ACKNOWLEDGEMENT

The author is deeply indebted to Dr. C G PUTTAPPA, Professor in Civil Engineering, M S Ramaiah Institute of Technology, who has been a great source of inspiration and guidance, support, advice and encouragement at all stages of the research work. His valuable suggestions, patient hearing and sparing valuable time are acknowledged with deep sense of gratitude.

The author is deeply indebted to Dr. C SASHIDHAR, Professor in Civil Engineering, Jawaharlal Nehru Technological University, Anantapur, for his valuable guidance, encouragement and support extended for the entire period of research work.

The author wishes to express his feelings of extreme gratefulness to Dr. K U MUTHU, Dean, Brindavan College of Engineering, who has been the constant source of inspiration, mentor and instrumental in developing zeal for gaining knowledge through systematic analysis. The enlightening discussions the author had at different stages has culminated in the presentation of this research work in the present form.

The author places on record his deep sense of gratitude to the Research and Development, of Jawaharlal Nehru Technological University, Anantapur, for providing the necessary support extended for completing the research work.

The author places on record his deep sense of gratitude to Dr. R Prabhakara, Professor and Head of the Department of Civil
Engineering, M.S.R.I.T, for all the encouragement provided at all stages of the research work.

The author places on record his deep sense of gratitude to the Management, Chief Executive, Principal and Academic Registrar of M.S.R.I.T, Bangalore, for providing the necessary infrastructure for completing the research work.

The author thanks the All India Council for Technical Education, New Delhi, for funding the Research Project being carried out at Dept. of Civil Engineering, M.S.R.I.T, Bangalore. The research work presented in this thesis is a part of the ongoing Research Project.

The author extends his gratitude to the post graduate students of Civil Engg. Dept. at M.S.R.I.T, who have assisted him while carrying out the experimental work.

The author extends his sincere thanks to Dr. H Narendra and all his colleagues for their help and moral support extended to him.

The author is deeply touched by the support, encouragement and sacrifice of his parents, wife Rani, Sons Gopi Krishna and Thiru Dheebak Krishna. They have been the strength and spirit for all the achievements of the author.

The author would like to place on record his sincere thanks to all those who have helped him directly or indirectly for the successful completion of the research work.

R. MOUROUGANE