

Seema K Nayar  
Kavitha Madhu  
Arun Baby Zacharia  
Mohammed Thowsif  
Sreeja Balakrishnan  
Indu M S  
Kishor P  
(Editors)

*Proceedings of International Web Conference in  
Civil Engineering for a Sustainable Planet*

*ICCESP 2021 (5<sup>th</sup> – 6<sup>th</sup> March, 2021)*

*Organized by*

Habilete Learning Solutions, Kollam, Kerala, India

*In Collaboration with*

American Society of Civil Engineers (ASCE)  
TKM College of Engineering, Kollam, Kerala, India  
Baselios Mathews II College of Engineering, Kollam, Kerala, India

*Published by*

AIJR Publisher, Dhaurahra, Balrampur, India 271604



## Table of Contents

Disclaimer .....	i
Foreword.....	ix
About the Conference.....	x
About ICCESP-2021 Organizer.....	xi
About the Collaborative Partners.....	xi
Organizing Committee.....	xiii
Peer Review Policy.....	xv
List of Reviewers.....	xvi
Keynote Speakers.....	xviii
Keynote Speech: Sustainable Construction Basic Practice – Strategy, Challenges, Importance Benefits and Positive Impact <i>P. Rajayogan</i> .....	xix
Keynote Speech: Climate and Construction: Chained by Carbon – A Perspective <i>Narayanan Neithalath</i> .....	xxi
Keynote Speech: Technologies for Smart Transportation <i>Anusha S.P.</i> .....	xxiii
Keynote Speech: Significance of Soil Moisture Content and its Measurement Techniques <i>Susha Lekshmi S.U. and D.N. Singh</i> .....	xxv
Keynote Speech: How Can We Change Our Earth to be A Better Place? <i>Simon Shim</i> .....	xxvii
Selection of Performance Objectives and Key Performance Indicators in PPP Projects: A Review <i>Anna Mathew, Seema K Nayar, Santhosh Sathyapal</i> .....	1
Barriers to Adoption of Precast Concrete Construction in Buildings <i>Alan Verghese Ittyeipe, Anu V. Thomas</i> .....	9
Study of Risk Management in EPC Contracts in Highway Constructions: A Case Study of Kollam and Alappuzha Bypass <i>Sayiba S, Seema K. Nayar</i> .....	19
Augmented and Virtual (Mixed) Reality for Asset Management in a Construction Warehousing Facility: A Modelling and Simulation Study <i>Elias B. Sayah, Kishor P</i> .....	27
Identification of Attributes Based on TQM Principles Influencing Construction Quality in STP Project <i>Krishna B. Chavan, Dr. N. A. Hedao</i> .....	37

Analytical Study on Seismic Performance of Aluminium Sandwich Shear Wall with Different Core Shapes <i>Alka Susan Mathew and Regi P. Mohan</i> .....	46
A Review on the Plastic Hinge Characteristics of Beam-Column Joints in RC Moment Resisting Frames <i>Surya SS, Sajeeb R</i> .....	52
Evaluation of Dispute Prone Areas in Construction Projects <i>Manu Noushad, Anu V. Thomas, Ramaswamy K. P.</i> .....	62
Analysis of Compensation for Delay and Settlement of Disputes Clauses in CPWD Contract Guidelines <i>Neethu Elsa Anil1, Reshma Kassim, Sinu Philip Varghese</i> .....	69
Effect of variation of strain rate on the tensile properties of Coconut leaf midrib - A sustainable material for ground improvement <i>V P Jishnu, N Sankar, S Chandrakaran</i> .....	76
Use of GIS in Decision Making for Geotechnical Investigation <i>Farhan Rafique Khan, Dr. Bhumika Das, Dr R.K Mishra</i> .....	83
Influence of Shear Strength of Soil on Stresses in Footing-A Review <i>Aleena Sam, Arunima Anil A, Smitha Anna Kurian, Sujina Kabeer, Dr. Jayamohan J, Aarya J Nath</i> .....	94
A Review on sustainable reuse of dredged sediments in earthwork infrastructures <i>Athira S, Dr. Subaida E.A</i> .....	102
Experimental Study on the Impact of Type of Sulphate in Lime Stabilised Clays <i>Sindhu A R, Minukrishna P2, B.M. Abraham</i> .....	109
Geosynthetic reinforced soil bridge abutments under base motion dynamic loading <i>Mehdi Askari, Jaber Mamaghani, Hamid Reza Razeghi, S. Mustapha Rabmaninezhad</i> .....	119
A Review on Finned Pile Foundation <i>Chandni S, Rekha Ambi</i> .....	129
Strength Characterisation of Nanochemical Stabilized Kuttanad Clay for Pavement Construction <i>Regi P. Mohan and Adarsh P</i> .....	137
Load-Settlement Behavior of Adjacent Strip Footings Resting on Slopes <i>Anjali A, Jayamohan J, Rageena S S</i> .....	146
Undrained Strength Characteristics of Fibre Reinforced Expansive Soils <i>G. Surya Narayana Kurup, Sona P. S., Luthfa U., Varsha Manu, Amal Azad Sahib</i> .....	153
Hybrid Blue-Green Infrastructure: Feasibility Study for the State of Maharashtra; India <i>Satpute Rushikesh, Khare Kanchan</i> .....	162
Flood Risk Assessment of Thiruvananthapuram City, Kerala <i>Niranjana J S, Feba Paul, Hridya D Nambiar, Ashly Joy, Neethu Roy</i> .....	170
Assessment of Spatio-Temporal Variations of Particulate Matter and Gaseous Pollutants in The Port City, Paradip, East Coast of India <i>Rashmi Ranjan Behera Arakshita Majhi, Deepy Ranjan Satapathy</i> .....	179

