ACKNOWLEDGEMENT

It is my privilege to take this opportunity to record and express my deep sense of gratitude and indebtedness to my supervising guide and mentor Dr. Mujahid Husain Professor and Head, Department of Civil Engineering, SSBT’s College of Engineering and Technology, Bambhori, Jalgaon for his inspiring and motivational guidance in the problem, keen interest, critical supervision, instructive criticism, constant encouragement and accommodating discussions during the course of my research. The most needed and most important and driving force was provided by Respected Prof. Dr. Sunil Kute Professor and Head, Department of Civil Engineering K.K.Wagh College of Engineering, Nasik, without which I would not have been galvanized to complete this project. Hence my humble respect for him.

I am also thankful to Dr. Vinod Tibrewala Chancellor, Dr. Avinash Mehta Vice-Chancellor, Dr. Sanjay Madan Research Co-coordinator, Dr. Mahendrasingh Poonia, Research Co-coordinator (Mathematics), all faculty and staff of Shri Jagdishprasad Jhabarmal Tibrewala University, Jhunjhunu, Rajasthan, India for necessary help and kind co-operation during the research work.

My sincere thanks to Hon. Shri. Dadasaheb Subhash Deo re, Chairman, S.S.V.P.S’s Bapusaheb Shivajirao Deore College of Engineering and Polytechnic, Dhule (M.S.), Secretary and all members of management council, S.S.V.P.S’s Bapusaheb Shivajirao Deore College of Engineering and Polytechnic, Dhule for their invaluable help and constant encouragement throughout the period of the research work by providing all the facilities.

I am grateful to Hon. Prin. Dr. Hitendra D. Patil and Hon. Prin. Dadasaheb Pramod B. Kachave, S.S.V.P.S’s Bapusaheb Shivajirao Deore College of Engineering and Polytechnic, Dhule for granting the permission and providing all facilities to carry out this work.

I take this opportunity to thank Prof. M. S. Patil, Head, Department of Applied Science Polytechnic (second shift). My Departmental colleagues Prof. Dharmraj S. Patil, Prof. Subhash S. Mahale, Prof. Kailas G. Suryawanshi Prof. Vikas G. Patil Prof. Smt. Ranjana Vaibhavshali Khairnar, Prof. Vinay B. Patil, Prof. Mrs. Manisha Deore, Prof. Mrs. Madhuri Patil, Prof. Mrs.
Bhavana Patil, Prof. Miss. Yogeshwari Patil for their continuous motivation, unstinted help and co-operation. I am thankful to Mr. J. S. Patil, Registrar, S. S. V. P. S’s Bapusaheb Shivajirao Deore Polytechnic, Dhule, and all the Head of the Departments of S. S. V. P. S’s Bapusaheb Shivajirao Deore College of Engineering and Polytechnic Dhule for devoting their time for discussing the certain problems related to my research work. I am also thankful to our non teaching staff Mr. M. D. Patil, Mr. C. M. Patil, Mr. Sunil Chaudhari, Mr. Shabbir, Mr. Riyaz, and Mr. Nadim Shaikh. Many thanks goes to teaching and non-teaching staff of S. S. V. P. S’s Bapusaheb Shivajirao Deore College of Engg. & Polytechnic, Dhule, for their timely help.

I would like to acknowledge Mr. Gulabrao V. Patil, Librarian (Engg.), Mr. M. N. Patil, Librarian (Poly.), Mr. S. R. Shaikh, Mr. R. R. Patil, Mr. P. R. Patil, Mr. Dilip V. Rawandale, Mr. Manoj B. Patil, Mr. Kiran Shinde and all the library staff of S. S. V. P. S’s Bapusaheb Shivajirao Deore College of Engg. & Polytechnic, Dhule, for the collection of literature and their cooperation during the reference work.

Thanks also due to Mr. Sanjay K. Sonar, Sanjay Computers, Dhule, for this timely computerizing the data of present work precisely.

I know she may not like it but with all honesty I express my gratitude towards my wife Mrs. Aruna Suresh Pawar for her continuous moral support, encouragement, understanding, inspiration and patience throughout the period of this work. I am also thankful to my son Mr. Kaustubh Suresh Pawar, my daughter Mrs. Deepali Mohan Patil, my son-in-law Mr. Mohan Yashwant Patil and my grand-daughter Yutika Patil for their co-operative enthusiasm during the research work. It is possible that as a human being I may have forgotten to mention the names of many well wishers and volunteers, hence hereby I express my deepest gratitude and sincere thanks to all of them.

At the end, I could not forget my respected and beloved parents, Late Appasaheb Pandurang Badgu Pawar and Late Venubai Pandurang Pawar for their forever blessings with me to continue with all perseverance during difficult situation in my life.

Suresh Pandurang Pawar
FUTURE OF EARTH
IN OUR HANDS

MAKE EARTH
POLLUTION
FREE