

ICCEASI-2021

Virtual Conference

International Conference on

**Civil Engineering, Architecture and Sustainable
Infrastructure**



**23rd - 24th
September,
2021**

Organized By

Babu Banarasi Das University, Lucknow

in Association with

Institute For Engineering Research and Publication (IFERP)

ICCEASI -21

International Conference on
**Civil Engineering, Architecture and
Sustainable Infrastructure**

**BBDU, Lucknow, Uttar Pradesh
23rd – 24th September, 2021**

Organized by:
Babu Banarasi Das University, Lucknow
In Association with:
Institute For Engineering Research and Publication



Rudra Bhanu Satpathy

Chief Executive Officer

Institute For Engineering Research and Publication.

On behalf of *Institute For Engineering Research and Publications (IFERP)* and in association with *Babu Banarasi Das University, Lucknow, India*. I am delighted to welcome all the delegates and participants around the globe for the *“International Conference on Civil Engineering, Architecture and Sustainable Infrastructure” (ICCEASI -21)-Virtual Conference*” Which will take place from *23rd – 24th September, 2021*

It will be a great pleasure to join with Engineers, Research Scholars, academicians and students all around the globe. You are invited to be stimulated and enriched by the latest in engineering research and development while delving into presentations surrounding transformative advances provided by a variety of disciplines.

I congratulate the reviewing committee, coordinator (**IFERP & BBDU**) and all the people involved for their efforts in organizing the event and successfully conducting the International Conference and wish all the delegates and participants for their virtual presence.

Sincerely,



Rudra Bhanu Satpathy



(+91) 44 - 4958 9038



info@iferp.in
www.iferp.in



Rais Tower, 2054/B, 2nd Floor, 'L' West Block, 2nd Ave, Anna Nagar, Chennai, Tamil Nadu 600040, India

Preface

The *International Conference on Civil Engineering, Architecture and Sustainable Infrastructure (ICCEASI-21)* is being organized by *Babu Banarasi Das University, Lucknow, India* in Association with *IFERP-Institute for Engineering Research and Publication* on the 23rd – 24th September, 2021.

The “*International Conference on Civil Engineering, Architecture and Sustainable Infrastructure*” was a notable event which brings Academia, Researchers, Engineers, Industry experts and Students together.

The purpose of this conference is to discuss applications and development in area of “**Civil Engineering, Architecture**” which were given International values by *Institute for Engineering Research and Publication (IFERP)*.

The International Conference attracted over 85 submissions. Through rigorous peer reviews 50 high quality papers were recommended by the Committee. The Conference aptly focuses on the tools and techniques for the developments on current technology.

We are indebted to the efforts of all the reviewers who undoubtedly have raised the quality of the proceedings. We are earnestly thankful to all the authors who have contributed their research works to the conference. We thank our Management for their wholehearted support and encouragement. We thank our Principal for his continuous guidance. We are also thankful for the cooperative advice from our advisory Chairs and Co-Chairs. We thank all the members of our local organizing Committee, National and International Advisory Committees.

Message from Steering Committee Chair



Dr. Om prakash Netula

Professor & Head

Department of Civil Engineering

BabuBanarasi Das University

The conference provides platform for researchers to get networked and exchange the ideas for further progress in research and development. 2021 - First International Conference on Civil Engineering, Architecture and Sustainable Infrastructure (ICCEASI - 21) is a flagship conference of BBD University and it is motivated by the grand success of ICCEASI-21 wherein all the papers accepted and presented have been indexed in Scopus. ICCEASI-21 has a vision to make the researchers to have good social networking in the areas of Civil Engineering Architecture and bring forward to the society their contributions. I am thankful to IFERP, for their support in making this conference to get approval from Scopus Index journals and UGC care journals.

I thank our Honorable Chancellor, President and Vice Chancellor, Babu Banarasi Das University, IFERP Team for his constant support and encouragement to conduct such a prestigious conference in the state of Uttar Pradesh. I thank Vice Chancellor Prof (Dr.) Arun Kumar Mittal for motivation and support to organize this conference.

My sincere gratitude's are towards our vibrant Civil Engineering faculty and staff members for their un-tired efforts towards the conference.

The conference has peer reviewed process for all the articles to maintain the quality interactions and publications by using feedback from reviewers and anti plagiarism software. Tutorials and keynote sessions have been arranged to benefit the researchers to work on recent challenges in emerging technical areas. The organizing committee of BBD University has done a good job in bringing out the proceedings, thanks to committee.

I wish all the conference participants and organizers a big success!

Message from Convenor



Mr. Shubhranshu Jaiswal

Assistant Professor & Departmental In- Charge

Department of Civil Engineering

Babu Banarasi Das University

First Virtual International Conference on Civil Engineering, Architecture and Sustainable Infrastructure (ICCEASI- 2021), will be held during 23rd September to 24th September 2021 organised by Babu Banarasi Das University, Lucknow, Uttar Pradesh, India. ICCEASI – 2021 is to bring together innovative academics and industrial experts from the different fields of Engineering to the common forum.

The primary goal of the conference is to promote research and development activities in different fields of Civil Engineering, Architecture and Sustainable Infrastructure and to promote scientific information interchange between researchers, developers, engineers, students, and practitioners working in India and abroad. Conference is aimed at providing a platform to all researchers to interact, share their research findings and to discuss their research ideas with the co-researchers from all over the world. It also provides an opportunity to highlight recent developments and to discuss future directions on these exciting fields.

Keynote lectures by experts in various fields will inspire the researchers and provide an exposure to various aspects and an opportunity for discussions with distinguished experts. It is earnestly hoped that the conference will be of great success in bringing more researchers together.

Researchers from various research laboratories, industries, academia and the research scholars pursuing their Doctoral / Masters Work are invited to present their original work and participate in ICCEASI – 2021, a two days virtual event in the academic and serene environs organized by Babu Banarasi Das University, Lucknow, in Collaboration with IFERP.

I wish all the conference participants and organizers a big success!

Message from Convenor



Mr. Faraz Khan

Assistant Professor In Department of Civil Engineering

Babu Banarasi Das University

It is my pleasure to welcome all the attendees for the First International Conference on Civil Engineering, Architecture and Sustainable Infrastructure (ICCEASI - 21). held at Babu Banarasi Das University, Lucknow, India from September 23-24, 2021. The marvels of human mind perennially persuade the gathering and growth of human knowledge. In bringing out this volume of scientific knowledge, we are largely benefited from the ICCEASI-21 conference under the technical support of IFERP.

The ICCEASI 2021 committees rigorously invited submissions for many months from authors to contribute to the conference by submitting articles that illustrate research results, application projects, survey work and industrial experiences describing significant advances in the disciplines of Civil Engineering. This effort guaranteed submissions from an unparalleled number of internationally recognized top-level researchers. All the submissions underwent a strenuous peer-review process which comprised expert reviewers. These reviewers were selected from a talented pool of Technical Committee members and external reviewers on the basis of their expertise. The papers were then reviewed based on their contributions, technical content, originality and clarity. The entire process, which includes the submission, review and acceptance processes, was done electronically. All the accepted for presentation and publication in the proceedings, which will be indexed in Scopus. All these efforts undertaken by the Organizing and Technical Committees has led to an exciting, rich and a high quality technical conference program, featuring high-impact presentations for all attendees to enjoy, appreciate and expand their expertise in the latest developments in various areas covering Civil Engineering and Architecture

It is my humble wish that the professional dialogue among the researchers, scientists, engineers, students and educators continues beyond the event and that the friendships and collaborations forged will linger and prosper for many years to come.

Message from Steering Committee member



Mr. Kamal Nabh Tripathi

Assistant Professor In Department of Civil Engineering

Babu Banarasi Das University

Welcome to ICCEASI-21; The ICCEASI-21 conference has established itself as a worldwide reference for the dissemination of high-quality research in all aspects of Civil Engineering, and for fostering interaction and exchange of ideas. The high number of submissions provided an excellent opportunity for a high-quality program, but also called for a demanding and laborious paper evaluation process. Technical Program Committee worked efficiently and responsibly under tight time constraints to produce reviews for each paper. To allow the conference participants to benefit from further worthwhile and stimulating research results.

Finally, we want to express our gratitude to the steering committee chairs, the Organizing Committee, the International Advisory Committee, the institutional volunteers, and the IFERP coordinators, who have all contributed to the success of this conference, both directly and indirectly. May God grant us all good health so that we can make this gathering a success and a pleasure!

Chief Guest



Prof Dr Munaz Ahmed Noor

Vice-Chancellor,
Bangabandhu Sheikh Mujibur Rahman Digital University
(BDU)
Dhaka, Bangladesh

BIOGRAPHY

In the history of the Bangali Nation, the historic 7 March speech is an unforgettable event. In this day, our Father of the Nation, Bangabandhu Sheikh Mujibur Rahman, declared two significant things. He declared the independence of Bangladesh and economic emancipation. We got our independent Bangladesh after nine months of independence war under his leadership. However, our economic liberation, which is his Sonar Bangla, couldn't be achieved in his hands as he, along with his many family members, was brutally killed on 15 August 1975. Now, the daughter of the Father of the Nation, our Honorable Prime Minister Sheikh Hasina, is fulfilling her father's dream to create Sonar Bangla, which, in her words, is "Digital Bangladesh," whereby we will become a middle-income country by 2021 and a developed country by 2041. Now, this newly established "Bangabandhu Sheikh Mujibur Rahman Digital University," based on its name, has both Bangabandhu and Digital Vision. This is why this university is vital to the Bangali Nation. Bangabandhu Digital University (BDU) has the mandate to establish, sustain, and support the Digital Bangladesh vision. This is a significant and challenging responsibility for all the staff members, faculty members, and students of this university. This digital university should retain the heart of a traditional university while at the same time will embrace new tastes, new literature, and new values. I am grateful to our Hon'ble Prime Minister for entrusting me with this immense responsibility. The vision of this digital university is to become the world's leading teaching, learning, and research universities in science, technology, and engineering. Our mission is to reduce the skills gap that exists between the industry and academia. We would like to produce competency-based human resources so that they can immediately contribute to nation building after graduation. Students preparing for the digital age must have an understanding of the basics of STEM. Our vision is to create an online learning platform for all citizens of Bangladesh. Everybody should be in the workforce. With this online platform, learning will be individualized and may provide more choices for the citizens who, in the past, had only limited choices. This will not replace the traditional classroom but enhance it. We need to promote education that teaches reason, values, analysis, and even invention. Future workers should be flexible, inventive, creative, and able to work in teams. The future is limitless, but to reach it, we need new concepts of education, learning, and teaching. This digital revolution will sweep away all the old darkness and old practices. We cannot fight it, but we can adapt to it. It is a new age, and it is time for us to acknowledge the value and idea of a digital university.

ICCEASI -21

International Conference on
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Keynote Speakers



Prof. Ashutosh Mohanty

Professor

Faculty of Science and Technology

Center of Excellence in Disaster Management &
Environment

Bhopal, Madhya Pradesh, India

BIOGRAPHY

Seventeen years of Strategic Leadership Experience and Expertise on Interdisciplinary Academic Teaching, Skilled Training, Research, Outreach Programme Management on ; Integrated Disaster Risk Reduction , Climate Change Adaptation & Resilience ,Urban Environmental Management, Governance and Policy Affair, Water Resource Management, Green & Clean Energy, EIA, Sustainable Development and Mountain Development strategies, ideas, policies & practices in developing countries . Already worked for South, South-East, Central Asian Countries and Hindu-Kusch Himalaya Region. Associated with Institutional and Human Capacity Development, Regional Collaboration and Networking, Applied Research , Interdisciplinary DRR Curriculum Development, Modular Training and M&E Programme.

