ACKNOWLEDGEMENT

I am highly indebted to Dr. G. Swaminathan, Assistant Professor, Department of Civil Engineering, National Institute of Technology, Tirucirappalli, for giving me an opportunity to work with a real practical problem, for his guidance, constant encouragement and invaluable suggestions throughout the course of the work and preparation of thesis.

My sincere thanks are due to Dr. M. Chidambaram, Director, Dr. K. Kuppusamy and Dr. K. Palanichamy, Former Heads, Dr. C. Natarajan, Professor and Head, Department of Civil Engineering, National Institute of Technology, Tirucirappalli, for permitting to make use of the facilities in the Environmental Engineering Laboratory and for the timely help during experimental investigations.

My sincere thanks are due to all Non-Teaching Staff of National Institute of Technology, Tirucirappalli, for extending their full help and co-operation in building the experimental facility and in conducting the experiments.

I am placing on record my sincere appreciation for the constant encouragement and support provided by the Management, Principal, Teaching Staff and Non-Teaching Staff of Anjalai Ammal Mahalingam Engineering College, Kovilvenni, Thiruvarur.

My heart felt sincere thanks are due to V. Durairaj and D. Jayarani (Parents), S. Selvalakshmi (Wife), D. Shankar (Brother), D. Mahalakshmi (Sister) for their sacrifice, patience, cooperation, support during the entire period of this work, without which this work would not have been completed.

D. SIVAKUMAR