ACKNOWLEDGEMENTS

The author feels it his privilege to work this thesis under the esteemed guidance of two Professors, Dr. A. SreeRamaRao, former Principal, JNTU College of Engineering, Kakinada, and Dr. C.R.K.Sarma, Former Principal S.V.H.College of Engineering Machilipatnam.

Firstly, the author thanks Dr. Sree Rama Rao, for accepting to guide his work. and feels highly indebted to him for his dexterous guidance, elderly affection, forgiveness for the lapses on the part of the author, friendly association during the time of work and the warmth and the hospitality showered all through his association at Kakinada. The extensive discussions with Dr. Rao have been lively and thought-provoking, without which the thesis would not have got this shape.

The author had long association with Dr. C.R.K.Sarma as his former H.O.D. and Principal. Not only in his officiating capacity, personally, Dr. Sarma guided him in many walks of his life, which is deeply acknowledged. Thanks are due to his constant guidance, and encouragement during the progress of the work.

The author also thanks the Principals, Vice-Pincipals and Heads of the department of Civil Engineering department, JNTU College of Engineering, Kakinada, for their encouragement and cooperation during the tenure of the work.

The author remembers and thanks Ln.Dr. Badam Balakrishna, for all the useful discussions during the period of the project, which had helped him to give a base to program the work. He also is thankful for Sri. A.W.Iqbal for useful discussions on the programming part of the project.

The author is also thankful to Sri. D.Madhusudhana Sastry, Chairman, Management Committee, S.V.H.College of Engineering, Machilipatnam, for
permitting him to carry out his Ph.D work and Lt. Col. T. Narasimha Rao, Principal, of our college, for all his encouragement and enquires during the work.

The author wishes to put on record the encouragement and best wishes given by the staff of the civil engineering department, during the work.

A timely help is worth Millions - The help and co-operation of many of his friends and colleagues are worth recollecting at this moment, especially of Sri K.Suresh, Sri Y.NandaKishore, Sri. Achyutaramaiah at Kakinada. Thanks are also due to his colleagues Sri. D.H.Rao, Sri. M.RavindraKrishna, and his cousins, Bhaskar and Sudheer for their timely help at different times during the project.

Lastly, and specially, the patient and affectionate support of his mother his wife Anuradha and daugther Sneha that have given him the moral boost to work for this Ph.D, without which this work could not have been taken up, are deeply acknowledged.