Associated Institutions and Centre of excellence in the Region like

1. Asian Institute of Technology, Thailand
2. Bangladesh University of Engineering and Technology, Dhaka, Bangladesh
3. CSK- Agriculture University, HP- India
4. CSIR- Institute of Himalayan Bioresource Technology
5. Palacký University Olomouc, Czech Republic
6. Institute of Mountain Hazards and Environment, CAS, China
7. Indian Institute of Public Administration ,New Delhi ,India
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9. United Nations University-International Leadership Institute ,Jordan
10. Kabul University, Afghanistan
11. Tribhubhan University, Nepal
12. Kathmandu University, Nepal
13. Lanzhou University ,China
14. Agriculture University, Bengaluru, India
15. Sher-e-Kashmir University of Agricultural Sciences and Technology, Kashmir
16. Tata Institute of Social Sciences, (TISS),India
17. National Institute of Rural Development, Hyderabad ,India
18. Mongolia International University, Ulaanbaatar, Mongolia
20. Shoolini University ,India



Ir. Dr. Mohammed Alias Yusof

Professor

Department of Civil Engineering

Faculty of Engineering

National Defense University of Malaysia

BIOGRAPHY

Ir. Dr. Mohammed Alias Yusof is Professor in the Department of Civil Engineering, Universiti Pertahanan Nasional, Malaysia. He graduated with B. Eng (Hons) degree in Civil Engineering from Universiti Teknologi Malaysia (UTM) in 2002, a MSc. degree in Integrated Construction Project Management from Universiti Teknologi Mara (UiTM) in 2005 and PhD degree in Civil Engineering from Universiti Pertahanan Nasional Malaysia in 2013. His main research interests are in the blast resistant materials such as concrete, glass, and also military and commercial explosives. He is registered Professional Engineer with Practising Certificate (PEPC) with Board of Engineer Malaysia. He has about 15 years experience in construction industry and 14 years of experience as an academician. Dr Mohammed Alias Yusof is author of " Blast Resistant Materials : Concrete and Glass", book. This book focus on the introduction to explosive technology, blast phenomena, blast resistant concrete and glass. Dr. Mohammed Alias has published extensively in the areas of blast resistant materials and technology, with a total publication count of more than 80, has served as reviewer for prestigious journals Science and Technology Journal. In 2017, he has been awarded a Distinguish Scientist by Venus International Foundation, Chennai, India for his valuable contribution in the field of blast resistant materials and civil Engineering.



Engr. Philip P. Ermita

Dean, College of Engineering
University of Perpetual Help - Calamba Campus
Philippines

BIOGRAPHY

Dr. Philip Ermita is currently the Dean of the College of Engineering of University of Perpetual Help System Delta Calamba Campus in the Philippines. From 2005-2010, Dr. Ermita worked in the different manufacturing industries such as ceramics and electronics manufacturing company. From 2010 up to the present, he is strongly involved in academic development and innovation of engineering programs through Outcomes Based Education transition. He is strongly committed to animate engineering education through engineering research for student's welfare, development and global opportunities.

Prof Dr. Philip P. Ermita, PIE, ASEAN Eng.
Professional Industrial Engineer
ASEAN Engineer Register



Dr. Ako R. Hama

Associate professor
Civil and Environmental Engineering
American University of Iraq, Sulaimani
Iraq

BIOGRAPHY

Dr. Ako was born in Sulaimania, Kurdistan Region, Iraq in 1972 and did his kindergarten, elementary, primary and secondary schools in Sulaimania . He is holding honor PhD, MSc and BSc. degrees in civil and environmental engineering. He has been in academic and research fields since 2000 as a professor and teaching at many universities as a visitor professor and teaching at AUIS since 2019 . He is teaching and advising undergraduate, graduate and PhD courses. He occupied several academic positions chair ,faculty and adjunct faculty member. He is proudly a voting member in American Society of Civil Engineering ASCE since 2019 and also in Environmental and Water Resources Institute EWRI also since 2019 . Furthermore, he has been a PE professional engineer in Iraq Engineer Union IEU and Kurdistan Engineering Union KEU since 1995 . Dr. Ako has been awarded many certifications and appreciation letters from different academic and governor sections. Having published more than 16 scientific papers and articles in well-known International and local scientific journals, he is an international outstanding Elsevier Journals reviewer. He has engineering soft skills for more than ten different softwares and worked in tenths of engineering projects as an expert , professional engineer and supervisor

- Ph.D. University of Technology, Baghdad
- M.Sc. University of Technology ,Baghdad
- B.Sc. University of Baghdad



Dr. Vitantonio Roma

Head of Geotechnical Engineering Department
TEAM Engineering Spa, Italy

BIOGRAPHY

Vitantonio Roma, a Civil Engineer with more than 20 years of experience in the field of Civil Engineering. Experienced in design, project and proposal management of infrastructures (railways and roadways, tunnels, bridges), buildings and power plants. I have been working at international projects in Europe, Asia, Africa and US. His Master degree in Structural Engineering (cum laude) and a Doctorate degree in Geotechnical Engineering from Technical University of Turin (Politecnico), Italy. During PhD he spent 1 year at Georgia Institute of Technology of Atlanta, Georgia, US as visiting PhD student. He wrote about 30 technical-scientific articles and 2 books on geophysical methods MASW-REMI-HVSR. Also hold a Master in Business Administration from the Business School of Il Sole 24 ore (the Sun 24 Hours Journal). Also had experience as Proposal Manager in Maire Engineering-Tecnimont for the Infrastructures Department from 2007 to 2010 and Head of Proposals Department in TEAM Engineering from 2011 to 2017.

currently he hold the positions of:

- Head of the Geotechnical Department for the international consulting firm TEAM Engineering (Italy).
- Vice-President of the Geotechnical Comitee of the Order of Engineers of Rome
- Deputy Representative in the the Geotechnical Comitee of the Italian Council of the Engineers.

Also, a member of

- the National Association of Geotechnical Engineers (AGI)
- the International Society Soil Mechanics and Foundation Engineering (ISSMFE)
- the International Society Rock Mechanics (ISRM)
- the Italian Association of Railway Engineers (CIFI)

his 20 years of experience shows that he is open-minded and business-oriented, with strong team leadership.

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1st Session chair: Mr. Shubhranshu Jaiswal/ Mrs. Neeti Mishra

Mr. Shubhranshu Jaiswal

- Assistant Professor & Departmental In-charge, Babu Banarasi Das University Lucknow

Mrs. Neeti Mishra

- Assistant Professor, Babu Banarasi Das University Lucknow

2nd Session chair: Mr. Mohd. Afaque Khan/ Mr. Kamal Nabh Tripathi

Mr. Mohd. Afaque Khan

- Assistant Professor, Babu Banarasi Das University Lucknow

Mr. Kamal Nabh

- Assistant Professor, Babu Banarasi Das University Lucknow

3rd Session chair: Mr. Ankit Verma/ Mr. Ravi Maurya

Mr. Ankit Verma

- Assistant Professor, Babu Banarasi Das University Lucknow

Mr. Ravi Maurya

- Assistant Professor, Babu Banarasi Das University Lucknow

4th Session chair: Mr. Faraz Khan/ Mr. Bilal Siddiqui

Mr. Faraz Khan

- Assistant Professor, Babu Banarasi Das University Lucknow

Mr. Bilal Siddiqui

- Assistant Professor, Babu Banarasi Das University Lucknow

ICCEASI -21

International Conference on *Civil Engineering, Architecture and Sustainable Infrastructure*

BBDU, Lucknow, Uttar Pradesh, 23rd – 24th September, 2021

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Assistant Professor, Civil Engineering
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Andhra Pradesh , India

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Telangana, India

Gomasa Ramesh

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Telangana, India

Kolimi Shaiksha Vali

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Vellore Institute of Technology
Tamil Nadu, India

Lovleen Gupta

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Assistant Professor, Civil Engineering
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Maharashtra , India

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Motihari College of Engineering,
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SET – Jain University
Karnataka, India

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Gujarat, India

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Assistant Professor, Civil Engineering
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Uttar Pradesh, India

Yusuf Sultan

Assistant Professor, Civil Engineering & Applied Mechanics
Shri G. S. Institute of Technology and Science
Madhya Pradesh, India

Abhishek Chaudhari

Research Scholar, Civil Engineering
Sardar Vallabhbhai National Institute of Technology
Uttar Pradesh, India

Ahsan Rabbani

Assistant Professor, Civil Engineering
Darbhanga College of Engineering
Bihar, India

B Suguna Rao

Assistant Professor, Civil Engineering
Ramaiah Institute of Technology
Karnataka, India

Dr C V Siva Rama Prasad

Associate Professor, Civil Engineering
Vignana Bharathi Institute of Technology
Telangana, India

Dr. Manish Pandey

Assistant Professor, Civil Engineering
National Institute of Technology (NIT)
Telangana, India

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Associate Professor, Chemical Engineering
MVGR College of Engineering (A)
Andhra Pradesh, India

Dr. Shrikant M. Harle

Assistant Professor, Civil Engineering
Prof Ram Meghe College of Engg & Management
Maharashtra, India

Dr. Sudheer Kumar Yamsani

Assistant Professor, Civil Engineering
National Institute of Technology Warangal
Telengana, India

Dr.G.Babu Rao

Associate Professor, Civil Engineering
Narasaraopeta Engineering College
Andhra Pradesh, India

Dr.Ganesh Shivaji Ingle

Associate Professor, Civil Engineering
MIT World Peace University
Pune, India

Dr.M. Bhuvaneshwari

Assistant Professor, Civil Engineering
SRM Institute of Science and Technology
Tamil Nadu, India

Likhith M L

Assistant Professor, Civil Engineering
Vemana institute of Technology (Affiliated to VTU)
Karnataka, India

Mr. Nabajyoti Modak

Assistant Professor, Civil Engineering
Anand Institute of Higher Technology (AIHT)
Tamil Nadu, India

Mrs. R. Geethamani

Assistant Professor, Civil Engineering
Bannari Amman Institute of Technology
Tamil Nadu, India

Mrs.Preetha.V

Assistant Professor, Civil Engineering
Bannari Amman Institute of Technology
Tamil Nadu, India

N.V.Manjunath

Assistant Professor, Civil Engineering
Bannari Amman institute of technology
Tamil Nadu, India

Rajesh Jadhav

Associate Professor, Civil Engineering
Bharati Vidyapeeth College of Engineering
Maharashtra, India

Rajiv Bannerejee

Associate Professor, Civil Engineering
Integral University
Uttar Pradesh, India

Abhishek Dixit

Other, Research Scholar, Civil Engineering
Shiv Nadar University
Delhi , India

Dr.P.Samatha Chowdary

Assistant Professor, Civil Engineering
R.V.R & J.C College of Engineering
Andhra Pradesh , India

Rohit Sahu

Assistant Professor, Mecchanical Engineering
GL Bajaj Institute of Technology and Management
Uttar Pradesh, India

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ICCEASI -21

**International Conference on
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ABSTRACTS

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Challenges and opportunities in precast construction industry in Indian Scenario

¹ Abhi K. Rakholiya, ²Pravin R.Minde, ³Mrudula S. Kulkarni

^{1,2,3} Dr. Vishwanath Karad MIT World Peace University, Pune, Maharashtra, India

Abstract

The concept of “built it fast” within the most conservative way has not changed since the beginning; in any case, unused advances have been created to suit present-day world development. We are as of now on the skirt of large-scale urbanization thus confronting a tremendous request for building houses. India is the world’s fastest developing nation with a financial development rate averaging 7.5% for the last 5 years. One such arrangement is pre-cast concrete development innovation. The essential reason for pre-cast development is to create structural components in a productive work environment with getting to specialized abilities and hardware to diminish fetched and time uses on the location whereas improving the quality and consistency of Pre-cast innovation, the so-called unusual strategy within the Indian field can encourage both speed and quality and abuse the preferences that ventures offer in terms of reiterations and volume. Pre-cast concrete technologies are now widely used and practiced in the industry. Thermal, acoustic, and seismic resistant technologies, as well as aesthetically pleasing architectural pre-cast facades for buildings, are already available and used in many countries. With such innovative products and construction, pre-cast technology can gain traction in the Indian construction industry.

