ACKNOWLEDGEMENT

I express my heartfelt gratitude to my Guide Prof. Dr. M. K. SASEETHARAN M.E., Ph.D., Professor of Civil Engineering, for his able guidance, deep involvement, constant encouragement and enthusiastic discussions throughout the period of this research work.

I sincerely thank Prof. Dr. R. Elangovan, M.E., Ph.D., Professor of Civil Engineering, Government College of Technology, Coimbatore, for his constant support, encouragement and precious suggestions during the period of this research work.

I am grateful to Dr. V. Palanisamy M.E., Ph.D., the Principal, Government College of Technology, Coimbatore, who gave the necessary permission and who made the necessary facilities available to me for the carrying out of the experiments.

I wish to remember with love and gratitude the emotional competence displayed by my two beloved daughters I. ACHSAH JOY PONMANI and I. TIRZAH MINI JEEVAMANI, when they missed my companionship during the final and critical period of preparation of the thesis.

I thank all the Civil Engineering Staff Members Dr.T.Meenambal, Dr.S. Jayanthi, Mrs.J.Jeyanthi M.E., Mrs.Jeyapriya M.E., Mr.R.Rajakumar M.E., Ms.B. Hemalatha M.E., Mrs.Josephine Aruputha Roy, Mr.B.Soundararajan, Mr.G. Krishnamoorthy and Mr.Thirumalai for their constant encouragement and for their helps.

I thank all the M.E. and Ph.D. research Scholars with whom I enjoyed the research life, for their volunteered helps and for their moral support.

I sincerely thank Dr. Joseph Christadoss M.A., Ph.D., for offering valuable suggestions for the improvement of the stylistic features of the thesis.
I am indebted to Dr. Paulraj M.E., Ph.D., Er. Archies, Er. Ramesh, Er. R. Chandrasekaran, Er. P. Manimaran and Er. Viswanathan for the helps volunteered by them in improving the quality of the thesis.

I thank Mr. Sreenivasan, Mr. Gopalan, Er. P. Ananthanarayanan B.E. and Er. K. Marimuthu B.E., for their wholehearted support extended in shaping up this thesis book.

I express my sincere gratitude to all the Engineers working in Tamilnadu Pollution Control Board (TNPCB), Coimbatore. My special thanks are due to Er. K. Kumar, M.E., Mr. B. Gowtham, Mr. Muneer and Mr. Muneeswaran, VIMTA Laboratory for their timely helps and for their support throughout the period of this research works.

I thank all those who I missed to mention explicitly for helping me in accomplishing this task.