Bioremediation of hydrocarbon-rich wastewater by aerobic granules of oil degrading bacterial strains in salinity influence <i>Sayanti Ghosh, Saswati Chakraborty</i> .....	189
A Positive Response to Urban Ecological Aspects Around an Urban Pond Through Urban Design Guidelines <i>Lakshmi S Shaji</i> .....	197
A Review on the Negative Impacts of Black Sand Mining on the Ecosystem of Kerala <i>C Sharon</i> .....	208
Prediction of Groundwater Quality Using Artificial Neural Network <i>Rita Maria Joseph, Alna D Manjaly, Sreeram Unni, Able E C, Vinitha Sharon</i> .....	213
Transport of Microplastics from Municipal Solid Waste Landfills to Aquatic system: An Overview <i>Kshitij Upadhyay, Samir Bajpai</i> .....	222
Geo Physicochemical Properties for Soil Base Subsurface Constructed Wetland System <i>Arvind Kumar Swarnakar, Dr. Samir Bajpai, Dr. Ishtiyaq Ahmad</i> .....	228
Continuous flow electrocoagulation system for the treatment of coir industry wastewater <i>Ayyappan.U., Indu M.S, Adithya. G. Murickan, Balagopal J., Arun S Kumar, Priya K L</i> .....	234
The Potential of Sewage Treatment through Constructed Wetlands in Northeast India: A Critical Review <i>Getu Yoka, Ajay Bharti</i> .....	243
Review on Factors Governing Stress Concentration Factor at Tubular Joints <i>Gemi Maria Mathews, Althaf M</i> .....	247
Seismic Retrofitting of Structures Using Steel Bracing: An Overview <i>Silpa S, Chinsu Mereena Joy</i> .....	253
A Review on Residual Life Assessment of Plain and Reinforced Concrete Members <i>Ajimi S, Keerthy M Simon, Bharati Raj</i> .....	262
Fatigue Life Prediction of Plain and Reinforced Concrete – A Review <i>Vishnu B S, Dr. Keerthy M Simon, Dr. Bharati Raj J</i> .....	271
Comparison of Hysteresis Models for Nonlinear Dynamic Analysis of Structural Systems <i>Arya Bharath T K. and Nisha A.S.</i> .....	280
A Review on Seismic Issues and Remedies in High-Rise Structures <i>Adarsh S. and Sajeeb R.</i> .....	290
A Review on the Seismic Performance Assessment of Steel Diagrid Structures <i>Nourin N., Hazeena R. and Asif Basheer</i> .....	300
Comparison of Analytical Models for Seismic Induced Pounding in Buildings – A Review <i>Meghna V, Nisha A.S.</i> .....	310
Mechanical Properties of Concrete with Coconut Shell and Fibre as Additives <i>Dr. Bindhu. K.R, Miss Abiya B, Miss Hasna Haneef, Mr. Jinu David, Mr. Justin Mathew Joseph</i> .....	319