Keywords

Pre-cast construction, Infrastructure sector, Sustainable, Project management.

A Review of Road Side Drainage System and Disaster Management utilizing Permeable concrete

¹Abhishek Kumar Sinha, ²Ankit Verma, ³Prof. (Dr.) Omprakash Netula

¹M.Tech Scholar, Transportation Engineering, Babu Banarasi Das University, Lucknow, India

²Assistant Professor Department of Civil Engineering, Babu Banarasi Das University, Lucknow, India

³Professor & HOD Department of Civil Engineering, Babu Banarasi Das University, Lucknow, India

Abstract

Permeable concrete is a relatively an incipient concept for road pavements, with increase into the quandaries in rural and urban areas cognate to the low ground dihydrogen monoxide level and agricultural livestock quandaries. Permeable concrete has introduced as a road pavement material. Permeable concrete is now being researched and being optimised to be utilized as apaving material due to its facility to sanction dihydrogen monoxide to permeate itself to recharge groundwater level and minimize storm dihydrogen monoxide runoff and store the extravagant dihydrogen monoxide for further use. The invention and utilisation of permeable concrete as pavements showcases its applications and engineering properties, including environmental benefits, structural properties, durability. In any area, cost consideration is the primary factor which must be kept in mind. Permeable concrete pavement is unique and efficacious betokens to meet growing environmental demands. By storing storm dihydrogen monoxide and sanctioning it to percolate into the ground and amass the extravagant dihydrogen monoxide. This Keenly intellectual Management System of inclemency dihydrogen monoxide technology engenders more efficient land use by eliminating the desideratum for retention ponds, swell, and other costly management contrivances. The archetype showcases the perspicacious management and working of the project and paper. An endeavor to experiment the compressive vigor of permeable concrete by varying quantity of sand is withal made.

Index Terms

Storm water, excessive water, permeable concrete, pipe system, water utilization.

A Study on the use of Bio-medical (COVID-19) waste in the production of Modern Eco-Friendly Construction Bricks, A Review

¹Jyoti Tiwari, ²Shubhranshu Jaiswal

¹B-Tech Student, BabuBanarasi Das University, Lucknow, Uttar Pradesh

²Assiatant Professor, BabuBanarasi Das University, Lucknow, Uttar Pradesh

Abstract

In this modern world, we have a lot of new and emerging construction technologies. A lot of researches are in progress and a lot of them to be done according to the need of Civil Engineering. Something similar we are going to do during this seminar. The Coronavirus (COVID-19) pandemic will not only create a global health crisis, but it is also now threatening the environment. A multidisciplinary collaborative approach is required to fight against the pandemic and reduce the environmental risks regarding with the disposal of used personal protective equipment (PPE). This paper explores an innovative way to reduce pandemic generated waste by recycling the used face masks with other construction materials. The waste will be recycled and reused as substitutes in construction because construction applications take up significant amounts of aggregates and cement. This review submits that there is an opportunity for the use of bio-medical(COVID) waste as an innovative alternative in the construction industry which can stimulate economic growth and could boost the drive of government towards the achievement of some of the sustainable development goals. Also similar kind of research may be proceeded in future by using fly ash and PPE in bricks to increase its strength and make it cost-effective, eco-friendly and sustainable option.

Keywords

personal protective equipment (PPE), Bio waste, Modern Bricks, Sustainable Bricks, Eco-friendly Bricks

Road Safety Audit on Existing Road Stretch of Mathura– Vrindavan Road

¹ Deepak Panwar, ² Amir Ali Khan, ³ Saurabh Jaglan, ⁴ Dr. Sachin Dass

¹ Highway Safety Engineer, Sumanil Designers and Consultants Private Limited, Vaishali, Ghaziabad, U.P

² Research scholar, Deenbandhu Chhoturam University of Science and Technology, Murthal, Sonipat, Haryana

³ Assistant Professor, Deenbandhu Chhoturam University of Science and Technology, Murthal, Sonipat, Haryana

⁴ Assistant Professor, Deenbandhu Chhoturam University of Science and Technology, Murthal, Sonipat, Haryana

Abstract

During the planning, construction, and maintenance phases of a road, a Road Safety Audit is a critical technique for paying much attention to road safety. It is “a formal, systematic and detailed examination of a road project by an independent and qualified team of auditors that leads to a report of the potential safety concerns in the project.” (IRC: SP: 88 – 2019). From the DPR stage to the operational and maintenance stage, a road safety audit including checklist should be a compulsory part at every stage of the project. In this study a comprehensive safety analysis of the existing 7.85 km stretch on Mathura – Vrindavan road (MDR- 123) is carried out at actual site locations. Project Road starts from Vrindavan Mor Near Masani police station and terminates in Vrindavan near Munger Raj Mandir. According to the IRC, a number of recommendations are required to address the inadequacies of advances cautionary sign, hazard marker on parapet wall of culvert, delineators, proper marking etc for safe and efficient traffic movement. The goal of this research is to determine the most likely causes of road accidents and to come up with solutions. Various recommendations/ remedial measures are also suggested and priorities presented in this study.

Keywords

RSA, Delineators, Road Safety Manual, Hazard Marker, Checklist.

Synthesis and Characterization of Aluminium Fumarate Metal-Organic Frameworks impregnated on Polyurethane Foam

¹ Anju R, ² Meera V

^{1,2} Department of Civil Engineering, Government Engineering College, Thrissur, Kerala, India

Abstract

The exclusion of hazardous contaminants from water/wastewater is one of the major challenges faced throughout the world. Presently though there are several effective technologies, adsorption seems to be the best option due to cheapness and high efficiency. Metal organic frameworks (MOFs) are a class of compounds consisting of metal ions or clusters coordinated to organic ligands to form porous substances. The application of metal organic frameworks in adsorption of hazardous contaminants are more appealing than traditionally used adsorbents like activated carbon, zeolites etc. because of their enhanced efficiency and structural integrity. The MOFs shall be coated on to a suitable support medium to increase their practical applicability in wastewater treatment. In this study, Aluminium Fumarate Metal Organic Frameworks (Al-Fum MOFs) synthesized by green method were impregnated into the polymer, polyurethane foam (PUF), which was functionalized with carboxyl groups. Characterization of the Al-Fum MOFs impregnated PUF (Al-Fum MOFs-PUF) and PUF were done using Fourier Transform Infrared (FTIR) spectroscopy, Brunauer-Emmett-Teller (BET) analyser and Scanning Electron Microscope (SEM). SEM images after impregnation showed bound Al-Fum MOFs on the surface of PUF and increased pore size. BET analysis revealed the surface area, mean pore diameter and total pore volume of Al-Fum MOFs-PUF as 9.08 m²/g, 2.14 nm and 0.0042 cm³/g and for PUF as 2.97 m²/g, 0.49 nm and 0.00036 cm³/g. The FTIR analysis showed the characteristic functional groups which confirmed the incorporation and effective binding of Al-MOFs in PUF. Thus the enhanced surface properties viz. surface area, mean pore diameter and pore volume together with effective binding on functionalized PUF make Al-Fum MOFs-PUF suitable for removing various pollutants from water/wastewater with enhanced efficacies.

Keywords

Metal organic frameworks, Adsorption, Aluminium fumarate, Al-Fum MOFs-PUF

Re-design through Adaptive Reuse: An approach for designing Sustainable Heritage

¹ **Ankita Bajpai**, ² **Ashish Mishra**

¹ Freelance Architect, Educator

² Research Scholar MNNIT Allahabad

Abstract

Sustainable Architecture is not a choice anymore, but instead it is emerging to become a requisite part of the current design and construction practices. The building that reflect a city's character, origin of our cultural values, define the architectural character of the city, need to be sustained. Yes the heritage buildings should be focused equally, as it is not only about the structure, but all the associated activities. The historic built environment is a finite and non- renewable resource and like any other environmental resource, it needs sustaining for the welfare of future generations. The emphasis is not only on the built heritage, but also on the indigenous artistic skills and practices which, if not checked for sustainability, shall fade. Hence Adaptive reuse should be adopted.

This paper aims to retain and reuse significant historic architecture and harmoniously unite it with the current built and open spaces. To achieve this aim a research strategy is designed to meet the major four objectives: Firstly a literature related to sustainable development, adaptive reuse is reviewed. Secondly identify the dead heritage zones and analyse about the gradual changes from past to present. Third step is to preserve and reuse the existing building and propose revitalization of heritage precincts. Fourth step is to use the surrounding areas more effectively that benefits the local people providing employment, recreational spaces and art galleries. Finally, research conclusions are mapped and few recommendations useful for professionals following practice of adaptive reuse of historic buildings are implemented.

Keywords

Adaptive Reuse, Sustainable Heritage , Sustainable development, Sustainable Values.

Remediation Technology for Metal Contaminated Site: A Review

¹Ashish Mishra, ²Neeti Mishra, ³Ankita Bajpai

¹ Research Scholar MNNIT Allahabad

² Research Scholar Shri Ramswaroop University

³ Freelance Architect, Educator

Abstract

Indiscriminate use of pesticides in agricultural practices, improper dumping of industrial wastes, accidental leaks and spills, unscientific mining activities etc has lead to contamination of soil, water, air and environment as a whole. People living near a contaminated site may be exposed to hazardous contaminants by direct contact with it, inhaling it or through any other indirect route. Hence to reduce the amount of contamination there needs a remediation technology which can fully remove contaminants or reduce its further movement.

This review paper describes all the remediation technologies which are applicable for metal contaminated sites. Each site has different characteristics and contamination level based on which different types of technologies can be used. Each technology has its own advantages and disadvantages, hence selecting technology for a site is a complex process. This review paper will help stakeholders to understand different remediation technologies and their characteristics.

Keywords

Remediation, contamination. solidification/stabilisation , metals.

