to Dr.K.Thanasekaran, Professor, CES, Anna University, Chennai for his invaluable guidance, co-operation, encouragement during the course of this work and making this research a meaningful one.

My sincere thanks to Dr. A. Navaneetha Gopalakrishnan, Director, CES, and Dr. K. Ilamparuthi, Head, Department of Civil Engineering, Anna University, Chennai for their support. I am grateful to the members of my Doctoral Committee, Dr.R.A. Ramanujam, Head, Chemical Engineering Department, CLRI and Dr. R. Jayabalou, Scientist-in- Charge (Retd.), NEERI, Chennai for their valuable suggestions and support.

My special thanks are due to Dr.T.Ramasami, Secretary, DST, New Delhi, Prof.Dr.A.B.Mandal, Director, CLRI for their encouragement and permission to do this research work. I am grateful to Dr. S. Rajamani Former Director, CLRI, Dr. G. Sekaran, Head, ETD and other CLRI Colleagues, Ravindranath, Chitra, Umamaheswari, Thirumaran, Srinivasan, Suthanthararajan, Shanmugam, Prasad Rao, Arunachalam and Radhakrishnan for their affectionate help during my studies. Assistance rendered by Porselvam, Vidhyadevi, Sudharsanvarma, Mohana Praba, Athilakshmi and Chandrasekar during the studies are gratefully acknowledged. Thanks are also due to Priya and Edwin Paul for their support in instrumental analysis. Words cannot truly express my deep gratitude and appreciation to my entire family and especially to my parents for their loving support.

(SRI BALA KAMESWARI)