A Comprehensive Review on the Mechanism of Concrete Deterioration in Accelerated Aggressive Environment <i>S. S. Sneha and K. P. Ramaswamy</i> .....	332
A Review on Seismic Behaviour of Coupled Wall Structures <i>Anu Philip, Bushra M. A.</i> .....	341
A Suitability Study of Using Crushed Fluorescent Lamp Waste as Fine Aggregates <i>Hanna C. Joshy, Mansoor Ali K., Rameez Z., Sarath S., Ramaswamy K. P.</i> .....	349
Shear Strength of Steel Fiber Reinforced Reactive Powder Concrete & Geopolymer Concrete – A Comparison <i>Aravind S Kumar, Dr. Bharati Raj J, Dr. Keerthy M Simon</i> .....	357
Comparative Study on Performance of Precast Structural Insulated Panels with Different Shear Connectors <i>Ajith M, Dr. Bharati Raj. J, Dr. Keerthy M Simon</i> .....	367
Preparation and Properties of Alkali Activated Coarse Aggregates Using Fly Ash and Slag <i>Rugma Sunil, Parvathy Panicker L., R. Megha, Athira K. Vijayan, Ramaswamy K. P.</i> .....	375
A Review on the Mechanisms and Analysis of Fatigue in Ductile Materials <i>Amal A. and Mohammed Thowsif</i> .....	381
A Review on Seismic Performance Analysis of High Rise Modular Steel Construction (MSC) <i>Rishma Jasmin, Asif Basheer</i> .....	389
Effect of alkali content and slag content on the fresh and hardened properties of air-cured alkali activated mortar containing fly ash <i>Namitha S., Muhammed Nabil K., Mohammed Rafiqeque N. V., and Reshma Sundhar, Thushara Raju, Ramaswamy K. P, Saraswathy, B.</i> .....	399
Behaviour of longitudinally stiffened stainless-steel plate girder under combined bending and shear <i>Sajith Chandran T and Ajith M S</i> .....	406
Design of A Sustainable Flood Resistant Structure for Rebuilding Resilient Kerala Post Floods <i>Sahana Hashim and Dr. M Sirajuddin</i> .....	417
Response Spectrum Analysis of Multi Storied Building on Sloping Ground with Ground, Middle and Top Soft Storey <i>Shankar H. Sanni, Ratnakala. S. Bidreddy</i> .....	424
Interlocking Pavement Tiles using RCA with Industrial Waste as Admixtures <i>Anjana S, Diya Elizabeth Isaac, Neelanjana S, Aswathy G</i> .....	436
Influence of Concrete Mixture Composition on Acid Resistance of Concrete: A Review <i>Chinnu Mariam Ninan, K P Ramaswamy, R Sajeel</i> .....	442
Development of Alkali Activated Pervious Cementless Concrete <i>K. Aiswarya, A. A. Alfyia, R. Deepak1, V. S. Devadath and K. P. Ramaswamy</i> .....	450
A Review and Laboratory Trials on the Development of Geopolymer Mortar from Ceramic Waste <i>Amala Michal , Sneha Binoy, Akshay Mohan, Alisha A., Ramaswamy K. P.</i> .....	456

A Review on Behaviour of Beam Column Joint Using EAF Steel Slag Concrete <i>Ajmal Khan R, Rekha Ambi</i> .....	461
Railbus from Edappally Railway Station to Vallarpadam Container Terminal <i>Jiza James, Joseena Joseph, Angel Sebastian</i> .....	469
Evaluation of the Effectiveness of Traffic calming measures <i>Gayathri K.B</i> .....	475
Safety Impact Analysis of Lane Conversion on Selected Highway Corridor <i>Swathy P Mohan, Archana S, Ebin Sam S</i> .....	488
Potential of Driver Physiological Measures for Assessing Non-Urban Highway Geometry <i>Anitha Jacob, Jisha Akkara, Jinesh K. J, Jose P. Therattil</i> .....	494
A Review on the Significance of Integrated Transportation and Land Use Planning Model for the Planning of Urban Areas <i>Sebastian Anju</i> .....	506
A Review on Studies Based on Vehicle Stability and Safety on Rural Horizontal Curves <i>Y K Remya, Anitha Jacob, E A Subaida</i> .....	515
Effect of Two Lane Non-Urban Highway Geometry on Workload Profile of Drivers <i>Jisha Akkara, Anitha Jacob and Subaida E A, Dona Joy, Sreelakshmi K S</i> .....	524
Comparative Study on Spatial Clustering Methods for Identifying Traffic Accident Hotspots <i>Mohd. Minhajuddin Aquil, Mir Iqbal Fafeem</i> .....	535
Pedestrian Flow and Capacity Analysis at Railway Stations <i>Archana S, Parthiban P, Dr. Samson Mathew</i> .....	544
Artificial Neural Networks in Pavement Engineering: A Recent Review <i>Abhishek Kurian, Elvin Sunildutt</i> .....	553
Performance Evaluation of Cold Bituminous Mix Reinforced with Coir Fibre <i>R. Amal, J. Narendra, M. Sivakumar, M.V.L.R. Anjaneyulu</i> .....	559
Study on VG-30 BC Mix by Partial Replacement of Cashew Nutshell Liquid for Rural Road <i>Prashanth H D, Shishirakrishna S, Jayakrishna Bhat D</i> .....	569