Study on Behaviour of Self Healing Concrete, A Review

**¹ Bhanu Pratap Singh, ²Dr. Rakesh Varma, ³Dr. Rajendra Kumar
Srivastava**

¹ Ph.D Scholar, SRMU, Lucknow-225003, India

² Professor, Faculty of Civil Engineering, SRMU, Barabank-225003, India

³ Professor, Faculty of Civil Engineering (Retired Engineer in Charge, UPPWD) , SRMU, Barabanki-225003, India

Abstract

This paper discusses about the behaviour of self healing concrete. Through collecting, sorting and analyzing the domestic and foreign references of self-healing concrete. Self-healing concrete types include self-healing concrete based on concrete itself, self-healing concrete based on shape memory alloy, bionic self repairing and on microbial.

Crack formation is very common phenomenon in concrete structure which allows the water and different type of chemical into the concrete through the cracks and decreases their durability, strength and which also affect the reinforcement when it comes in contact with water, CO₂ and other chemicals. For repairing the cracks developed in the concrete, it requires regular maintenance and special type of treatment which will be very expensive. So, to overcome from this problem autonomous self-healing mechanism is introduced in the concrete which helps to repair the cracks by producing calcium carbonate crystals which block the micro cracks and pores in the concrete. The selection of the bacteria was according to their survival in the alkaline environment. The condition of growth is different for different types of bacteria. For the growth, bacteria were put in a medium containing different chemical at a particular temperature and for a particular time period. Bacteria improves the structural properties such as tensile strength, water permeability, durability and compressive strength of the normal concrete which was found by the performing different type of experiment on too many specimens had varying sizes used by different researchers for their study of bacterial concrete in comparison with the conventional concrete and from the experiment it was also found that use of light weight aggregate along with bacteria helps in self healing property of concrete. For gaining the best result a mathematical model was also introduced to study the stress-strain behavior of bacteria which was used to improve the strength of concrete.

Self – Healing concrete is mostly defined as the ability of concrete to repair its small cracks autonomously. The idea of self healing concrete was inspired from the animals. Damaged skin of trees and animals can be repaired autonomously. Remediating cracks in concrete structure is important for its service durability and structure safety.

Keywords

self-healing, self-repair, autonomous healing, automatic healing, auto-treatment, self-treatment, Bio- concrete, bio-inspired, biological concrete, calcite, bio- mineralization and calcite precipitation

Study of Textural Behavior of Concrete Pavement: A Case Study of Yamuna Expressway

¹Daya Shankar Ray, ²Dr Rajendra Kumar Srivastava, ³Dr Rakesh Varma

¹ Research Scholar (Author)

² Professor SRMU, E-in-C (Rtd) UP PWD, Managing Director, UP State Bridge Corporation

³ Professor SRMU, CE (Rtd) UP Irrigation

Abstract

In the modern world, transportation has reached to a new level with enhanced technology and innovative material for the construction. Modern time requires higher speed and lesser time of travel between origin and destination, hence expressways have attained more priority than the other category of road. There are availability of design module of lesser intersections, lesser obstruction, hence providing higher speeds even >100 kmph. The rigid pavement design of the expressways has given higher speed but has somehow compromised in the surface friction part too and to balance this part, there has been a provision of higher texture depths which has given better gripping value both in dry and wet conditions. But now it has come into notice that there are a number of accident due to tire bursting phenomenon, that is occurring in the rigid pavement, Texture provided on the pavement is basically a series of repeating figures drawn transverse to the moving direction in order to attain a desired value of skid resistance and friction so as to avoid skidding in any condition. But in view of this there is an abrupt increase in the amount of energy being produced and this is causing the problem of tire bursting. The kinetic theory of gases has given the kinetic energy of the enclosed gas before the test and after the test. Since there is an increase in the pressure of the tires hence using Gay Lussac's law we concluded there will be an increase in the temperature. The increase in the kinetic energy gave us the conclusion about the mean texture depth that can be adopted Friction analysis and the contact area patch analysis has also given the reasons why low inflation pressure and the poor quality of the tires can lead to the tire bursting phenomenon .

Hence this paper has analysed the amount of energy that is contributed by the higher texture depths into the rolling tire rolls on the surface of rigid pavement and how it gets distributed into the atmosphere and some absorbed by the rolling tire.

Keywords

texture , energy ,tire bursting , tire pressure

A Review on Delay at Signalized Intersection Using Various Delay Models

¹ Harsh rai, ²Ravi Maurya, ³Prof.(Dr.) Omprakash Netula

¹ M.tech scholar, Transportation Engineering, Babu Banarasi Das University

² Assistant Professor, Department of Civil Engineering, Babu Banarasi Das University

³ Professor & HOD, Department of Civil Engineering, Babu Banarasi Das University

Abstract

In India estimated population is 1.3 billion and maximum number uses their private vehicle such as bike, cars etc. for completing a trip or public vehicle such as buses, auto rickshaw etc. are also used for transportation purpose. In country like USA, Russia has homogeneous traffic condition which is strict lane restriction and other traffic rules are mandatory to follow, but traffic condition in India is heterogeneous which is mixed traffic condition and no lane restriction. Level of service LOS is an important factor for Indian traffic condition and LOS could be obtained only by calculating delay at an intersection. Delay at signalized intersection can be of different type such as stopped time delay, travel time delay, control delay, data are collected by different devices such as video camera, global positioning system GPS, and google maps is also used. In this study delay at signalized intersection is calculated with the help of different model which is HCM model, Webster model, Queuing model etc. All these models are suitable for homogeneous traffic condition and with strict speed control but in India the traffic condition is heterogeneous and mixed composition of traffic flow so for the calculation of heterogeneous traffic condition it is mandatory to make some modification in models for calculation of delay.

Keywords

Homogeneous, Heterogeneous, Level of service LOS, Stopped time delay, Travel time delay, Control delay, Webster, HCM, Queuing.

A Numerical Study of the Performance of Structural Elements with Carbon Fiber Reinforced Polymers (CFRP) Using Linear and Nonlinear Analyses

¹Michael B. Baylon, ²Abdalelah A. Mohammed

^{1,2,3} Associate Professor, Civil Engineering, Polytechnic University of the Philippines

Abstract

Carbon-fiber-reinforced polymers (CFRP) have been a staple material in retrofitting RC structural elements, such as beams, girders, and columns. After assessing the seismic vulnerability of a school building named Santa Lucia High School which is located 3.1 km from the West Valley Fault, the building performance has been compared when it is applied with CFRP in the ground floor columns. Based on the HazardHunterPH website, the building location is prone to ground shaking at a PHIVOLCS Earthquake Intensity Scale of VIII. Thus, this study aimed to model the building using a computer software, compare the pushover curves of the column with or without CFRP, determine the performance points of the most critical column using Capacity-Spectrum Method (CSM), constructing the seismic fragility curves of the critical column with or without CFRP, and evaluate the two model's difference in terms of parametric results. From the as-built plans and material property of the two models – with or without CFRP – structural models were created and then simulated with different ground motion data of strong earthquake event, in preparation for the Capacity Spectrum Method and performance point determination. The pushover curves created for the two models resulted to an average of 20.4% improvement in its base shear. Consequently for both models, an average of 66% improvement of seismic fragility curves across damage ranks (from slight damage to complete damage) where the intensity measure in terms of peak ground acceleration (PGA), ranges from 0.175g to 0.4g for the model without CFRP vis-à-vis a range of 0.5g to 1.3g for the model with CFRP.

Study on Strength on Concrete with Partial Replacment on Coarse Aggregate with E-Waste

¹ Parth Sengar, ² Mohd. Adil, ³ Bilal Siddiqui, ⁴ Prof. (Dr.) Omprakash Netula

^{1,2} B.Tech Student, , Department of Civil Engineering, Babu Banarasi Das University, Lucknow, India.

³ Assistant Professor, Department of Civil Engineering, Babu Banarasi Das University, Lucknow, India.

⁴ Professor And Head of Department, Department of Civil Engineering, Babu Banarasi Das University, Lucknow, India

Abstract

Cement concrete popular building material because of its mouldability in the plastic state and when solidifies become a hard material capable to take very high compressive strength about 70% of the concrete volume comprises of aggregates which not only gives bulk to the concrete mix but also takes considerable amount load properties of concrete produced from it. This paper reports an experimental work carried out to study the effectiveness of E-waste to be used as partial replacement of coarse aggregates E-waste is the discarded been designed and the replacement level tested were 10 15 and 20% for every replacement level slump test and compressive strength test is carried and reported in this paper.

Use of electronic waste in concrete is one of the effective ways of disposing E-waste which otherwise would be lying in landfills creating the environmental issues

Evaluation of Mechanical Performance of High Performance Hybrid Fiber Reinforced Concrete Containing Micro Silica

¹N. V. N. Prabath, ²P. Ramadoss

¹ Research Scholar, ² Professor,

^{1,2} Department of Civil Engineering, Pondicherry Engineering College, Pondicherry, India

Abstract

Due to extended use of concrete structures in military applications and runways, concrete structures are subjected to heavy/impact loads that vary both in velocity and intensity. Addition of fibers helps concrete overcome its shortcomings such as low durability, high shrinkage and less resistance to impact loading. The addition of fibers in high performance concrete (HPC) can overcome its shortcomings such as low durability, high shrinkage and less resistance and also improve the brittle behavior and the energy absorption capacity. In this study, we focused to develop the strengthening of HPC using steel and Polypropylene fibers. Moreover, an increase in volume fractions of both steel and polypropylene fibers leads to an increase in the compressive, splitting tensile and flexural strengths of concrete. The experimental results showed that the use of hybrid fibers with 1.5% in HPC concrete has improved the strength of the concrete when compared to HSC and single fibers with HPC.

Keywords

High performance concrete, steel and Polypropylene fibers, HSC, concrete

Review Paper on Design of Complex Traffic Signals at Nonsignalized Intersections

¹Pranav Kumar Pal, ²Ravi Maurya, ³Prof. (Dr.) Omprakash Netula

¹ M.tech scholar, Transportation Engineering, Babu Banarasi Das University, Lucknow, India

² Assistant Professor Department of Civil Engineering, Babu Banarasi Das University, Lucknow, India

³ Professor @ HOD, Department of Civil Engineering, Babu Banarasi Das university, Lucknow, India

Abstract

Smooth traffic control is only possible when all intersections are well signalized. The conflicts arising from movements of traffic in different directions is solved by time sharing of the principle. The main purpose of this paper is to design traffic signals to ensure an orderly flow of traffic, provide an opportunity for pedestrians or vehicles to cross an intersection and help reduce the number of conflicts between vehicles entering intersections from different directions.

Keywords

Traffic signals, traffic light, traffic control, traffic flow, traffic density, intersection, Passenger Car Unit.

