ACKNOWLEDGEMENT

My sincere gratitude to Dr. K. Elangovan, Assistant Professor, Department of Civil Engineering, PSG College of Technology, Coimbatore, for his able guidance and kind efforts in steering this research work.

I would like to place on record my immense gratitude to my doctoral committee members, Dr. S. C. Natesan, Dean, Civil Engineering, VLB College of Engineering and Technology, Coimbatore and Dr. A. Sethurathinam, Academic Coordinator, Coimbatore Institute of Technology, Coimbatore for their constructive comments, advice, and constant encouragement.

I am very much thankful to Dr. V. Selladurai, Principal and Dr. R. Prabhakar, Secretary, Coimbatore Institute of Technology, Coimbatore and Dr. R. Rudramoorthy, Principal, PSG College of Technology, Coimbatore for their patronage during this research work and facilities provided throughout the course period.

I am grateful to Dr. K. Subramanian, Professor and Head, Department of Civil Engineering, Coimbatore Institute of Technology, Coimbatore and Dr. J. V. Ramasamy, Professor and Head, Department of Civil Engineering, PSG College of Technology, Coimbatore for their help throughout the course of my research work.

I would like to express my sincere thanks to my mother S. Girija, brother Dr. R. Gowrishankar, wife Mrs. P. Nalina, Master S. Dhyaneshwar, daughter Kum. S. N. Harini and son Baby Sri Ram Nandhakishore for their affection, moral support and care during this research. I am very much thankful to almighty for blessings to complete this work successfully.

R. SATHYANARAYAN SRIDHAR