ACKNOWLEDGEMENT

My first and foremost thanks are due to Dr. C. Umarani, Associate Professor, Division of Structural Engineering, Department of Civil Engineering, Anna University, Chennai for her valuable guidance, constant help and encouragement throughout this work.

Dr. K. Ilamparuthi, Professor and Head, Department of Civil Engineering, Anna University, Chennai helped and encouraged me. I am greatly indebted to him.

My sincere thanks are due to the Doctoral Committee members, Dr. C. Antony Jeyasehar, Professor and Head, Department of Civil and Structural Engineering, Annamalai University and Dr. K. Nagamani, Professor, Division of Structural Engineering, Department of Civil Engineering, Anna University, Chennai, for their valuable suggestions.

My heartfelt thanks are due to Dr. L. Suganthi, Professor and Head, Department of Management Studies, Anna University, Chennai for extending her support and encouragement in the completion of this research.

Last but not the least, I extend my deepest gratitude to my family members and friends for their constant support and encouragement to complete this work.

KAMAL S