Behaviour of Extended shear tab connection subjected to concentrated loads

¹ Priti Satakar, ² Dr. S.N. Londhe, ³ Dr. P. R. Dixit

¹ Research Scholar, Vishwakarma Institute of Information Technology-Pune University

² Professor, Vishwakarma Institute of Information Technology-Pune University

³ Associate Professor, Vishwakarma Institute of Information Technology-Pune University

Abstract

one of the most important features in steel building structures is the connection joint between various components. The most common type of connection is Extended shear tab (EST) in which a shear tab is welded to the supporting member and is bolted to the web of the supported beam. The reason which makes this type of connection attractive to engineers and fabricators because using EST connections eliminates excessive beam end cutting and modifications. It has become a popular alternative for light to moderate end shear connection as it is a cost effective connection in steel frame building. Present work exhibits a numerical study on the failure mechanism of extended shear tab connections using Finite element method (FEM). The solutions of FEM were compared with experimental results reported in the literature. Experimental Validated model was utilized for finite element analysis of 22 extended shear tab connections with different seven parameters. FEM results were analysed to determine the effects of these parameters on the failure of extended shear tab connections. Furthermore the comparison of results has been made with design given by 14th edition of the American Institute of Steel Construction Manual (AISC). It has been seen that the extended shear tab connections mostly fail in shear tab twisting, bolt shear, bolt bearing and net shear bending interaction. Additionally the analysis of the stresses around the bolt holes based on the mode of failures is presented.

Keywords

Extended shear tab, AISC Design Procedure, Finite Element study

Strength and Cost Evaluation of Different Types of Nano Material Concrete for Economical Construction Using Ordinary Portland Cement

¹ Raghavendra Prasad H D,² Nagaraj Sitaram

¹ Department of Civil Engineering, Jain University, Bangalore

² Department Of Civil Engineering, East Point College Of Engineering And Technology, Bangalore

Abstract

Recent days, the applications of nano materials in construction are finding a resolution for decreasing the use of cement and decreasing the emission of Carbon Emission in the atmosphere. The outcome of various percentages of Multi - Walled Carbon Nanotubes (MWCNTs), Titanium Di Oxide (TiO₂) and Copper Oxide (CuO) on the cement to investigate the properties of hardened cement paste and cubes was inspected. The addition percentages of Ordinary Portland cement (OPC) with % replacement of MWCNT, TiO₂ and CuO were 0%, 0.1%, 0.25% and 0.5%. The concrete cube is tested and the results have shown the replacement of OPC with up to 0.5% of the multi walled carbon nanotubes with optimum amount can be considered for both enlightening mechanical properties with the increment of strength up to 22% for OPC. Cost analysis have been done to check the performance of different Nano Material Concrete with which Titanium Di Oxide (TiO₂) give best performance when compare to Multi – Walled Carbon Nanotubes (MWCNTs) and Copper Oxide (CuO). When it comes to carbon score Multi – Walled Carbon Nanotubes (MWCNTs) gave more efficiency by reducing the usage of cement when compare to Titanium Di Oxide (TiO₂) and Copper Oxide (CuO).

Land Value Capture Finance Framework in India: A Comparative Review of TOD Policies Measures

¹ Sahil Singh Kapoor, ² Dr. Tejwant Singh Brar

¹ PhD Research Scholar, Sushant School of Art and Architecture, Sushant University, Gurugram

² Professor, Sushant School of Art and Architecture, Sushant University, Gurugram

Abstract

Several Indian metropolitan cities are willing to adopt and explore various methods to implement transit-oriented development (TOD) around their transit stations to reverse the ongoing trend of automobile-oriented urbanization. However, lack of adequate links between land-use and public transportation planning has widened the transit funding gap and severe fiscal constraints in most Indian cities to finance highly capital intensive Mass Rapid Transit System (MRTS). This research study identifies enabling factors besides transit investment that may influence development-based Land value capture (LVC) mechanism and TOD based investment in transit station areas or corridors. These are favorable macro and micro-design conditions, encouraging regulatory and institutional framework, considerable transit technologies expertise, and adaptive local market conditions. The understanding of established national and state-level Indian TOD policies is done through identified study factors and indicators mentioned below. This paper proposes a conceptual assessment framework with a value capture strategy through the integration of strategic land-use development, public transportation, and transit funding. Indeed, Delhi TOD policy of MPD- 2021 encourages an efficient blend of diverse compatible land-use including residential, retail, office, and public space near transit stations. However, transit-supportively land-use requires effective coordination among local municipalities and transit companies to allow physical integration of transit station facilities with surrounding private properties and neighborhoods. TOD works on a policy-based concept which needs to be flexible and renewed as per the area requirements and its importance to the city or metropolitan region to reap accessibility and economic agglomeration increases as external economic benefits of public transport investment are capitalized to capture land value increases near transit areas.

Keywords

Indian cities, Land Value capture, Policies, Transit-oriented development

100%door to door coverage of segregated waste for a region by integration of RFID and IT solutions in Pune City

¹ Sangram C. Patil, ² Milind R. Gidde

^{1,2} Bharati Vidyapeeth (Deemed to be University) College of Engineering, Pune

Abstract

In India, many cities have a major problem with door-to-door coverage of separate waste collection due to the continued increase in the rate of population growth in urban areas and newly added villages. Existing cities are having a hard time to cover 100% D2D waste collection, one of which is Pune. The Municipal Corporation of Pune continually alters its boundaries.

The city of Pune is the hub of the IT industry, but Pune city is lacking in technology integration. That is why some citizens are taking advantage of the municipal corporation's insufficient tracking of door to door collection. However, that's the necessity in the waste management industry these days. In the current situation, it is not possible to physically supervise and keep a record of waste collection.

The Pune Municipal Corporation has problems such as door to door, solid waste Collection, Segregation, Monitor, Tracking, and Disposal of waste. The integration of RFID and IOT based IT solutions, has the potential to achieve 100% door-to-door collection of segregated waste collection.

Keywords

IT solution for door-to-door collection, segregation, surveillance, tracking and disposal of solid waste.

An Experimental Investigation on the Effect of GGBS and Steel Fibers on Deep Beams

¹ SathyaPriya.K, ²Dr. T.Ch.Madhavi

¹ Assistant Professor, Department of Civil Engineering, Sri Venkateswara College of Engineering, Sriperumbudur

² Professor and HOD, Department of Civil Engineering, SRM University, Ramapuram

Abstract

The present paper study is mainly focussing on investigating the characteristics of concrete with partial replacement of cement by Ground Granulated Blast Furnace Slag (GGBS) and steel fiber. In this experimental work, tests are to be conducted by adding ground granulated blast furnace slag (GGBS) in various proportions of 0%, 20%, 40%, 60%, 80% and steel fiber of 1% to concrete. Cubes and cylinders are tested for the compressive strength and split tensile strength at 7 days and 28 days. Deep beams of size 150mm x 325mm x 750mm are tested under two-point loading to study its behavior at 28 days. The load deflection characteristics, crack patterns and failure modes are observed. The maximum compressive strength of concrete is obtained for 20% GGBS replacement for cement along with the addition of 1% steel fiber. The split tensile strength of concrete G20SF1 having 20% GGBS with 1% steel fiber was optimum level which gives more than 30-35% more strength than the control concrete. The ultimate load carrying capacity of the deep beams is higher when compared to the control concrete reinforced deep beam. Diagonal shear cracks appear at higher loads for all GGBS fiber reinforced deep beams. The deflection at ultimate load for all GGBS fiber reinforced deep beams is lesser than the control deep beam except 80% GGBS fiber reinforced concrete beam.

Keywords

GGBS, steel fiber, deep beam, strength, deflection, behavior

Traffic Monitoring System

¹Saurabh Shukla, ²Ankit verma, ³Prof. (Dr.) Omprakash Netula

¹ M.tech scholar, Transportation Engineering, Babu Banarasi Das University, Lucknow, India

² Assistant Professor of Civil Engineering, Babu Banarasi Das University, Lucknow, India

³ Professor & HOD Department of Civil Engineering, Babu Banarsi Das University, Lucknow, India

Abstract

Traffic is part of every day lives. Every one needs to get point A to B at some time traffic congestion will never be eliminated but it can be managed to minimize delay maintain speed and improve travel time reliability. The current traffic management issue mainly due to the inefficient timer base traffic system. Traffic Monitoring System have many method to monitor by using Camara on traffic junction, Drone and many other traffic signals.

Optimizing the Mixture Proportion and Prediction of Compressive Strength of Polymer Modified Recycled Coarse Aggregate Concrete: A Review

¹Savithri S. Nair, ²Deepa Balakrishnan S

¹ Research Scholar, School of Engineering, Cochin University of Science and Technology, Kochi, Kerala, India

² Professor, School of Engineering, Cochin University of Science and Technology, Kochi, Kerala, India

Abstract

In order to prevent the deterioration of natural resources, utilisation of recycled materials is an effective alternate option. This will reduce the consumption and depletion of non-renewable resources to a greater extent. Recycled coarse aggregate is one such material that can be used to prevent the excess usage of natural aggregate. However, the properties of recycled coarse aggregate vary with different factors such as, water cement ratio, density, porosity etc which is basically due to the heterogenous nature of recycled coarse aggregate. All these factors will influence in reduction of compressive strength of Recycled Coarse Aggregate Concrete (RCAC) to a greater extent. Studies show that such losses can be prevented by adding supplementary cementitious materials. In this study Styrene Butadiene Rubber (SBR) is taken as the supplementary cementitious material.

In recent times, mixture design optimization is been encouraged and is one of the most needed method for designers to predict the compressive strength of concrete. So far Recycled Coarse Aggregate Concrete (RCAC) mixing proportion was based on experiments and results based on previous researches. We need a satisfying solution for proportioning recycled concrete mixture along with reduced cost and environmental sustainability. In computational optimization of RCAC, the properties of the recycled coarse aggregates such as moisture content, water absorption, apparent density etc as well as, water cement ratio, aggregate cement ratio, aggregate sand ratio etc were to be considered. If the input parameters are chosen properly, the prediction model exhibits higher precision. The importance of this paper is to highlight the advancement in the field of optimisation design and to show the significance of choosing input parameters for computational model for greater efficiency.

Keywords

Recycled coarse aggregate concrete, Optimising mix proportion, Properties of recycled coarse aggregate.

Geopolymer Concrete: Review Paper

¹Shivam Verma, ²Bilal Siddiqui, ³Prof.(Dr.) Om Prakash Netula

¹ M.Tech, 1st Year, Babu Banarasi Das University, Lucknow, India

² Assistant Professor, Babu Banarasi Das, University, Lucknow, India

³ Professor & H.O.D, Department of Civil Engineering, Babu Banarasi Das University, Lucknow, India

Abstract

This paper present an overview of advances in geopolymers formed by the alkaline activation of aluminosilicates is presented alongwith opportunities for their use in building construction. The properties of mortars/concrete made from geopolymeric binders are discussed with respect to fresh and hardened states, interfacial transition zone between aggregate and geopolymer, bond with steel reinforcing bars and resistance to elevated temperature. The durability of geopolymer pastes and concrete is highlighted in terms of their deterioration in various aggressive environments. R&D works carried out on heat and ambient cured geopolymers at CSIR-CBRI are briefly outlined alongwith the product developments. Research findings revealed that geopolymer concrete exhibited comparative properties to that of OPC concrete which has potential to be used in civil engineering applications

Keywords

Geopolymer concrete , Activator, Bond strength , Compressive strength , Durability .

Evaluation of Water Quality Index of surface water for Morena Region, Madhya Pradesh, India

¹ Shyamveer S. Chauhan, ² Aditya K. Agarwal, ³ Dr. M.K.Trivedi

¹ Research Scholar, Civil Engineering Department, MITS Gwalior

² Assistant Professor, Civil Engineering Department, MITS Gwalior

³ Professor & Head, Civil Engineering Department, MITS Gwalior

Abstract

The Purpose of this study is to determine the status of quality of water in Morena district. There are many rivers and its tributaries which are flowing in the morena region, out of which we have selected Chambal River, Saankh river and Kotwal reservoir for analysis. The water of the river used by these villages for their routine work. Sampling and Analysis was Performed from the duration of Oct 2020 to Nov 2020. These three sampling site are selected for sample collection and for Physio-chemical analysis, 12 Parameters are selected. For the assessment of water quality there are several ways as find suitable for drinking, industrial, and irrigation use. Water quality index is a unique number which describe the quality of water in terms of index number and produce a baseline data, for assessment of quality of water. As this WQI serves as decision support tool for pollution control agencies.

Keywords

Chambal river, Saank River, Drinking Water, Water Quality Index

Strength Studies on Fly Ash Based Fibre Boards for Buildings

¹Sridhar.S, ²Poornima.M

^{1,2} Bannari Amman Institute of Technology, Tamil Nadu, India

Abstract

Green buildings are becoming emerging trends in the construction industries. Now-a-days the construction projects focuses on the use of recycled and efficient materials in order to reduce the emission of carbon-di-oxide. Our objective is to make a product using naturally available material like coconut fiber, rice husk ash and fly ash, which can be added as admixtures with cement. These admixtures are readily available in rural areas, available at low-cost; they are ecologically friendly and can reduce the environmental impact. They are renewable and less weight. Fibers have been used in construction materials for a very long time. Making fiber reinforcement is both energy and economically efficient. The usage of fibers in addition with construction materials like cement can promote eco friendly and sustainable solutions. The initial part of the experiments consists of compressive and splitting tensile strength tests of cylinders and cubes to determine the properties of the concrete in addition with natural fibers at different ages. Our aim is to investigate the efficiency of natural fibers (coconut fiber and rice husk ash) and fly ash replacement ratios on fresh and hardened properties of concrete mixtures. This project is gives the detailed report on the properties of fly ash concrete composites with locally available natural fiber. The purpose of this project was to study the strength of fly ash mixed with fibers that can be used for construction. This project mainly focuses the study of effects of replacement of the cement by its weight with different percentages of fly ash and addition of natural fiber.

Keywords

Green buildings, natural fibers, eco friendly, sustainable solution, compressive and split tensile strength.

Influence of Redundant Binary Codes in Evolutionary Optimization of Water Distribution Systems

¹ Umar Dahiru Abubakar, ² Tiku Tanyimboh

¹ Kaduna Polytechnic

² University of Witwatersrand

Abstract

A widely used approach in the design of water distribution networks is Evolutionary algorithm (EA). That is a search space containing potential solutions which are encoded based on a particular structure. However, when EAs are encoded, they are represented by an n-bit string, where n equals to the number of bits, generating a number of valid codes for each decision variable. Thus, if the vector of decision variables cannot be expressed exactly to binary, then excess codes are generated which are termed redundant as they do not correspond to any valid gene (decision variable). The study will investigate the handling of redundant binary codes (RBCs) which involves remapping to any valid genes thereby providing alternative path for evolution. The model adopted for this study is the penalty-free multi-objective evolutionary optimization approach (PF-MOEA). PF-MOEA proves significant improvement in finding near optimal solutions and has outperformed other algorithms in the literature. In addition, it does not require any boundary search parameter or ad-hoc penalty function. The results obtained for the employed bench mark network indicates robustness and efficiency of the approach in handling RBCs. Finally, it concludes that PF-MOEA is capable of handling complex and challenging optimization problems seamlessly.

Keywords

Evolutionary algorithm, Multi-Objective optimization, Redundant binary codes, Water distribution systems

A Review on Self-Healing Concrete

¹Vandana Kushwaha, ²Neeti Mishra

¹M.Tech Structural Engineering, Babu Banarasi Das University, Lucknow, India

²Assistant Professor, Department of Civil Engineering, Babu Banarasi Das University, Lucknow, India

Abstract

Concrete is the most widely used construction material. The formation of cracks is a major drawback in concrete. In this paper an overview is given on the developments and advancement in self-healing mechanism. Crack formation is the much popular phenomenon in concrete structure that enables the water and various type of chemical into the concrete into the cracks and reduces their durability, toughness and which attacks the reinforcement if it comes in contact with water, CO₂ plus other chemicals. Self-healing concrete could resolve the obstacle of concrete structures depreciating considerably before the end of their lifespan. Concrete is quite one of the principal materials employed in the building industry, from the foundation of constructions to the edifice of bridges as well as underground parking lots. This characterized as the capacity of concrete to repair its breaks or cracks autogenously or autonomously. Nevertheless, self-healing concrete is classified into two parts: autonomous self-healing concrete and autogenous self-healing concrete

Keywords

concrete, cracks, formation, building, permeability, repair, carbon dioxide, healing, construction

Eradication of Iron from Ground Water Using Affordable Filter Technique

¹ S. Vanitha, ² Dr. N. K. Rajan

¹ Research Scholar, Sathyabama Institute of Science and Technology, Chennai, India

² Professor and Head, M.N.M. Jain Engineering College, Chennai, India

Abstract

Water purity is one of the deciding factors for good health to sustain in the globe. Intentional as well as non-malicious human activities which include groundwater abstraction, subsurface mining, vegetation removal, chemical explosions and infrastructure loading are the sources for contamination of groundwater. This paper deals the low-cost filter technique. Quality of groundwater has enhanced by removal of total iron concentration from 1.03mg/lit to 0.4mg/lit which permissible limit of iron concentration is 0.3mg/lit using low-cost solid phase extractor. Sugar cane bagasse adsorbent and pre-treated neem powder adsorbent have been selected as low-cost filtering extractor. Sugarcane bagasse removes 61.16% of iron content with 150 grams adsorbent whereas pre-treated Neem powder removes 50.48% of iron content with 150 grams of adsorbent.

Infusion of Zero Acreage farming(Z-Farming) on Urban stock in pulling Sustainable development goals: A Key for favourable Environmental Impact

¹ Varsha Verma

¹ Assistant Professor, School Of Architecture & Planning, Babu Banarasi Das University, Lucknow

Abstract

The brisk Urbanization has fostered us to consume more resources than ever and polluting the mother earth by deforestation and waste products. It's out of question to live in a society with much poverty and environment degradation. Economic growth will remain the basis for human development, but it must change and become less environmentally destructive. Sustainable development can steer us for the same by balancing our economic need with environmental and social needs to gain peace and prosperity. This can be attained by sustainable development goals adopted by United Nation that are the universal call of action to protect our planet and achieve sustainable future for all. These 17-SDGs are competent in addressing climate change and ensure environmental sustainability thereby equating economic, environmental, social growth. Zero Acreage farming(Z-Farming) can be an apparatus in accomplishing such SDG's of sustainability up to some measure by redefining the vast potential of unused urban and poverty effected spaces. The diffusion of urban farming will reflect a rising awareness of how food and farming can accelerate in SDG's and make a transition towards more sustainable, resilient, and efficient use of urban spaces. The concept will contribute to specific building related challenges, technical restraints and regulatory framework through discussions on opportunities and challenges of using urban building stock instead of vacant farmlands for farming.

Keywords

Zero-Acreage Farming, 17-SDG's, Urbanization, Sustainable development.

Climate Change – Time to Rethink Structural Engineering

¹ **Vikita Bora**, ² **Shivangi Saxena**

¹ Assistant Professor, School of Civil Engineering, Dr. Vishwanath Karad, MIT, World Peace University, S.No.124, Paud Road, Kothrud, Pune

² Student, School of Civil Engineering, Dr. Vishwanath Karad, MIT, World Peace University, S.No.124, Paud Road, Kothrud, Pune

Abstract

The world is witnessing the biggest man-made disaster of all times – Climate Change. The Structural Engineering Community has a major role in both - the problem and the solution - of this disaster. It is imperative that they become aware of the impacts that their design decisions can have on the environment. This paper talks about the Civil Structural Engineers' role in causing Climate Change and the avenues available to them to ameliorate those. Simple and varied examples from current industrial practice are provided to enhance understanding validate feasibility. The aim of this paper is to urge all the structural engineers to take a moment and ponder on the impact that their work and research can have on the future of this planet. Current research needs are emphasized wherever recognized.

Keywords

Structural Engineering, Sustainable Development, Sustainable Design Techniques, Sustainable Materials

Use of River Sediment in River Training Work

¹Vishal V. Kamble, ²Madhura C. Aher

¹ Department of Civil Engineering, NDMVP's KBT College of Engineering, Nashik, India

² Department of Civil Engineering, NDMVP's KBT College of Engineering, Nashik, India

Abstract

The worldwide water demand is increasing but reservoir storage capacities across the globe are decrease the global average annual rate of storage loss owing to reservoir sedimentation is estimated to be between 0.5 and 1% of total storage capacity on average. Sediments play a vital role in elemental biking in the aquatic environment. Natural river stretches are normally in morphological equilibrium, with sediment intake equalling sediment outflow on average. As the flow enters the dammed reach of a reservoir, sediment deposition occurs due to a decrease in flow velocity and a drop in the flow's transport capacity. Sediment-related problems can occur on upstream and downstream and varying widely from one site to another site. A major effect of sedimentation is the loss of storage capacity.

The quality of construction is depending on the quality of materials to be used for constructions. The selection of good quality of construction materials are big very challenges for the construction. The quality of aggregate depends on the quality of rocks and stones explored from the quarries. Sediment-related problems can reduced by using river training work. Use of sediment in river training work for optimizing cost of material and time, importance of utilizing of sediment.

Keywords

River training work, time and cost calculation.

Comparative Analysis of T-Beam Along With Deck Slab by Courbon's Method and Staad Pro

**¹ Mohd. Zain, ² Ashwani Kumar Pandey, ³ Prof. Dr. Rakesh Varma,
⁴ Dr. Ranjendra Kumar Srivastava**

¹ Phd Scholar and Assistant Professor Shri Ramswaroop Memorial University

² M.Tech Student Shri Ramswaroop Memorial University

³ Retired Chief Engineer Level I Irrigation Department U.P., Professor Shri Ramswaroop Memorial University

⁴ Retired Engineer in Chief UP P.W.D. and Retired M.D. U.P. Bridge Corporation

Abstract

Bridge design is crucial because it entails a great deal of difficulty in terms of analyzing loads and load distribution on structural components. The new programme STAAD Pro V8i version was used to analyse a T-beam bridge using IRC loadings and the logical method approach. The main goal of this research is to study the T-beam of the bridge, as well as the deck slab, using Courbon's method and calculating the values of bending moment, shear force, and deflection for a span range of 18.25 m, and to compare the manual results with those obtained using the programme STAAD Pro V8i.

Keywords

T-Beam along with deck slab, Courbon's method, IRC loadings, logical method approach.

A Review of Non-Motorized vehicles Characteristics and Behavior on Urban Road

¹Ankit Kumar Pathak, ²Bilal Siddiqui, ³Prof. (Dr.) Omprakash Netula

¹ M.Tech Scholar, Transportation Engineering, Babu Banarasi Das University, Lucknow, India

² Assistant Professor, Department of Civil Engineering, Babu Banarasi Das University, Lucknow, India

³ Professor & HOD, Department of Civil Engineering, Babu Banarasi Das University, Lucknow, India

Abstract

In India not only the motorized vehicles (MV) moving on road are in majority but also the demands are increasing at a constant rate. Still even after all the craze about bikes and cars, non-motorized vehicles (NMV) holds their fort strongly and for students who go to school or people travelling for short distance non-motorized vehicle mainly bicycles are used. The traffic in India is mostly mixed traffic where we can see bikes, cars, and even busses and trucks on road. In Highway Capacity Manual (HCM) there are no clear provisions about the effects of non-motorized vehicles on road and thus research regarding bicycles (NMV) attracts many researchers whether the conditions are of either heterogeneous traffic or homogeneous traffic.

Keywords

Non-motorized Vehicles (NMV), Motorized Vehicles (MV), Highway Capacity Manual.

Ground Water Quality of Lucknow City

¹ Adarsh Mishra, ² Prof. (Dr.) Omprakash Netula, ³ Mr. Faraz Khan

¹ B. Tech Research Scholar, B. Tech Civil Engineering, Babu Banarasi Das University, Lucknow, India

² Professor and Head of Department, Department of Civil Engineering, Babu Banarasi Das University, Lucknow, India

³ Assistant Professor, Department of Civil Engineering, Babu Banarasi Das University, Lucknow, India

Abstract

Without water life is not sustainable on earth major source of drinking water is ground water. Lucknow being a populated city and metro Politian city, drinking water scarcity is common problem. Surface water in ground water are both source of drinking water in Lucknow. Primarily ground water was safe to drink but due to huge discharge of untreated industrial effluent and other human activities the ground water is contaminated. This is responsible for diseases like hepatitis, jaundice, dysentery, and diarrhoea. In this few station selected at Lucknow city for collecting ground water sample to check temperature, turbidity, conductivity, TDS, chloride, fluoride, total hardness, alkalinity, nitrate and phosphate.

Assessment of Rainwater in Lucknow

¹ **Mohammad Adish Siddiqui**, ² **Prof. (Dr.) Omprakash Netula**,

³ **Mr. Faraz Khan**

¹ B.Tech Research Scholar, Civil Engineering, Babu Banarasi Das University, Lucknow, India

² Professor & Head of Department, Department of Civil Engineering, Babu Banarasi Das University, Lucknow, India

³ Assistant Professor, Department of Civil Engineering, Babu Banarasi Das University, Lucknow, India

Abstract

Lucknow metropolitan city is one of the most populated of India, which have been facing many problems such as overpopulation, water scarcity, waterlogging, etc among these water scarcity problem though conservation and storage of rainwater. The rainwater can be used for all purpose by human beings, thus it is necessary to check chemistry of rainwater.

The rain water samples were collected from the five zones of Lucknow city. For the comparative study, water samples have been collected from two different dates first from first rainfall and second after 3 days of interval in the second rainfall. The heavy metal concentrations were found in both first and second rainfall water samples in all zones of Lucknow city. The concentration of chromium, cadmium and lead were found to be sufficiently high in several samples. These heavy metals show the concentration above the permissible limit as set by WHO, which can cause various adverse health impacts.

Design of Taylor Dampers in Seismic Prone Zone

¹Daljeet Pal Singh, ²Prof. (Dr.) Omprakash Netula

¹ Research Scholar, Department of Civil Engineering, Babu Banarasi Das University, Lucknow, India

² Professor & Head of Department, Department of Civil Engineering, Babu Banarasi Das University, Lucknow, India

Abstract

Structures are the essential components of civil engineering which form the theme of all the infrastructure ranging from the houses to the high rise skyscrapers. But as we all know that an earthquake can strike anytime and can cause the collapse of the building. These collapses can be very fatal to the human life. Not only this our structures and mankind is too much affected by these collapses. In order to sort out these issues we shall design some special type of dampers as per the criteria of design on the software itself. This design shall be very beneficial for increasing the resisting capacity of the building to resist the seismic load and absorb it in itself.

In present scenario, the building structures play a very important role in everyone's life. And it is the structural engineer who designs it economically and efficiently. But sometimes unknowingly earthquake strikes or fire or due to design error etc. the building collapses and the major structural member column fails which ultimately leads to failure of the structure. We cannot stop these type of earthquakes and their causing collapses but we can draw some strategies in order to prevent the failure and save lives. So, the structural member column should be so strengthened so that it can resist the various loads like earthquake loads etc. in order to prevent the failure of column. So, if the column does not fail there will be no sudden collapse of the beam and the human's life living can also be saved. So in order to reduce the extent of collapse and failure it is very necessary to provide Taylor Dampers that will absorb the seismic energy and which will resist the earthquake to a certain extent and the building will be safe.

Keywords

Taylor Damper, FVD 500, Maximum Storey Displacement, Seismic Energy.

Structural Design of Raft Foundations - A Sustainable Option for (G+10) High Rise Buildings in Alluvial Region- A Case Study in Uttar Pradesh Region, India

¹ Devesh Ojha, ² Prof. (Dr.) Rajendra Kumar Srivastava

¹ Research scholar, Civil Department, Shri Ramswaroop University, Lucknow, India

² Retired Engineer in Chief UP P.W.D. and Retired M.D. U.P. Bridge Corporation

Abstract

In this age of rapid urbanization, due to scarcity of the space in prime locations especially in major cities, constructions are proposed even on refilled areas, which may be of natural fill or engineering fill. In the present scenario, the major problem in focus is the geotechnical issues acting as the barrier in the construction of tall buildings in such areas [10]. It is always beneficial to have a raft foundation on alluvial soil for high rise buildings. But, however, it is a matter of great concern that what foundation will be proposed on such type of natural soils or man-made refills [12]. In this paper, an attempt has been made to design a raft foundation based on its geotechnical analysis. An extensive survey of research works devoted to study the geotechnical parameters affecting the behavior of raft foundation is carried out with detailed experiments raft foundations are increasingly being recognized as an economical and effective foundation system for high rise buildings. This paper sets out some principles of design for such foundations, including design for the geotechnical ultimate limit state, the structural ultimate limit state and the serviceability limit state. Attention will be focused on the improvement in the foundation performance due to the raft being in contact with, and embedded within, the soil.

Keywords

raft foundation, high rise buildings, alluvial region

Stabilization of B.C. Soil by Using Chemical and Fly Ash

¹DhanajayBagwatrao Bawaskar, ²Dr. S.S.Koranne

¹ P. G. Student, Department of Civil Engineering, Government Engineering College Aurangabad, Maharashtra, India

² Associate Professor, Department of Civil Engineering, Government Engineering College Aurangabad, Maharashtra, India

Abstract

Black cotton soils are very susceptible to detrimental volumetric changes with changes in moisture. This behavior of soil is attributed to the presence of mineral montmorillonite which has an expanding lattice. Extensive research is going on to find the solutions to Black cotton soils. Recent investigations on chemical stabilization revealed that electrolyte like Calcium Sulphate, Calcium Carbonate, and Zinc Chloride can be used in place of conventionally used lime, due to their ability to supply adequate cautions. Fly ash is a waste byproduct from thermal power plants consuming thousands hectares of precious land for its disposal and also causing severe health and environmental hazards.

This work presents the results of experimental program undertaken to investigate the effect of Calcium Sulphate, Calcium Carbonate, Zinc Chloride and fly ash at different percentage on properties of black cotton soil. From the results it is observed that 1.5% of Zinc Chloride and 12% of Fly ash improves the properties of black cotton soil as compared to Calcium sulphate & Calcium Carbonate. The conclusion drawn from this investigation is that combination of 1.5% of chemical and 12% of fly ash is more effective in improving the properties of black cotton soil.

Keywords

Fly Ash, Calcium Sulphate, Calcium Carbonate, Zinc Chloride, Black Cotton Soil

Building Rating Systems: A Critical Review on Their Sustainability Compatibility

¹Divya Mohanan, ²Dr. Deepa G Nair

¹ Assistant Professor, MES College of Engineering, Kuttippuram, Kerala

² Associate Professor, Cochin University of Science & Technology, Kerala

Abstract

The most accepted international definition of sustainable development quoted from the Brundtland Report published in 1987 states that development that meets the needs of the present without compromising the ability of future generations to meet their own needs. This definition serves as a foundation for many fields including the building sector to consider sustainability and focuses on the three pillars of sustainability social, economic and environment. Building industry due its multi-faceted nature requires building codes, standards, and certification systems to effectively address the sustainability assessment. In last decade many buildings rating system evolved that addresses sustainability in one or the other way and many more are on the drawing boards yet to come. This paper attempts to offer a comprehensive literature review of seven popular building rating systems (LEED (US), BREEAM (UK), CASBEE (Japan), GRIHA, LEED, IGBC), scrutinizing their macro areas, segments of sustainability and thus highlight the need for a framework which addresses assessment of the building in terms of sustainability as a whole.

Keywords

Building Rating Systems, Sustainability, LEED, BREEAM, CASBEE, GRIHA, LEED, IGBC

Study on Earthquakes Vibration Control using Modified Frame Shear Wall

¹ Vikas Singh, ² Km Rekha Yadav, ³ Deepak Yadav Prashant Kumar Singh, ⁴ Anurag Yadav, ⁵ Mohammad Afaque Khan, ⁶ Prof.(Dr.) Omprakash

Netula

^{1,2} B Tech Student , Department of Civil Engineering, Babu Banarasi Das University, Lucknow, India

³ Assistant Professor, Department of Civil Engineering, Babu Banarasi Das University, Lucknow, India

⁴ Professor and Head of Department, Department of Civil Engineering, Babu Banarasi Das University, Lucknow India

Abstract

In past earthquakes, numerous structures (Reinforced Concrete) have encountered either extraordinary sorts of harm or then again crumbled. On structures which were fell by seismic tremors different examinations have been completed. As step by step seismic zones are changing the structures which are prior not inclined to Earthquake, now came in serious zones, so for them this technique for reinforcing should be possible effectively. What's more, for those structures which was not built as per present day code technique, by assessing them as indicated by their significance esteem specified in code (IS 1893 part1:2002) we can ahead of time give adequate firmness to those working to oppose the parallel loads altogether by building outside shear mass of sufficient quality according to Code arrangements.

A Review on Utilization and Valorization of Waste Products in Concrete Construction

¹Navneet Singh, ²Shubhranshu Jaiswal, ³Dr. Omprakash Netula,
⁴Adarsh Kumar, ⁵Vaibhav Roshan, ⁶Abhinav Singh Rathore

^{1,4,5,6}B.Tech Scholar, Civil Engineering, Babu Banarasi Das University, Lucknow, India

² Assistant Professor, Dept. of Civil Engineering, Babu Banarasi Das University, Lucknow, India

³ Head of Department, Dept. of Civil Engineering, Babu Banarasi Das University, Lucknow, India

Abstract

The concept of recycling is one of the major concerns nowadays as it helps in protection of Environment because it reduces need for extracting, refining and processing of raw materials. Hence many researches in Civil Engineering are oriented on using waste materials and reducing cost of construction material especially in concrete as it is most frequently and widely used material in construction. Using waste products in concrete reduces the cost of production as well as helps in conservation and protection of Environment. Here an experimental program was conducted in which, different waste products like concrete debris (from demolished structures), micro silica (from production of elemental silicon or alloy containing silicon), marble dust (from extraction and production of marble) and glass (from various daily sources) are being combined in different ratios and combinations for construction of concrete blocks to get new products with having properties as same as the conventional one. The engineering properties of modified concrete blocks, made from combination of different waste products, are then compared with one another and also with known engineering properties and conventional concrete samples on the basis of compressive strength, durability, split tensile strength, flexural strength and Schmidt hammer. This study is oriented on finding best combination for replacement of concrete materials by using these waste products without effecting the properties of conventional concrete.

Keywords

Concrete Debris, Micro Silica, Marble Dust, Glass, Valorization, Green Concrete

Estimation of Land Surface Temperature from Landsat-8 TIRS using NDVI base Emissivity Method: A Case Study In Imphal Iril River Sub-Catchment

¹Ngangom Robertson, ²Dr. Oinam Bakimchandra

¹ Civil Engineering Department, NIT Manipur, India

Abstract

Land surface temperature is one of the most important parameter for climatic models and also considered as an important indicator for sustainable agriculture. Imphal-Iril river sub- catchment lies in Manipur valley, where Agriculture land (16.5%) and Forest (73%) are found to be the predominant LULC classes. The objective of the study is to indirectly estimate the Land surface Temperature distribution in different Land Use within the catchment using satellite derived normalized difference vegetation index (NDVI) and land surface emissivity (LSE). Land surface temperature was computed from LANDSAT 8 TIRS band 10 imagery data(Thermal Band) and that of NDVI was generated from LANDSAT 8 OLI band 5(NIR) and band 4(Red) using ArcGIS tools for three different time period which are 22 November 2018, 8 December 2018 and 9 Jan 2019. In order to validate the computed LST, Forty Five in-situ observations data for different Land Used were measured by using Temperature Probe. The continuous Land Surface Temperature maps for three different time period are generated to understand the Land Surface Temperature variability in the region.

Keywords

Land Surface Temperature, Land Surface Emissivity, TIRS, NDVI, LULC

Study and Analysis of Bamboo Reinforced Concrete Structures

¹Noor Khan, ²Mr. Kamal Nabh Tripathi

^{1,2} Student, Civil Engineering, Babu Banarasi Das University Lucknow, India

Abstract

Around the world agriculture has been considered as an important part of economic development. It is an requisite of an agenda for raising the global issue of 21st Century. The increase in population growth has laid to the rapid growth of urban development and industrial development in various countries across the world as a result there is release of huge amount of harmful toxic compound in the environment which affect the quality of life and ecological function. These pollutants can enter in the soil system through improper waste disposal, industrial and urban effluent discharge, sewage sludge, pesticides and fertilizer application, unauthorized dumping house hold waste. Unprocessed solid waste and release of sewage effluent in environment and their use for crop production is the major path for contamination of Agricultural soil with toxic metals and organic pollutants. In developing countries disposal of untreated municipal solid waste is the major concern. The municipal solid waste contains harmful pollutants which causes harmful result to human and surrounding.

The study aimed at evaluating the effect of leaching pollutant of municipal solid waste on Agricultural sub-soil quality

A Review of Amendment of Geotechnical Properties with the Help of Various Amenders Such as Red Mud & Flyash

¹ Shaikh Abu Ammar, ² Ankit Verma, ³ Prof. (Dr.) Omprakash Netula

¹ B.Tech, Civil Engineering, Babu Banarasi Das University, Lucknow, India

² Assistant professor, Department of Civil Engineering, Babu Banarasi Das University, Lucknow, India

³ Professor & Head, Department of Civil Engineering, Babu Banarasi Das University, Lucknow, India

Abstract

Red mud is a waste thing from the Alumina industry and it makes a lot of prosperity dangers to the nature, if it is left masterminded without indispensable wellbeing measures, therefore safe expulsion practices and reuse of the thing are one of the plans. This report is one of the bits of utilizing the red mud in a predominant and money related way. In this paper the red mud is used as an elective advancement material after remediation by Amenders, for instance, flyash. This gives a wise equilibrium technique similarly as abundant material which can use in Civil Engineering Works.

Keywords

Red mud, flyash, waste material

Research on Heavy Metal Pollution of River Ganga: A Review

Shivendra Pratap Singh

B.Tech Student, Babu Banarasi Das University, Lucknow, Uttar Pradesh, India

Abstract

The people of India consider the river Ganga as a sacred place. Its importance has been acknowledged by various scientific and academic institutions. However, its use has been questioned due to the increasing number of anthropogenic activities.

Heavy metals such as copper and aluminum are known to cause water pollution in developing nations. This issue can be caused by the accumulation of these metals in the environment. Heavy metals are known to cause various health problems such as developmental retardation and cancer among humans. The pollution of the river Ganga has been identified as one of the most significant factors contributing to the increasing cases of these diseases.

Effect of using Human Hair as Fibre Reinforcement in Translucent Concrete, A Review

¹ Utkarsh Sharma, ² Nishit Mishra, ³ Rishabh Kumar Yadav, ⁴ Shivansh Mishra, ⁵ Ravi Maurya

¹ B-Tech Student, Babu Banarasi Das University, Lucknow, Uttar Pradesh, India

² Assistant Professor, Babu Banarasi Das University, Lucknow, Uttar Pradesh, India

Abstract

In this modern world, we have a lot of new and emerging construction technologies. A lot of researches are in progress and a lot of them to be done according to the need of Civil Engineering field. Something similar we are going to do during this study. As we know, population of this world is increasing day by day that's why, population density on earth is increasing and this increasing population density is redirecting our construction field to build more Skyscrapers. Due to this human act, it's getting hard to have sunlight in some areas. Even in some buildings, sunlight never reaches to the ground floor. To fight with this problem, as it's solution, a lot of researches are done on Translucent Concrete. Translucent Concrete permits light through it and gives an attractive look to construction. As we know, if there is a head, there must be a tail, There are some drawbacks with using Translucent Concrete like it's manufacturing cost, less tensile strength and less compressive strength. To fulfil the objective of this study, we are going to make an experiment in which we are using human hair as fibre reinforcement by 2% of total weight. After that all the required tests will be done. This kind of study may be proceeded in future by using human hair in Translucent Concrete to increase it's tensile strength and make it cost-effective.

Keywords

Translucent Concrete, Workability, Compressive Strength, Tensile Strength.

Study on Water Quality of River Gomti for Two Different Scenarios in Lucknow City

¹Talib Sohail, ²Dr. Omprakash Netula, ³Mr. Faraz Khan

¹ B.Tech Research Scholar, Civil Engineering, Babu Banarasi Das University, Lucknow, India

² Professor and Head of Dept., Department of Civil Engineering, Babu Banarasi Das University, Lucknow, India

³ Assistant Professor, Department of Civil Engineering, Babu Banarasi Das University, Lucknow, India

Abstract

The U.S Geological survey states that there are over 332,519,000 cubic miles of water on the planet Earth among which 97% of all the water on Earth is held by the oceans and contains heavy composition of salt in it and most of the remaining 3% is frozen in the glaciers and icebergs. The atmosphere, rivers, lakes and underground stores hold less than 1% of all the fresh water and this small amount has to provide the fresh water required to support Earth's entire population. River is a water body which plays a very important role in the life of human beings as well as the other living organisms like animals and plants on the earth. River used to be one of the most important source of clean water during earlier days but nowadays due to the heavy contamination the quality of water of river is decreasing day by day. The river Gomti in Lucknow was an important source of water for the different uses few decades ago. However, because of the rapid global changes, current status of the river is very critical from environmental, aesthetic and commercial usage point of view. Henceforth, this research work focused on assessing the current as well as predicting its future situation using different scenarios while considering key drivers of global changes namely climate change and population growth. Water Evaluation and Planning (WEAP), a numerical simulation tool, was used to model river water quality using two scenarios viz. business as usual (BAU) and scenario with mitigation methods. Water quality was analysed & studied along the 12km stretch of Gomti river in Lucknow (Uttar Pradesh).

Study of Leaching Pollutants in Agricultural Sub-Soil by Dumping of Solid Waste

¹ Kamal Nabh Tripathi, ² Dr. Omprakash Netula

^{1,2} Assistant Professor, Civil Engineering, Babu Banarasi Das University Lucknow, India

Abstract

Around the world agriculture has been considered as an important part of economic development. It is an requisite of an agenda for raising the global issue of 21st Century. The increase in population growth has laid to the rapid growth of urban development and industrial development in various countries across the world as a result there is release of huge amount of harmful toxic compound in the environment which affect the quality of life and ecological function. These pollutants can enter in the soil system through improper waste disposal, industrial and urban effluent discharge, sewage sludge, pesticides and fertilizer application, unauthorized dumping house hold waste. Unprocessed solid waste and release of sewage effluent in environment and their use for crop production is the major path for contamination of Agricultural soil with toxic metals and organic pollutants. In developing countries disposal of untreated municipal solid waste is the major concern. The municipal solid waste contains harmful pollutants which causes harmful result to human and surrounding.

The study aimed at evaluating the effect of leaching pollutant of municipal solid waste on Agricultural sub-soil quality

Corrosion Mechanism, Prevention & Repair Measures Of Rcc Structures

¹ **Abhishek Patel**, ² **Ashutosh**, ³ **Ankit Singh**, ⁴ **Aftab Alam**, ⁵ **Neeraj Pathak**,
⁶ **Mrs. Neeti Mishra**

^{1,2,3,4,5} B.Tech Scholars, B.Tech Civil Engineering, Babu Banarasi Das University, Lucknow, India

⁶ Assistant Professor, Department of Civil Engineering, Babu Banarasi Das University, Lucknow, India

Abstract

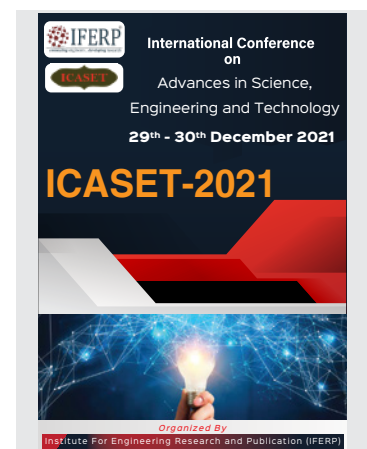
Corrosion causes the damages regarding to the concrete structures those results in major complications affecting the mean life of the structure. But cannot be brought to end totally. Corrosion can be brought down to a certain point where it is less effective in nature through certain processes and certain practices. Permeability (penetration of water through certain pores) is an opening to the corrosion. Structures which are susceptible to corrosion get damaged due to corrosive nature of the reinforcement in concrete structures. Suitable and effective repair system is an unavoidable protective solution for corrosion affected concrete structures. Repair materials, its criteria various techniques and methodology has been taken into account for prevention and curing, repairing of concrete structures. This review paper discusses all the aspects corrosion it's mechanism the preventive measures that can be taken to prevent corrosion in a RCC structure and the repairs measures that can be further taken into account to eliminate corrosion in the structure. The review also helps us to grab all the necessary points from the previous researchers that are undergone in this field.

Keywords

Corrosion, Penetration, Structure, Permeability, Techniques and methodology Preventive & Protective Solutions

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